BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

STRATAGOLD CORPORATION

EAGLE GOLD PROJECT

HEAP LEACH FACILITY DETAILED DESIGN

PROJECT NO.: 0792018
DOCUMENT NO.: 01
DATE: November 16, 2017

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 500 - 980 Howe Street
Vancouver, BC Canada V6Z 0C8
Telephone (604) 684-5900
Fax (604) 684-5909

November 16, 2017
Project No.: 0792018

Mark Ayranto
Victoria Gold Corporation
Suite 584 – Bentall Four
1055 Dunsmuir Street
Vancouver, BC V7X 1K8

Dear Mr. Ayranto,

Re: HEAP LEACH FACILITY DETAILED DESIGN

Please find attached a draft copy of our above-referenced report for your review and comment. We trust this meets your current requirements.

Yours sincerely,

BGC ENGINEERING INC.
per:

Troy Meyer, PE, P.Eng.
Principal Geotechnical Engineer

TABLE OF CONTENTS

TABLE OF CONTENTS i
LIST OF TABLES ii
LIST OF APPENDICES ii
LIST OF DRAWINGS iii
1.0 Introduction 1
1.1. General 1
1.2. Objective and Scope 2
2.0 Site Conditions 3
2.1. General 3
2.2. Climate 3
2.3. Site Subsurface Conditions 3
2.3.1. Overburden 4
2.3.2. Bedrock 4
2.3.3. Groundwater 5
2.3.4. Permafrost 5
2.4. Hydrology 6
2.5. Seismicity 6
3.0 Design Criteria and Approach 8
3.1. Permitting Considerations 8
3.2. Design Requirements 8
3.3. Design Basis 9
3.4. Engineering Design Criteria 10
4.0 HLF Design Components 14
4.1. General 14
4.2. Heap Leach Pad and Confining Embankment 14
4.2.1. General 14
4.2.2. Liner System 14
4.2.3. Underdrain System 15
4.2.4. Confining Embankment 15
4.3. Event Pond 16
4.4. Surface Water Controls 16
4.5. Instrumentation 17
5.0 Engineering Analyses 18
5.1. General 18
5.2. HLF Foundation Preparation 18
5.2.1. Ground Ice Identification 19
5.2.2. Ground Ice Removal 21
5.2.3. Final Foundation Preparation 22
5.3. Liner Systems Design 23

5.3.1. Liner Subgrade 23
5.3.2. Geomembrane Selection 23
5.3.3. Liner System Testing 24
5.3.4. Description of Liner Systems 25
5.3.5. Leak Detection and Recovery Systems 25
5.3.6. Overliner Drain Fill 26
5.4. Leach Pad Drainage System Design 26
5.4.1. Drain Pipe Network 26
5.4.2. PLS Riser Pipes 27
5.4.3. Closure Drain System 27
5.5. Event Pond Sizing 28
5.6. Interceptor Ditches 28
5.7. Spillways 29
5.8. Slope Stability Analyses 29
5.9. Settlement Assessment 30
5.10. Water Balance Considerations 31
6.0 Limitations 32
7.0 Closure 33
References 34

LIST OF TABLES

Table 2-1. Design storm events. 6
Table 3-1. Summary of design requirements for State of Nevada. 8
Table 3-2. Engineering design criteria. 11
Table 5-1. Frozen material management. 20
Table 5-2. Event pond sizing. 28
Table 5-3. Calculated peak flows. 29

LIST OF APPENDICES

APPENDIX A SUPPORTING INFORMATION

A1 BGC Engineering, Inc. (2012a), 2011 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report, January 20, 2012.

A2 BGC Engineering, Inc. (2012b), 2012 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report, November 30, 2012.

A3 BGC Engineering, Inc. (2017a) Eagle Gold Project 2016 Heap Leach Facility Geotechnical Investigation, June 2017.

A4 Various Laboratory Testing Reports, Golder 2012.

A5 Seismic Peak Ground Accelerations for Design, Technical Memorandum, Tetra Tech, November 2012.

APPENDIX B IN-HEAP POND SPILLWAY ANALYSIS

APPENDIX C SOLUTION PIPE CALCULATIONS

APPENDIX D PIPE DEFLECTION ANALYSIS

APPENDIX E IN-HEAP POND AND EVENT PONDS SIZING

APPENDIX F LINER LEAKAGE ANALYSIS

APPENDIX G SLOPE STABILITY ANALYSES

APPENDIX H SETTLEMENT ANALYSES

APPENDIX I EVENT POND LINER BALLAST DESIGN

APPENDIX J PROJECT TECHNICAL SPECIFICATIONS

LIST OF DRAWINGS

EGHLF-XD-00-01 TITLE SHEET AND DRAWING INDEX

EGHLF-XD-00-02 GENERAL NOTES AND LEGEND

EGHLF-XD-01-01 GENERAL ARRANGEMENT PLAN

EGHLF-XD-01-02 SURVEY CONTROL PLAN

EGHLF-XD-01-03 SURFACE GEOLOGY MAP

EGHLF-XD-01-04 SITE INVESTIGATION PLAN

EGHLF-XD-01-05 OVERALL LAYOUT PLAN

EGHLF-XD-02-01 PHASE 1 PAD GRADING PLAN

EGHLF-XD-02-02 PHASE 1 ORE PILE PLAN

EGHLF-XD-02-03 PHASE 1 PAD GRADING CROSS-SECTIONS – SHEET 1 OF 1

EGHLF-XD-02-04 PHASE 1 PAD GRADING CROSS-SECTIONS – SHEET 1 OF 2

EGHLF-XD-02-05 CORRIDOR TYPICAL SECTIONS

EGHLF-XD-02-06 LINER DETAILS

EGHLF-XD-03-01 PHASE 1 TEMPORARY DIVERSION CHANNEL P & P – SHEET 1 OF 2

EGHLF-XD-03-02 PHASE 1 TEMPORARY DIVERSION CHANNEL P & P – SHEET 2 OF 2

EGHLF-XD-03-03 PHASE 1 UNDERDRAIN PIPING PLAN

EGHLF-XD-03-04 PHASE 1 UNDERDRAIN PIPING DETAILS

EGHLF-XD-03-05 CLOSURE PIPING PLAN AND PROFILE
EGHLF-XD-04-01 EMBANKMENT PLAN VIEW
EGHLF-XD-04-02 EMBANKMENT CROSS-SECTIONS
EGHLF-XD-04-03 EMBANKMENT DETAILS
EGHLF-XD-05-01 IN-HEAP SUMP DETAILS – SHEET 1 OF 2
EGHLF-XD-05-02 IN-HEAP SUMP DETAILS – SHEET 2 OF 2
EGHLF-XD-05-03 PLS SUMP DETAILS – SHEET 1 OF 2
EGHLF-XD-05-04 PLS SUMP DETAILS – SHEET 2 OF 2
EGHLF-XD-05-05 LDRS AND CLOSURE SUMP DETAILS
EGHLF-XD-05-06 MONITORING VAULT DETAILS
EGHLF-XD-06-01 PHASE 1 PLS RECOVERY PIPING PLAN VIEW
EGHLF-XD-06-02 PHASE 1 PLS RECOVERY PIPING DETAILS – SHEET 1 OF 2
EGHLF-XD-06-03 PHASE 1 PLS RECOVERY PIPING DETAILS – SHEET 2 OF 2
EGHLF-XD-07-01 EVENT POND PLAN VIEW
EGHLF-XD-07-02 EVENT POND CROSS-SECTIONS
EGHLF-XD-07-03 EVENT POND DETAILS – SHEET 1 OF 2
EGHLF-XD-07-04 EVENT POND DETAILS – SHEET 2 OF 2
EGHLF-XD-07-05 EVENT POND SPILLWAY PLAN AND PROFILE
EGHLF-XD-07-06 EVENT POND SPILLWAY TYPICAL SECTIONS AND DETAILS
EGHLF-XD-08-01 IN-HEAP POND SPILLWAY PLAN AND PROFILE
EGHLF-XD-08-02 IN-HEAP POND SPILLWAY BOX CULVERT PLAN AND PROFILE
EGHLF-XD-08-03 IN-HEAP POND SPILLWAY DETAILS
EGHLF-XD-09-01 INSTRUMENTATION PLAN
EGHLF-XD-09-02 INSTRUMENTATION DETAILS

1.0 INTRODUCTION

1.1. General

This report presents the design documents prepared by BGC Engineering, Inc. (BGC) for the proposed Heap Leach Facility (HLF) at StrataGold Corporation's (SGC) Eagle Gold Project located in Yukon Territory, Canada. SGC is a directly held, wholly owned subsidiary of Victoria Gold Corp. The Project is planned as an open pit operation with a leach facility and an adsorption-desorption-recovery (ADR) processing plant. The Eagle Gold Site is in the center of the Yukon Territory about 350 kilometers north of the capital, Whitehorse, and approximately 45 kilometers north of Mayo, a small village on the Stewart River. The proposed project site is located within the lower Dublin Gulch/Eagle Creek watershed (Drawing EGHLF-XD-00-01).

The project facilities general arrangement plan including the Heap Leach Facility (HLF) is shown on Drawing EGHLF-XD-01-01. The HLF will accommodate approximately 77 Mt of ore at full build-out, and has an approximate capacity of 25 Mt in the Phase 1 pad.

Ore excavated from the pits will be crushed at the crusher complex to be located north of the Eagle pit, and transported via an approximately 1.2-km long conveyor to the east edge of the leach pad ultimate limit. The crushed ore will be transported to the leach pad and stacked using mobile conveyors and a radial stacker, where a dilute cyanide solution will be applied to the ore heap top surface and leached through the heap. The leachate solution will drain by gravity to an internal process pond located at the base of the HLF confining embankment. The pregnant leach solution (PLS) will be pumped from the in-heap pond to the ADR plant for processing to extract gold.

The HLF is shown on Drawing EGHLF-XD-01-05 and consists of a three-phase leach pad and internal collection pond and an external event pond. The confining embankment and event pond be constructed during Phase 1 HLF construction.

This report presents the detailed design for the Phase 1 HLF including the following components:

- HLF confining embankment
- Phase 1 pad
- Event pond
- Interception ditches
- Spillways.

The detailed design layouts and grading plans prepared for the construction of the Phase 1 HLF are shown on Drawing EGHLF-XD-02-01. The limits of the future subsequent pad phases shown on Drawing EGHLF-XD-02-01 are approximate. The interceptor ditch to be constructed during Phase 1 HLF construction is shown on Drawing EGHLF-XD-02-01. The event pond that will be used to store excess water will be constructed during Phase 1 and is shown on Drawing EGHLF-XD-07-01. The design of other mine facilities such as conveyors, roads, pumping systems, and the ADR plant is being prepared by others.

1.2. Objective and Scope

The objective of this study was to provide an overall layout of the Phases 1 through 3 HLF with a detailed design for the construction of the Phase 1 HLF and Event Pond. This report presents the elements of the engineering analysis and design work performed including the following:

- Compilation of relevant available project and site data
- HLF design objectives, criteria and approach (based on discussions with StrataGold and other consultants working on the project)
- Project description for HLF design components
- General site description including location, climatology, surface conditions, geology, geotechnical characteristics, and seismicity
- Sizing, layouts and grading plans for the Phase 1 pad, confining embankment and Event Pond
- Design details of the HLF including liner systems, and solution drainage, collection and conveyance
- Design details of the confining embankment and spillway channel
- Slope stability analyses for the embankment, ore heap and pad
- Evaluation of foundation settlement for the leach pad
- Operational water balance computations for the HLF
- Design details of the Event Pond including crests, spillways, sumps, liner systems, and leak detection
- Design of temporary surface water interceptor ditches
- Technical specifications for construction.

The various aspects of the detailed design are included in the following sections and appendices of the report and in the design drawings.

2.0 SITE CONDITIONS

2.1. General

A detailed description of the HLF site is provided in various reports prepared by BGC (2012a, 2012b, 2017a). These reports are included as Appendix A and the relevant findings from these reports are summarized herein.

The HLF site topography involves moderate to high relief, with ground elevation varying from approximately 880 to 1400 masl. A surface geology map of the HLF site was prepared by BGC and is presented as Drawing EGHLF-XD-01-03.

2.2. Climate

The property lies within the Mayo Lake–Ross River Eco-region in central Yukon. The area is characterized by a "continental" type climate, with moderate annual precipitation and a large temperature range. Summers are short and can be hot, while winters are long and cold with moderate snowfall. Rainstorm events can occur frequently during the summer, and may contribute 30% to 40% of the annual precipitation. Higher elevations are snow-free by mid-June.

Frost action may occur at any time during the summer or fall. Climate monitoring began at the Potato Hills station (located in the upper Dublin Gulch watershed) in August 2007 and at the Camp station (located close to the existing exploration camp) in August 2009. Both stations are still in operation. Regional climate data was collected from up to nine stations throughout the Yukon Territory.

The mean annual temperature for the area is approximately -3°C, with an annual range of 63.5°C for the period of record. The estimated mean annual precipitation in the study area ranges from 350 mm to over 600 mm. This range in annual estimated precipitation reflects the elevation changes at the site. This climate description has been summarized from Stantec (2011b), Knight Piesold (2013) and Lorax (2017). More recent precipitation data has also been reviewed as part of the design and found to be within the natural variability. Additional climate data is discussed in Section 5.10 – Water Balance Considerations.

2.3. Site Subsurface Conditions

Geologic conditions in the Dublin Gulch area have been strongly influenced by the geotectonic forces that produced the Eagle Zone deposit. The folding, faulting and plutonic activities have resulted in relatively weak rock mass with relatively poor mechanical properties. Further, with frost fracturing and permafrost common at the latitude of the project site, shallow subsurface processes and rock/soil characteristics are more complex.

Overburden soils encountered on the sloping ground at the HLF site typically consist of a veneer of organic soils overlying a blanket of colluvium, which overlies weathered bedrock. Placer tailings (fill remainders of old artisan mining operations) cover most of the valley bottom of Dublin Gulch,

which is outside the footprint of the HLF. Alluvial soils are occasionally encountered along undisturbed valley-bottom areas.

The bedrock encountered in the area is generally classified as metamorphosed sedimentary rock, with a variably deep weathering profile. The intact rock strength of the encountered rock types is highly variable, with strength ranging between R0 class (i.e., corresponding to < 1 MPa Unconfined Compressive Strength, UCS) and R4 (50-100 MPa UCS). The average intact strength is estimated to be approximately R2 (5-25 MPa) in the metasedimentary rock, depending upon the degree of weathering, but with significant variability across the site.

2.3.1. Overburden

Overburden soil conditions are distinctly different in the Dublin Gulch valley bottom from those encountered above the valley bottom in Ann Gulch in the area of the proposed HLF. In the uplands above the valley bottom, the upper soil unit consists of a thin horizon of organic soil, rootlets, woody debris and plant matter ranging from 0.1 to 2.7 m thickness and averaging approximately 0.3 m. The organic cover above the valley bottom overlies colluvium; the colluvium ranges in thickness from 0.2 to 15.2 m, and averaging approximately 2.9 m. The colluvium consists of angular gravel with occasional cobbles in a silt and sand matrix, derived from transported weathered metasedimentary bedrock. The colluvium may also include variable amounts of organics, which are often observed in distinct layers within the colluvium.

The placer tailings in the Dublin Gulch valley bottom have highly variable particle size distribution and density, and are generally saturated. The HLF facilities layout does not overlay the placer tailings deposits; however, these materials may be used for construction of required fills. The material is generally a well graded, silty sand and gravel, ranging to sand and gravel with some silt and occasional cobbles and boulders. There is little to no vegetative cover on the placer tailings.

Seismic refraction surveys were performed in the project area to evaluate the variability of the overburden depth. Generally, the thickness of the overburden transitions smoothly from very little at the top of the slopes increasing to the valley floor. This is the same trend with the depth of weathering. The results of the surveys are included in Appendix A2.

2.3.2. Bedrock

Bedrock was observed in the uplands above Dublin Gulch immediately below colluvium at depths ranging between 0.0 and 16.8 m below existing grade (average observed depth to bedrock is 3.5 m). The left abutment (looking downstream) of the proposed HLF confining embankment is characterized by colluvium up to 4 m in thickness over weathered bedrock (generally class R0 to R1). R1 class rock, referred to as Type 3 rock in this report and Appendix A, has a minimum intact UCS strength greater than 1 MPa and can be excavated with normal excavating equipment. The data in the right abutment area indicate colluvium thickness greater than 6 meters.

Observed bedrock consists of highly to completely weathered metasedimentary rock (i.e., Type 3 rock) or moderately to highly weathered rock (i.e., Type 2 rock). The observed metasediments

are in general strongly foliated yellowish brown to dark grey phyllites interbedded with quartzites. The quartzites are variably gritty, micaceous, and massive. Phyllitic metasediments are composed of muscovite-sericite and chlorite.

The rock mass quality and characteristics have been inferred from observations in boreholes within the heap leach pad footprint. Rock Mass Rating values of 20 to 30 were determined from the observed rock core to about 10 m depth, then increased to about 45 to 50 at most locations.

The seismic refraction surveys confirmed the depth to highly weathered bedrock ranging from 1 to 5 m along the hillside in the area of the proposed HLF Event Pond. The depth to moderately weathered bedrock ranged from 10 to 20 m in this area.

Seismic refraction results indicate highly weathered bedrock ranging from 0 to 4 m below ground in the proposed HLF confining embankment left abutment. The depth to moderately weathered bedrock ranged from 20 to 25 m in this area.

2.3.3. Groundwater

The regional drainage patterns are largely controlled by the structural geologic features such as faults and folds. Near surface groundwater is recharged by precipitation and flows toward the valley floors through the alluvial/colluvial sediments and the fractured bedrock. Therefore, the groundwater table mimics the topography. Surface seeps have been noted at the site; they are typically seasonal and may be structurally controlled by geologic contacts in places.

The observed groundwater depths in the upper Ann Gulch valley range on the upper slopes from 6.1 m below grade close to the middle of Ann Gulch to 15.4 m in the headwaters of Ann Gulch. It is anticipated that these levels will vary seasonally. A standpipe piezometer installed at borehole BH-BGC16-091 in the area of the planned HLF confining embankment indicated a water level of 10 m and 5 m below top of pipe measured in September 2016 and June 2017, respectively. These levels correspond to 5 m below the adjacent streambed in September 2016 and level with the streambed in June 2017. The piezometer location is approximately 50 m away from the streambed.

2.3.4. Permafrost

Frozen ground as discontinuous permafrost was encountered within the footprint of the HLF footprint in about 6 of 30 test pits in the Ann Gulch basin. When observed in a plan view, the test pits with frozen ground are scattered in the Phase 1 HLF pad area and in the area of the proposed event ponds. Frozen ground was typically encountered within colluvial gravels and gravels and sands with depths varying between 0.6 m to 2.8 m, and occasionally included excess ice with limited thickness. Section 5.2.1 presents requirements for identifying and removing ice-rich materials.

2.4. Hydrology

The hydrology of the region is generally characterized by large snowmelt runoff during the spring freshet, which quickly taper off to low summer stream flows interspersed with periodic increases in flow associated with intense rainfall events (Stantec 2012).

The U.S. Army Corps of Engineers Hydrologic Engineering Center's Hydrologic Modeling System (USACE HEC-HMS), version 4.1 (USACE 2010) was used to determine the peak flows and runoff volumes for the HLF and Event Pond spillways. The Soil Conservation Service (SCS) storm method was used for rainfall distribution (NRCS 1986).

The SCS curve number method (NRCS 1986) was used for estimating the runoff from storm events. Rainfall initial losses depend primarily on soil characteristics and on land use (surface cover). The curve number (CN) method uses a combination of soil conditions and land use to assign curve numbers. Curve numbers represent the runoff potential of a soil type (i.e., the higher the CN, the higher the runoff potential). A value for CN of 70 was selected for the HLF. The time of concentration for each sub-basin was calculated using Figure 1 in the Manual of Operational Hydrology in British Columbia (MOE 1991). This graphical method takes into consideration the area and the terrain of the basin. The SCS unit hydrograph method was used to transform rainfall to runoff. The lag time was calculated as 0.6 times the time of concentration.

Rainfall depths are based on a technical memorandum prepared by Knight Piesold (2013). More recent precipitation data compiled by Lorax (2017) were examined and for this design the more conservative data from Knight Piesold (2013) were utilized. Rainfall depths and rainfall distribution were calculated for 100-year, 500-year and Probable Maximum Precipitation (PMP) events. The design storm events are listed in Table 2-1.

Table 2-1. Design storm events.

Return Period (years)	24-hour Duration Precipitation Depth (mm)
100	71
500	89
PMP	256

2.5. Seismicity

According to the site-specific seismic hazard analysis previously performed for this site (Tetra Tech, 2012), a design PGA of 0.35g should be used for facilities requiring low-probability (e.g., 1 in 5,000, or 1 in 10,000-yr events) or maximum design earthquake (MDE) ground motions, and a PGA of 0.25g should be used for facilities requiring a 1 in 2,475-year event (equivalent to a 2 percent probability of exceedance in 50 years). The lower PGA (0.25g) was used for ground motions associated with a design basis earthquake (DBE), and the higher PGA (0.35g) was used for ground motions associated with an MDE event.

Pseudo-static analyses were performed to evaluate the stability of the HLF under seismic (earthquake) loading. A pseudo-static stability analysis incorporates the effects of seismic loads by subjecting the two-dimensional sliding mass to a horizontal acceleration equal to a seismic coefficient based on the peak ground acceleration (PGA) expected during an earthquake.

According to recommendations provided by the United States Army Corps of Engineers miscellaneous paper GL-84-13 (Hynes-Griffin and Franklin, 1984), a seismic coefficient equal to one-half the PGA is appropriate for a pseudo-static analysis of structures in which deformations of up to about 1 m are tolerable (i.e., 0.125g for a DBE design, and 0.175g for an MDE design at this site).

The DBE was used in the operational pseudo-static analyses, while the MDE was used in the post-closure pseudo-static analyses. The magnitude and distance of the DBE (NRCAN 2017) and MDE (Tetra Tech 2012) are M = 5.7 at 17 kilometers and M = 7.0 at 30 kilometers, respectively.

3.0 DESIGN CRITERIA AND APPROACH

3.1. Permitting Considerations

Regulations and permitting requirements for Heap Leach Facilities in the Yukon Territory are not expressly stated, but rather, they have historically relied on regulations from other regions and on precedence established from other successful projects. Previous studies (Scott Wilson 2010) selected Brewery Creek, the gold mine (operational from 1996 until 2002) located approximately 55 km east of Dawson City, Canada as the example facility to follow for permitting guidelines. This was understood to be the only HLF permitted in the Yukon, the design of which was based on the Nevada State guidelines and associated permitting limitations. This approach has been carried into the feasibility study and final design along with best engineering practice.

The Heap Leach Facility design standards adopted for the project include:

- The regulatory requirements of Yukon and Canada;
- The Yukon Water Board Licensing Guidelines (2009);
- The existing project Water Use License permit requirements;
- Guidelines from the Canadian Dam Association (2013, 2014); and
- Permitting requirements of the State of Nevada. These are not regulatory requirements in the Yukon, but are considered as standards for best practice.

3.2. Design Requirements

As mentioned, there are currently no published international standards for the design and construction of the heap leach facility. Nevada State Guidelines provide minimum standards for heap leach facilities and have been adopted for the Project. North American standards for the design of embankment dams were used where applicable, specifically the Canadian Dam Association (CDA 2014) guidelines and the National Building Code as required by the CDA guidelines. Table 3.1 summarizes the main technical and permitting requirements for the State of Nevada for the key elements of the HLF design.

Table 3-1. Summary of design requirements for State of Nevada.

Heap Leach Feature	Description
Leach Pad	System must have containment capability equal to or greater than that of a composite liner consisting of a synthetic liner over one foot of compacted soil at a permeability of 1×10^{-6} cm/s or 1×10^{-5} cm/s if a leak detection system is used beneath portions of the liner with the greatest potential for leakage
	Synthetic liners must be rated as having resistance to fluid passage equal to a permeability of less than or equal to 1×10^{-11} cm/s.

Heap Leach Feature	Description
Solution Ponds	System must have a primary synthetic liner and a secondary liner that meet the above-described liner specifications. The synthetic liners must be separated by a fluid transmission layer which is capable of transmitting leaked fluids at a rate that will ensure that excessive head will not develop on the secondary liner.
Solution Management and Containment	Process components must be demonstrated to have the capacity to "withstand" the runoff from a 100-year, 24-hour precipitation event. In addition, facility fluid management systems must demonstrate the capability of remaining "fully functional" and fully contain all process fluids including all accumulation resulting from a 25-year, 24-hour precipitation event. The foregoing standards are minimal and additional containment capacity may be required if surface water bodies or human populations are in close proximity to the facility, or if groundwater is shallow.
Foundations	Consider static / dynamic loads and differential movement or shifting.
Construction QA/QC	Regulations require that each applicant develop and carry out a quality assurance and quality control program for liner construction. A summary of the QA/QC program results must be submitted with as-built drawings after construction has been completed.
Neutralization/Detoxification of Spent Ore	Spent ore, whether it is to be left on pads or removed from a pad, must be rinsed until it can be demonstrated either the remaining solid material, when representatively sampled does not contain levels of contaminants that are likely to become mobile and degrade the waters of the state under the conditions that will exist at the site, or, the spent ore is stabilized in such a manner as to inhibit meteoric waters from migrating through the material and transporting contaminants that have the potential to degrade the waters of the state.

3.3. Design Basis

The Yukon Water Board Licensing Guidelines for Type A Quartz Mining Undertakings provide specific guidance for selected mine site earthworks facilities, as follows:

"*General: Type A quartz mining undertakings may vary significantly in their magnitude and in the potential environmental effects associated with them. The guidelines contained in this document assume the development of a mine with significant potential environmental impacts such as those resulting from acid rock drainage or the failure of a large tailings impoundment. Projects such as this are considered to fall into the Very High Consequence of Failure category described in the Canadian Dam Safety Guidelines (January 1999). In situations where this category is not appropriate for some reason, the Board is prepared to consider well developed and documented justification for the use of alternative consequences of failure criteria developed in accordance with the Canadian Dam Safety Guidelines.*"

Further, specific design guidance is included as follows:

- The design, construction, operation, maintenance and surveillance of dams and associated water management structures should be carried out in a manner which is consistent with the recommendations contained in the Canadian Dam Safety Guidelines (January 1999) for the Very High Consequence Category, unless compelling reasons consistent with the Canadian Dam Safety Guidelines for a lower consequence category are provided.
- Long-term dams and associated water management structures should be designed to withstand the Maximum Credible Earthquake (MCE) and pass the Probable Maximum Flood (PMF). Shorter term structures may be built to lesser standards but a compelling rationale for the selected criteria must be provided.
- Heaps should be designed to have a minimum factor of safety under static loading of 1.3 for short term cases (i.e., within the mine life) and 1.5 for long term cases (i.e., abandonment) as described in the Investigation and Design of Mine Dumps British Columbia Mine Waste Rock Pile Research Committee (1991). The factor of safety for dams should be as recommended in the Canadian Dam Safety Guidelines (January 1999).
- Designs for dams and associated water management structures, rock dumps, and heaps should recognize the probable presence of permafrost and should include appropriate measures to manage permafrost and maximize the stability of the structures consistent with recommendations contained in the Canadian Dam Association – Dam Safety Guidelines (2013).

Although previous versions of the Dam Safety Guidelines are reference (1999 and 2007), the latest version (2013) was used for the Project.

BGC (2017b) performed a dam breach analysis to provide input into evaluating the HLF embankment hazard classification, per Canadian Dam Association (2013) guidelines. The results confirm that the confining embankment can be classified as a *Significant* dam (i.e., there is no permanent population or infrastructure at risk in the inundation path, and restoration of fish and wildlife habitat is highly possible). Nevertheless, the Water Use License (WUL) for the Project imposes an *Extreme* dam classification (the most stringent possible) for hydrologic and storage criteria. Thus, the *Extreme* hydrologic and storage criteria have been used for the HLF design. The WUL does not include a requirement to impose more conservative geotechnical criteria beyond those specified in the CDA guidelines; nevertheless, geotechnical criteria applied here assume a *High* hazard dam classification. The dam classifications used here also consider the input from the Application of Dam Safety Guidelines to Mining Dams (CDA 2014), and have been vetted during consideration and consultation between owner and regulators.

3.4. Engineering Design Criteria

The parameters and criteria presented in Table 3.2 below form the basis of design for the HLF. Geotechnical design criteria were developed by BGC while ore parameters were provided by StrataGold or other consultants working on the project.

Table 3-2. Engineering design criteria.

General	Quantity/Criteria
Heap ore capacity	Approximately 77 Mt
Ore processing	Average of 10.8 Mt/a of crushed ore over a 275-day crushing and stacking season Fine ore Three-stage crushing to 6.5 mm (P_{80}) - primary crushing 365 days (29,500 tpd), secondary/tertiary 275 days per year (39,200 tpd)
Leach pad type	Permanent, multiple lift
Stacking schedule	275 days per year
Stacking Rate	Approximately 40,000-45,000 tpd
Agglomeration	Belt Type or Agglomerator Drum, first 2 years of operation if required.
Stacking method	Conveyor-stacker for crushed ore
Stacked dry density of ore	Initial - 1.70 t/m^3
Stack / lift height	Nominal 10 m lifts
Overall slope angle of stacked ore	2.5:1 (H:V), 22 degrees
Ore Setback	5 m from perimeter road 10 m from dam
Leach schedule	365 days per year
Solution application method	Drip emitters (buried for cold weather operations)
Solution application rate	10 l/hr/m^2
Total leach cycle time	90-day primary leach
Solution application flow	2,070 m^3/hour
Geotechnical Stability	**Quantity/Criteria**
Design Basis Earthquake (DBE)	0.14g (1 in 475-year return period) 0.25g (1 in 2475-year return period)
Maximum Design Earthquake (MDE)	Moment Magnitude 6.0 0.35g (Acceleration at the site estimated for the Maximum Credible Earthquake)
Minimum embankment Factor of Safety	Static Loading - 1.5 (impounding), 1.3 (non-impounding), Seismic Loading - 1.0 (use pseudo-static methods)
Permafrost	Ice-rich materials encountered in the pad or pond foundations will be removed; if thaw unstable, will be removed also.
Confining Embankment	**Quantity/Criteria**
General	To provide stable confinement of the ore and create an In-Heap Pond
Overflow spillway	Sized to pass the PMF peak flow with 0.5 m of freeboard assuming heap storage is at capacity at the start of the event.
In-Heap Pond design capacity	Approximately 24 hours of operational storage, calculated based on the solution flow rate.

General	Quantity/Criteria
Groundwater	**Quantity/Criteria**
General	A drainage system is required beneath the liner system to control groundwater pressures. The system is to collect and monitor groundwater in a controlled manner before discharge downslope of the containment embankment.
Pad Liner System	**Quantity/Criteria**
Overliner Drain Fill (ODF)	Crushed clean rock to provide a free draining layer under the placed ore and to protect the lining system from damage by ore placement while not impacting the conveyance of solution to the recovery wells. ODF will consist of a minimum 1.0 m thickness (within the In-Heap Pond) of minus 38 mm clean durable rock with less than 20 percent passing the No. 4 ASTM sieve size, and less than 5 percent fines passing the No. 200 ASTM sieve size and minimum in place hydraulic conductivity of $2x10^{-4}$ m/s.
Geosynthetic (geomembrane) Liner	Suitable liner material to provide required puncture resistance, elastic strain range and resistance to solution attack and chemical breakdown along with cold weather performance for the project's climate conditions (refer to LLDPE project standard specifications).
Geosynthetic Clay Liner (GCL)	Geosynthetic clay liner below the geosynthetic liner to provide a composite liner to minimize leakage. Objective maximum permeability 1×10^{-5} cm/s or 1×10^{-6} cm/s in the absence of a leachate detection and removal system.
Solution collection and recovery system	A system to collect leachate and convey it to solution recovery wells. System to comprise overliner drain fill and a network of collection pipes to convey solution to the In-Heap Pond area while limiting solution head on liner.
Leak detection and recovery system (LDRS)	A system within the In-Heap Pond and Event Pond to collect leakage through the composite liner and convey it to monitoring points. The system to comprise geonet or similar synthetic drainage product to collect and convey any leaked solution to a gravel filled sump and pumping system.
LDRS monitoring	Monitoring of the flow into the LDRS to ensure that allowable rates (determined by permitting authorities) are not exceeded.
Solution Recovery Wells	**Quantity/Criteria**
General	Solution is to be recovered from the heap through inclined well casings equipped with submersible pumps installed in the In-Heap Pond solution storage area along the upstream dam slope. Adequate access for installing and recovering pumps from well casings will be provided on the dam crest.
Event Pond	**Quantity/Criteria**
General	The purpose of the event pond is to temporarily store excess inflows that cannot be stored in the In-Heap Pond. Any overflow into the event pond will be evacuated, and used as make-up water, as fresh ore is added to the HLF. During the initial heap operation, the event

General	Quantity/Criteria
	pond may also be used as temporary storage for make-up water. Otherwise, the Event Pond will be kept dry.
Overflow spillways	Sized for routed PMF peak flow with 0.5 m of freeboard.
Storage Capacity	Sized to contain the runoff volume from the PMF event.
Contingency Pond	Provisions will be made in the design layouts for an additional pond to store seasonal accumulation. Detailed design of this pond will be performed at a later date.
Liner system	Lining to comprise a double composite geosynthetic liner system with LDRS

4.0 HLF DESIGN COMPONENTS

4.1. General

The following sections present a detailed description of the Eagle Gold Phase 1 HLF design components. Design details and engineering analyses are presented in Section 5.0.

4.2. Heap Leach Pad and Confining Embankment

4.2.1. General

The Phase 1 HLF is designed to accommodate approximately 25 million tonnes (dry weight) of ore and comprises a confining embankment across Ann Gulch and a lined heap leach pad area.

The confining embankment is designed to provide safe storage for the required ore tonnage and temporary storage of fluids for pumping to the plant. The embankment creates an In-Heap Pond area for pumping of pregnant solution to the recovery (ADR) plant. The In-Heap Pond and embankment size was based on providing storage for 24 hours of operational solution flow.

The double-lined Event Pond serves as overflow containment providing additional storage in case the In-Heap Pond capacity is exceeded.

4.2.2. Liner System

The liner for the leach pad and Event Pond will consist of a composite geomembrane and underlying low-permeability bedding material, which is the state-of-practice liner system for heap leach facilities. The design incorporates a textured 80 mil linear low-density polyethylene (LLDPE) liner. A geosynthetic clay liner (GCL) will be used in lieu of a 300mm thick layer of compacted low-permeability material.

A layer of Overliner Drain Fill (ODF) comprised of gravel material will be placed over the LLDPE geomembrane to promote drainage. The ODF will consist of a minimum 1.0-meter-thick layer of crushed material in the In-Heap Pond area. A network of perforated piping will be embedded in the layer to help convey the solution within the layer. Drainage collected in the overliner collection system will report to the In-Heap Pond and to be reclaimed via the solution collection wells located on the upstream face of the HLF confining embankment. The primary functions of the ODF are to minimize the head on the geomembrane liner system to reduce the risk of process solution leakage, protect the synthetic liner from damage during ore placement, and maximize the return of the gold containing pregnant solution for processing.

Solution collection pipes will be placed within the ODF to convey PLS and meteoric water flows to the In-Heap Pond. The drainage pipe network, along with the ODF layer is designed to limit hydraulic head levels on the liner system.

Section 5.0 presents the liner and pad drainage system design and construction details are shown on Drawings EGHLF-XD-06-01 through EGHLF-XD-06-03.

4.2.3. Underdrain System

The HLF underdrain system provides for the collection and drainage of subsurface water beneath the lined facility to limit upward pressure on HLF liner. The underdrain will be constructed with geofabric wrapped around granular drain rock backfill materials and 100mm perforated pipes placed at regular intervals (approximately 75m spacing) beneath all phases of the HLF, with additional drains to be installed during construction as field conditions dictate. The drains will convey subsurface water to collector pipes that will discharge to an outlet monitoring vault. The vault is configured to allow for sampling of seepage flows for water quantity and quality, and will be equipped with a pump system to return flows to the HLF for use as make up water or allow flows to outfall if discharge criteria are met. Details of the proposed underdrain system are shown in Drawings EGHLF-XD-03-03 and EGHLF-XD-03-04.

In addition to providing control for groundwater seepage, the underdrain system also provides some leak monitoring capability for the upper HLF. The transverse primary underdrains will provide interception of potential leakage through the liner, and the underdrain header pipes will be placed below the PLS header pipe corridor where flows will be concentrated during leaching operations, thereby providing leak monitoring of critical areas most likely to have fluid present on the liner system during much of the operational life of the facility.

The proposed liner system is designed to limit any leakage through the geomembrane by use of a low permeability GCL. It is highly unlikely that substantial leakage through the geomembrane and GCL components of the liner due to the composite nature of the liner system. Under normal conditions, low hydraulic head levels will be present over the liner system in the upper HLF area resulting in low leakage rates. The In-Heap Pond will include a double lined facility with a leak detection and recovery system. In these areas, the underdrain system will provide a secondary detection capability.

In the unlikely event that unplanned measurable leakage occurs from the liner system, the discharge would be identified during regular water quality monitoring of flows at the outlet monitoring vault. Separate non-perforated collection pipes for each phase of the HLF allow the outflows from each area to be monitored independently. This allows for more focused mitigation actions in the case of water quality exceedance from the underdrain monitoring system. The vault is also equipped with a pump system (designed by others) to return any leakage identified to the HLF.

4.2.4. Confining Embankment

The confining embankment will provide heap stability and containment of process solutions in the In-Heap Pond. The embankment dam is designed as an earthfill/rockfill structure with a geomembrane lined upstream dam face.

The embankment section includes an 8 m crest width for road and pipeline access and 2.5H:1V upstream and downstream slopes. Approximately 60 m of the embankment crest adjacent to the inclined solution well casings will be widened to 11 m to accommodate the PLS riser pipe system

and allow for maintenance access in this area. The embankment fill will be derived from material taken from required excavations in the HLF and plant site areas.

The In-Heap Pond and area behind the dam will be double-lined with leak detection to the elevation of the embankment crest. The volume of fluid within the pore spaces of the ore is equivalent to approximately 24 hours of operational solution flow at a nominal rate of 2,070 m^3/hr plus a freeboard of 1.5 m.

Section 5.0 presents design calculations related the embankment and In-Heap Pond. Drawings EGHLF-XD-04-01 through EGHLF-XD-04-03 present construction details for the embankment. Drawings EGHLF-XD-08-01 through EGHLF-XD-08-03 present construction details for the In-Heap Pond.

4.3. Event Pond

The external Event Pond is double-lined and is sized to provide containment storage for the Probable Maximum Flood (PMF) event with some additional capacity for seasonal accumulation of water. Water storage requirements were informed through an iterative process using stochastic water balance modeling (Mines Group, 2017). The Event Pond will be constructed to temporarily store excess process solution that may occur during upset conditions, freshet, and excess precipitation events. The solution contained in the pond will be recycled back into the heap leach circuit. The pond will incorporate a leak detection and recovery system beneath the upper liner system.

If solution cannot be recycled back to the HLF due to water balance constraints, it will be stored within the Event Pond. In the unlikely event storage volume within the Event Pond is at capacity, the solution will be treated through the cyanide detoxification plant and the water treatment plant prior to discharge. Section 5.10 presents the Event Pond sizing calculations.

4.4. Surface Water Controls

Temporary runoff interceptor ditches will be constructed for each phase of the heap leach pads to collect stormwater runoff prior to entering the heap pad. The ditches are sized for the 100-year, 24-hour event, and armored with riprap and will be constructed and in operation before construction of each pad phase. Once the heap leach pads are ready for the next phase the temporary interceptor ditch will be filled and regraded for placement of the liner for the next phase. Drawings EGHLF-XD-03-01 and EGHLF-XD-03-02 present the layout of the temporary interceptors and liner tie and phase transition details.

A narrow bench (10 m wide) will be constructed adjacent to the HLF confining embankment crest for stormwater collection and conveyance of flows to the HLF spillway. In the event of an emergency or other unforeseen circumstances in which pumping of solution ceases, or in the event of excessive surface runoff from the heap leach pad, discharge of excess water or solution will be directed in a controlled manner through a lined spillway to the Event Pond. Solution levels within the In-Heap Pond are expected to be kept low during normal operations. However, during emergency situations, the HLF spillway will prevent overtopping of the embankment, and will

maintain containment of the solution. The HLF spillway is designed to safely convey the flow from the PMF event. The Event Pond will incorporate internal and outlet spillways to pass the PMF peak flows after attenuation through the ponds. Drawings EGHLF-XD-08-01 through EGHLF-XD-08-03 present the spillway design and Section 5.7 presents the hydraulic calculations.

4.5. Instrumentation

Operational monitoring requirements for the HLF will include instrumentation for measuring phreatic levels and pore pressures within the foundation and embankment, fluid levels within the heap and sumps, and movement of the embankment. Monitoring will be used to verify the facility components are performing as expected and to provide early warning of problematic conditions. Observations on the performance of the initial stages may provide useful information for optimizing subsequent stages of development.

Two pairs of vibrating wire piezometers will be located within the In-Heap Pond, one pair in the LDRS sump and one pair in the overliner layer at the base of the sump to monitor the fluid levels. The piezometers will be installed in inclined riser pipes to contain instrument lead wires for access at the dam crest.

The piezometers installed in the In-Heap Pond shall be Geokon model 4500S/SV-350kPa (or equivalent). Barometric readings are required to adjust the piezometric readings from the 4500S/SV model, therefore a barometer, such as Geokon model 4580-1, must also be installed.

Three pairs of vibrating wire piezometers will be located within the Phase 1 leach pad overliner layer upgradient of the In-Heap Pond. These piezometers shall be Geokon model 4500AL/ALV-170kPa (or equivalent) and will be installed in conduit pipes to contain instrument lead wires for access at the perimeter road.

A series of eight survey monuments will be located along the crest of the embankment at 50 m intervals to allow monitoring of potential movement.

Frost protection should be immediately applied over all piezometers installed. Alternatively, piezometers can be installed in a glycol bath arrangement.

The initial reading and reporting frequency for all piezometers is every two weeks, when accessibility allows. In case of extreme climate events or seismic events, the piezometers monitoring frequency shall be increased as necessary.

Dam instrumentation details are presented in Drawings EGHLF-XD-09-01 and EGHLF-XD-09-02.

5.0 ENGINEERING ANALYSES

5.1. General

The following sections present the engineering analyses and detailed design of the Eagle Gold Phase 1 HLF. Design and analyses included: geotechnical stability and settlement analyses, liner and drainage systems design, interceptor ditch and spillway design, HLF water balance, In-Heap Pond and Event Pond design.

5.2. HLF Foundation Preparation

The Heap Leach Facility Foundation Improvement Plan (StrataGold 2017) provides a review of the characteristics and the estimated spatial extent of the ground ice under the HLF, and highlights the characteristics of the ground ice encountered during site investigations, and includes a definition and discussion of ice-rich soils. The report discusses how ice-rich soil can be identified during construction and reviews ground ice removal measures, as well as potential techniques to thaw ice-rich soils which can then be excavated after thawing. Removal of ice-rich materials and replacement (as necessary) with compacted fill shall be performed to the satisfaction of the Engineer. The general approach for excavation and identification and removal of ice-rich materials is provided below:

Identify and Remove Topsoil and Loose or Unsuitable Materials

The natural ground surface will be cleared, grubbed and stripped of all organic and unsuitable materials generally 3m outside of the limits of the HLF. Clearing and grubbing will include the removal of vegetation and roots and stripping includes the removal of topsoil, defined as soil of any gradation or degree of plasticity that contains significant quantities of visually identifiable organics (e.g., vegetable matter, sod, roots, or humus) as determined by the Engineer. The thickness of organics (in most cases equal to the depth of the topsoil) to be removed will vary across the site and will be determined by the Engineer based on the character and thickness of material encountered. Clearing, grubbing and stripping will generally be conducted as a single operation.

Excavation to Type 3 Bedrock

In the area of the HLF embankment, excavation to Type 3 bedrock (or better) will be completed. Bedrock at the Project site is subdivided into three broad categories – Type 1, Type 2 and Type 3. Type 3 bedrock consists of highly weathered metasedimentary rock that has a confined compressive strength of 1 to 5 MPa. Type 3 bedrock is the lowest quality rock mass that is considered to behave as rock (rather than as a soil) and can be recognized on the basis of evident preserved fabric of the parent rock within the highly-weathered rock mass and requires moderate effort to excavate with heavy excavators. Identification of Type 3 bedrock will be identified by suitable qualified construction personnel under the supervision of the Engineer.

Identify and Remove Ice-Rich Soils

Ice-rich soils in permafrost, when thawed and generating excess pore pressures, can result in soil instabilities and therefore, it is critical to identify and remove any ice-rich soils in the foundation of the HLF prior to liner construction and stacking. On the other hand, if the frozen ground does not contain excess ice (no ice-rich soils) and is thaw stable, there is negligible impact on the stability of the ground upon thaw.

For preparation of the HLF foundation subgrade, all organic soils will be removed, exposing the underlying colluvium. Removal of loose native colluvium and weathered bedrock will be required to provide a suitable subgrade for the placement of the liner and the ore in areas beyond the HLF embankment.

5.2.1. Ground Ice Identification

A primary goal of the HLF foundation preparation work will be to identify whether ice-rich soils exist in the foundation subgrade. Since all ice-rich soil shall be removed from the footprint of the HLF, if it does exist, it must be further classified into the appropriate frozen soil type so it can be removed from the HLF footprint and managed accordingly. The identification and management of ice-rich soils can involve up to four steps that would include, in order:

1. Visual observations.
2. Test pit excavations, where no visible ice was identified.
3. Shallow auger drilling where test pitting was not conclusive.
4. Increased density of test pitting and/or drilling.

After completing the first two steps, the ground will then be inspected for the presence of ice and classification of the material (following the system described in Table 5-1), to determine if additional excavation may be necessary. The first observations in the field will be made using surficial grab-samples approximately every 25 m immediately upon excavation and exposure of the layer.

Table 5-1. Frozen material management.

Material Classification Type	Frozen Material Type	Strategy	Management Description
I	Fine and/or coarse-grained colluvial/alluvial soils or weathered bedrock with little or no ice content	Used as fill or stockpiled for closure	Used as general fill or if excess to a local fill requirement stored for reclamation.
II	Coarse-grained sands and gravels with zones of variable ice content	Used as fill	Exposed and readily thawed and drained, and then used as general fill within embankments and platforms.
III	Fine-grained soils with relatively thin zones (lenses) of low proportions of "excess ice"	Stockpiled for closure	Separated and co-disposed with other nonfrozen soils within stockpiles to be used for reclamation.
IV	Fine-grained silty and clayey soils with relatively thick lenses of highly visible "excess ice"	To IROSA*	Segregated at excavation site based on prior field data/ information, and additional observations during excavations. Excavated and hauled to IROSA located in the Haggart Creek valley.
V	Small quantities of ice-rich soils (fine or coarse)	Locally stored	Disposed of adjacent to excavation sites where thawing and drainage can be managed locally rather than hauled to the IROSA.

Note: * IROSA: ice-rich overburden storage area

If ground ice is visible, and the soil is predominantly fine-grained with visible ice laterally continuous between observation points and the ice lensing is greater than 1mm, or the volumetric ice content is estimated to be more than 10%, the material is classified as Type IV. This material is considered to be ice rich soil and shall be excavated and hauled to the IROSA.

If ground ice is visible, the soil is fine or coarse grained with isolated pockets between observation points with ice lensing less than 1mm, or the volumetric ice content is estimated to be less than 10%, the material is classified as Type I/II/III. This material, for the purposes of the HLF foundation, is not considered ice rich soil and will only be excavated and hauled to the Reclamation Stockpiles (location per the Owner) if in the opinion of the Engineer it is necessary.

If ground ice is not visible and the soil is predominantly fine-grained, the temperature of the sample shall be taken and the sample manually warmed in the field. If the soil is <0 C and then excess water forms upon warming, the soil is classified as Type III. This material, for the purposes of the HLF foundation, is not considered ice rich soil and will only be excavated and hauled to the Reclamation Stockpiles (location per the Owner) if in the opinion of the Engineer it is necessary.

If ground ice is not visible, the soil is fine or coarse-grained and the sample shows little moisture or remains intact upon warming, it is Type II, and this material, for the purposes of the HLF foundation, is not considered ice rich soil and will remain in-situ and/or can be used as fill within the HLF footprint.

Since the required subgrade excavation depth may be thin, it is possible that the excavation required for foundation preparation does not reach to the permafrost table. Therefore, ice-rich or thaw unstable soil that is not visible on the exposed subgrade cannot be excluded, so additional investigations will be conducted to demonstrate the absence of ice rich soils at depth (i.e., to a depth of 6 m below the initial subgrade). With respect to outside the HLF embankment foundation area, test pits using a large excavator will be excavated to Type 3 bedrock or, if bedrock is not encountered, to a depth of at least 6 m below the initial excavated subgrade. Due to the heterogeneous nature of the ground, investigations at 100 m x 100 m spacing will be completed while foundation preparation is being carried out. Samples will be visibly inspected as described above and classified accordingly. Test pits should be properly backfilled and compacted using approved, non-frost susceptible and ice-free fill material.

Shallow auger drilling will only be carried out at locations where test pit excavation is not successful (i.e., did not reach 6 m below the initial excavated subgrade). The locations and density of boreholes in an area will be determined in the field under the supervision of the Engineer, but in general, will be used to supplement and refine the test pitting findings. The ground ice inspection boreholes are expected to reach competent bedrock but also to be not deeper than 6 m.

All observations from site shall be supervised by an engineering professional with experience in ground ice characterization. Where adjacent test pitting and augering show conflicting results, additional test pitting and/or augering will be completed in the intervening zones to resolve any issues related to identifying lateral extent of ice-rich soil.

5.2.2. Ground Ice Removal

Excavating ice-rich soils, in particular coarse colluvium, is challenging due to the high strength of the frozen material at temperatures below mainly -1°C, as the amount of unfrozen water in the ground becomes negligible.

The frozen ground can be broken using a ripper tooth attached to a large dozer or an excavator. Once broken, the pieces of ice rich soil can be loaded and hauled with excavator and haul trucks to the reclamation stockpile or hauled to the IROSA. As described above, the goal of excavating will be to excavate to Type 3 bedrock in the area of the embankment, and if ice-rich soil is present, excavate to below the extent of ice-rich soil.

As stripping and excavating of the active layer and the permafrost advances, ground thawing is initiated at the new surfaces. These newly thawed conditions can result in surficial soil sliding and slumping, and cause non-trafficable condition for heavy equipment, necessitating the use of rig mats, or additional fill.

To evaluate the foundation conditions and demonstrate the absence of ice-rich soil in the foundation area, the subgrade will be visually monitored following stripping, under the supervision of the Engineer. The monitoring will focus on visually identifying signs of subsidence and water surfacing. If ice-rich soil is present under the excavated subgrade and it is exposed to warming during the summer, the ground would start to thaw, settle and water would be visible at the surface. Depending on the time of the year, this would be visible within days following the excavation. The presence of ice rich soil in shallow ground can also be noted if runoff shows a daily pattern. In the absence of snow melt, increase in runoff at the bottom of HLF construction areas towards the end of day can be related to the melting of ground ice.

In addition to ripping ice rich soils, it is also possible to allow the exposed subgrade to thaw naturally during the summer. The thickness of the ground layer that thaws during a summer depends on the surface, ground and climate conditions. The vegetation forms the main insulating layer within the footprint of the HLF. By clearing the vegetation and stripping the active layer, ground ice containing permafrost is exposed to the atmosphere. Judging from the ground temperature data available (BGC 2012b) thaw depths between 2 m and 3 m can be expected for the area in one summer, where ice-rich soil is present. While natural thawing of ice-rich soils is generally not practical during preparation of the HLF subgrade due to time constraints, it may prove useful in some areas where the ice content is low (< 10%) and sporadically located (i.e., non-ice-rich soils), and the subgrade area can be exposed for the summer prior to development. The steps for natural thawing operations would include as follows:

- Strip vegetation and organic layer prior to summer
- Expose frozen surface to atmosphere
- Excavate any thawed ground at the end of the period or by end of summer.

Independent of the thawing method used, controlling surficial melt water runoff, sediment transport and potential soil instabilities that occur upon ground thawing will be necessary. This will be achieved by digging dewatering trenches or installing drainage pipes that provide a controlled drainage system as well as potential sediment transport. Running or standing water on permafrost subgrades will be avoided.

5.2.3. Final Foundation Preparation

The first excavation pass will then be undertaken to the lines and grades as specified by the Engineer. During final grade preparation, there may still be areas left with pockets of loose or unsuitable materials. Under the direction of the Engineer, these loose or unsuitable materials will be removed. Unsuitable materials may include ash, boulder or gravel zones, soft saturated zones, highly organic zones or drilling mud pits.

The evaluation methods for loose or unsuitable materials will depend on the location and the materials that will be placed over the subgrade. The evaluation methods may include proof-rolling with a loaded dump truck or similar pneumatic-tired equipment to ensure that the surface is firm and smooth. Probing with a metal rod may also be performed.

Soft or yielding areas delineated by the evaluation methods described above that cannot be stabilized by compacting under the supervision of the Engineer will be removed and replaced with site grading fill or structural fill meeting the requirements of these specifications. If deemed necessary by the Engineer, the treated areas will be re-evaluated by test pitting such that the cut face is clearly visible so that they can be examined and logged by the Engineer. After the reevaluation has been completed, the test pit locations will be backfilled with the excavated material and compacted in layers to the surface to the satisfaction of the Engineer.

Once the foundation area has been managed to mitigate instances of loose or unsuitable materials or ice rich soils, and in the HLF embankment area confirmation that Type 3 bedrock is exposed, the Engineer will be notified and a final inspection will be undertaken to determine the appropriate method of treatment for the ground surface prior to the placement of the embankment and underdrain system. The methods of treatment that will be utilized may include trimming and shaping the surface, scarifying, moisture conditioning, or compacting of any area where fill material was placed.

Further details are described in the Foundation Improvement Plan (StrataGold 2017) and the Project Technical Specifications (Appendix J).

5.3. Liner Systems Design

5.3.1. Liner Subgrade

Once foundation preparation has been completed (see Section 5.2), the liner subgrade will be prepared. Subgrade preparation for the GCL placement will involve subgrade compaction to 95 percent of the maximum dry density based on ASTM D 698. Rocks larger than 38 mm in diameter will first be removed from the upper 150 mm of the subgrade prior to compaction. Areas to receive liner that consist of weathered rock or site grading fill will require import of fine-grained material to cover the surface and form a suitable subgrade.

5.3.2. Geomembrane Selection

The critical aspects of geomembrane selection for this project include accommodation for puncture resistance, elongation capacity (elasticity), ability to accommodate expected foundation consolidation in fill areas under the ore heap, adequate interface shear strength between the pad geomembrane and the underlying soil liner or GCL and overlying cover fill for heap stability, and satisfactory performance under exposure to climatic conditions (temperature expansion and contraction, wind forces, and sunlight ultraviolet (UV) effects).

The geomembrane types typically used for heap leach facilities are LLDPE, HDPE, and polyvinyl chloride (PVC). The more flexible LLDPE and PVC geomembranes are best for buried applications subjected to high loads such as the leach pad. HDPE geomembrane is best for exposed applications such as the ponds and ditches. LLDPE geomembranes were selected for the leach pad including the In-Heap Pond geomembrane, and HDPE geomembranes were selected for the Event Pond for the following reasons:

- LLDPE geomembrane has significantly better elongation performance, puncture resistance, interface friction strength, and stress cracking resistance compared to HDPE geomembrane.
- LLDPE geomembrane remains flexible at temperatures well below freezing to about -25°C with a low temperature brittleness of -70°C according to ASTM D-746.
- HDPE geomembrane has better chemical and UV resistance.
- LLDPE geomembrane can be readily seamed to HDPE geomembrane.

A 2.0-mm (80-mil) LLDPE top geomembrane was selected for the leach pad, based on performance requirements and past design and construction experience. The geomembrane will be double-side textured above the GCL to enhance heap stability and construction safety. The Event Pond top geomembrane will be 2.0-mm (80-mil) single-side textured HDPE with the textured side up for traction.

A geocomposite (drainage net) will be installed between the In-Heap Pond and Event Pond geomembrane systems and will tie to a leak detection sump and pipe system for collecting and removing any leaks through the top geomembrane. The geocomposite will consist of a geonet heat-laminated on both sides with nonwoven geotextile. The geonet is a netlike polymeric material formed from intersecting ribs integrally joined at the junctions and is used to facilitate drainage between the geomembranes.

5.3.3. Liner System Testing

A large-scale puncture test was performed on the 1.5mm (60-mil) and 2.0mm (80-mil) double-side textured LLDPE geomembrane underlain by a GCL and subgrade soil liner and overlain by granular fill with various maximum particle sizes. The soil subgrade and cover fill materials were of representative samples obtained from the project site. A normal stress of 4,413 kPa (640 psi), which represents 150% of maximum ore load, was applied for 48 hours and the geomembrane inspected for damage. No punctures were observed visually or detected by a vacuum box test with a negative pressure of 62 kPa (9 psi). The geomembrane puncture test results are included in Appendix A4. Liner puncture tests for the following drain cover materials:

- Minus 25mm (1-inch)
- Minus 38mm (1.5-inch)
- Minus 50mm (2-inch).

All tests passed for both 1.5mm and 2.0mm LLDPE geomembrane with no significant damage to liner under max static loading. Therefore 1.5mm LLDPE with a drain cover material containing particles up to 50mm could be considered acceptable for operational use. However, 2.0mm LLDPE with maximum 38mm drain cover particle size was conservatively selected for design for better operational reliability of the liner system and to mitigate against potential geomembrane damage considering construction loading that may occur during placement of the drain gravel over the geomembrane.

A large scale direct shear test was performed on the interface between the textured LLDPE geomembrane and the underlying GCL and soil subgrade and overlying cover fill materials from

the site. The test was performed to obtain interface shear strength parameters for use in the heap stability analyses. The results of the test are provided in Appendix A4 along with results of the stability analyses. Further discussion of the stability analyses is found in Section 5.8 of this report.

Wind uplift calculations completed for the Event Pond liner, along with liner ballast calculations, are presented in Appendix I.

5.3.4. Description of Liner Systems

The lining system for the In-Heap Pond areas are comprised of the following, from top to bottom:

- A minimum 1m thick layer of overliner material with imbedded perforated drainage piping
- A 2.0mm (80-mil) LLDPE primary liner
- A geonet that is part of the LDRS and located between the primary and secondary liners
- A 1.5mm (60-mil) low-linear density polyethylene (LLDPE) secondary liner
- A geosynthetic clay liner (GCL)
- Prepared subgrade beneath the GCL.

The lining system for the HLF pad (up-gradient of the In-Heap Pond) are comprised of the following, from top to bottom:

- A layer of overliner material with imbedded perforated drainage piping
- A 2.0mm (80-mil) LLDPE liner
- A geosynthetic clay liner (GCL)
- Prepared subgrade beneath the GCL.

The Event Pond will be a double-lined facility with LDRS having the following components, from top to bottom:

- A 2.0mm (80-mil) high-density, polyethylene (HDPE) primary liner
- A geonet that is part of the LDRS and located between the primary and secondary liners
- A 1.5mm (60-mil) low-linear density polyethylene (LLDPE) secondary liner
- A geosynthetic clay liner (GCL)
- Prepared subgrade beneath the GCL.

5.3.5. Leak Detection and Recovery Systems

A Leak Detection and Recovery System (LDRS) will be constructed within the In-Heap Pond and Event Pond and will consist of a monitoring sump equipped with an automatic, fluid-level activated pump located between the top and bottom liners. The pump will be sized to sufficiently remove fluids to minimize head on the bottom liner.

The ponds will contain a sump for collection of any potential leaks in the top liner via the geonet material located between the two geomembranes to allow fluid to the sump. Drawings EGHLF-XD-05-01 through EGHLF-XD-05-06 present the LDRS sump and pipework design details for the In-Heap Pond. Drawings EGHLF-XD-07-01 through EGHLF-XD-07-04 present the LDRS sump and pipework design details for the Event Pond. Appendix F presents the liner leakage and sump sizing calculations and establishes alert levels for operational monitoring of the LDRS flows.

5.3.6. Overliner Drain Fill

Solution will be collected in the high permeability overliner material at the base of the heap pad, with perforated collection pipes placed within the overliner to increase solution removal rates. A drain cover fill layer (termed Overliner Drain Fill or ODF within the construction documents) will be placed over the entire leach pad area including the upstream face of the confining embankment. Competent durable rock for production of ODF gravel shall be produced from crushing and/or screening operations of ore and/or mine waste and/or from screening of sand and gravel aggregate from borrow sources. Some screening and/or crushing may be required to produce the specified material. The design criteria specify an ODF permeability and maximum ore heap load to ensure both reasonable spacing of the drain pipes and fully drained heap conditions. The minimum loaded hydraulic conductivity of the ODF will be $1x10^{-4}$ m/s.

The minimum ODF thickness in the leach pad area will be 0.6 m. A thicker layer, a minimum of twice the pipe diameter, shall be placed above the larger diameter primary collection drain pipes. A minimum ODF thickness of 1.0 m will be placed in all areas to receive run-of-mine ore, along any haul routes, and in the PLS sump area.

The Project Technical Specifications (Appendix J) present requirements for the ODF material and placement, including construction of a test fill to ensure liner protection, thickened ODF sections over pipework, in the In-Heap Pond area, in the run-of-mine area, and in haul traffic routes.

5.4. Leach Pad Drainage System Design

5.4.1. Drain Pipe Network

The piping network embedded in the ODF will consist of a series of dual wall corrugated, smooth interior, slotted collection pipes. The piping network will provide rapid transport of process solution to the In-Heap Pond and maintain a minimal head on the liner. The drain pipe network will accommodate the volumes from a 100-year, 24-hour storm in addition to 150% of the flow generated from the applied leaching solution. The drain pipes are located within the ODF material placed above the pad liner and will collect and convey the stormwater and solution to the In-Heap Pond.

The drain pipes will consist of 100-mm, 250-mm and 450-mm diameter corrugated dual-wall, perforated ADS N-12 pipes. A series of 100-mm primary collector pipes will be spaced at 25 m on center and arranged in a “herringbone” pattern to convey flows for collection in 450-mm header pipes. Where slope lengths dictate, secondary 250-mm collector pipes will be required to convey flows from the 100-mm pipes to the 450-mm header pipes.

To maximize the efficiency of the ore’s drainage and to minimize the potential for leakage through the pads’ liner system, the hydraulic head above the liner was designed to be less than a maximum height of 0.6 m resulting in a minimum secondary pipe spacing ranging from 12 m to 17 m depending on the slope of the leach pad. Appendix C presents the pipe spacing and flow design calculations. Drawing EGHLF-XD-06-01 illustrates the layout of the solution collection

pipework in the ODF material. Appendix D presents the methods and results of a pipe deflection analysis completed for the proposed HLF.

5.4.2. PLS Riser Pipes

The collection pipe network in the overliner drain fill will direct the solution to the sump at the toe of the embankment for pumping through inclined riser pipes. Solution will be pumped from the sump through three of five available inclined risers to the process plant. The inclined vertical wells will extend from the base of the In-Heap Pond to the embankment crest. The inclined arrangement will consist of five thick-walled, steel pipes, each approximately 0.90 m in diameter to allow for raising and lowering of a submersible pump (designed by others). Three pumps will have the capacity to meet the solution application throughflow. The remaining two riser pipes will be installed as a back-up, in order to maintain access to the sump in the event that any riser pipes become blocked. The base of the risers will rest on a gravel layer, additional layers of geotextile and geomembrane, and will be located within the overliner material, not on the liner, to provide a buffer zone above the liner system to resist the riser pipes from pushing down into the liner. The base of the sump will be constructed approximately 2 m below the elevation of the surrounding liner.

The riser pipes will be surrounded with a zone of ODF, which will act as a protective layer. A zone of ODF will be placed around the base of each riser and at least 5 m above the PLS header pipes and drain loop for frost protection and protective material, and to promote flow of solution toward the riser. Beyond the zone of ODF, the regular crushed ore will be placed. Drawings EGHLF-XD-05-02 through EGHLF-XD-05-05 present the sump design details.

Design of the riser pipes considered the maximum vertical stress expected on the pipes based on the ultimate heap configuration. The inclined solution extraction wells will be constructed using solid steel casing sections (ASTM 139 high strength low alloy steel, A606 Type 4) with a nominal outside diameter (OD) of 900 mm and a minimum wall thickness of 19 mm (Schedule 40).

5.4.3. Closure Drain System

During closure of the heap leach facility, the cyanide in the spent ore will be destructed and the heap will be rinsed. Once acceptable water quality is verified, the liner system below the In-Heap Pond will be punctured by drilling to allow complete drainage of water through a pre-installed outlet system. The closure sump and drain pipes are sized to convey the wettest month precipitation to minimize solution accumulation within the spent ore. The closure drain system will consist of a LLDPE lined gravel sump with perforated N-12 pipe drain loop directing flow to PE outlet pipes. The closure sump will be placed directly below the leak detection sump to direct residual flows from the leak detection system to the closure outfall.

At closure, the liner system will be punctured by drilling through two 250 mm open casing pipes extending to the In-Heap Pond installed during initial construction. The PLS and LDRS Sump liners will be punctured by a drill string which will be lowered through each casing. A series of steel plates installed during initial construction will guide the drill and stop the drilling head at the

appropriate depth within the closure sump. Once the drill string is retrieved, fluid will drain trough the punctured liner into the closure sump where it will enter the closure drain loop and drain by gravity to the outlet monitoring vault. Three 300 mm N-12 pipes lead from the closure drain loop at a minimum 2% slope; approximately 40 m downstream from the closure sump, the three drain pipes merge into one 300 mm N-12 pipe where the grade steepens significantly.

The closure drain pipes will be directed to the underdrain system outlet vault, and will use similar controls to allow for water quality and quantity monitoring. The underdrain pump return system will remain in place to allow return of flows to the HLF if needed. The closure outlet system is presented in Drawings EGHLF-XD-03-05, EGHLF-XD-05-05, and EGHLF-XD-05-06.

5.5. Event Pond Sizing

The Event Pond is sized to provide storage for the Probable Maximum Flood (PMF) storm event from the ultimate HLF (all phases). The PMF event rainfall depth was estimated to be 256 mm (Knight Piesold 2012) which is assumed to contribute entirely over the ultimate HLF pad footprint. The rainfall volume from the PMF reporting to the Event Ponds is summarized in Table 5.2 for each planned phase and assumes no water loses or abstractions during the rainfall event.

Table 5-2. Event pond sizing.

Item	Volume (m^3)
PMF Phase 1	119,312
PMF Phase 2	59,904
PMF Phase 3	79,616
Total	**248,832**

The actual capacity of the Event Pond is 299,906 m^3 to the spillway invert at elevation 894.5m and a total capacity of 340,372 m^3 to the crest elevation of 895.5m. The additional capacity of the Event Pond to the spillway invert, above what is necessary to contain the full PMF, allows for seasonal accumulation of fluid and/or additional draindown volume equivalent to 28–47 hours of operational flow. Drawings EGHLF-XD-07-01 through EGHLF-XD-07-06 present the construction details for the Event Pond.

5.6. Interceptor Ditches

Temporary runoff interceptor ditches or berms will be constructed for each phase of the heap leach pads to collect stormwater runoff from entering the heaps. The ditches are sized for the 100-year, 24-hour event, and armored with riprap. The design incorporates a trapezoidal channel with 2.5H:1V sides and a 2 m wide bottom, with a 300 mm thick layer of rock riprap for erosion protection. Drawings EGHLF-XD-03-01 and EGHLF-XD-03-02 present the layout of the temporary interceptors and liner tie and phase transition details.

5.7. Spillways

The embankment spillway has been sized to accommodate the full PMF peak flow (in accordance with the Yukon Water Board requirement for long-term structures) routed through the facility. Flow from the HLF spillway will then be conveyed to the Event Pond via an emergency spillway to Dublin Gulch.

The spillway was sized assuming Phase 1 of the pads are constructed, and future pad phases are yet to be developed, and the pad is loaded with ore to the elevation of the spillway invert. The scenario also conservatively assumed that the loaded ore is completely saturated when the design storm events occur and that the Phase 1 interceptor ditch overtops at the onset of the event. The spillway at the heap leach facilities is designed to convey a discharge representing the routed PMF event and will be appropriately armored with fabric-formed concrete. All subsidiary drainage structures are designed to convey a 100-year, 24-hour storm and will be armored with riprap. Table 5.3 presents peak flows calculated for the spillway design. Drawings EGHLF-XD-08-01 and EGHLF-XD-06-06 present the In-Heap Pond spillway layout and details. Drawings EGHLF-XD-07-05 and EGHLF-XD-07-06 present the Event Pond spillway layout and details. Appendix B presents the in-heap pond spillway analysis.

Table 5-3. Calculated peak flows.

Facility	100 year (cms)	PMF (cms)
HLF Spillway		12.2
Event Pond Spillway		3.8
HLF Interceptor Ditches	4.6	-

5.8. Slope Stability Analyses

The HLF embankment is classified as *Significant* hazard according to Canadian Dam Association (CDA) dam classification guidelines (CDA, 2014). However, for conservatism the HLF embankment design criteria for seismicity is considered as a *High* hazard. CDA recommendations for *High* hazard dams include consideration of the Earthquake Design Ground Motion (EDGM) produced by an earthquake with an annual exceedance probability of 1 in 2,475, and factors of safety as summarized in Table 5-4.

Table 5-4. Target factors of safety for slope stability, after CDA (2013).

Loading Condition	Minimum Factor of Safety
Static, During construction (non-impounding)	1.3
Static, Long-term (impounding)	1.5
Pseudo-static	1.0
Post-earthquake	1.2

Based on the site-specific SHA (Appendix A5), a design PGA of 0.35g should be used for facilities requiring low-probability (e.g., 1 in 5,000, or 1 in 10,000-yr events) or maximum design earthquake (MDE) ground motions, and a PGA of 0.25g should be used for facilities requiring a 1 in 2,475-year event (equivalent to a 2 percent probability of exceedance in 50 years). The lower PGA (0.25g) was used for ground motions associated with a design basis earthquake (DBE), and the higher PGA (0.35g) was used for ground motions associated with an MDE event.

The HLF was evaluated for both static and pseudo-static (earthquake) conditions using the DBE for operational conditions and the MDE for post-closure pseudo-static conditions.

The stability analysis was conducted using the Slope/W component of GeoStudio 2016 (v. 8.16) by GEO-SLOPE International Ltd. Slope/W was used to conduct limit equilibrium analyses using the Morgenstern-Price method, which satisfies both moment and force equilibrium. The Slope/W program incorporates a search routine to locate the failure surfaces with the lowest factor of safety within user-defined search limits. Trial failure surfaces were defined with both “entry and exit” and “block specified” slip surface types, which allow the search routine to focus on two different failure methods.

Additional details including parameters and material properties used in the analyses are provided in Appendix G along with the results of the analyses. Acceptable factors of safety are demonstrated for both the ore pile and the confining embankment as well as the event ponds.

5.9. Settlement Assessment

Construction of the HLF will apply loads to the foundation soils which would result in total and differential settlements. If large enough, these settlements could impact the performance of the proposed liner system and collection pipe network at the base of the HLF pad. In addition, the settlements may impact the stability of the confining embankment and the performance of other facilities directly associated with the embankment such as the conveyor system and the In-Heap Pond. A finite element stress-deformation model was used to estimate the strain on the liner system and drainage pipes due to expected loading conditions. The assessment has been conducted using data collected from geotechnical site investigations and site information obtained from various BGC reports.

The maximum allowable strain on the composite liner system is 8%, which represents the recommended value for the textured LLDPE geomembrane. While the Geosynthetic Clay Liner (GCL) yield strain is estimated to be more than 50%, in practice the maximum allowable strain would be less than 10% to limit the thinning of bentonite which could affect the performance of

the GCL. The results of the differential settlement analyses presented in Appendix H predict a maximum value of 2%, which indicates a factor of safety of about 5 for the GCL and 4 for the geomembrane.

HDPE pipe can withstand an axial strain approaching 10% without permanent damage. For conservatism and to account for pipe joint separation, a maximum allowable strain of 5% was used for the proposed HDPE solution collection pipes. The analyses indicate a factor of safety of 2.5 for the HDPE drainage pipework.

5.10. Water Balance Considerations

A preliminary deterministic monthly water balance model was used to predict the system performance during the active life of the HLF and as the initial basis for the HLF embankment elevation and configuration.

The preliminary water balance model computations were performed for several cases, including considerations for above and below average precipitation data from recent years of record to estimate the system accumulation of process solution and the makeup water required.

A more detailed operational heap leach facility water balance model (HLF WBM) was then developed (The Mines Group, 2017) with the primary objectives of evaluating heap leach pad performance in terms of predicting: 1) makeup water demands, and 2) the potential for maintaining an adequate level of emergency pond storage volume through the life of the mine and into closure. The available emergency storage volume is defined as the total pond capacity minus the volume of water in storage within the pond system at any given point in time. Modeling was performed using both deterministic stochastic (risk or probability functions) approaches.

The design and storage capacities of the In-Heap and Event Ponds were finalized after considering primarily the stochastic results of the HLF WBM and the HLF Contingency Water Management Plan, by minimizing the probability of higher risk conditions. The modeling indicates that there is very low risk of encroaching on the required minimum emergency storage volume during normal operations.

6.0 LIMITATIONS

BGC Engineering Inc. (BGC) prepared this document for the account of StrataGold Corporation's (SGC) Eagle Gold Project located in Yukon Territory, Canada. SGC is a directly held, wholly owned subsidiary of Victoria Gold Corp. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves all documents and drawings are submitted for the confidential information of our client for a specific project. A record copy of this document is on file at BGC. That copy takes precedence over any other copy or reproduction of this document.

7.0 CLOSURE

We trust the above satisfies your requirements at this time. Should you have any questions or comments, please do not hesitate to contact us.

Yours sincerely,

BGC ENGINEERING INC.
per:

Troy Meyer, P.Eng.
Principal Geotechnical Engineer

Reviewed by:

Thomas G. Harper, PE
Principal Civil Engineer

TM/TH/bb/sjk

REFERENCES

BGC Engineering, Inc. (2012a), 2011 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report, January 20, 2012.

BGC Engineering, Inc. (2012b), 2012 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report, November 30, 2012.

BGC Engineering, Inc. (2017a) Eagle Gold Project 2016 Heap Leach Facility Geotechnical Investigation, June 2017.

BGC Engineering, Inc. (2017b), Technical Memorandum - In-Heap Pond and Events Pond Dam Breach Inundation Modelling, November 2017.

British Columbia Mine Waste Rock Pile Research Committee (1991), Mined rock and overburden piles: investigation and design manual, interim guidelines. Piteau Associates Engineering Ltd., British Columbia Ministry of Energy, Mines and Petroleum Resources.

Canadian Dam Association – Dam Safety Guidelines (2013), Dam Safety Guidelines. Toronto, Ontario Canada.

Canadian Dam Association - Dam Safety Guidelines. (2014), Application of dam safety guidelines to mining dams, Edmonton, AB.

GEO-SLOPE International, Ltd. (2004), User's Guide – Slope\W for Slope Stability Analysis – Version 4, Calgary, Alberta, Canada.

KCA (2012), Eagle Gold Project Report of Metallurgical Test Work, October 2012, prepared for StrataGold Corp, Vancouver BC, by Kappes Cassiday & Associates, Reno, NV.

Knight Piesold Ltd., (2013). Climate Baseline Data Summary, prepared for Vitoria Gold Corp, Eagle Gold Project, August 30, 2013.

Spencer, E. (1967), A Method of Analysis of the Stability of Embankments Assuming Parallel Inter-Slice Forces. Geotechnique, Vol. 17, No. 1, pp. 11-26.

LaGatta, M. D., Boardman, B. T., Cooley, B. H. and Daniel, D. E. (1997), Geosynthetic Clay

Liners Subjected to Differential Settlement. J. Geotech. Geoenv. Eng. 123(5), pp 402-411.

Lorax, (2017), Eagle Gold Hydrometerology Report, 13 March 2017.

MAC (2001) Mining Association of Canada. Developing an Operation Maintenance Surveillance Manual for Tailings and Water Management Facilities, 49 p., viewed April 2013,

MAC (2011) Mining Association of Canada. A Guide to the Management of Tailings Facilities, 68 p., viewed April 2013,

The Mines Group (2017). Water Balance Modeling for the Eagle Gold Mine Heap Leach Pad Facility.

National Research Council Canada (2005), National Building Code of Canada.

NRCS (1986) Natural Resources Conservation Service, United States Department of Agriculture, Urban Hydrology for Small Watersheds, TR-55.

Stantec (2011a), Eagle Gold Project, Environmental Baseline Report: Surficial Geology, Terrain and Soils; prepared for Victoria Gold Corp., June 2011.

Stantec (2011b), Eagle Gold Project, Environmental Baseline Report: Climate, prepared for Victoria Gold Corp., March 2012.

Stantec (2012), Eagle Gold Project, Environmental Baseline Data Report: Hydrology 2011 Update, prepared for Victoria Gold Corp., June 2012.

StrataGold Corp (2017), Eagle Gold Project Heap Leach Facility Foundation Improvement Plan 2017-01, July 2017.

U.S. Army Corp of Engineers (USACE) Hydrologic Engineer Center (HEC), HEC-HMS Computer Program Version 3.5 User's Manual, August 2010a.

U.S. Army Corp of Engineers (USACE) Hydrologic Engineer Center (HEC), HEC-RAS Computer Program Version 4.1.0 User's Manual, January 2010b.

Yukon Water Board (2009), Licensing Guidelines for Type A Quartz Mining Undertakings. http://yukonwaterboard.ca/policy/OLD/quartz_guidelines.pdf

APPENDIX A
SUPPORTING INFORM ATION

APPENDIX A-1
2011 GEOTECHNICAL INVESTIGATION

APPENDIX A-2
2012 GEOTECHNICAL INVESTIGATION

APPENDIX A-3
2017 GEOTECHNICAL INVESTIGATION

APPENDIX A-4
VARIOUS LABORATORY REPORTS, GOLDER, 2012

APPENDIX A-5
SEISMIC PEAK GROUND ACCELERATIONS FOR DESIGN, TETRA TECH, 2012

APPENDIX B
IN-HEAP POND SPILLWAY ANALYSIS

APPENDIX C
SOLUTION PIPE CALCULATIONS

APPENDIX D
PIPE DEFLECTION ANALYSIS

APPENDIX E
IN-HEAP POND AND EVENT PONDS SIZING

APPENDIX F
LINER LEAKAGE ANALYSIS

APPENDIX G
SLOPE STABILITY ANALYSIS

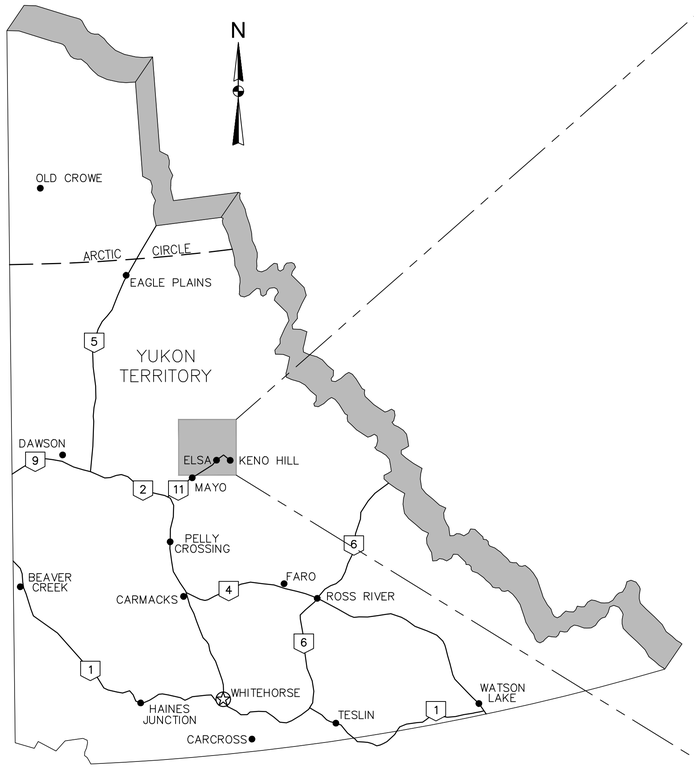
APPENDIX H
SETTLEMENT ANALYSIS

APPENDIX I
EVENT POND LINER BALLAST DESIGN

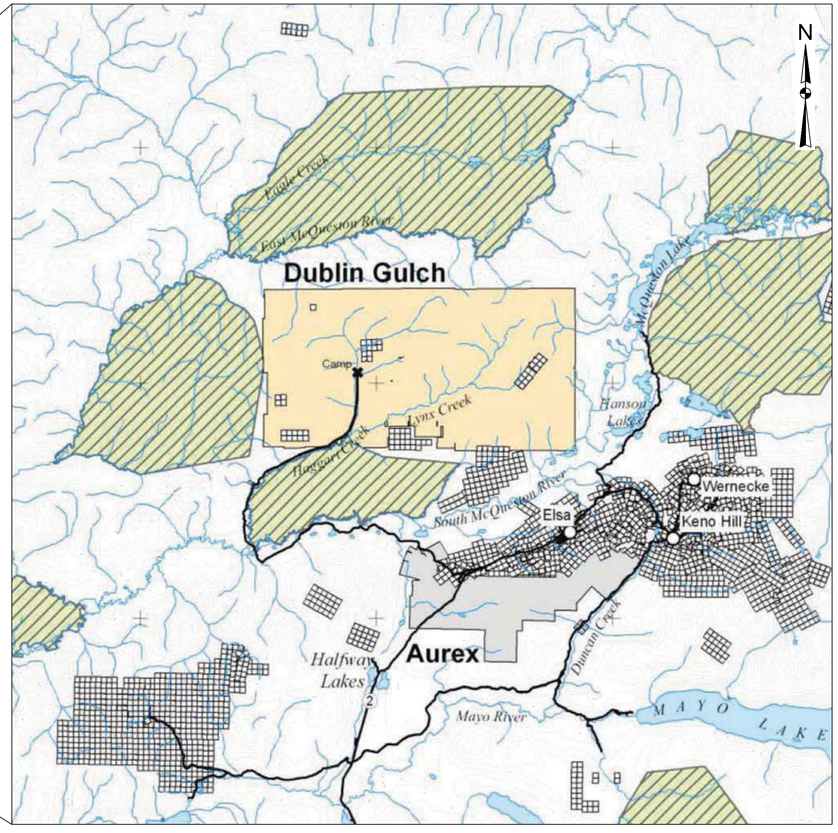
APPENDIX J
PROJECT TECHNICAL SPECIFICATIONS

DRAWINGS

EAGLE GOLD PROJECT
HEAP LEACH FACILITY
PHASE 1 FINAL DESIGN



REGIONAL LOCATION MAP



PROJECT LOCATION MAP

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

DWG No.	TITLE
EGHLF-XD-00-01	TITLE SHEET AND DRAWING INDEX
EGHLF-XD-00-02	GENERAL NOTES AND LEGEND
EGHLF-XD-01-01	GENERAL ARRANGEMENT PLAN
EGHLF-XD-01-02	SURVEY CONTROL PLAN
EGHLF-XD-01-03	SURFACE GEOLOGY MAP
EGHLF-XD-01-04	SITE INVESTIGATION PLAN
EGHLF-XD-01-05	OVERALL LAYOUT PLAN
EGHLF-XD-02-01	PHASE 1 PAD GRADING PLAN
EGHLF-XD-02-02	PHASE 1 ORE PILE PLAN
EGHLF-XD-02-03	PHASE 1 PAD GRADING CROSS-SECTIONS - SHEET 1 OF 2
EGHLF-XD-02-04	PHASE 1 PAD GRADING CROSS-SECTIONS - SHEET 2 OF 2
EGHLF-XD-02-05	CORRIDOR TYPICAL SECTIONS
EGHLF-XD-02-06	LINER DETAILS
EGHLF-XD-03-01	PHASE 1 TEMPORARY DIVERSION CHANNEL PLAN AND PROFILE - SHEET 1 OF 2
EGHLF-XD-03-02	PHASE 1 TEMPORARY DIVERSION CHANNEL PLAN AND PROFILE - SHEET 2 OF 2
EGHLF-XD-03-03	PHASE 1 UNDERDRAIN PIPING PLAN
EGHLF-XD-03-04	PHASE 1 UNDERDRAIN PIPING DETAILS
EGHLF-XD-03-05	CLOSURE PIPING PLAN AND PROFILE
EGHLF-XD-04-01	EMBANKMENT PLAN VIEW
EGHLF-XD-04-02	EMBANKMENT CROSS-SECTIONS
EGHLF-XD-04-03	EMBANKMENT DETAILS
EGHLF-XD-05-01	IN-HEAP SUMP DETAILS - SHEET 1 OF 2
EGHLF-XD-05-02	IN-HEAP SUMP DETAILS - SHEET 2 OF 2
EGHLF-XD-05-03	PLS SUMP DETAILS - SHEET 1 OF 2
EGHLF-XD-05-04	PLS SUMP DETAILS - SHEET 2 OF 2
EGHLF-XD-05-05	LDRS AND CLOSURE SUMP DETAILS
EGHLF-XD-05-06	MONITORING VAULT DETAILS
EGHLF-XD-06-01	PHASE 1 PLS RECOVERY PIPING PLAN VIEW
EGHLF-XD-06-02	PHASE 1 PLS RECOVERY PIPING DETAILS - SHEET 1 OF 2
EGHLF-XD-06-03	PHASE 1 PLS RECOVERY PIPING DETAILS - SHEET 2 OF 2
EGHLF-XD-07-01	EVENT POND PLAN VIEW
EGHLF-XD-07-02	EVENT POND CROSS-SECTIONS
EGHLF-XD-07-03	EVENT POND DETAILS - SHEET 1 OF 2
EGHLF-XD-07-04	EVENT POND DETAILS - SHEET 2 OF 2
EGHLF-XD-07-05	EVENT POND SPILLWAY PLAN AND PROFILE
EGHLF-XD-07-06	EVENT POND SPILLWAY TYPICAL SECTIONS AND DETAILS
EGHLF-XD-08-01	IN-HEAP POND SPILLWAY PLAN AND PROFILE
EGHLF-XD-08-02	IN-HEAP POND SPILLWAY BOX CULVERT PLAN AND PROFILE
EGHLF-XD-08-03	IN-HEAP POND SPILLWAY DETAILS
EGHLF-XD-09-01	INSTRUMENTATION PLAN
EGHLF-XD-09-02	INSTRUMENTATION DETAILS

NOT FOR CONSTRUCTION

DRAFT

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: TITLE SHEET AND DRAWING INDEX
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: N.T.S. / DWG No.: EGHLF-XD-00-01 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\07792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-00-01.dwg Layout: EGHLF-00-01 Plot Date: Oct 26 17 Time: 1:13 PM

GENERAL NOTES:

UNLESS OTHERWISE INDICATED ON THE DRAWINGS, THE FOLLOWING GENERAL NOTES SHALL APPLY:

1. ALL COORDINATES AND ELEVATIONS ARE SHOWN IN METRES, UNLESS NOTED OTHERWISE. COORDINATES AND TOPOGRAPHY ARE IN NAD83 (CSRS) UTM ZONE 8N COORDINATE SYSTEM. SURVEY PROVIDED BY UNDERHILL GEOMATICS LTD.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ACCOMPANYING DRAWINGS, SPECIFICATIONS, AND THE REPORT TITLED: "EAGLE GOLD PROJECT - HEAP LEACH FACILITY DETAILED DESIGN - DRAFT" ISSUED AUGUST 11, 2017. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD UNCERTAINTIES ARISE WITH THE DRAWINGS, SCOPE, AND/OR TECHNICAL SPECIFICATIONS.
3. UNLESS BGC AGREES OTHERWISE IN WRITING, THIS DRAWING SHALL NOT BE MODIFIED OR USED FOR ANY PURPOSE OTHER THAN THE PURPOSE FOR WHICH BGC GENERATED IT. BGC SHALL HAVE NO LIABILITY FOR ANY DAMAGES OR LOSS ARISING IN ANY WAY FROM ANY USE OR MODIFICATION OF THIS DOCUMENT NOT AUTHORIZED BY BGC. ANY USE OF OR RELIANCE UPON THIS DOCUMENT OR ITS CONTENT BY THIRD PARTIES SHALL BE AT SUCH THIRD PARTIES' SOLE RISK
4. SURFICIAL GEOLOGY PROVIDED BY BGC.
5. ALL DIMENSIONS, STATIONING, AND SCALES ARE SI METRIC SYSTEM.
6. SITE INVESTIGATION BOREHOLES, TEST PITS, AND SEISMIC LINE LOCATIONS SHOWN ON THESE DRAWINGS ARE THE BASIS FOR INTERPRETATION OF SUBSURFACE CONDITIONS FOR DESIGN. SEE APPENDIX A - SUPPORTING INFORMATION OF THE REPORT TITLED: "EAGLE GOLD PROJECT - HEAP LEACH FACILITY DETAILED DESIGN - DRAFT" ISSUED AUGUST 11, 2017. SUBSURFACE CONDITIONS MAY VARY BETWEEN THE SITE INVESTIGATION LOCATIONS DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ACTUAL SUBSURFACE CONDITIONS FOR CONSTRUCTION, AS WELL AS ANY CHANGES IN DESIGN GROUND LINES VERSUS EXISTING GROUND LINES BASED ON 2 METRE CONTOUR INTERVAL TOPOGRAPHY.
7. TOPOGRAPHY AND MINE FACILITY LAYOUTS PROVIDED BY HATCH.
8. ROAD SURFACES TO BE SLOPED AND GRADED TO DRAIN. CULVERTS TO BE INSTALLED AS REQUIRED TO PREVENT PONDING.
9. FINAL DESIGN OF SITE-WIDE ACCESS ROADS BY OTHERS, OTHER THAN THAT SHOWN HEREIN.
10. FINAL DESIGN OF THE PROCESS PLANT, CONVEYORS AND RELATED FACILITIES BY OTHERS. ELECTRICAL UTILITIES DESIGNED BY OTHERS.
11. FINAL DESIGN OF THE BARREN AND PREGNANT DELIVERY PIPELINES AND ASSOCIATED PUMPING AND DISTRIBUTION SYSTEMS, FRESH WATER SUPPLY PUMPS AND PIPELINES BY OTHERS.
12. ALL FOUNDATIONS AND OTHER EXCAVATIONS SHALL BE INSPECTED BY THE OWNER'S ENGINEER PRIOR TO FILL PLACEMENT.
13. ALL DRILL HOLES SHALL BE PLUGGED WITH CEMENT OR BENTONITE (WITHIN LIMITS OF AFFECTED AREA).

GENERAL LEGEND:

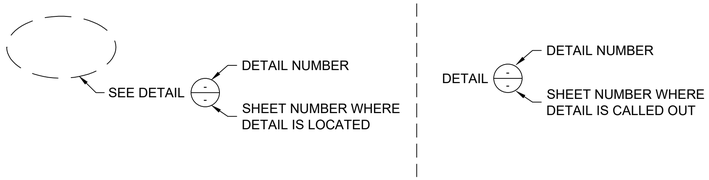
1020 — EXISTING CONTOURS (m)

1020 — PROPOSED GRADING CONTOURS (m)

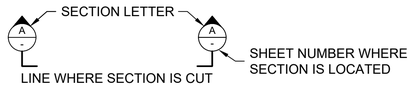
EXISTING FACILITIES

PROPOSED FACILITIES

DETAIL CALL-OUT



CROSS-SECTION LOCATION



ABREVIATIONS:

ADS	- ADVANCED DRAINAGE SYSTEMS, INC.
ASTM	- AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWWA	- AMERICAN WATER WORKS ASSOCIATION
BGC	- BGC ENGINEERING INC.
℄	- CENTRELINE
CQA	- CONSTRUCTION QUALITY ASSURANCE
CS	- CARBON STEEL
CSRS	- CANADIAN SPATIAL REFERENCE SYSTEM
DIA.	- DIAMETER
E	- EASTING (COORDINATE)
EL.	- ELEVATION
FG	- FINISHED GRADE
GCL	- GEOSYNTHETIC CLAY LINER
GWL	- GROUND WATER LEVEL
HDPE	- HIGH-DENSITY POLYETHYLENE
HLF	- HEAP LEACH FACILITY
I.D.	- INSIDE DIAMETER
INV	- INVERT
LDRS	- LEAK DETECTION AND RECOVERY SYSTEM
LLDPE	- LINEAR LOW-DENSITY POLYETHYLENE
MAX.	- MAXIMUM
MIN.	- MINIMUM
N	- NORTHING (COORDINATE)
NIC	- NOT IN CONTRACT
NOM	- NOMINAL
N.T.S.	- NOT TO SCALE
O.C.	- ON CENTRE
O.D.	- OUTSIDE DIAMETER
ODF	- OVERLINER DRAIN FILL
OZ.	- OUNCE
PLS	- PREGNANT LEACH SOLUTION
PE	- POLYETHYLENE
PVC	- POLYVINYL CHLORIDE
SCH.	- SCHEDULE
SL	- SEISMIC LINE
STA	- STATION
S.S.	- STAINLESS STEEL
TBD	- TO BE DETERMINED
TYP	- TYPICAL
UV	- ULTRAVIOLET
VWP	- VIBRATING WIRE PIEZOMETER
WSE	- WATER SURFACE ELEVATION
50 m	- DIMENSION IN METRES
2.5:1	- 2.5 HORIZONTAL TO 1 VERTICAL SLOPE
~	- APPROXIMATELY

FILL TYPES FOR CONSTRUCTION

MATERIAL No.	FILL MATERIAL NAME	FILL DESCRIPTION	MOISTURE CONDITIONING	LOOSE LIFT THICKNESS	COMPACTION EFFORT
①	SITE GRADING FILL	SITE GRADING SOILS FROM REQUIRED EXCAVATIONS AND CUT/FILL ACTIVITIES	2% +/- OF OPTIMUM	300 mm MAX.	95% OF ASTM D698 COMPACTION
②	SELECT FILL	FINE GRAINED MATERIALS FOR LINER BEDDING	-2% + 1% OF OPTIMUM	150 mm MAX.	95% OF ASTM D698 COMPACTION
③	STRUCTURAL FILL	WELL GRADED SOILS AND WEATHERED BEDROCK FROM REQUIRED EXCAVATIONS FOR EMBANKMENT FILL	2% +/- OF OPTIMUM	300 mm MAX.	95% OF ASTM D698 COMPACTION
④	OVERLINER DRAIN FILL (ODF)	CLEAN GRAVEL MATERIALS FOR HLF LINER COVER, PLS AND LDRS SUMPS	NONE	FILL NOTE 1	NONE REQUIRED
⑤	SELECT DRAIN FILL	CLEAN GRAVEL MATERIAL FOR UNDERDRAIN PIPES	NONE	AS REQUIRED	NONE REQUIRED
⑥	PIPE TRENCH BACKFILL	COARSE AGGREGATE STONE	NONE	AS REQUIRED	NONE REQUIRED
⑦	COMPACTED ROCKFILL	HIGH STRENGTH ROCK MATERIALS	AS REQUIRED	FILL NOTE 2	LARGE SCALE TEST FILL REQUIRED (FILL NOTE 2)
⑧	ANCHOR TRENCH BACKFILL	SITE GRADING FILL MATERIAL FOR USE IN LINER ANCHOR TRENCHES	AS REQUIRED	150 mm	85% OF ASTM D698 COMPACTION
⑨	ROAD WEARING COARSE	WELL GRADED SANDY GRAVEL	AS REQUIRED	150 mm	95% OF ASTM D698 COMPACTION
⑩	RIPRAP	COMPETENT ROCK FROM EXCAVATIONS	NONE	NONE REQUIRED	NONE REQUIRED
⑪	ORE	CRUSHED ORE MATERIAL FOR HEAP LEACHING	N/A	N/A	N/A

FILL NOTES:
1) OVERLINER DRAIN FILL TO BE PLACED IN A SINGLE LOOSE LIFT OF 0.6 m (MINIMUM) ON THE UPPER PAD AREAS AND 1.0 m (MINIMUM) IN THE IN-HEAP POND AREAS.
2) COMPACTED ROCKFILL THICKNESS AND COMPACTION DEPENDING ON AVAILABLE MATERIALS AND RESULTS OF LARGE SCALE TEST FILLS CONDUCTED BY THE ENGINEER DURING CONSTRUCTION, AS REQUIRED BY THE SPECIFICATIONS.

NOT FOR CONSTRUCTION

DRAFT

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-00-02.dwg Layout: EGHLF-00-02 Plot Date: Oct 26 17 Time: 1:21 PM

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: GENERAL NOTES AND LEGEND

SCALE:	DWG No.:	REV.:
N.T.S.	EGHLF-XD-00-02	0

N

E 458,000
E 459,000
E 460,000
E 461,000
N 7,102,000
N 7,101,000

PHASE 2 HEAP LEACH PAD PERIMETER BERM (NIC)
PHASE 3 HEAP LEACH PAD PERIMETER BERM (NIC)
TOPSOIL STOCKPILE 'C' (BY OTHERS)
EXFILTRATION OUTFALL OR CHANNEL TO SEDIMENT POND BY OTHERS
HEAP LEACH PHASE 2 (NIC)
PHASE 1 INTERCEPTOR DITCH
HEAP LEACH PHASE 3 (NIC)
PHASE 2 INTERCEPTOR DITCH (NIC)
HEAP LEACH PAD PERIMETER BERM
ANN GULCH
HLF SERVICE ROAD (BY OTHERS)
HEAP LEACH PHASE 1
PHASE 2 HEAP LEACH PAD PERIMETER BERM (NIC)
PROCESS PLANT SERVICE ROAD (BY OTHERS)
IN-HEAP POND LIMITS
PROCESS PLANT (BY OTHERS)
IN-HEAP POND SUMPS
HEAP LEACH PAD PERIMETER BERM
DUBLIN GULCH
RESERVED FOR EVENTS POND
IN-HEAP POND SPILLWAY
HAGGART CREEK
HEAP CONFINING EMBANKMENT
STEWART GULCH
EVENT POND
DUBLIN GULCH
HAUL ROAD (BY OTHERS)
EMERGENCY SPILLWAY
DITCH 'B'
CONTROL POND (BY OTHERS)
DITCH 'C'
CAMP (BY OTHERS)
OVERLAND CONVEYOR (BY OTHERS)
WATER TREATMENT PLANT (BY OTHERS)
TOPSOIL STOCKPILE 'B' (BY OTHERS)
EAGLE PUP GULCH
STUTTLE GULCH
EAGLE WASTE ROCK STORAGE

SCALE 1:5,000
100 0 100 200 300
METRES

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. PHASE 2 AND 3 FACILITY LAYOUT IS PRELIMINARY AND CONSTRUCTION OF PHASE 2 AND 3 FACILITY IS NOT IN CONTRACT.
3. MINE PLANT, CRUSHER, CONVEYORS, AGGLOMERATOR, CAMP, MONITORING VAULT, SEDIMENT PONDS, ACCESS ROADS AND OTHER INFRASTRUCTURE BY OTHERS.

DRAFT

NOT FOR CONSTRUCTION

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

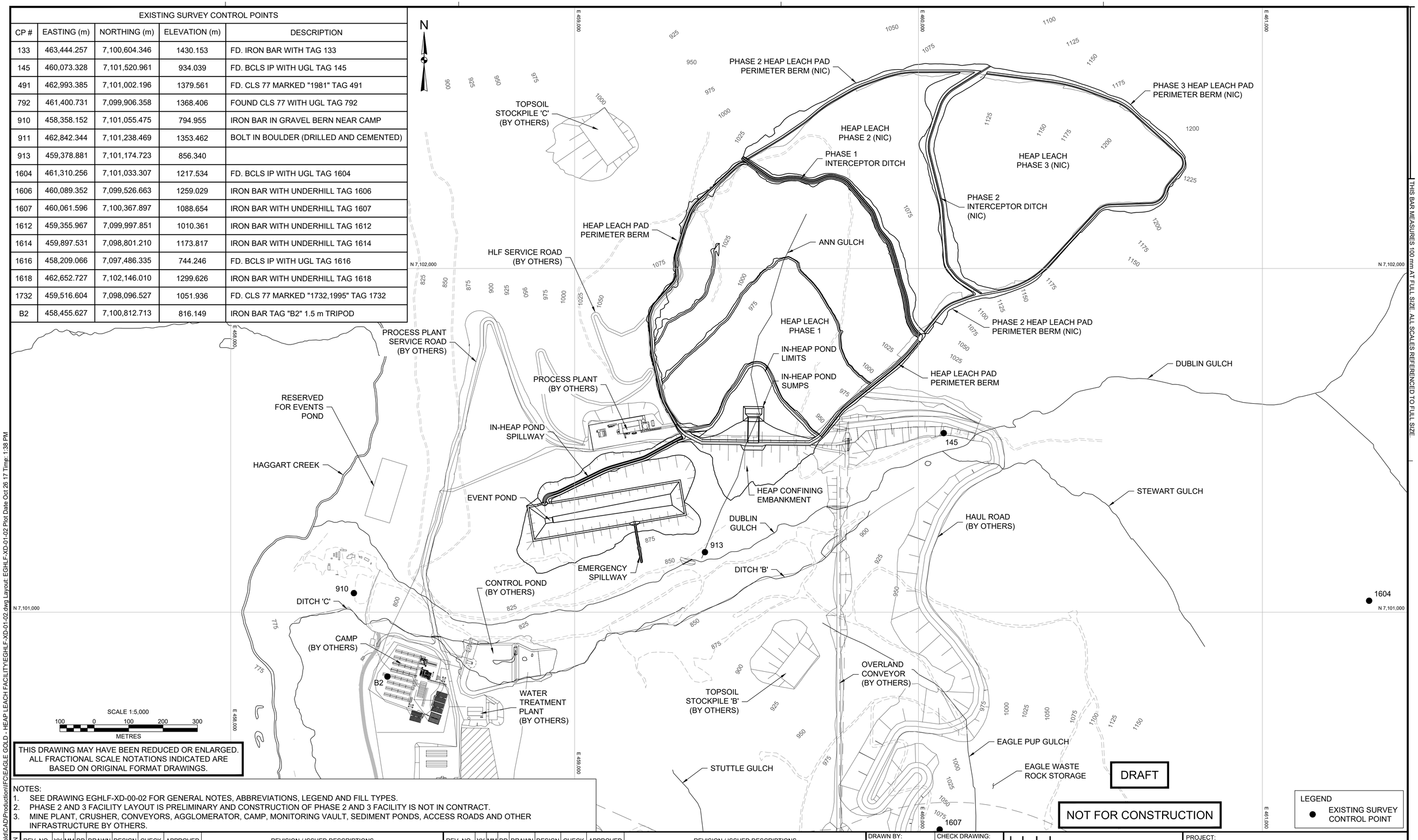
PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: GENERAL ARRANGEMENT PLAN

SCALE:	DWG No.:	REV.:
1:5,000	EGHLF-XD-01-01	0

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-01-01.dwg Layout: EGHLF-XD-01-01 Plot Date: Oct 26 17 Time: 1:31 PM

EXISTING SURVEY CONTROL POINTS				
CP #	EASTING (m)	NORTHING (m)	ELEVATION (m)	DESCRIPTION
133	463,444.257	7,100,604.346	1430.153	FD. IRON BAR WITH TAG 133
145	460,073.328	7,101,520.961	934.039	FD. BCLS IP WITH UGL TAG 145
491	462,993.385	7,101,002.196	1379.561	FD. CLS 77 MARKED "1981" TAG 491
792	461,400.731	7,099,906.358	1368.406	FOUND CLS 77 WITH UGL TAG 792
910	458,358.152	7,101,055.475	794.955	IRON BAR IN GRAVEL BERN NEAR CAMP
911	462,842.344	7,101,238.469	1353.462	BOLT IN BOULDER (DRILLED AND CEMENTED)
913	459,378.881	7,101,174.723	856.340	
1604	461,310.256	7,101,033.307	1217.534	FD. BCLS IP WITH UGL TAG 1604
1606	460,089.352	7,099,526.663	1259.029	IRON BAR WITH UNDERHILL TAG 1606
1607	460,061.596	7,100,367.897	1088.654	IRON BAR WITH UNDERHILL TAG 1607
1612	459,355.967	7,099,997.851	1010.361	IRON BAR WITH UNDERHILL TAG 1612
1614	459,897.531	7,098,801.210	1173.817	IRON BAR WITH UNDERHILL TAG 1614
1616	458,209.066	7,097,486.335	744.246	FD. BCLS IP WITH UGL TAG 1616
1618	462,652.727	7,102,146.010	1299.626	IRON BAR WITH UNDERHILL TAG 1618
1732	459,516.604	7,098,096.527	1051.936	FD. CLS 77 MARKED "1732,1995" TAG 1732
B2	458,455.627	7,100,812.713	816.149	IRON BAR TAG "B2" 1.5 m TRIPOD



THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE

DRAFT

NOT FOR CONSTRUCTION

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. PHASE 2 AND 3 FACILITY LAYOUT IS PRELIMINARY AND CONSTRUCTION OF PHASE 2 AND 3 FACILITY IS NOT IN CONTRACT.
3. MINE PLANT, CRUSHER, CONVEYORS, AGGLOMERATOR, CAMP, MONITORING VAULT, SEDIMENT PONDS, ACCESS ROADS AND OTHER INFRASTRUCTURE BY OTHERS.

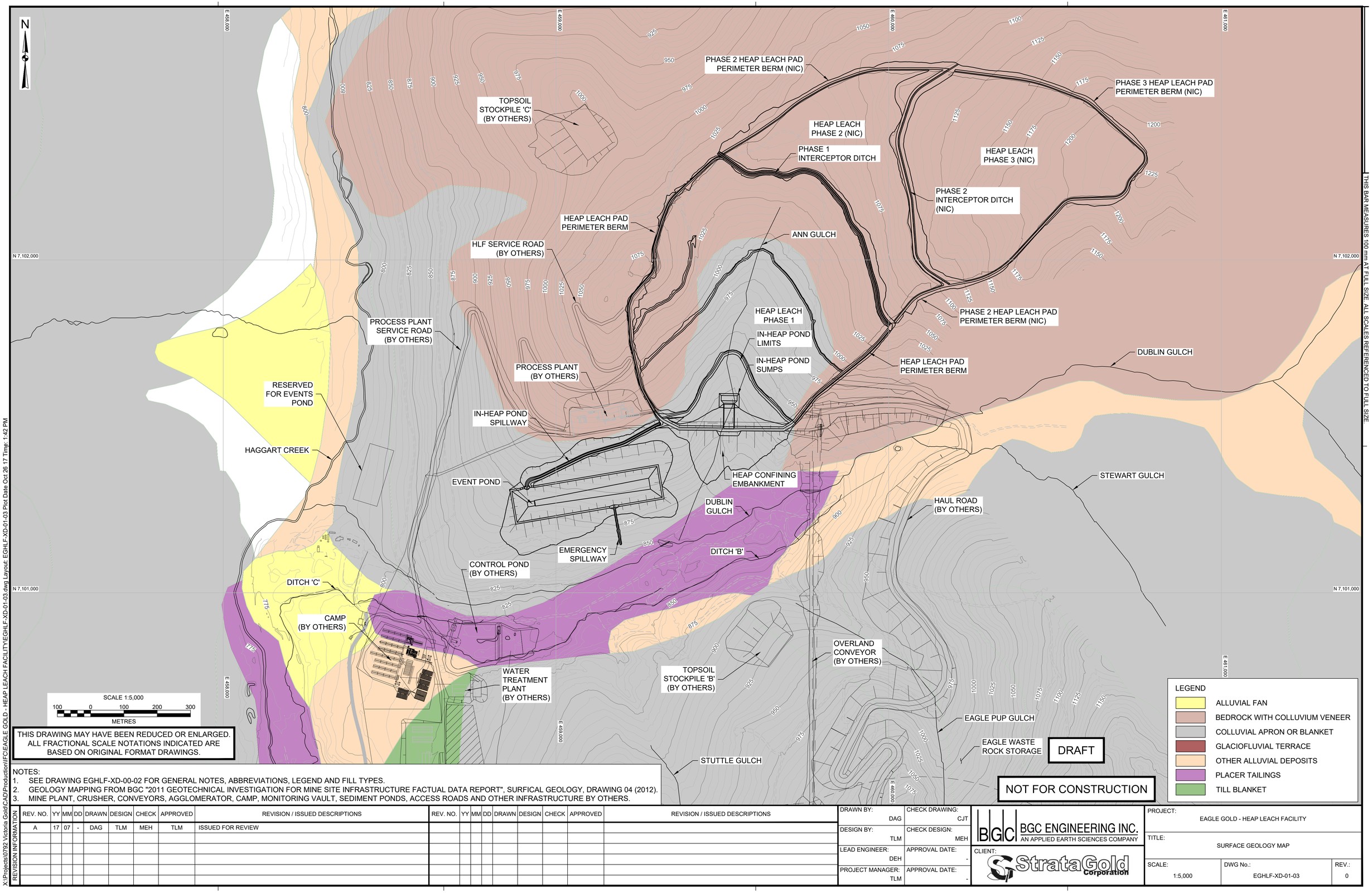
LEGEND
● EXISTING SURVEY CONTROL POINT

REVISION INFORMATION	REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
	A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: SURVEY CONTROL PLAN
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: 1:5,000 / DWG No.: EGHLF-XD-01-02 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-01-02.dwg Layout: EGHLF-XD-01-02 Plot Date: Oct 26 17 Time: 1:38 PM



THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. GEOLOGY MAPPING FROM BGC "2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", SURFICAL GEOLOGY, DRAWING 04 (2012).
3. MINE PLANT, CRUSHER, CONVEYORS, AGGLOMERATOR, CAMP, MONITORING VAULT, SEDIMENT PONDS, ACCESS ROADS AND OTHER INFRASTRUCTURE BY OTHERS.

DRAFT

NOT FOR CONSTRUCTION

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

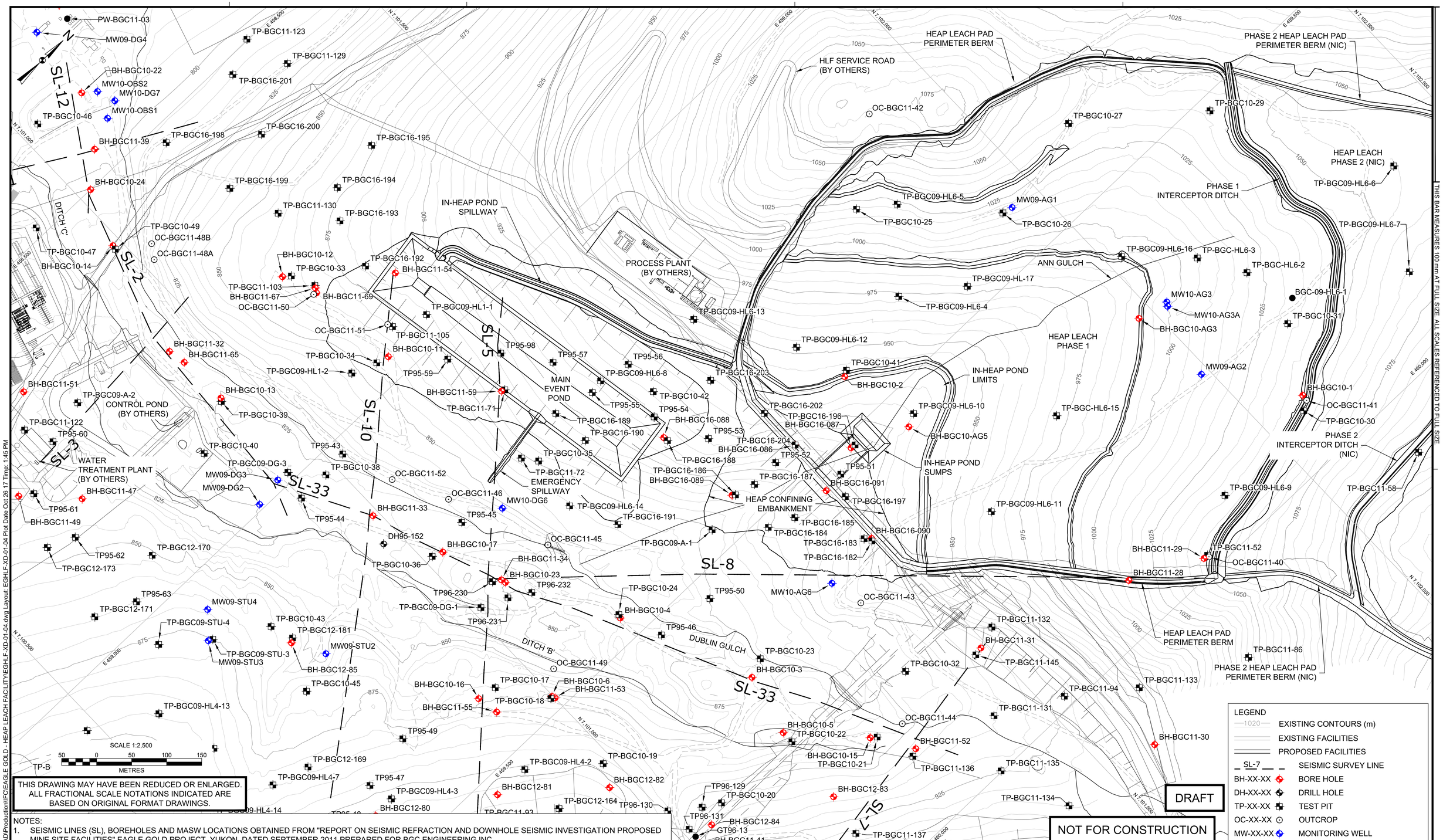
CLIENT: StrataGold Corporation

PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: SURFACE GEOLOGY MAP

SCALE:	DWG No.:	REV.:
1:5,000	EGHLF-XD-01-03	0

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-01-03.dwg Layout: EGHLF-XD-01-03 Plot Date Oct 26 17 Time: 1:42 PM



LEGEND

- 1020 EXISTING CONTOURS (m)
- EXISTING FACILITIES
- PROPOSED FACILITIES
- SL-7 SEISMIC SURVEY LINE
- BH-XX-XX BORE HOLE
- DH-XX-XX DRILL HOLE
- TP-XX-XX TEST PIT
- OC-XX-XX OUTCROP
- MW-XX-XX MONITORING WELL

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:

1. SEISMIC LINES (SL), BOREHOLES AND MASW LOCATIONS OBTAINED FROM "REPORT ON SEISMIC REFRACTION AND DOWNHOLE SEISMIC INVESTIGATION PROPOSED MINE SITE FACILITIES" EAGLE GOLD PROJECT, YUKON, DATED SEPTEMBER 2011 PREPARED FOR BGC ENGINEERING INC..

DRAFT

NOT FOR CONSTRUCTION

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	--	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

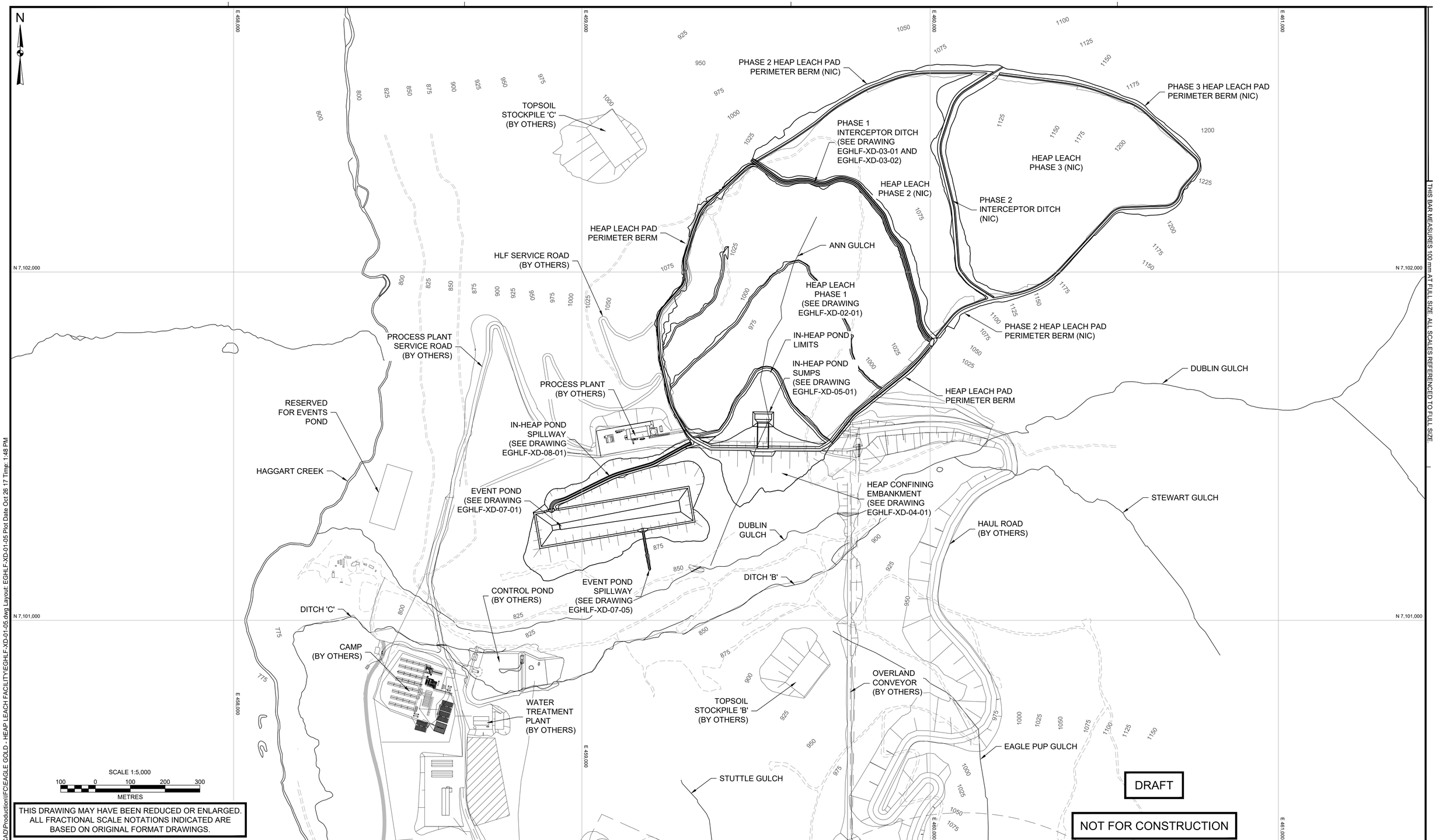
CLIENT: StrataGold Corporation

PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: SITE INVESTIGATION PLAN

SCALE:	DWG No.:	REV.:
1:2,500	EGHLF-XD-01-04	0

X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-01-04.dwg Layout: EGHLF-XD-01-04 Plot Date: Oct 26 '17 Time: 1:45 PM



THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

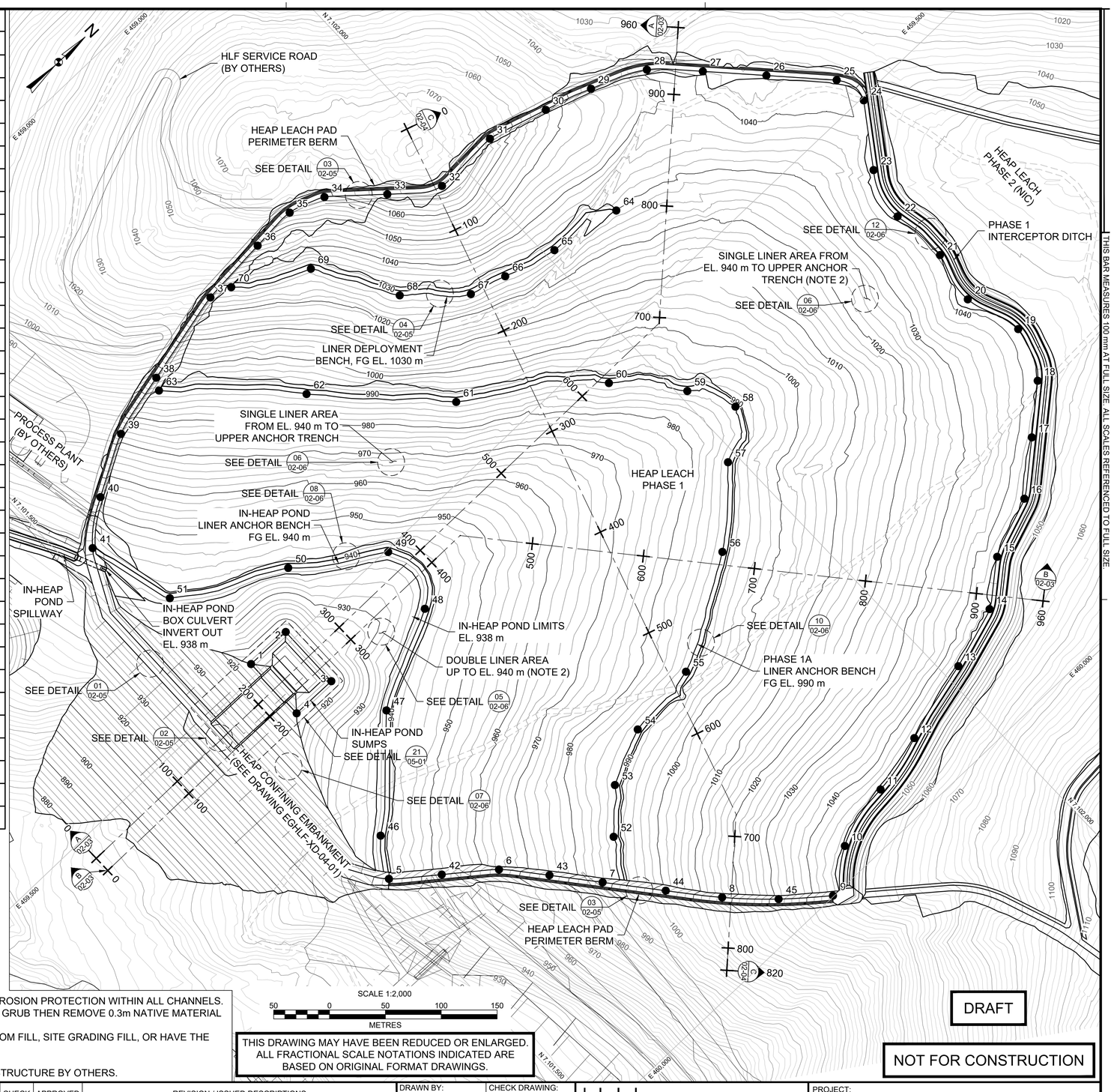
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: OVERALL LAYOUT PLAN
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: 1:5,000 / DWG No.: EGHLF-XD-01-05 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

X:\Projects\07792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-01-05.dwg Layout: EGHLF-XD-01-05 Plot Date: Oct 26 17 Time: 1:48 PM

PHASE 1 PAD GRADING CONTROL POINTS				
CP#	EASTING (m)	NORTHING (m)	ELEVATION (m)	DESCRIPTION
1	459,490.3	7,101,556.5	915.0	SUMP CREST
2	459,490.8	7,101,598.7	915.0	SUMP CREST
3	459,550.8	7,101,597.9	915.0	SUMP CREST
4	459,550.3	7,101,555.7	915.0	SUMP CREST
5	459,714.5	7,101,513.5	943.2	CREST
6	459,776.3	7,101,590.7	965.7	CREST
7	459,848.5	7,101,650.0	987.6	CREST
8	459,931.9	7,101,718.2	1017.3	CREST
9	459,999.1	7,101,791.2	1047.0	CREST
10	459,974.2	7,101,829.6	1046.7	CREST
11	459,959.6	7,101,887.5	1046.2	CREST
12	459,947.1	7,101,941.1	1045.6	CREST
13	459,927.6	7,102,014.0	1044.9	CREST
14	459,909.9	7,102,069.4	1044.3	CREST
15	459,880.7	7,102,106.5	1043.8	CREST
16	459,859.7	7,102,160.0	1043.2	CREST
17	459,824.6	7,102,202.6	1042.6	CREST
18	459,791.5	7,102,241.3	1042.1	CREST
19	459,746.0	7,102,260.5	1041.6	CREST
20	459,695.6	7,102,246.2	1041.0	CREST
21	459,649.8	7,102,255.4	1040.6	CREST
22	459,598.6	7,102,251.7	1040.0	CREST
23	459,553.7	7,102,264.7	1039.6	CREST
24	459,502.4	7,102,301.3	1039.0	CREST
25	459,472.6	7,102,296.2	1042.0	CREST
26	459,426.3	7,102,253.5	1043.5	CREST
27	459,384.4	7,102,214.8	1042.1	CREST
28	459,348.9	7,102,179.4	1041.6	CREST
29	459,326.8	7,102,131.5	1046.9	CREST
30	459,312.6	7,102,089.2	1053.4	CREST
31	459,296.9	7,102,035.2	1065.1	CREST
32	459,297.9	7,101,974.9	1069.9	CREST
33	459,269.6	7,101,934.4	1066.5	CREST
34	459,232.6	7,101,891.9	1059.5	CREST
35	459,221.3	7,101,859.7	1055.7	CREST
36	459,223.0	7,101,818.6	1046.3	CREST

PHASE 1 PAD GRADING CONTROL POINTS				
CP#	EASTING (m)	NORTHING (m)	ELEVATION (m)	DESCRIPTION
37	459,227.5	7,101,756.0	1026.7	CREST
38	459,246.2	7,101,671.4	996.5	CREST
39	459,260.8	7,101,614.0	974.0	CREST
40	459,289.2	7,101,561.7	954.5	CREST
41	459,317.4	7,101,525.1	940.7	CREST
42	459,744.3	7,101,550.4	954.1	CREST
43	459,811.1	7,101,619.9	975.9	CREST
44	459,892.8	7,101,685.8	1003.1	CREST
45	459,967.8	7,101,753.9	1032.4	CREST
46	459,681.4	7,101,534.8	940.0	BENCH CREST
47	459,603.8	7,101,615.7	940.0	BENCH CREST
48	459,561.5	7,101,703.3	940.0	BENCH CREST
49	459,502.1	7,101,714.5	940.0	BENCH CREST
50	459,450.8	7,101,639.8	940.0	BENCH CREST
51	459,397.4	7,101,544.4	940.0	BENCH CREST
52	459,825.7	7,101,685.2	990.0	BENCH CREST
53	459,793.0	7,101,717.9	990.0	BENCH CREST
54	459,771.0	7,101,767.0	990.0	BENCH CREST
55	459,763.3	7,101,833.9	990.0	BENCH CREST
56	459,708.1	7,101,931.3	990.0	BENCH CREST
57	459,653.4	7,101,990.2	990.0	BENCH CREST
58	459,621.9	7,102,029.3	990.0	BENCH CREST
59	459,582.2	7,102,007.7	990.0	BENCH CREST
60	459,528.6	7,101,961.8	990.0	BENCH CREST
61	459,446.8	7,101,851.0	990.0	BENCH CREST
62	459,349.3	7,101,758.9	990.0	BENCH CREST
63	459,256.1	7,101,665.3	990.0	BENCH CREST
64	459,421.3	7,102,072.9	1030.0	BENCH CREST
65	459,408.9	7,102,008.3	1030.0	BENCH CREST
66	459,395.5	7,101,960.3	1030.0	BENCH CREST
67	459,385.8	7,101,927.1	1030.0	BENCH CREST
68	459,342.8	7,101,880.1	1030.0	BENCH CREST
69	459,270.8	7,101,838.9	1030.0	BENCH CREST
70	459,233.6	7,101,775.9	1030.0	BENCH CREST



NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. THE REGRADED CONTOURS REPRESENT THE TOP OF THE LEACH PAD LINER WITHIN THE PAD, TOP OF ROAD SURFACES, AND BOTTOM OF EROSION PROTECTION WITHIN ALL CHANNELS. BELOW ELEVATION 940m, CLEAR & GRUB THEN REMOVE 1.8m NATIVE MATERIAL TO PREPARED SUBGRADE. ABOVE ELEVATION 940, CLEAR & GRUB THEN REMOVE 0.3m NATIVE MATERIAL TO PREPARED SUBGRADE.
3. ALL UNSUITABLE MATERIALS ENCOUNTERED DURING CONSTRUCTION MUST BE REMOVED AND EITHER REPLACED WITH COMPACTED RANDOM FILL, SITE GRADING FILL, OR HAVE THE EXCAVATED SURFACE PREPARED AS THE ROUGH GRADE SURFACE.
4. SLOPES OF THE REGRADED PAD GROUND SURFACE CONTOURS SHALL NOT EXCEED 2.5H:1V UNLESS NOTED OTHERWISE.
5. MINE PLANT, CRUSHER, CONVEYORS, AGGLOMERATOR, CAMP, MONITORING VAULT, SEDIMENT PONDS, ACCESS ROADS AND OTHER INFRASTRUCTURE BY OTHERS.

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

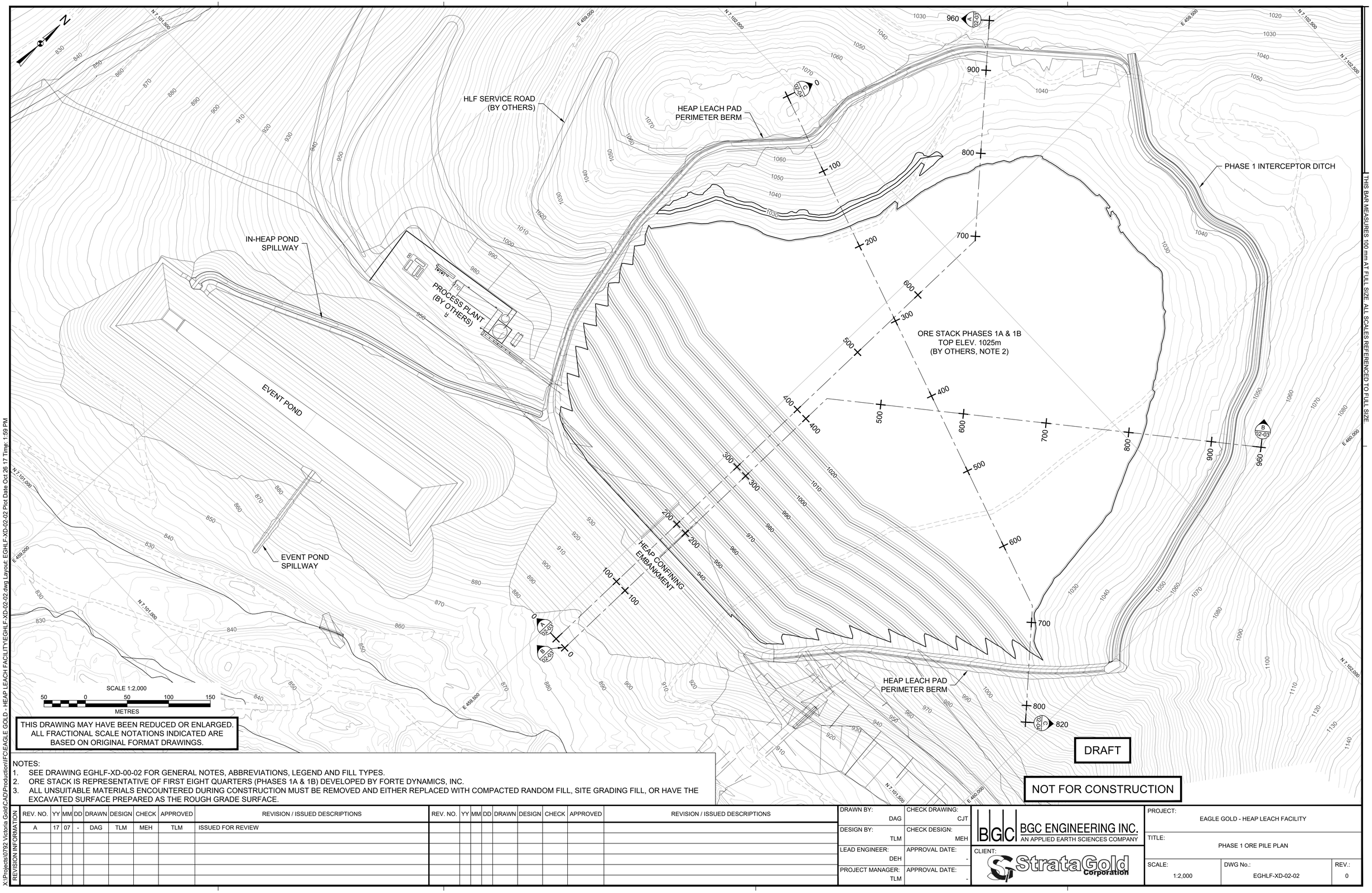
DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

PROJECT: EAGLE GOLD - HEAP LEACH FACILITY		
TITLE: PHASE 1 PAD GRADING PLAN		
SCALE: 1:2,000	DWG No.: EGHLF-XD-02-01	REV.: 0

X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-02-01.dwg Layout: EGHLF-XD-02-01 Plot Date Oct 26 17 Time: 1:53 PM



THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. ORE STACK IS REPRESENTATIVE OF FIRST EIGHT QUARTERS (PHASES 1A & 1B) DEVELOPED BY FORTE DYNAMICS, INC.
3. ALL UNSUITABLE MATERIALS ENCOUNTERED DURING CONSTRUCTION MUST BE REMOVED AND EITHER REPLACED WITH COMPACTED RANDOM FILL, SITE GRADING FILL, OR HAVE THE EXCAVATED SURFACE PREPARED AS THE ROUGH GRADE SURFACE.

DRAFT

NOT FOR CONSTRUCTION

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-02-02.dwg Layout: EGHLF-XD-02-02 Plot Date: Oct 26 17 Time: 1:59 PM

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

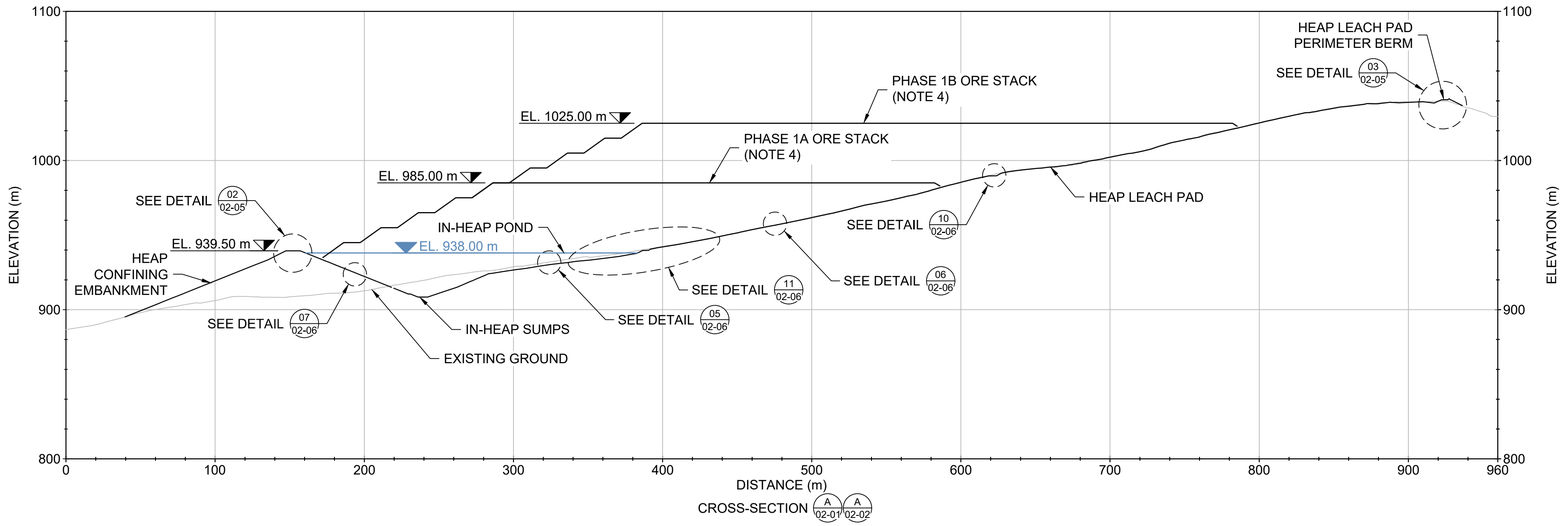
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

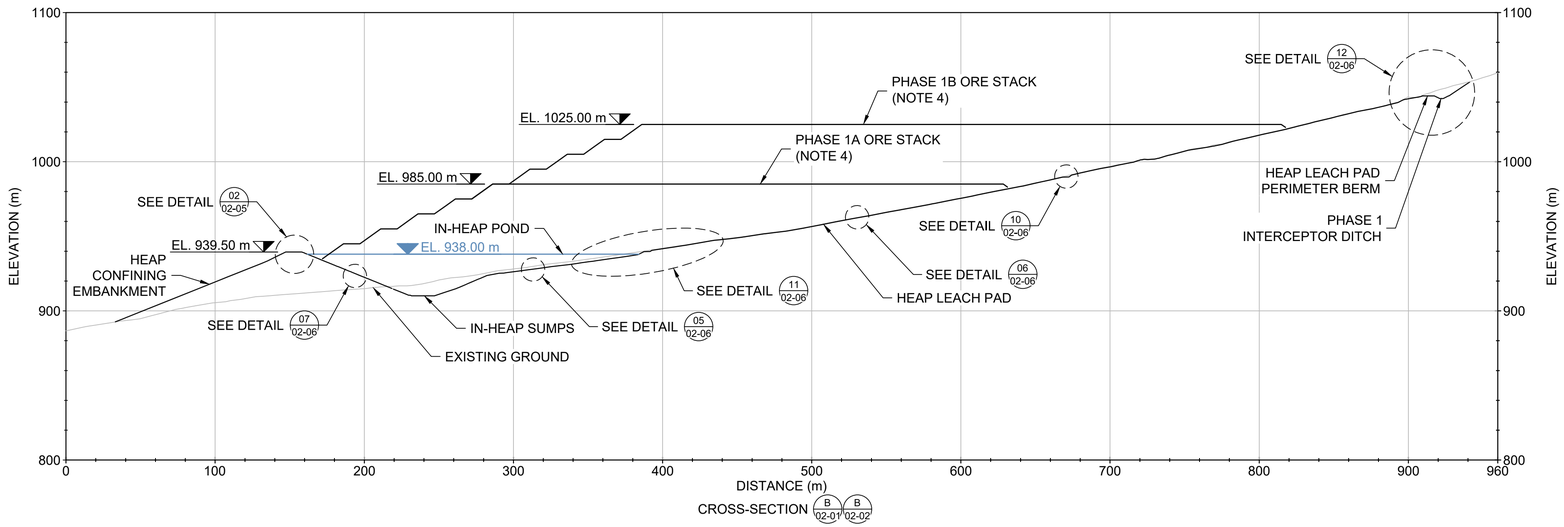
CLIENT: StrataGold Corporation

PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: PHASE 1 ORE PILE PLAN

SCALE:	DWG No.:	REV.:
1:2,000	EGHLF-XD-02-02	0





SCALE 1:2,000

50 0 50 100 150

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. PHASE 2 AND 3 PAD AND ORE STACK ARE NOT DESIGNED IN THIS CONSTRUCTION PACKAGE AND ARE NOT SHOWN.
3. BELOW ELEVATION 940m, CLEAR & GRUB THEN REMOVE 1.8m NATIVE MATERIAL TO PREPARED SUBGRADE. ABOVE ELEVATION 940m, CLEAR & GRUB THEN REMOVE 0.3m NATIVE MATERIAL TO PREPARED SUBGRADE.
4. ORE STACKING PLAN (BY OTHERS) MAY RESULT IN ORE HEAP STACK LIMITS DIFFERENT FROM SHOWN HERE. PHASES 1A/1B ORE STACKS ARE REPRESENTATIVE OF FIRST EIGHT QUARTERS DEVELOPED BY FORTE DYNAMICS, INC.
5. REQUIRED CONVEYOR RAMPS ON ORE HEAP STACK NOT SHOWN.
6. MAXIMUM OVERALL HEAP ORE STACK OUTSLOPE OF 2.5H:1V SHOWN. ORE WILL BE STACKED AT ANGLE OF REPOSE WITH BENCHES NECESSARY TO ACHIEVE THE OVERALL MAXIMUM OUTSLOPE ANGLE.

DRAFT

NOT FOR CONSTRUCTION

REVISION INFORMATION	REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
	A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

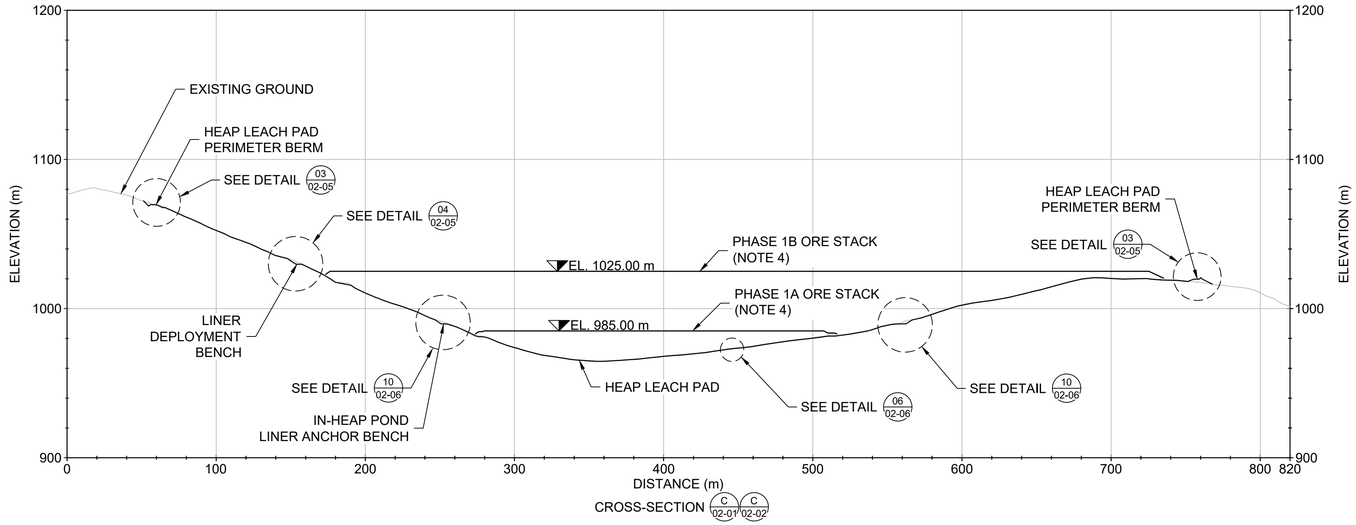
PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: PHASE 1 PAD GRADING CROSS-SECTIONS SHEET 1 OF 2

SCALE:	DWG No.:	REV.:
1:2,000	EGHLF-XD-02-03	0

THIS BAR MEASURES 100 mm AT FULL SIZE ALL SCALES REFERENCED TO FULL SIZE

X:\Projects\07792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-02-03.dwg Layout: EGHLF-XD-02-03 Plot Date: Oct 26 '17 Time: 2:02 PM



SCALE 1:2,000

50 0 50 100 150

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:

1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. PHASE 2 AND 3 PAD AND ORE PILE ARE NOT DESIGNED IN THIS CONSTRUCTION PACKAGE AND ARE NOT SHOWN.
3. BELOW ELEVATION 940m, CLEAR & GRUB THEN REMOVE 1.8m NATIVE MATERIAL TO PREPARED SUBGRADE. ABOVE ELEVATION 940m, CLEAR & GRUB THEN REMOVE 0.3m NATIVE MATERIAL TO PREPARED SUBGRADE.
4. ORE STACKING PLAN (BY OTHERS) MAY RESULT IN ORE HEAP PILE LIMITS DIFFERENT FROM SHOWN HERE. PHASES 1A/1B ORE STACKS ARE REPRESENTATIVE OF FIRST EIGHT QUARTERS DEVELOPED BY FORTE DYNAMICS, INC.
5. REQUIRED CONVEYOR RAMPS ON ORE HEAP PILE NOT SHOWN.
6. MAXIMUM OVERALL HEAP ORE PILE OUTSLOPE OF 2.5H:1V SHOWN. ORE WILL BE STACKED AT ANGLE OF REPOSE WITH BENCHES NECESSARY TO ACHIEVE THE OVERALL MAXIMUM OUTSLOPE ANGLE.

DRAFT

NOT FOR CONSTRUCTION

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

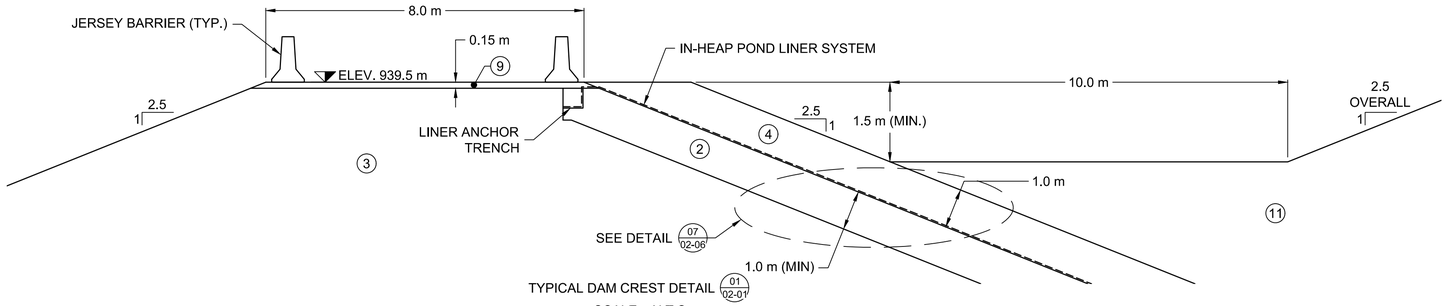
PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: PHASE 1 PAD GRADING CROSS-SECTIONS SHEET 2 OF 2

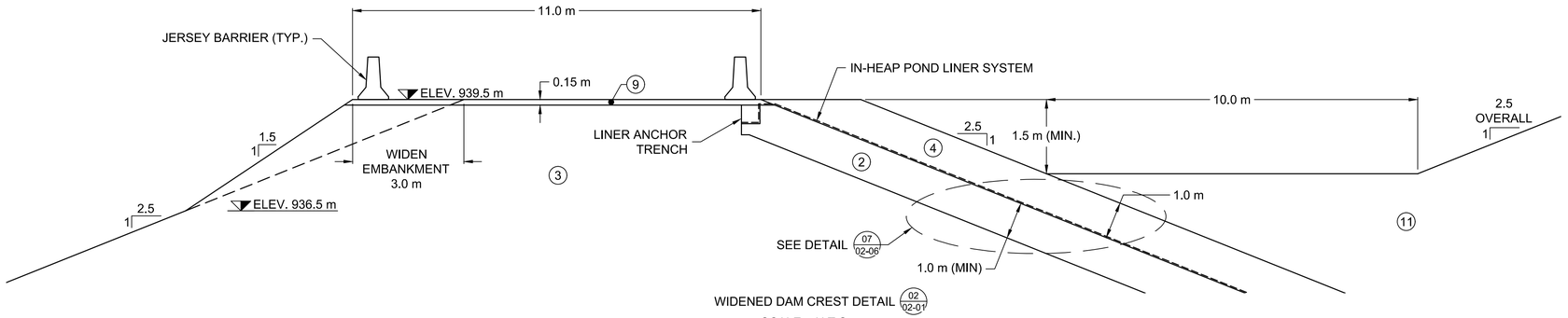
SCALE:	DWG No.:	REV.:
1:2,000	EGHLF-XD-02-04	0

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

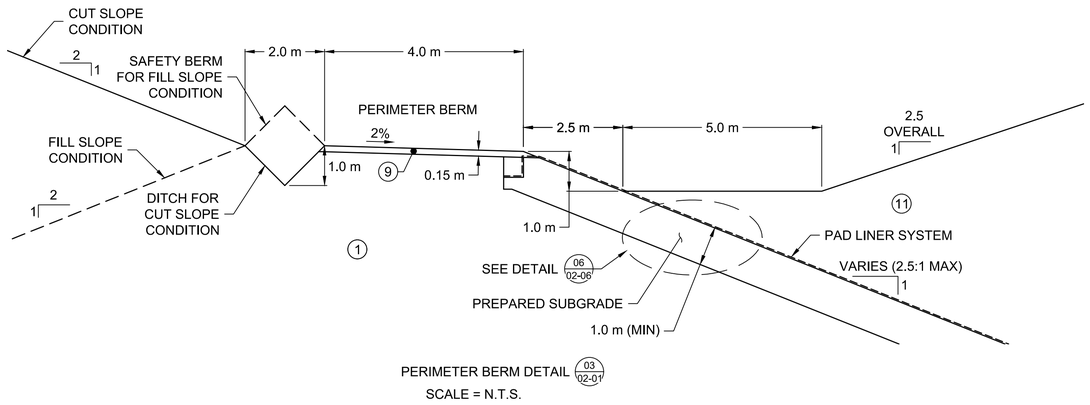
X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-02-04.dwg Layout: EGHLF-XD-02-04 Plot Date: Oct 26 17 Time: 2:05 PM



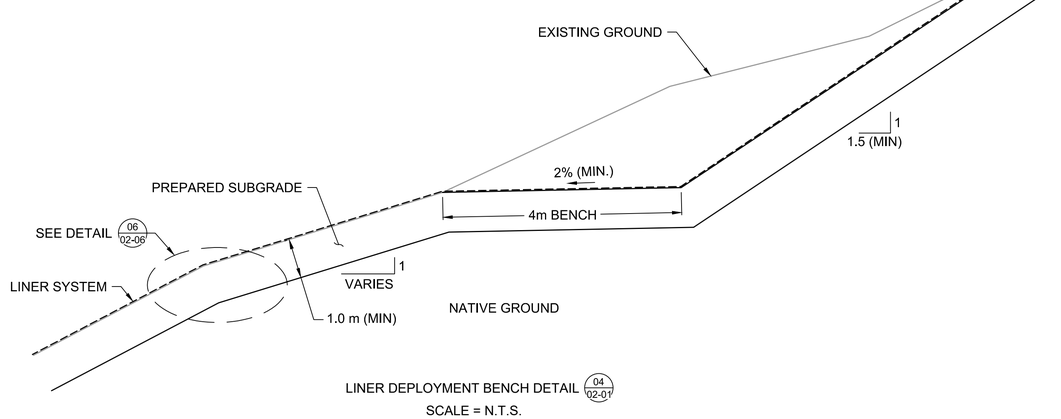
SCALE = N.T.S.



SCALE = N.T.S.



SCALE = N.T.S.



SCALE = N.T.S.

LEGEND

1	SITE GRADING FILL
2	SELECT FILL
3	STRUCTURAL FILL
4	OVERLINER DRAIN FILL
9	ROAD WEARING COURSE
11	ORE STOCKPILE

NOT FOR CONSTRUCTION

DRAFT

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.

REVISION INFORMATION

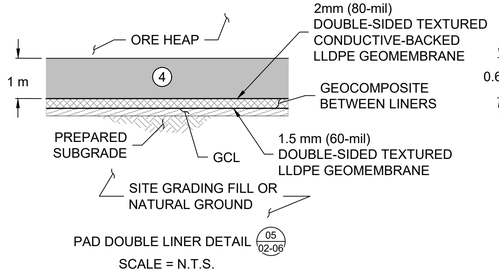
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: CORRIDOR TYPICAL SECTIONS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: N.T.S. / DWG No.: EGHLF-XD-02-05 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

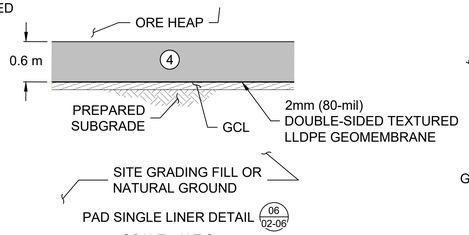
THIS BAR MEASURES 100 mm AT FULL SIZE ALL SCALES REFERENCED TO FULL SIZE

X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-02-05.dwg Layout: EGHLF-XD-02-05 Plot Date: Oct 26, 17 Time: 2:07 PM



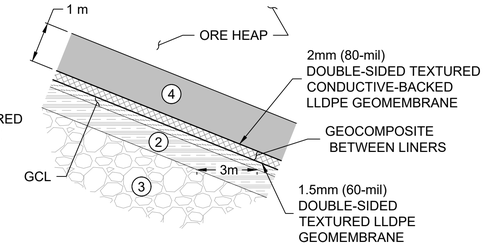
PAD DOUBLE LINER DETAIL (05 02-06)

SCALE = N.T.S.



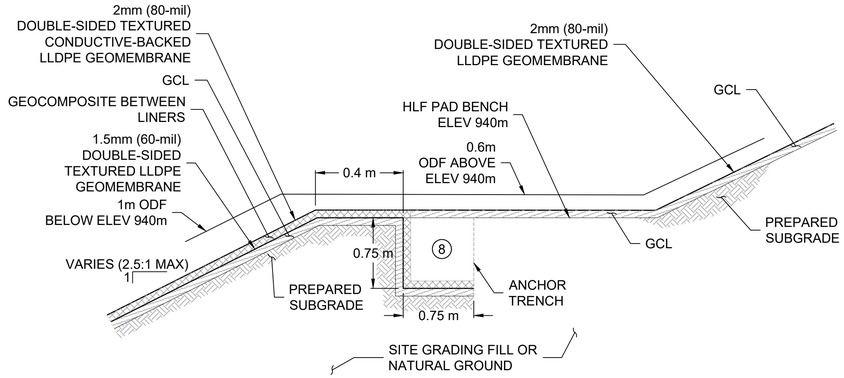
PAD SINGLE LINER DETAIL (06 02-06)

SCALE = N.T.S.



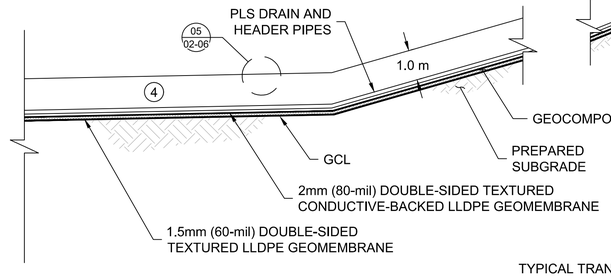
EMBANKMENT LINER DETAIL (07 02-06)

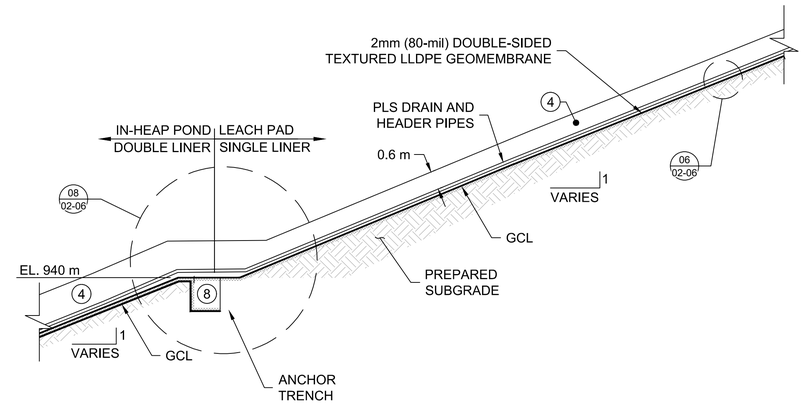
SCALE = N.T.S.



DOUBLE LINER GEOMEMBRANE ANCHOR DETAIL (08 02-06)

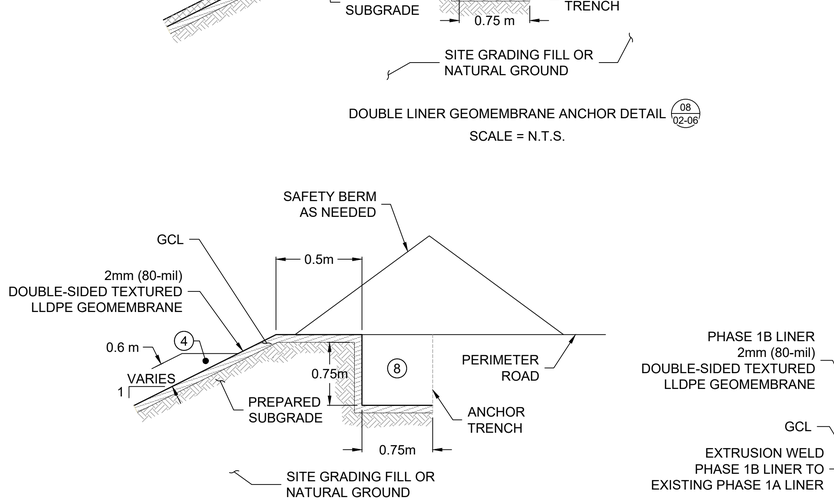
SCALE = N.T.S.





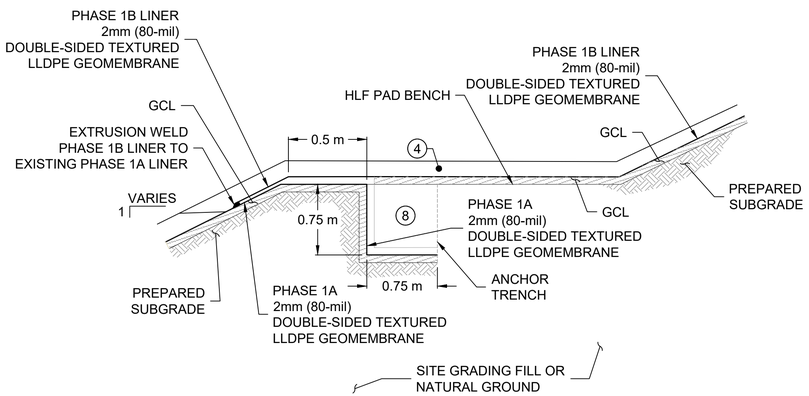
TYPICAL TRANSITION FROM IN–HEAP POND (11 02-06)

SCALE = N.T.S.



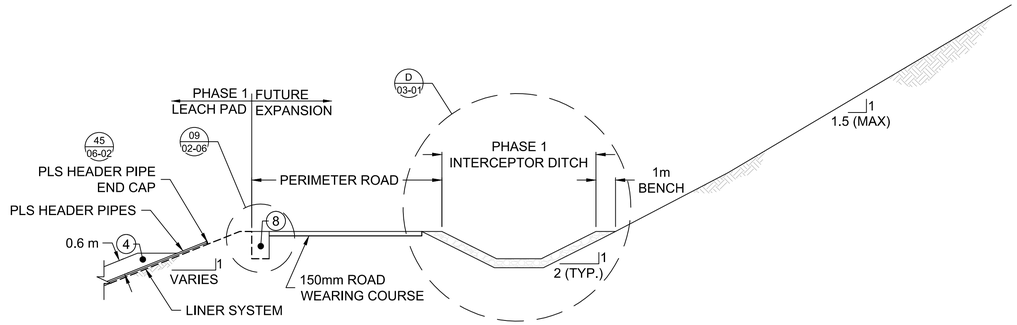
SINGLE LINER GEOMEMBRANE ANCHOR DETAIL (09 02-06)

SCALE = N.T.S.



PHASE 1B GEOMEMBRANE DETAIL (10 02-06)

SCALE = N.T.S.



TYPICAL PHASE 1 PERIMETER ROAD W/ INTERCEPTOR DITCH (12 02-06)

SCALE = N.T.S.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.

THIS BAR MEASURES 100 mm AT FULL SIZE ALL SCALES REFERENCED TO FULL SIZE

DRAFT

NOT FOR CONSTRUCTION

LEGEND
- (2) SELECT FILL
- (3) STRUCTURAL FILL
- (4) OVERLINER DRAIN FILL

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

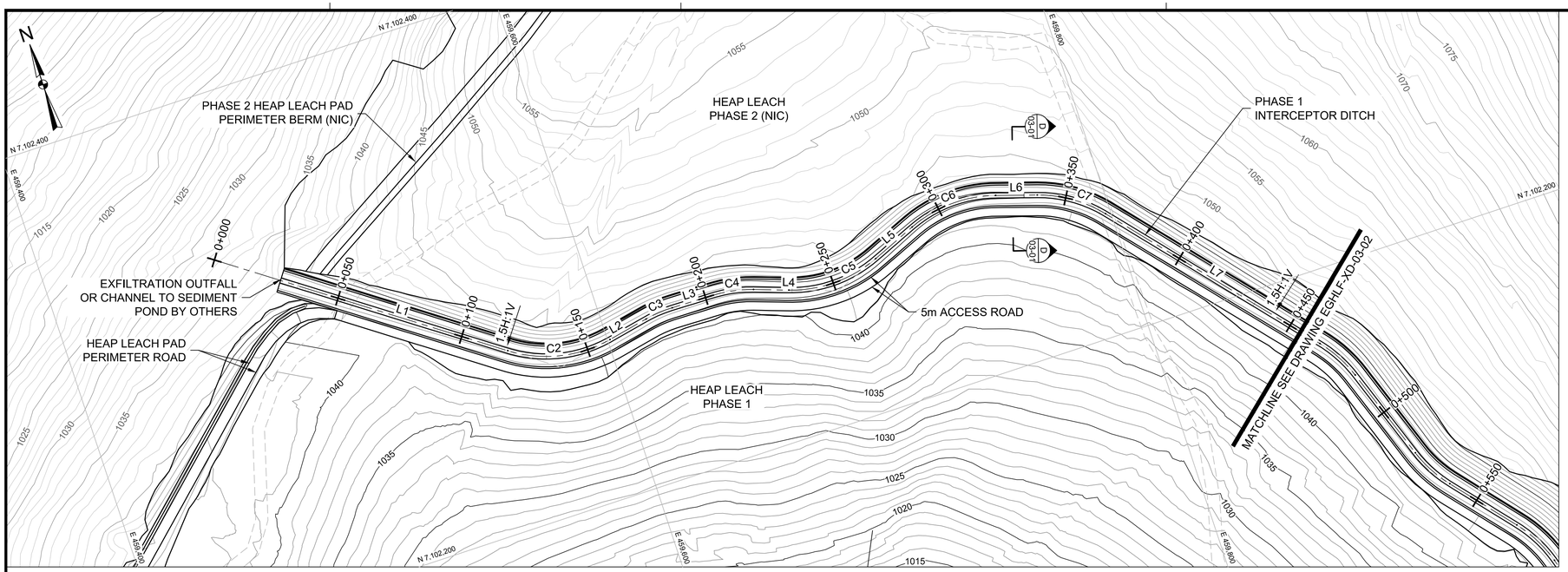
REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

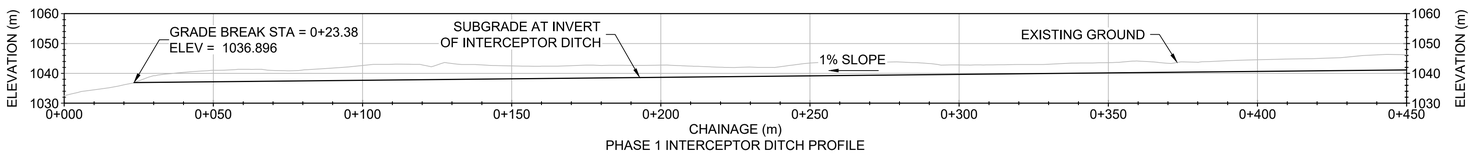
DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: LINER DETAILS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: N.T.S. / DWG No.: EGHLF-XD-02-06 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-02-06.dwg Layout: EGHLF-XD-02-06 Plot Date: Oct 26 17 Time: 2:09 PM

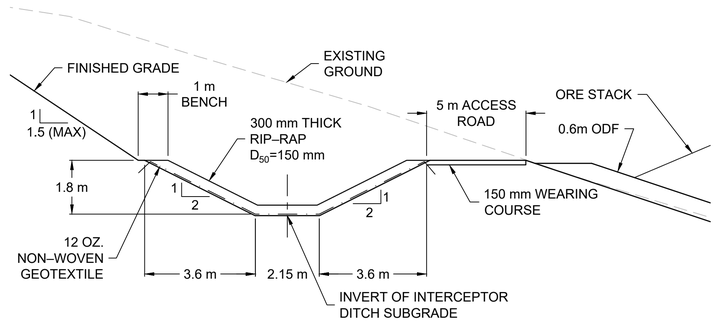


CURVE TABLE				
C#	RADIUS (m)	LENGTH (m)	START POINT (E,N)	END POINT (E,N)
C2	50.000	40.859	(459562.0907,7102268.5151)	(459600.9402,7102260.1897)
C3	50.000	11.032	(459616.6430,7102263.3317)	(459627.6108,7102264.2901)
C4	50.000	15.685	(459644.2734,7102263.9042)	(459659.6422,7102261.1074)
C5	50.000	36.530	(459672.5366,7102256.5916)	(459708.2450,7102257.6072)
C6	50.000	35.170	(459725.4238,7102264.7438)	(459759.8430,7102266.1913)
C7	50.000	27.718	(459775.1773,7102261.2848)	(459797.9631,7102246.1324)

LINE TABLE			
L#	LENGTH (m)	START POINT (E,N)	END POINT (E,N)
L1	118.596	(459465.5473,7102337.3943)	(459562.0907,7102268.5151)
L2	16.014	(459600.9402,7102260.1897)	(459616.6430,7102263.3317)
L3	16.667	(459627.6108,7102264.2901)	(459644.2734,7102263.9042)
L4	13.662	(459659.6422,7102261.1074)	(459672.5366,7102256.5916)
L5	18.602	(459708.2450,7102257.6072)	(459725.4238,7102264.7438)
L6	16.100	(459759.8430,7102266.1913)	(459775.1773,7102261.2848)
L7	96.773	(459797.9631,7102246.1324)	(459860.8059,7102172.5405)



PHASE 1 INTERCEPTOR DITCH PROFILE



TYPICAL PHASE 1 INTERCEPTOR DITCH SECTION (D 03-01) (D 03-02)

SCALE = N.T.S.

SCALE 1:1,000

25 0 25 50 75

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. TEMPORARY SLOPE ABOVE PHASE 1 INTERCEPTOR DITCH SHALL BE MAXIMUM 1.5H:1V OR AS OTHERWISE DIRECTED BY THE OWNER'S ENGINEER BASED ON VISUAL OBSERVATION OF FIELD CONDITIONS DURING CONSTRUCTION.

DRAFT

NOT FOR CONSTRUCTION

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

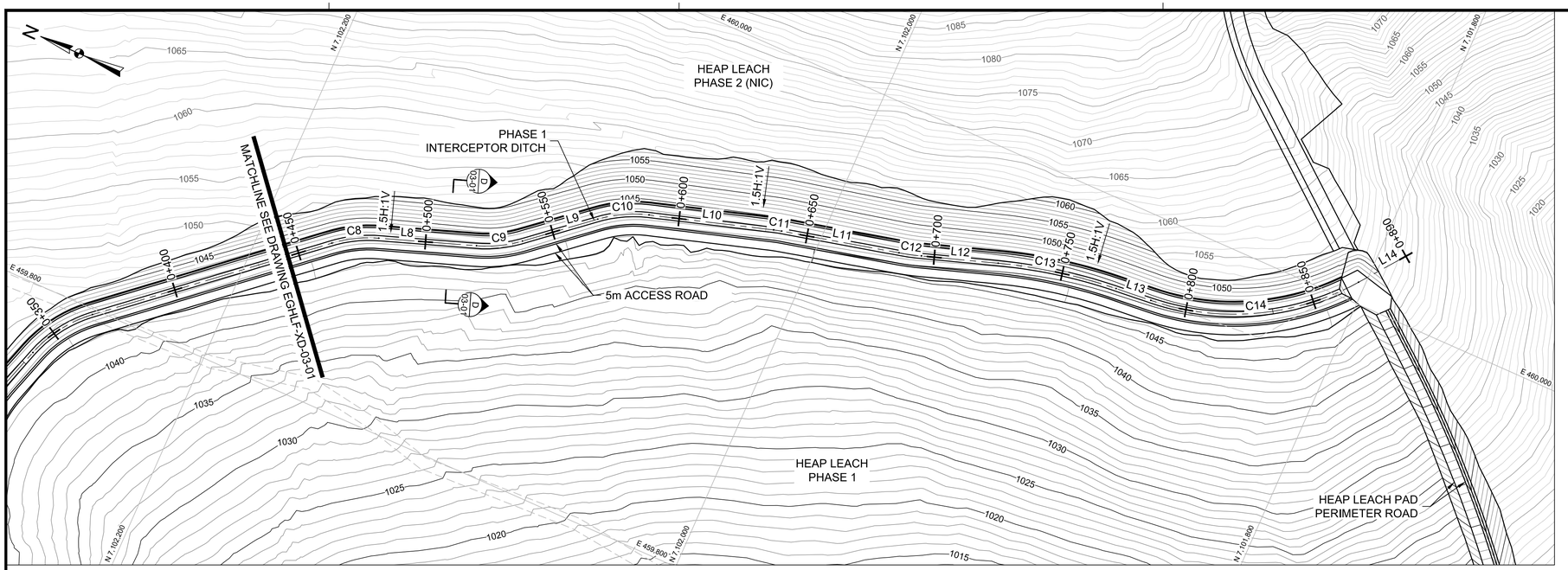
PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: PHASE 1 INTERCEPTOR DITCH PLAN AND PROFILE
SHEET 1 OF 2

SCALE:	DWG No.:	REV.:
1:1,000	EGHLF-XD-03-01	0

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-03-01.dwg Layout: EGHLF-XD-03-01 Plot Date: Oct 26 17 Time: 2:12 PM



CURVE TABLE				
C#	RADIUS (m)	LENGTH (m)	START POINT (E,N)	END POINT (E,N)
C8	50.000	18.386	(459860.8059,7102172.5405)	(459869.9362,7102156.7016)
C9	50.000	18.003	(459882.5727,7102120.8720)	(459891.4558,7102105.3247)
C10	50.000	20.089	(459910.9939,7102082.0873)	(459920.5296,7102064.5589)
C11	50.000	3.179	(459934.7629,7102018.1098)	(459935.5970,7102015.0432)
C12	100.000	8.828	(459946.2967,7101970.1105)	(459948.7178,7101961.6241)
C13	200.000	46.835	(459958.1628,7101933.3176)	(459967.6735,7101887.5674)
C14	100.000	83.166	(459968.9205,7101873.4136)	(460007.9153,7101802.6581)

LINE TABLE			
L#	LENGTH (m)	START POINT (E,N)	END POINT (E,N)
L8	37.993	(459869.9362,7102156.7016)	(459882.5727,7102120.8720)
L9	30.360	(459891.4558,7102105.3247)	(459910.9939,7102082.0873)
L10	48.581	(459920.5296,7102064.5589)	(459934.7629,7102018.1098)
L11	46.189	(459935.5970,7102015.0432)	(459946.2967,7101970.1105)
L12	29.841	(459948.7178,7101961.6241)	(459958.1628,7101933.3176)
L13	14.209	(459967.6735,7101887.5674)	(459968.9205,7101873.4136)
L14	20.935	(460007.9153,7101802.6581)	(460024.5651,7101789.9676)



PHASE 1 INTERCEPTOR DITCH PROFILE

SCALE 1:1,000

25 0 25 50 75

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

NOTES:

1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. TEMPORARY SLOPE ABOVE PHASE 1 INTERCEPTOR DITCH SHALL BE MAXIMUM 1.5H:1V OR AS OTHERWISE DIRECTED BY THE OWNER'S ENGINEER BASED ON VISUAL OBSERVATION OF FIELD CONDITIONS DURING CONSTRUCTION.
3. BASE TOPOGRAPHIC DATA BASED ON CONTOURS FROM LIDAR SURVEY PROVIDED BY M3 ENGINEERING, DATED 2011. CONTOUR INTERVAL IS 1 m.

DRAFT

NOT FOR CONSTRUCTION

REVISION INFORMATION

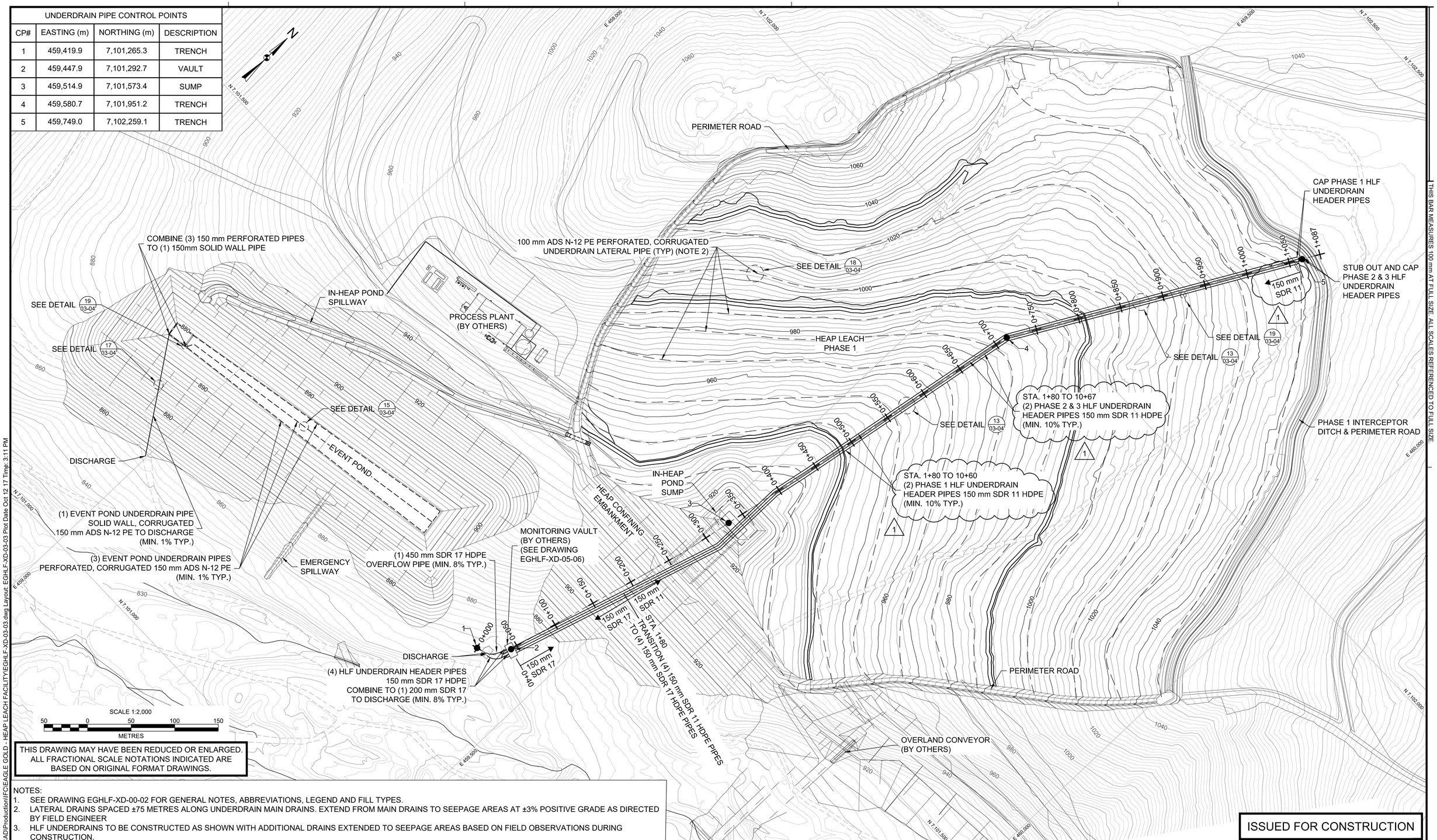
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: PHASE 1 INTERCEPTOR DITCH PLAN AND PROFILE SHEET 2 OF 2
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: 1:1,000 / DWG No.: EGHLF-XD-03-02 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

X:\Projects\07792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-03-02.dwg Layout: EGHLF-XD-03-02 Plot Date Oct 26 17 Time: 2:15 PM

UNDERDRAIN PIPE CONTROL POINTS			
CP#	EASTING (m)	NORTHING (m)	DESCRIPTION
1	459,419.9	7,101,265.3	TRENCH
2	459,447.9	7,101,292.7	VAULT
3	459,514.9	7,101,573.4	SUMP
4	459,580.7	7,101,951.2	TRENCH
5	459,749.0	7,102,259.1	TRENCH



SCALE 1:2,000

50 0 50 100 150

METRES

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. LATERAL DRAINS SPACED ±75 METRES ALONG UNDERDRAIN MAIN DRAINS. EXTEND FROM MAIN DRAINS TO SEEPAGE AREAS AT ±3% POSITIVE GRADE AS DIRECTED BY FIELD ENGINEER
3. HLF UNDERDRAINS TO BE CONSTRUCTED AS SHOWN WITH ADDITIONAL DRAINS EXTENDED TO SEEPAGE AREAS BASED ON FIELD OBSERVATIONS DURING CONSTRUCTION.

ISSUED FOR CONSTRUCTION

REVISION INFORMATION																
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS	REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW									
0	17	09	08	DAG	TLM	MEH	TLM	ISSUED FOR CONSTRUCTION									
1	17	10	12	DAG	TLM	MEH	TLM	UNDERDRAIN PIPES REVISED									

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

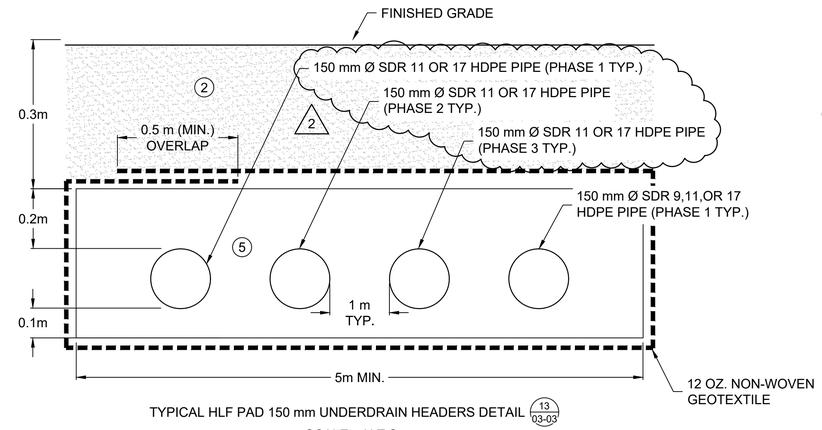
CLIENT: StrataGold Corporation

PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: PHASE 1 UNDERDRAIN PIPING PLAN

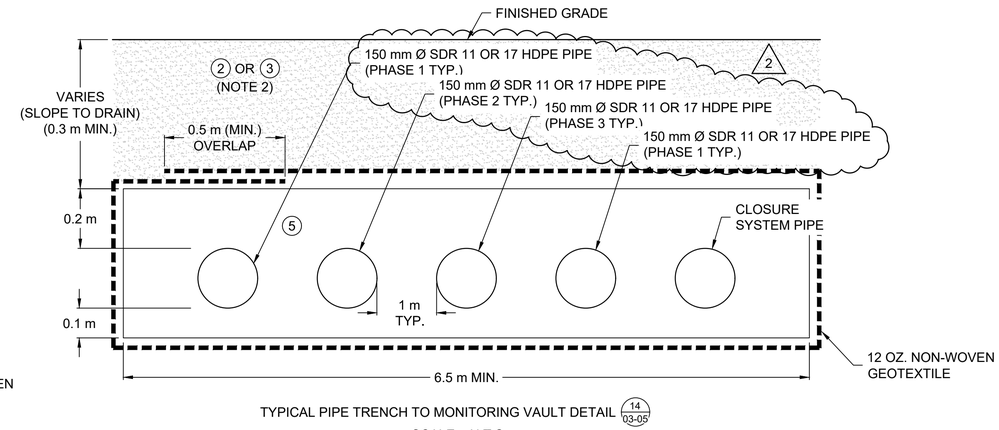
SCALE:	DWG No.:	REV.:
1:2,000	EGHLF-XD-03-03	1

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-03-03.dwg Layout: EGHLF-XD-03-03 Plot Date: Oct 12 17 Time: 3:11 PM



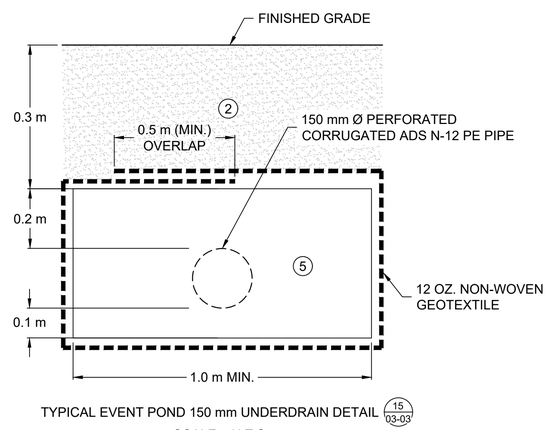
TYPICAL HLF PAD 150 mm UNDERDRAIN HEADERS DETAIL 13/03-03

SCALE = N.T.S.



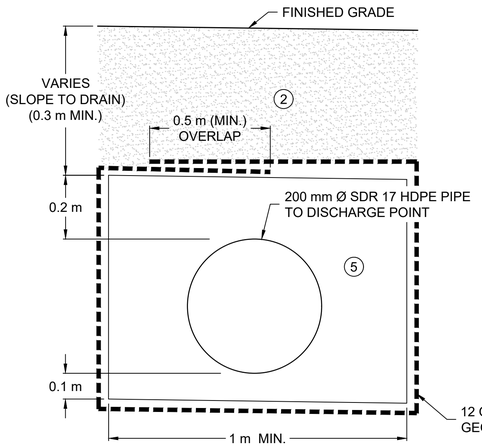
TYPICAL PIPE TRENCH TO MONITORING VAULT DETAIL 14/03-05

SCALE = N.T.S.



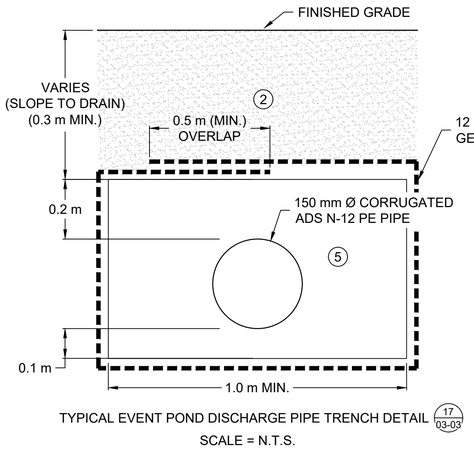
TYPICAL EVENT POND 150 mm UNDERDRAIN DETAIL 15/03-03

SCALE = N.T.S.



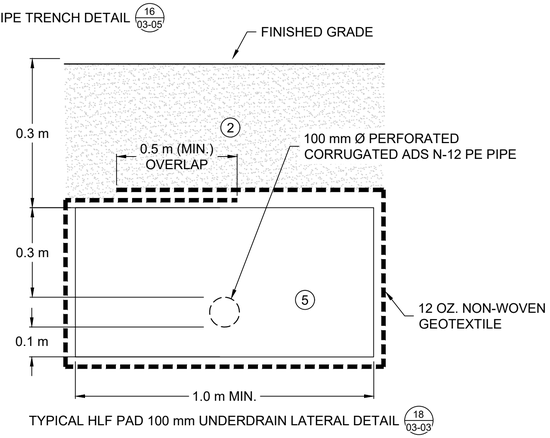
TYPICAL MONITORING VAULT DISCHARGE PIPE TRENCH DETAIL 16/03-05

SCALE = N.T.S.

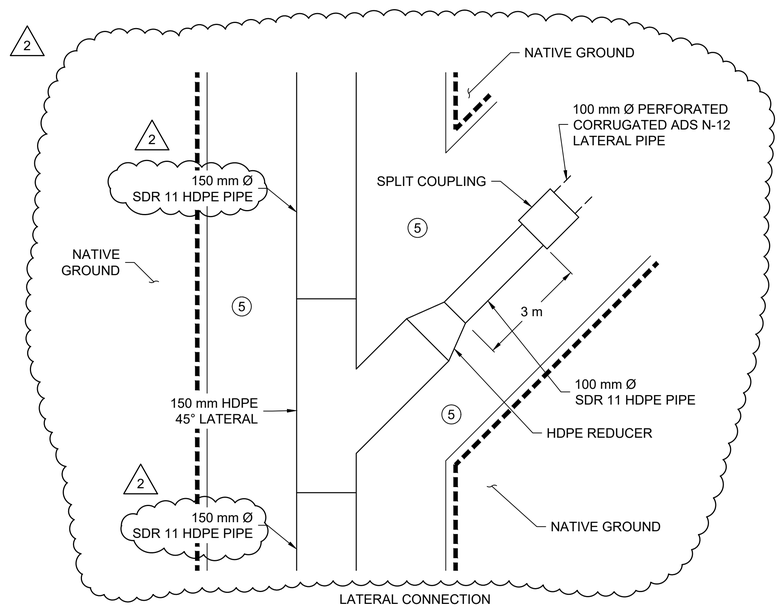


TYPICAL EVENT POND DISCHARGE PIPE TRENCH DETAIL 17/03-03

SCALE = N.T.S.



TYPICAL HLF PAD 100 mm UNDERDRAIN LATERAL DETAIL 18/03-03



TYPICAL UNDERDRAIN PIPE CONNECTION DETAIL 19/03-05

SCALE = N.T.S.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. SELECT FILL SHALL BE USED IN ALL TRENCH LOCATIONS OVERLAIN BY LINER. STRUCTURAL FILL MAY BE USED IN LOCATIONS UNDER THE EMBANKMENT PROVIDED NO ANGULAR PARTICLES OR PARTICLES LARGER THAN 75 mm ARE PLACED IN CONTACT WITH GEOTEXTILE.

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

ISSUED FOR CONSTRUCTION

LEGEND
- (2) SELECT FILL
- (3) STRUCTURAL FILL
- (5) SELECT DRAIN FILL

REVISION INFORMATION

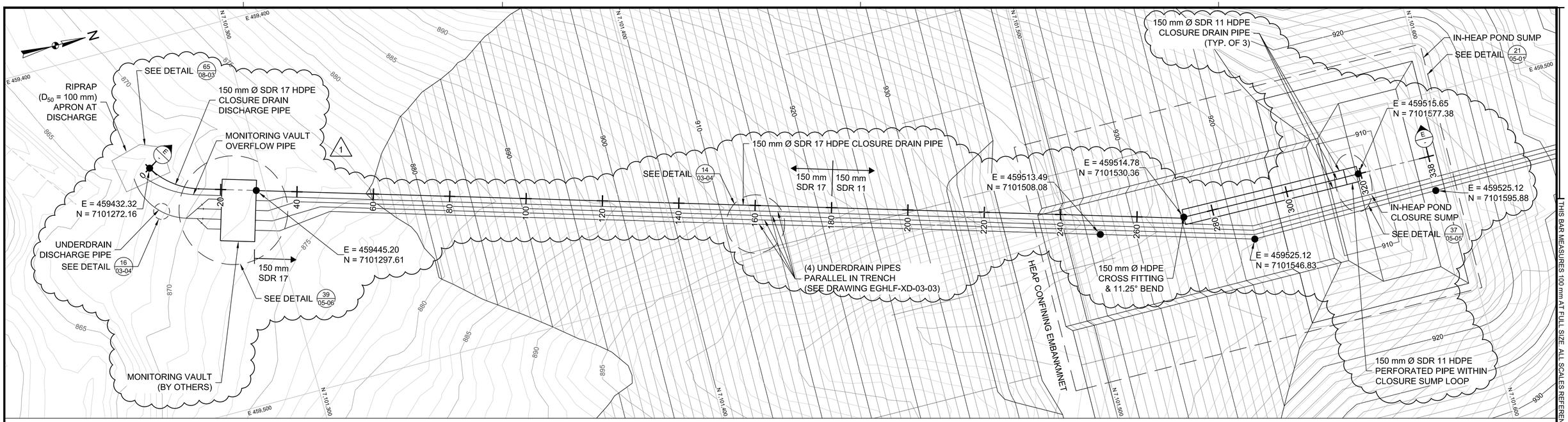
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
0	17	09	08	DAG	TLM	MEH	TLM	ISSUED FOR CONSTRUCTION
1	17	09	21	DAG	TLM	MEH	TLM	REVISE DETAILS
2	17	10	12	DAG	TLM	MEH	TLM	REVISE PIPE SDR

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: PHASE 1 UNDERDRAIN PIPING DETAILS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: 1:1,000 / DWG No.: EGHLF-XD-03-04 / REV.: 2
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

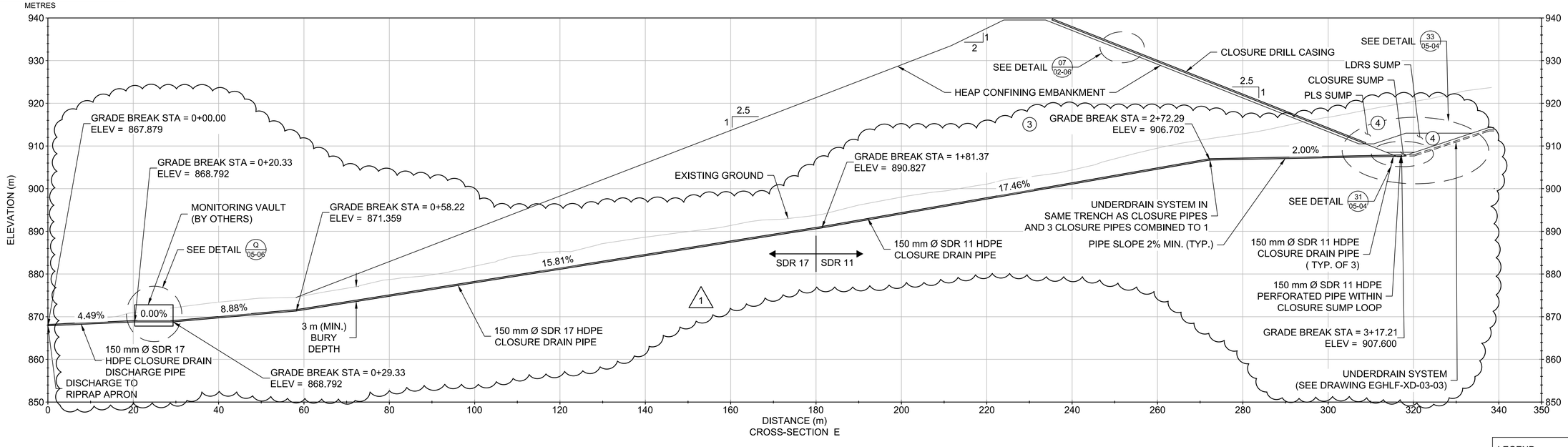
X:\Projects\07792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-03-04.dwg Layout: EGHLF-XD-03-04 Plot Date: Oct 24 17 Time: 4:56 PM



SCALE 1:500

10 0 10 20 30

METRES



THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

ISSUED FOR CONSTRUCTION

LEGEND
- (2) SELECT FILL
- (3) STRUCTURAL FILL
- (4) OVERLINER DRAIN FILL
- (5) SELECT DRAIN FILL

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
0	17	09	08	DAG	TLM	MEH	TLM	ISSUED FOR CONSTRUCTION
1	17	09	13	DAG	TLM	MEH	TLM	CLOSURE AND UNDERDRAIN ALIGNMENT AND PROFILE REVISED

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

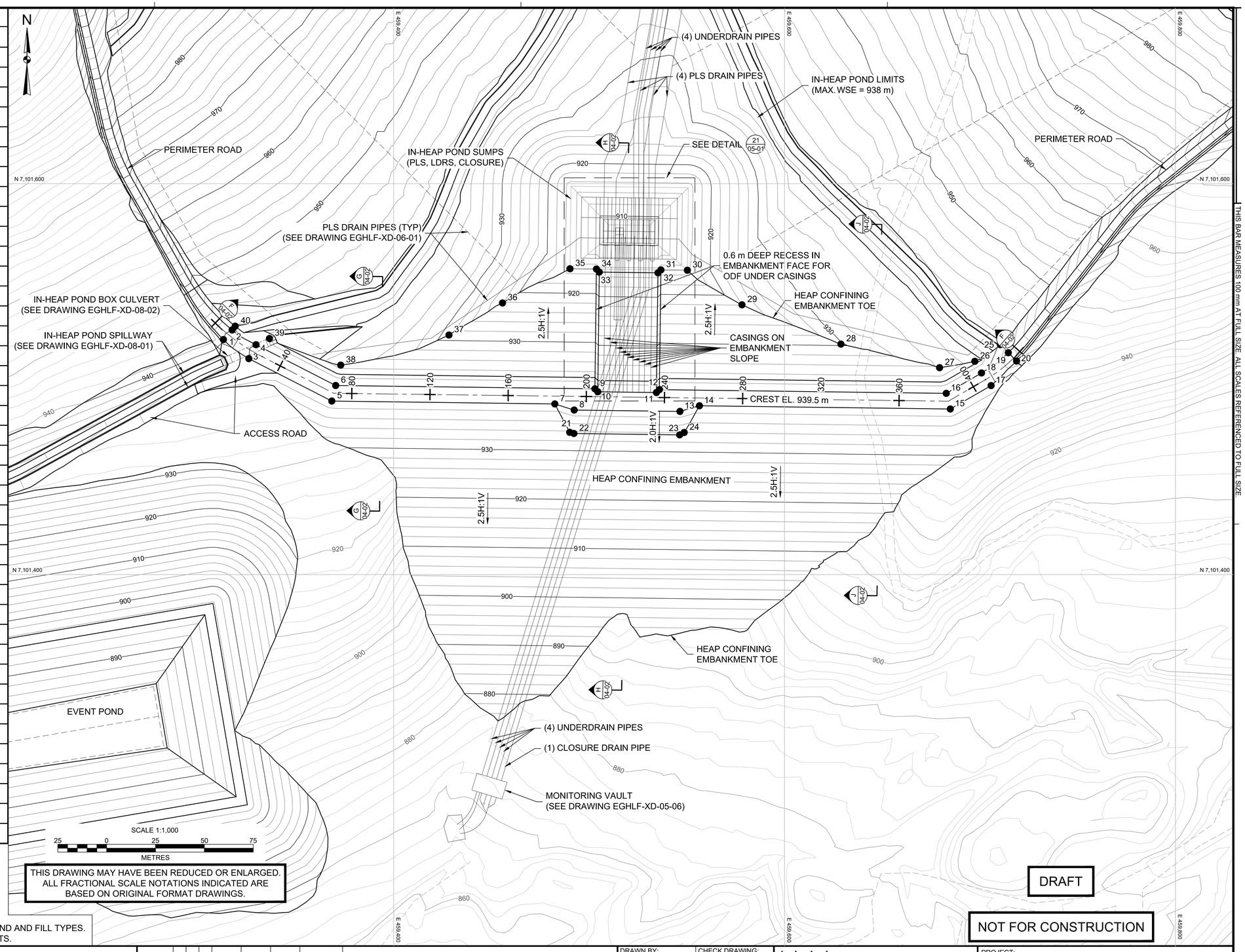
PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: CLOSURE PIPING PLAN AND PROFILE

SCALE:	DWG No.:	REV.:
1:500	EGHLF-XD-03-05	1

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-03-05.dwg Layout: EGHLF-XD-03-05 Plot Date: Oct 12, 17 Time: 4:10 PM

HEAP CONFINING EMBANKMENT FINISHED GROUND CONTROL POINTS				
CP#	EASTING (m)	NORTHING (m)	ELEVATION (m)	DESCRIPTION
1	459,312.9	7,101,520.2	940.7	CREST
2	459,317.4	7,101,525.1	940.7	CREST
3	459,325.9	7,101,510.5	939.5	CREST
4	459,329.6	7,101,517.6	939.5	CREST
5	459,368.4	7,101,488.8	939.5	CREST
6	459,370.3	7,101,496.8	939.5	CREST
7	459,482.5	7,101,487.3	939.5	CREST
8	459,492.4	7,101,484.2	939.5	CREST
9	459,503.0	7,101,495.0	939.5	CREST
10	459,504.4	7,101,493.5	939.5	CREST
11	459,534.4	7,101,493.1	939.5	CREST
12	459,536.0	7,101,494.6	939.5	CREST
13	459,546.5	7,101,483.5	939.5	CREST
14	459,556.5	7,101,486.4	939.5	CREST
15	459,684.8	7,101,484.7	939.5	CREST
16	459,682.7	7,101,492.7	939.5	CREST
17	459,705.7	7,101,496.7	939.5	CREST
18	459,700.7	7,101,503.2	939.5	CREST
19	459,714.5	7,101,513.5	943.2	CREST
20	459,718.7	7,101,509.2	943.3	CREST
21	459,490.1	7,101,472.8	933.7	TOE
22	459,492.2	7,101,472.2	933.5	TOE
23	459,546.3	7,101,471.5	933.5	TOE
24	459,548.6	7,101,472.7	934.0	TOE
25	459,710.4	7,101,517.6	940.6	TOE
26	459,697.3	7,101,509.1	936.7	TOE
27	459,679.3	7,101,505.9	934.3	TOE
28	459,628.8	7,101,517.9	929.7	TOE
29	459,578.2	7,101,538.0	921.9	TOE
30	459,550.3	7,101,555.7	915.0	TOE
31	459,536.8	7,101,555.9	915.0	TOE
32	459,535.2	7,101,554.4	915.0	TOE
33	459,505.2	7,101,554.8	915.0	TOE
34	459,503.8	7,101,556.3	915.0	TOE
35	459,490.3	7,101,556.5	915.0	TOE
36	459,455.7	7,101,539.0	922.2	TOE
37	459,428.3	7,101,522.5	928.9	TOE
38	459,372.9	7,101,507.2	935.3	TOE
39	459,336.5	7,101,520.8	938.3	TOE
40	459,318.9	7,101,527.1	939.7	TOE



THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. SEE PROJECT TECHNICAL SPECIFICATIONS FOR PAD GRADING REQUIREMENTS.

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

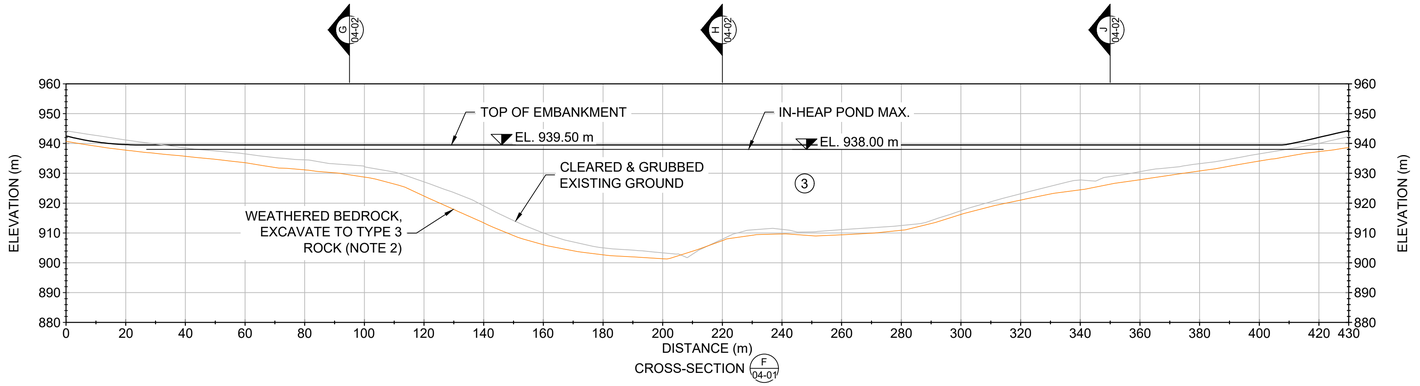
CLIENT: StrataGold Corporation

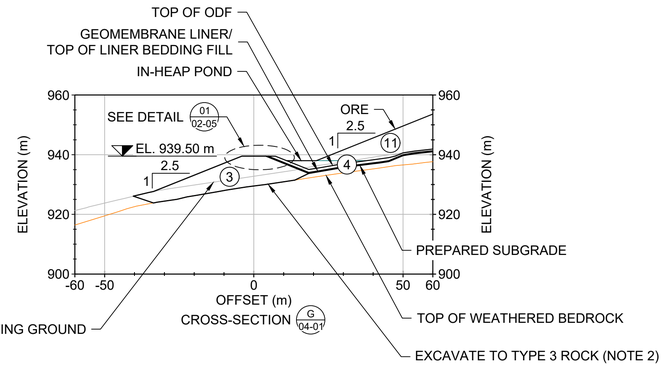
PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

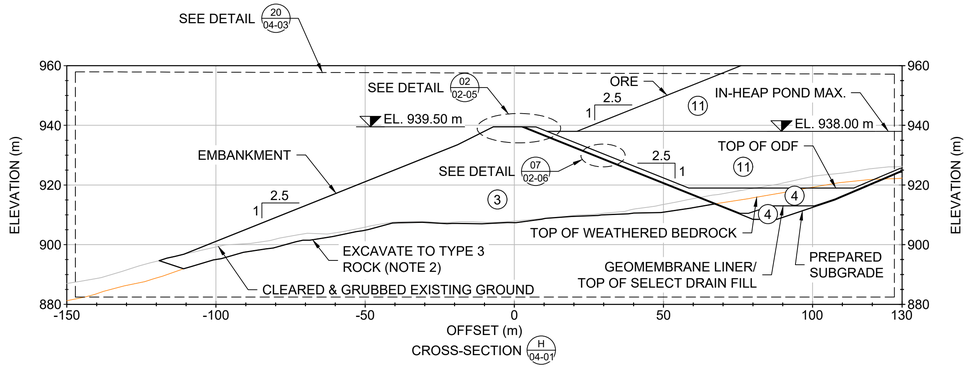
TITLE: EMBANKMENT PLAN VIEW

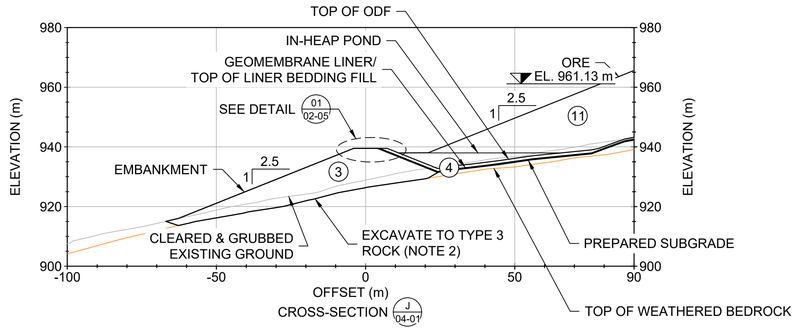
SCALE:	DWG No.:	REV.:
1:1,000	EGHLF-XD-04-01	0

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-04-01.dwg Layout: EGHLF-XD-04-01 Plot Date Oct 26 17 Time: 2:20 PM









SCALE 1:1,000

25 0 25 50 75

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. EMBANKMENT FOUNDATION AND ABUTMENT AREAS TO BE PREPARED BY EXCAVATION TO TYPE 3 (OR BETTER) BEDROCK PER PROJECT TECHNICAL SPECIFICATIONS. DEPTH TO TYPE 3 BEDROCK MAY VARY FROM THESE PLANS AND SHALL BE VERIFIED IN THE FIELD BY THE OWNER'S ENGINEER.
3. ORE STACK SLOPE IS 2.5H:1V OVERALL BUT SHALL BE COMPRISED OF 10 m LIFTS STACKED AT ANGLE OF REPOSE AS DETERMINED BY OTHERS..
4. SEE DRAWING EGHLF-XD-02-06 FOR IN-HEAP POND LINER DETAILS.
5. SEE DRAWING EGHLF-XD-04-03 FOR TYPICAL CONFINING EMBANKMENT SECTION..

DRAFT

ISSUED FOR CONSTRUCTION

LEGEND
- (3) STRUCTURAL FILL
- (4) OVERLINER DRAIN FILL
- (5) SELECT DRAIN FILL
- (11) ORE

REVISION INFORMATION

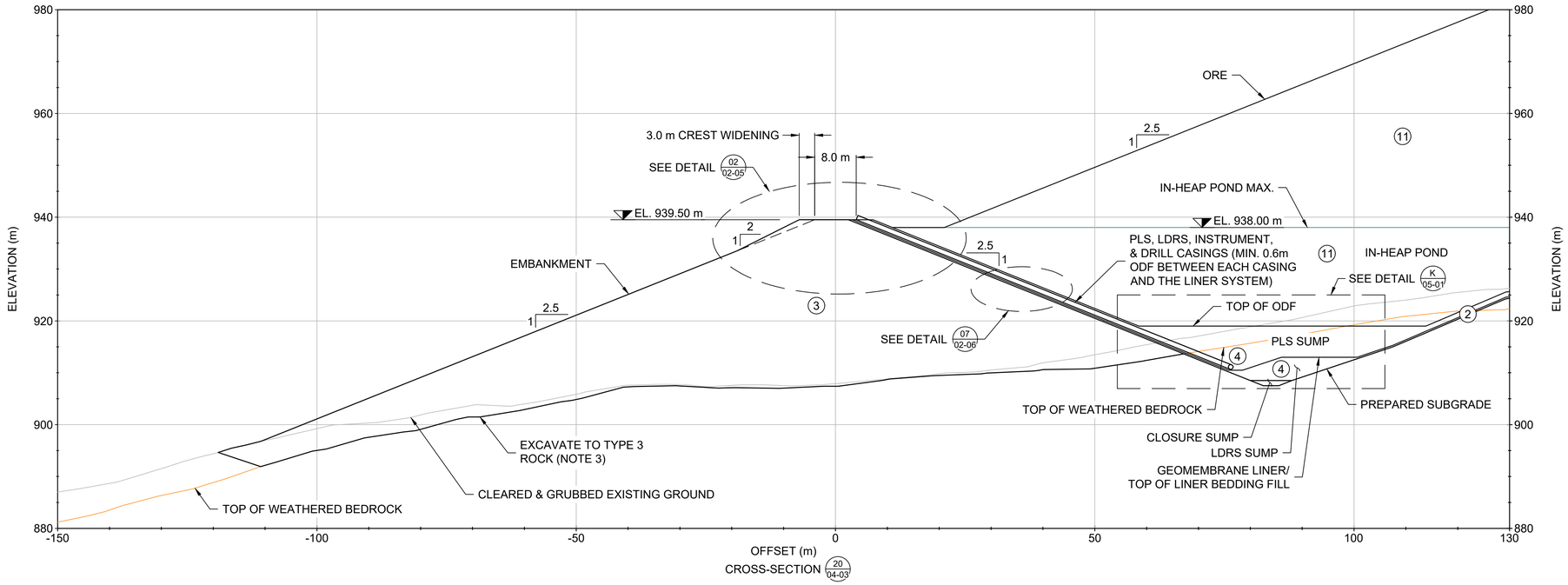
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: EMBANKMENT CROSS-SECTIONS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: 1:1,000 / DWG No.: EGHLF-XD-04-02 / REV.: A
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-04-02.dwg Layout: EGHLF-XD-04-02 Plot Date: Oct 26 '17 Time: 2:23 PM



CROSS-SECTION 20 04-03

SCALE 1:500

10 0 10 20 30

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. PLACE AND COMPACT SITE GRADING FILL OR PLACE PLACER TAILINGS AND TREAT WITH DEEP DYNAMIC COMPACTION PER PROJECT TECHNICAL SPECIFICATIONS.
3. EMBANKMENT FOUNDATION AND ABUTMENT AREAS TO BE PREPARED BY EXCAVATION TO TYPE 3 (OR BETTER) BEDROCK PER PROJECT TECHNICAL SPECIFICATIONS. DEPTH TO TYPE 3 BEDROCK MAY VARY FROM THESE PLANS AND SHALL BE VERIFIED IN THE FIELD BY THE OWNER'S ENGINEER.
4. ORE PILE SLOPE IS 2.5H:1V OVERALL BUT SHALL BE COMPRISED OF 10 m LIFTS STACKED AT ANGLE OF REPOSE AS DETERMINED BY OTHERS.
5. SEE DRAWING EGHLF-XD-02-06 FOR IN-HEAP POND LINER DETAILS.

DRAFT

ISSUED FOR CONSTRUCTION

LEGEND
- (2) SELECT FILL
- (3) STRUCTURAL FILL
- (4) OVERLINER DRAIN FILL
- (5) SELECT DRAIN FILL
- (11) ORE

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG | CHECK DRAWING: CJT
DESIGN BY: TLM | CHECK DESIGN: MEH
LEAD ENGINEER: DEH | APPROVAL DATE: -
PROJECT MANAGER: TLM | APPROVAL DATE: -

BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

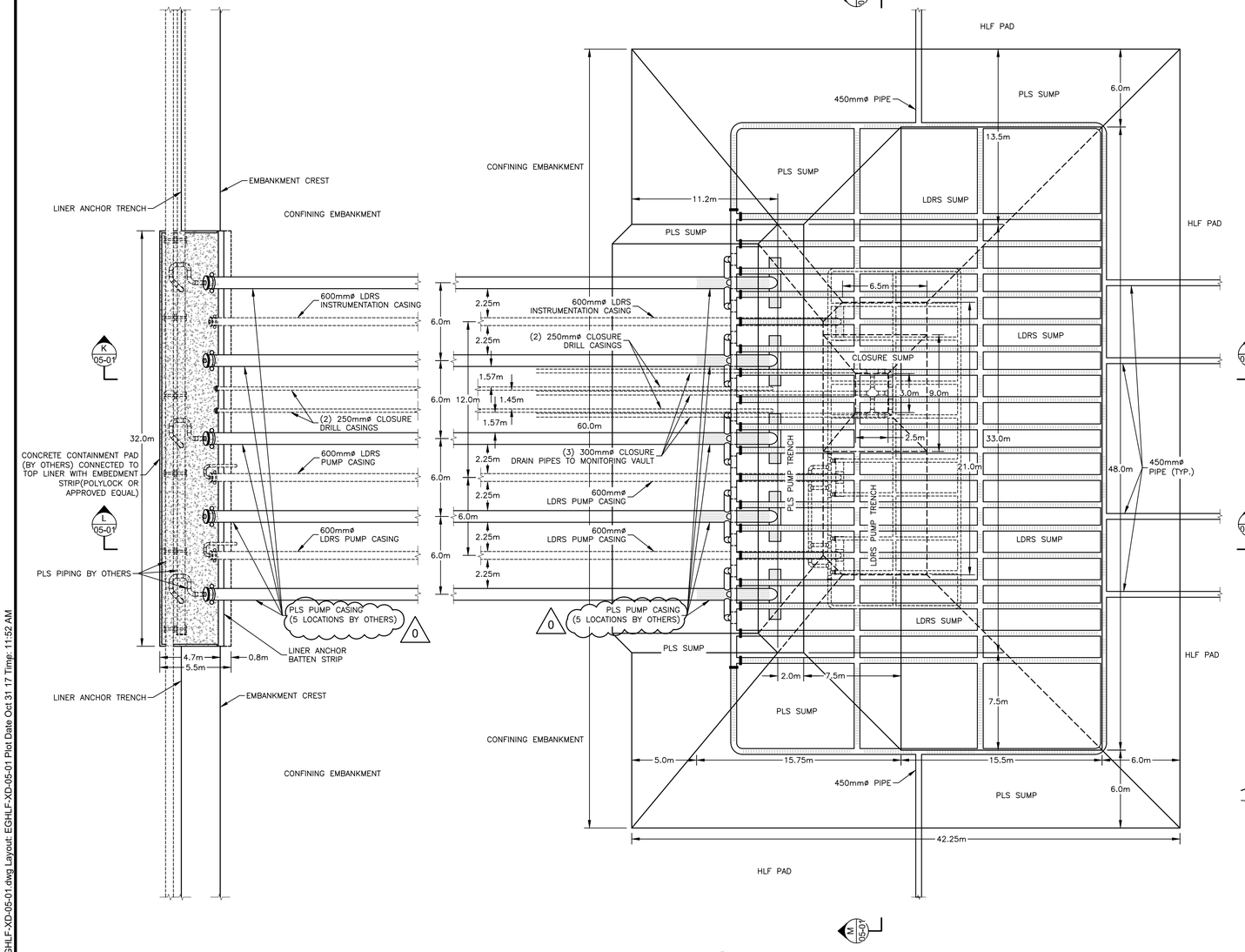
PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

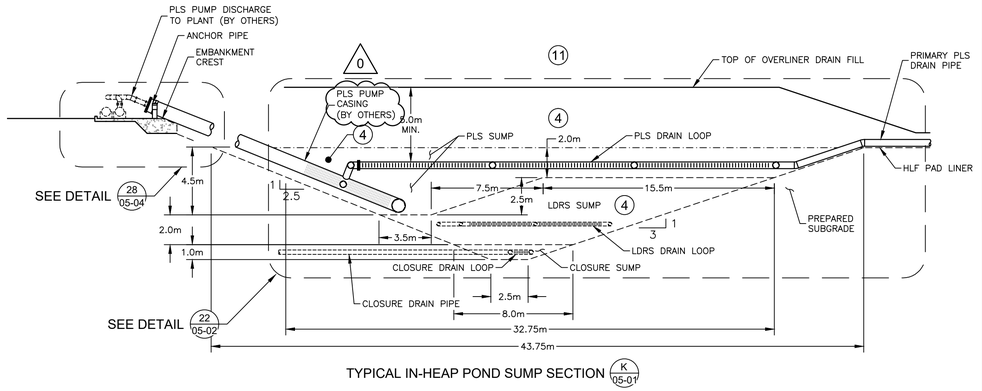
TITLE: EMBANKMENT DETAILS

SCALE:	DWG No.:	REV.:
1:500	EGHLF-XD-04-03	A

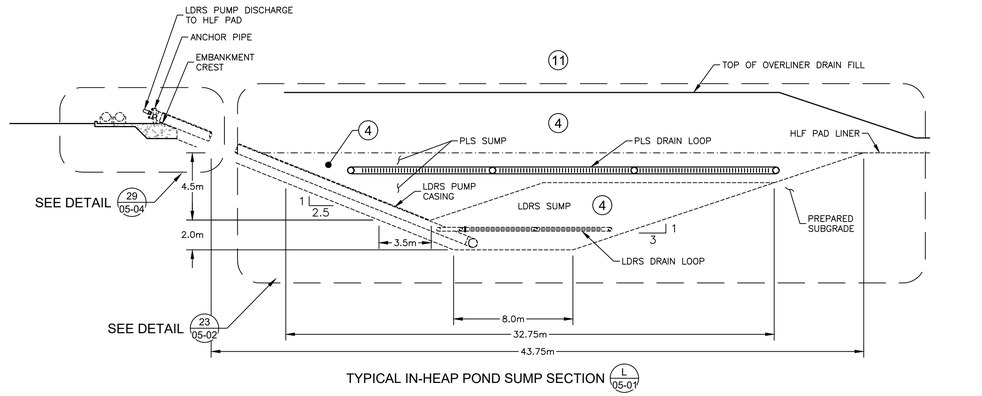
THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-04-03.dwg Layout: EGHLF-XD-04-03 Plot Date: Oct 26 17 Time: 2:25 PM

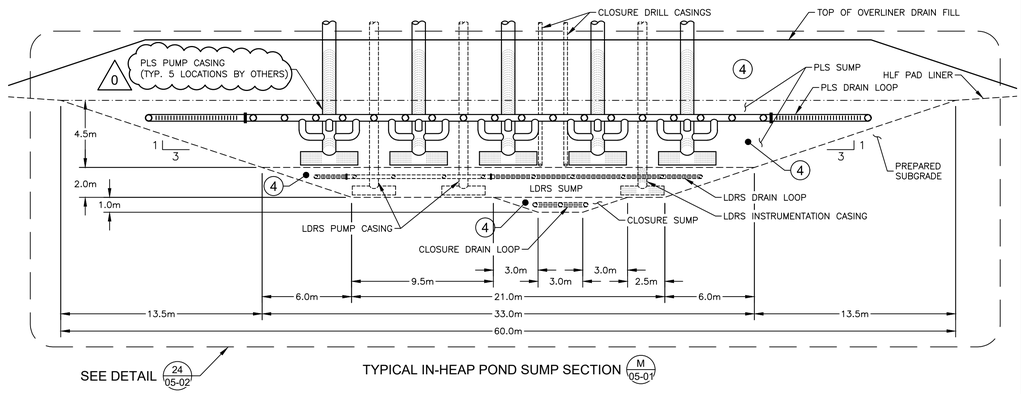




TYPICAL IN-HEAP POND SUMP SECTION K 05-01



TYPICAL IN-HEAP POND SUMP SECTION L 05-01



TYPICAL IN-HEAP POND SUMP SECTION M 05-01

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. RUB SHEET SHALL BE INSTALLED UNDER EACH STEEL CASING WITH DIRECT CONTACT TO THE LINER. RUB SHEET SHALL CONSIST OF A 16 OZ. NON-WOVEN GEOTEXTILE AND AN ADDITIONAL LAYER OF 2 mm (80-mil) DOUBLE-SIDE TEXTURED LLDPE GEOMEMBRANE PLACED BENEATH EACH PUMP CASING FOR LINER PROTECTION. TEMPORARILY SECURE RUB SHEET WITH SAND BAGS AS NEEDED.
3. 2 m LONG CONCRETE FILLED STEEL PIPE ANCHOR POSTS (EACH SIDE OF PUMP CASING) EMBEDDED 0.9 m INTO CONCRETE ANCHOR TO INHIBIT LATERAL MOVEMENT AND VERTICAL SETTLEMENT OF RISER.
4. ALL SOLID PIPE FITTINGS AND CONNECTIONS TO CONFORM TO AWWA C-906 STANDARDS.
5. INSTALL 12.5 mm (0.5") THICK STEEL PLATES ON TOP OF LINER TO PROTECT DURING CLOSURE DRILLING. STEEL PLATES ARE TO BE UNDERLAIN WITH CONVEYOR BELT MATERIAL OR 16 OZ. NON-WOVEN GEOTEXTILE AND THE EDGES BEVELLED TO PREVENT PUNCTURING OF LINER. STEEL PLATE INSTALLED IN CLOSURE SUMP IS TO INCLUDE AN ANGLE AT THE BOTTOM TO IDENTIFY TERMINATION POINT FOR DRILLING. STEEL PLATES ARE TO BE SPACED 0.2 m APART TO ALLOW ROOM FOR LINER SYSTEM BETWEEN THEM.
6. FREE-FLOATING (LOW FRICTION) PIPE SUPPORT TO BE INSTALLED AT TOP OF RISER TO ALLOW FOR THERMAL EXPANSION/CONTRACTION WHILE INHIBITING LATERAL MOVEMENT AND VERTICAL SETTLEMENT.
7. ALL CONNECTIONS BETWEEN PE AND STEEL PIPE (AND OTHER CONNECTIONS AS IDENTIFIED BY THE FIELD ENGINEER) SHALL BE COMPLETELY AND SECURELY WRAPPED WITH GEOCOMPOSITE TO AT LEAST 500 mm ON BOTH SIDES OF THE CONNECTIONS.

ISSUED FOR CONSTRUCTION

LEGEND
- (4) OVERLINER DRAIN FILL
- (5) SELECT DRAIN FILL
- (11) ORE STOCKPILE

REVISION INFORMATION

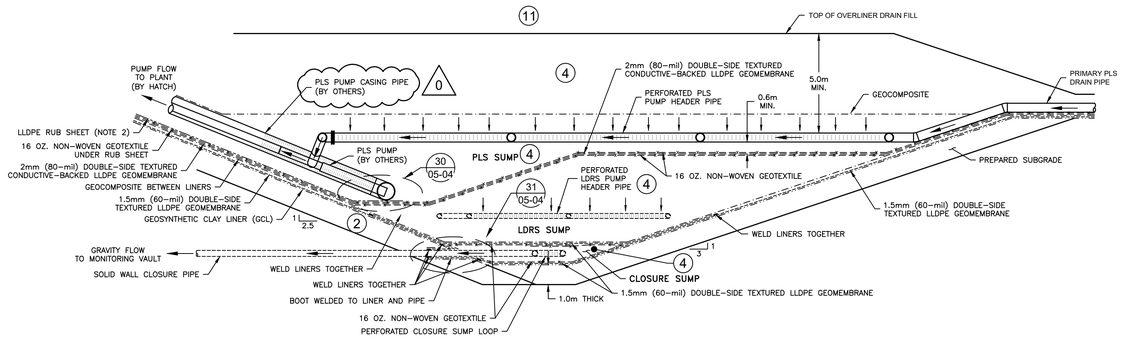
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
0	17	10	26	DAG	TLM	MEH	TLM	REVISE PLS CASING BY OTHERS, ISSUED FOR CONSTRUCTION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

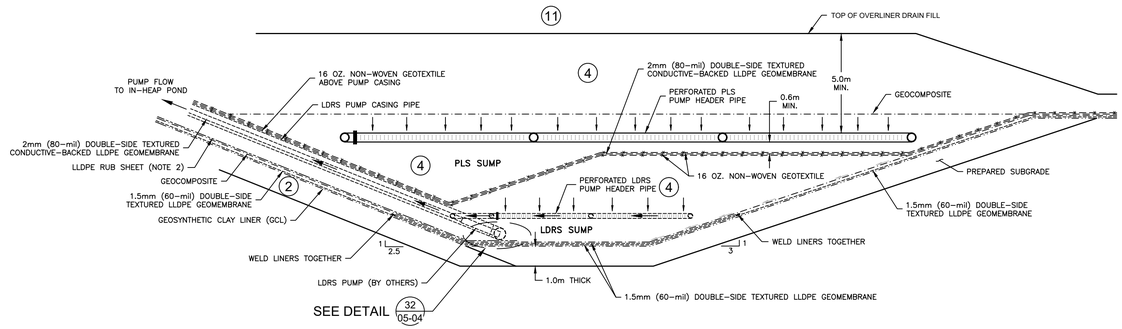
DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: IN-HEAP SUMP DETAILS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: N:\autocad\LOGO\StrataGold LogoBW.jpg	SCALE: N.T.S. / DWG No.: EGHLF-XD-05-01 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE ALL SCALES REFERENCED TO FULL SIZE

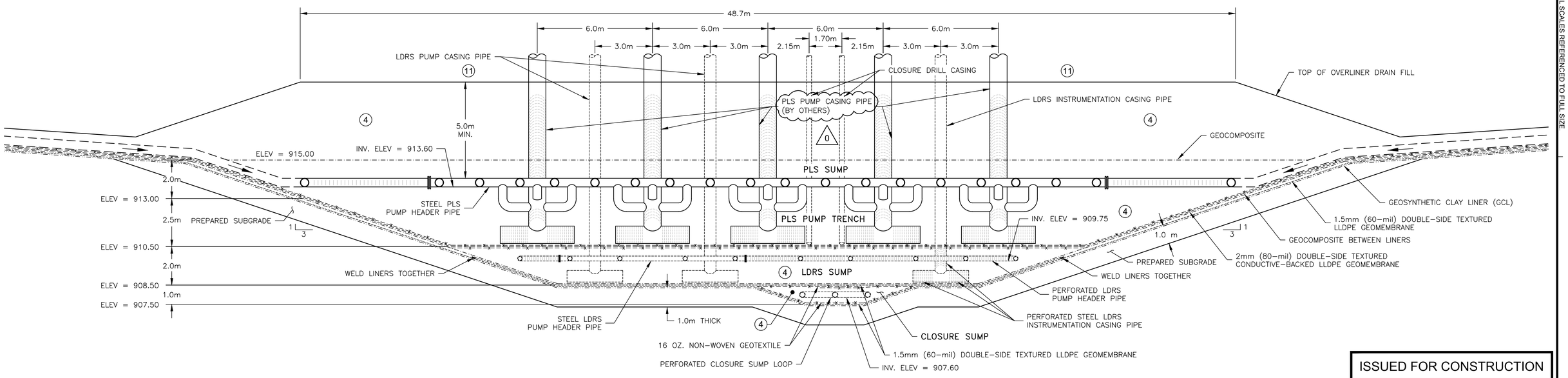
X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-05-01.dwg Layout: EGHLF-XD-05-01 Plot Date: Oct 31 17 Time: 11:52 AM



PLS, LDRS & CLOSURE SUMP DETAIL (22 / 05-01)



PLS, LDRS & CLOSURE SUMP DETAIL (23 / 05-01)



PLS, LDRS & CLOSURE SUMP DETAIL (24 / 05-01)

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. RUB SHEET SHALL BE INSTALLED UNDER EACH STEEL CASING WITH DIRECT CONTACT TO THE LINER. RUB SHEET SHALL CONSIST OF A 16 OZ. NON-WOVEN GEOTEXTILE AND AN ADDITIONAL LAYER OF 2 mm (80-mil) DOUBLE-SIDE TEXTURED LLDPE GEOMEMBRANE PLACED BENEATH EACH PUMP CASING FOR LINER PROTECTION. TEMPORARILY SECURE RUB SHEET WITH SAND BAGS AS NEEDED.
3. 2 m LONG CONCRETE FILLED STEEL PIPE ANCHOR POSTS (EACH SIDE OF PUMP CASING) EMBEDDED 0.9 m INTO CONCRETE ANCHOR TO INHIBIT LATERAL MOVEMENT AND VERTICAL SETTLEMENT OF RISER.
4. ALL SOLID PIPE FITTINGS AND CONNECTIONS TO CONFORM TO AWWA C-906 STANDARDS.
5. FREE-FLOATING (LOW FRICTION) PIPE SUPPORT TO BE INSTALLED AT TOP OF RISER TO ALLOW FOR THERMAL EXPANSION/CONTRACTION WHILE INHIBITING LATERAL MOVEMENT AND VERTICAL SETTLEMENT.
6. ALL CONNECTIONS BETWEEN PE AND STEEL PIPE (AND OTHER CONNECTIONS AS IDENTIFIED BY THE FIELD ENGINEER) SHALL BE COMPLETELY AND SECURELY WRAPPED WITH TWO LAYERS OF 12 OZ. GEOTEXTILE TO AT LEAST 500 mm ON BOTH SIDES OF THE CONNECTIONS.

ISSUED FOR CONSTRUCTION

LEGEND
- (2) SELECT FILL
- (4) OVERLINER DRAIN FILL
- (5) SELECT DRAIN FILL
- (11) ORE STOCKPILE
- 16 oz NON-WOVEN GEOTEXTILE
- 2mm (80-mil) DOUBLE-SIDE TEXTURED LLDPE GEOMEMBRANE
- 1.5mm (60-mil) DOUBLE-SIDE TEXTURED LLDPE GEOMEMBRANE
- GEOCOMPOSITE
- GEOSYNTHETIC CLAY LINER (GCL)
- LLDPE RUB SHEET

REVISION INFORMATION

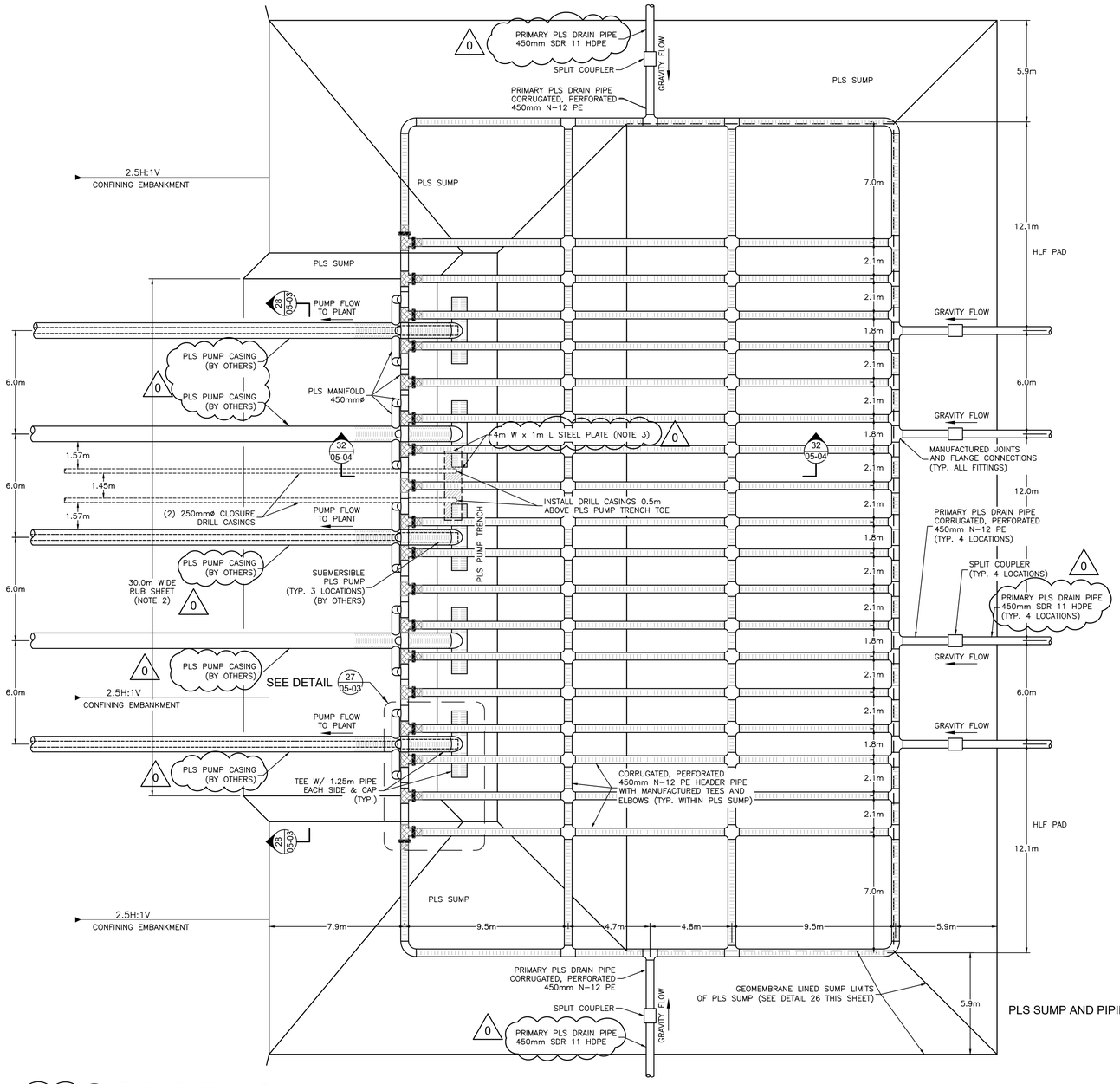
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
0	17	10	26	DAG	TLM	MEH	TJM	REVISE PLS PIPE BY OTHERS, ISSUED FOR CONSTRUCTION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

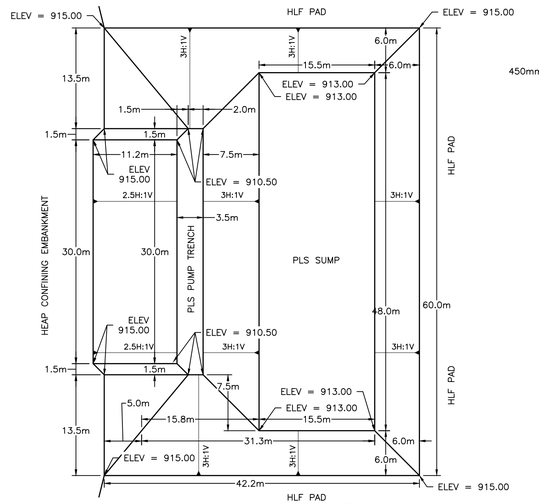
DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: IN-HEAP SUMP DETAILS
LEAD ENGINEER: DEH	APPROVAL DATE:	CLIENT: N:\autocad\LOGO\StrataGold LogoBW.jpg	SCALE: N.T.S. / DWG No.: EGHLF-XD-05-02 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

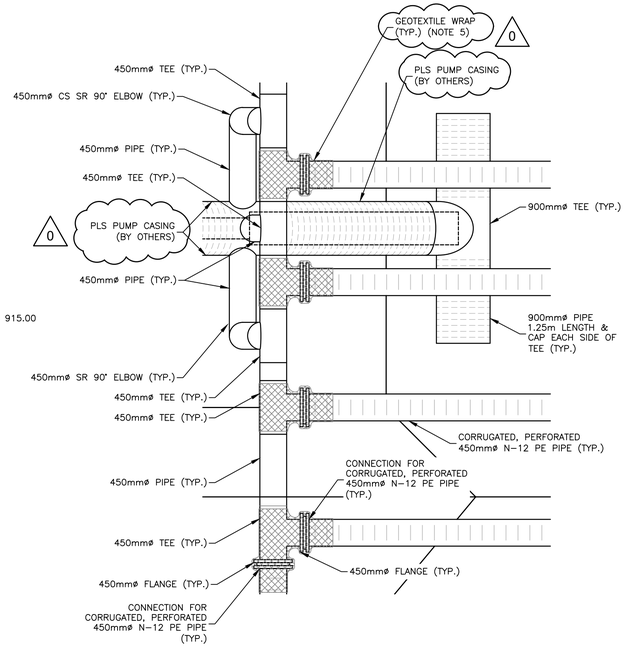
X:\Projects\07792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-05-02.dwg Layout: EGHLF-XD-05-02 Plot Date: Oct 31 17 Time: 12:12 PM



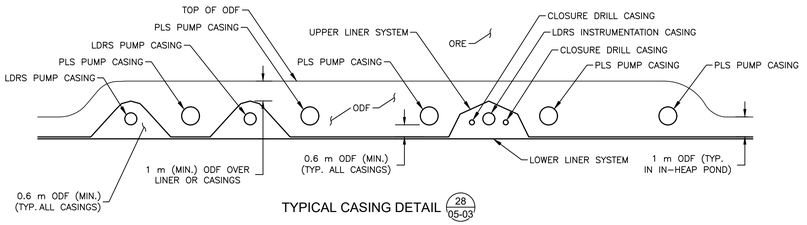
PLS SUMP AND PIPING PLAN (25 / 04-01)



PLS SUMP GEOMETRY DETAIL (26 / 04-01)



PLS CASING AND MANIFOLD DETAIL (27 / 05-03)



TYPICAL CASING DETAIL (28 / 05-03)

NOTES:

1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. RUB SHEET SHALL BE INSTALLED UNDER EACH STEEL CASING WITH DIRECT CONTACT TO THE LINER. RUB SHEET SHALL CONSIST OF A 16 OZ. NON-WOVEN GEOTEXTILE AND AN ADDITIONAL LAYER OF 2 mm (80-mil) DOUBLE-SIDE TEXTURED LLDPE GEOMEMBRANE PLACED BENEATH EACH PUMP CASING FOR LINER PROTECTION. TEMPORARILY SECURE RUB SHEET WITH SAND BAGS AS NEEDED.
3. INSTALL 12.5 mm (0.5") THICK STEEL PLATES ON TOP OF LINER TO PROTECT DURING CLOSURE DRILLING. STEEL PLATES ARE TO BE UNDERLAIN WITH CONVEYOR BELT MATERIAL OR TWO LAYERS OF 12 OZ. NON-WOVEN GEOTEXTILE AND THE EDGES BEVELLED TO PREVENT PUNCTURING OF LINER. STEEL PLATE INSTALLED IN CLOSURE SUMP IS TO INCLUDE AN ANGLE AT THE BOTTOM TO IDENTIFY TERMINATION POINT FOR DRILLING. STEEL PLATES ARE TO BE SPACED 0.2 m APART TO ALLOW ROOM FOR LINER SYSTEM BETWEEN THEM.
4. FREE-FLOATING (LOW FRICTION) PIPE SUPPORT TO BE INSTALLED AT TOP OF RISER TO ALLOW FOR THERMAL EXPANSION/CONTRACTION WHILE INHIBITING LATERAL MOVEMENT AND VERTICAL SETTLEMENT.
5. ALL CONNECTIONS BETWEEN PE AND STEEL PIPE (AND OTHER CONNECTIONS AS IDENTIFIED BY THE FIELD ENGINEER) SHALL BE COMPLETELY AND SECURELY WRAPPED WITH TWO LAYERS OF 12 OZ. GEOTEXTILE TO AT LEAST 500 mm ON BOTH SIDES OF THE CONNECTIONS.

0

ISSUED FOR CONSTRUCTION

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

REVISION INFORMATION

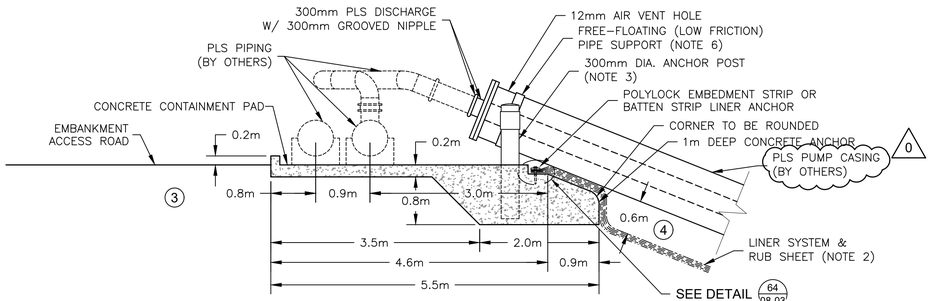
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
0	17	10	26	DAG	TLM	MEH	TLM	REVISE PLS PIPE SIZE AND BY OTHERS, REMOVE NOTE 3 AND RENUMBER, I.F.C.

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

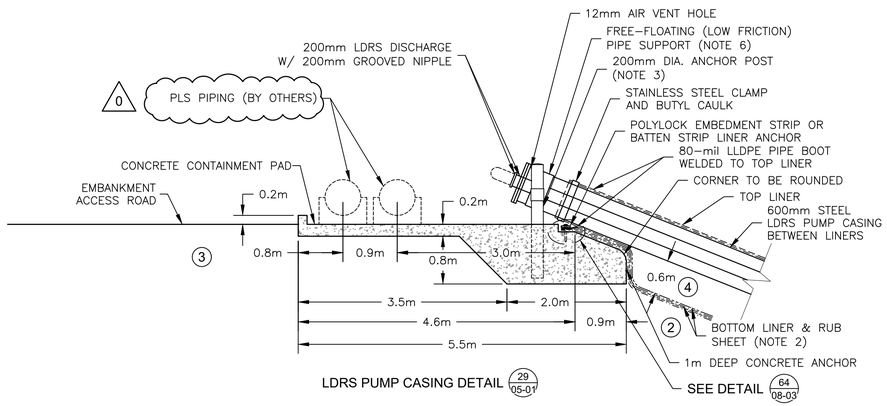
DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: PLS SUMP DETAILS
LEAD ENGINEER: DEH	APPROVAL DATE: 26	CLIENT: StrataGold Corporation	SCALE: N.T.S. / DWG No.: EGHLF-XD-05-03 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE ALL SCALES REFERENCED TO FULL SIZE

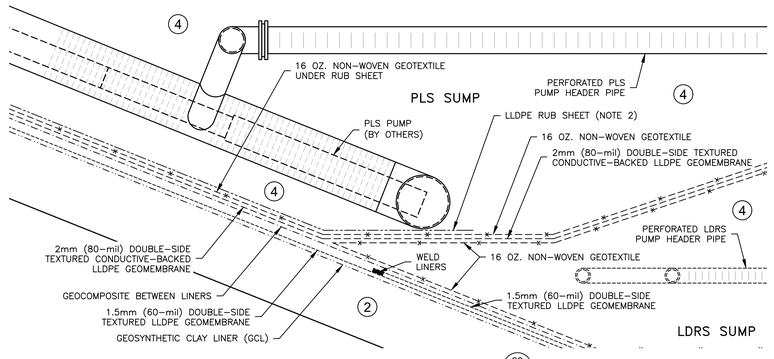
X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-05-03.dwg Layout: EGHLF-XD-05-03 Plot Date: Oct 26 17 Time: 1:10 PM



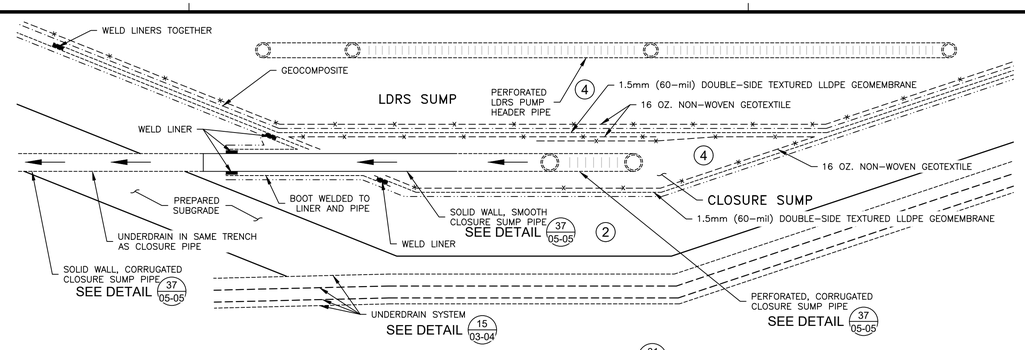
PLS PUMP CASING DETAIL (28 05-01)



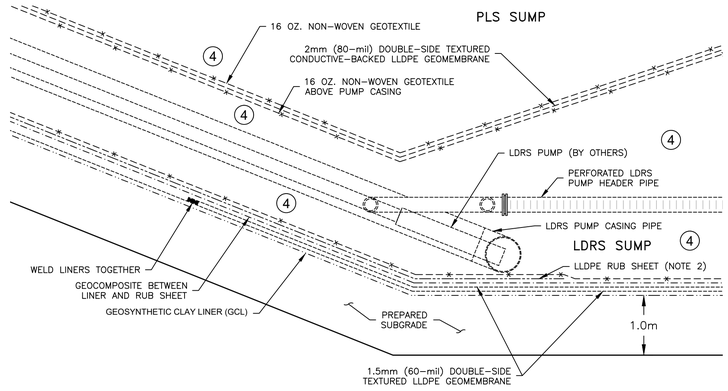
LDRS PUMP CASING DETAIL (29 05-01)



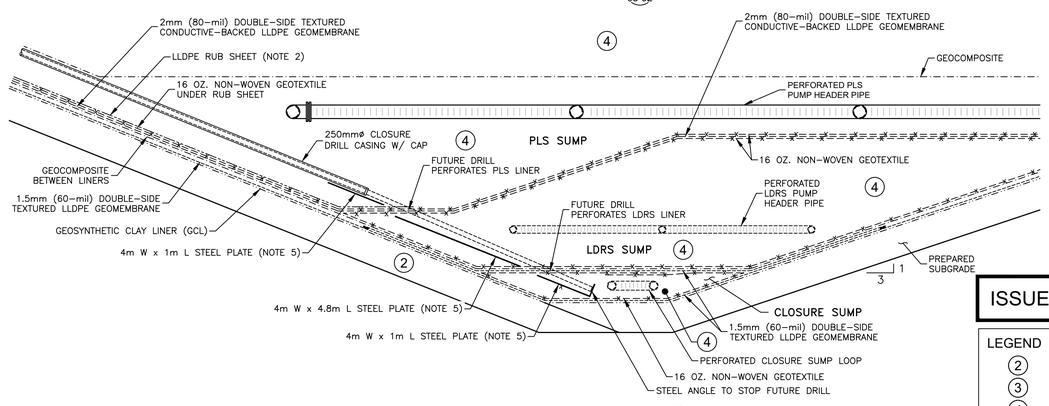
PLS SUMP LINER DETAIL (30 05-02)



CLOSURE SUMP LINER DETAIL (31 05-02)



LDRS SUMP LINER DETAIL (32 05-02)



CLOSURE DRILL CASING DETAIL (33 05-03)

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. RUB SHEET SHALL BE INSTALLED UNDER EACH STEEL CASING WITH DIRECT CONTACT TO THE LINER. RUB SHEET SHALL CONSIST OF A 16 OZ. NON-WOVEN GEOTEXTILE AND AN ADDITIONAL LAYER OF 2 mm (80-mil) DOUBLE-SIDE TEXTURED LLDPE GEOMEMBRANE PLACED BENEATH EACH PUMP CASING FOR LINER PROTECTION. TEMPORARILY SECURE RUB SHEET WITH SAND BAGS AS NEEDED.
3. 2 m LONG CONCRETE FILLED STEEL PIPE ANCHOR POSTS (EACH SIDE OF PUMP CASING) EMBEDDED 0.9 m INTO CONCRETE ANCHOR TO INHIBIT LATERAL MOVEMENT AND VERTICAL SETTLEMENT OF RISER.
4. ALL SOLID PIPE FITTINGS AND CONNECTIONS TO CONFORM TO AWWA C-906 STANDARDS.
5. INSTALL 12.5 mm (0.5") THICK STEEL PLATES ON TOP OF LINER TO PROTECT DURING CLOSURE DRILLING. STEEL PLATES ARE TO BE UNDERLAIN WITH CONVEYOR BELT MATERIAL OR 16 OZ. NON-WOVEN GEOTEXTILE AND THE EDGES BEVELLED TO PREVENT PUNCTURING OF LINER. STEEL PLATE INSTALLED IN CLOSURE SUMP IS TO INCLUDE AN ANGLE AT THE BOTTOM TO IDENTIFY TERMINATION POINT FOR DRILLING. STEEL PLATES ARE TO BE SPACED 0.2 m APART TO ALLOW ROOM FOR LINER SYSTEM BETWEEN THEM.
6. FREE-FLOATING (LOW FRICTION) PIPE SUPPORT TO BE INSTALLED AT TOP OF RISER TO ALLOW FOR THERMAL EXPANSION/CONTRACTION WHILE INHIBITING LATERAL MOVEMENT AND VERTICAL SETTLEMENT.
7. ALL CONNECTIONS BETWEEN PE AND STEEL PIPE (AND OTHER CONNECTIONS AS IDENTIFIED BY THE FIELD ENGINEER) SHALL BE COMPLETELY AND SECURELY WRAPPED WITH GEOCOMPOSITE TO AT LEAST 500 mm ON BOTH SIDES OF THE CONNECTIONS.

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

ISSUED FOR CONSTRUCTION

LEGEND
- (2) SELECT FILL
- (3) STRUCTURAL FILL
- (4) OVERLINER DRAIN FILL
- (5) SELECT DRAIN FILL
- (11) ORE STOCKPILE
- 16 oz NON-WOVEN GEOTEXTILE
- 2mm (80-mil) DOUBLE-SIDE TEXTURED LLDPE GEOMEMBRANE
- 1.5mm (60-mil) DOUBLE-SIDE TEXTURED LLDPE GEOMEMBRANE
- GEOCOMPOSITE
- GEOSYNTHETIC CLAY LINER (GCL)
- LLDPE RUB SHEET

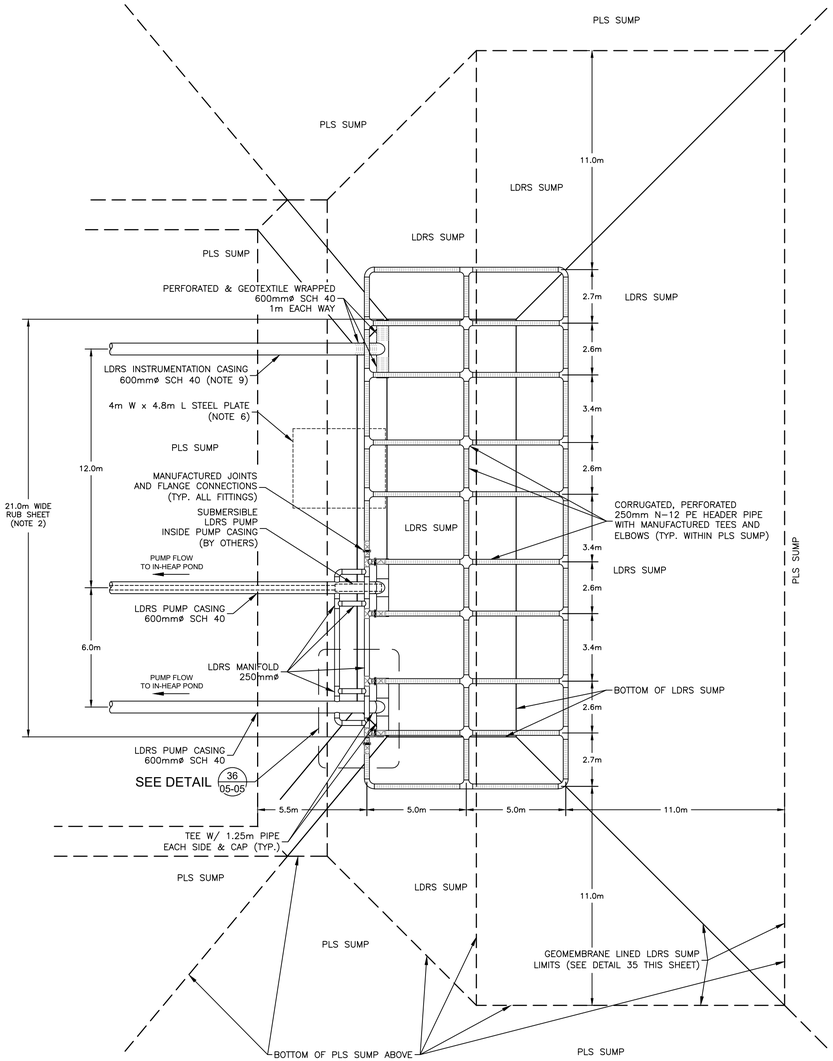
REVISION INFORMATION	REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
	A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
	0	17	10	26	DAG	TLM	MEH	TLM	REVISE PLS PIPE CASING BY OTHERS, ISSUED FOR CONSTRUCTION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

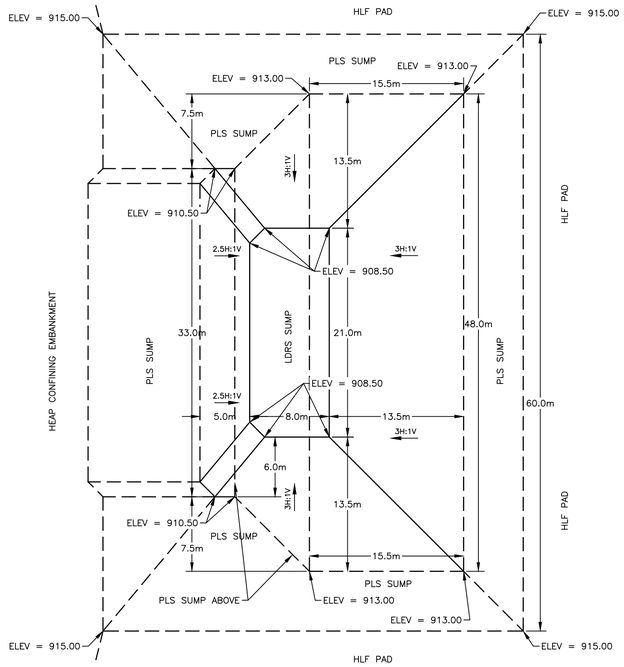
DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: PLS SUMP DETAILS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: N:\autocad\LOGO\StrataGold LogoBW.jpg	SCALE: N.T.S. / DWG No.: EGHLF-XD-05-04 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE ALL SCALES REFERENCED TO FULL SIZE

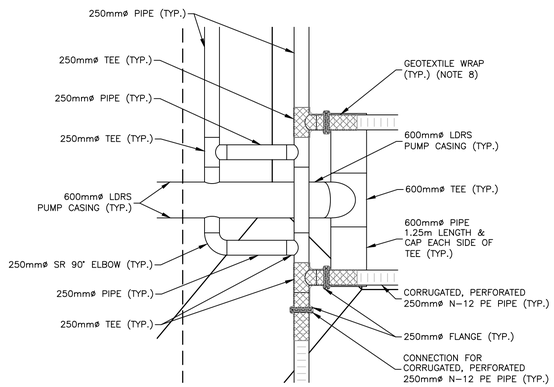
X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-05-04.dwg Layout: EGHLF-XD-05-04 Plot Date: Oct 31 17 Time: 12:23 PM



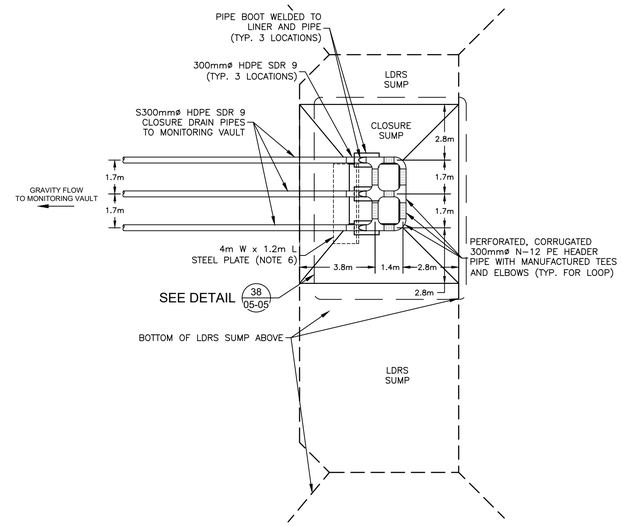
LDRS SUMP AND PIPING PLAN (34 / 05-01)



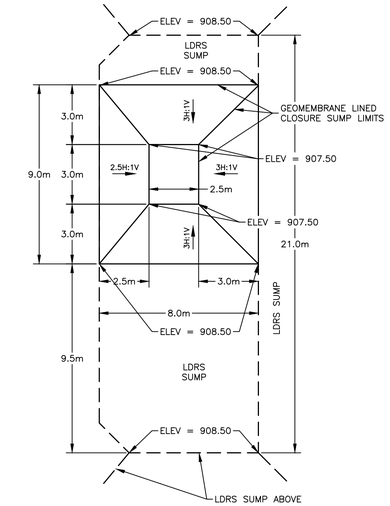
LDRS SUMP GEOMETRY DETAIL (35 / 05-05)



LDRS PIPING DETAIL (36 / 05-05)



CLOSURE SUMP AND PIPING PLAN (37 / 05-01)



CLOSURE SUMP GEOMETRY DETAIL (38 / 05-05)

NOTES:

1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. RUB SHEET SHALL BE INSTALLED UNDER EACH STEEL CASING WITH DIRECT CONTACT TO THE LINER. RUB SHEET SHALL CONSIST OF A 16 OZ. NON-WOVEN GEOTEXTILE AND AN ADDITIONAL LAYER OF 2 mm (80-mil) DOUBLE-SIDE TEXTURED LLDPE GEOMEMBRANE PLACED BENEATH EACH PUMP CASING FOR LINER PROTECTION. TEMPORARILY SECURE RUB SHEET WITH SAND BAGS AS NEEDED.
3. LDRS RISER PIPE ASSEMBLIES SHALL BE 600mm O.D. FABRICATED USING ASTM 139 HIGH STRENGTH LOW ALLOY STEEL (A606 TYPE 4.) MINIMUM PIPE WALL THICKNESS SHALL BE 17.5mm (SCH 40).
4. 2 m LONG CONCRETE FILLED STEEL PIPE ANCHOR POSTS (EACH SIDE OF PUMP CASING) EMBEDDED 0.9 m INTO CONCRETE ANCHOR TO INHIBIT LATERAL MOVEMENT AND VERTICAL SETTLEMENT OF RISER.
5. ALL SOLID PIPE FITTINGS AND CONNECTIONS TO CONFORM TO AWWA C-906 STANDARDS.
6. INSTALL 12.5 mm (0.5") THICK STEEL PLATES ON TOP OF LINER TO PROTECT DURING CLOSURE DRILLING. STEEL PLATES ARE TO BE UNDERLAIN WITH CONVEYOR BELT MATERIAL OR TWO LAYERS OF 12 OZ. NON-WOVEN GEOTEXTILE AND THE EDGES BEVELLED TO PREVENT PUNCTURING OF LINER. STEEL PLATE INSTALLED IN CLOSURE SUMP IS TO INCLUDE AN ANGLE AT THE BOTTOM TO IDENTIFY TERMINATION POINT FOR DRILLING. STEEL PLATES ARE TO BE SPACED 0.2 m APART TO ALLOW ROOM FOR LINER SYSTEM BETWEEN THEM.
7. FREE-FLOATING (LOW FRICTION) PIPE SUPPORT TO BE INSTALLED AT TOP OF RISER TO ALLOW FOR THERMAL EXPANSION/CONTRACTION WHILE INHIBITING LATERAL MOVEMENT AND VERTICAL SETTLEMENT.
8. ALL CONNECTIONS BETWEEN PE AND STEEL PIPE (AND OTHER CONNECTIONS AS IDENTIFIED BY THE FIELD ENGINEER) SHALL BE COMPLETELY AND SECURELY WRAPPED WITH TWO LAYERS OF 12 OZ. GEOTEXTILE TO AT LEAST 500 mm ON BOTH SIDES OF THE CONNECTIONS.
9. THE BOTTOM 2m OF LDRS INSTRUMENTATION CASING SHALL BE SLOTTED. SLOTTING IN THE STEEL PIPE SHALL BE 2mm WIDE BY 75mm LONG (MEASURED PERPENDICULAR TO PIPE FLOW) SPACED 150mm ON CENTER AROUND THE PIPE IN ROWS SPACED 150mm ON CENTER.

NOT FOR CONSTRUCTION

DRAFT

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

REVISION INFORMATION

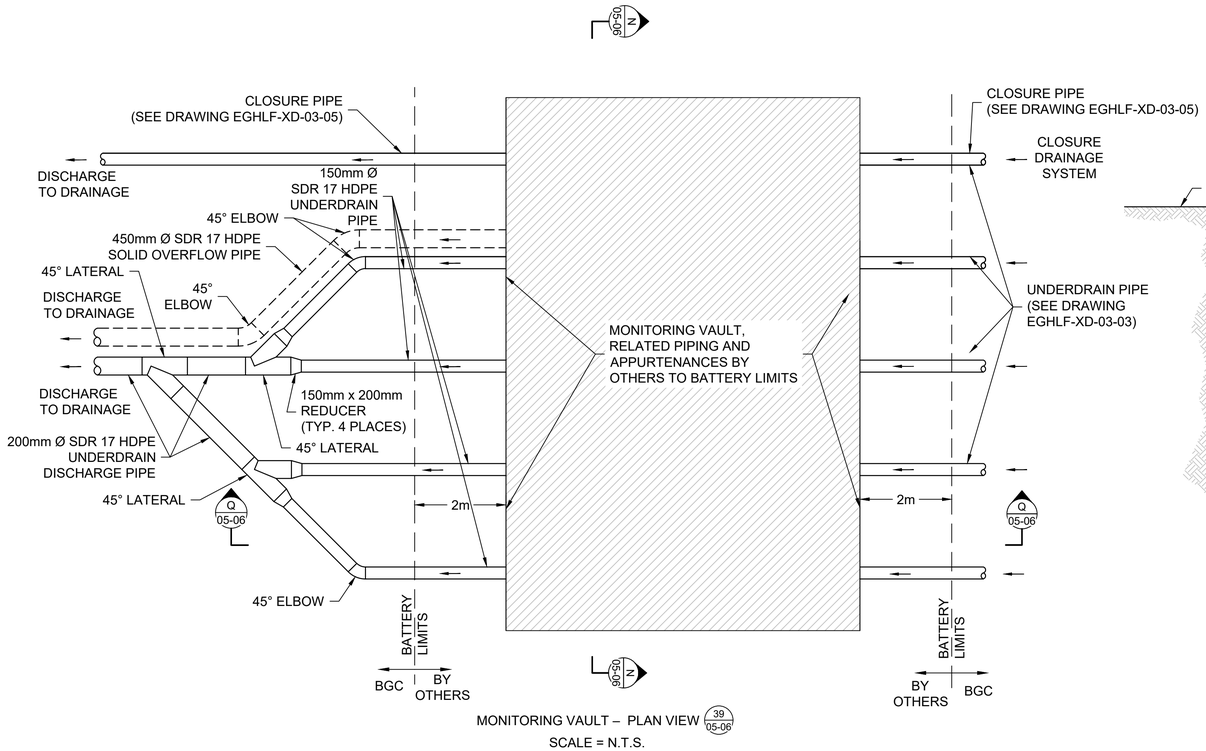
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: LDRS AND CLOSURE SUMP DETAILS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: N.T.S. / DWG No.: EGHLF-XD-05-05 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

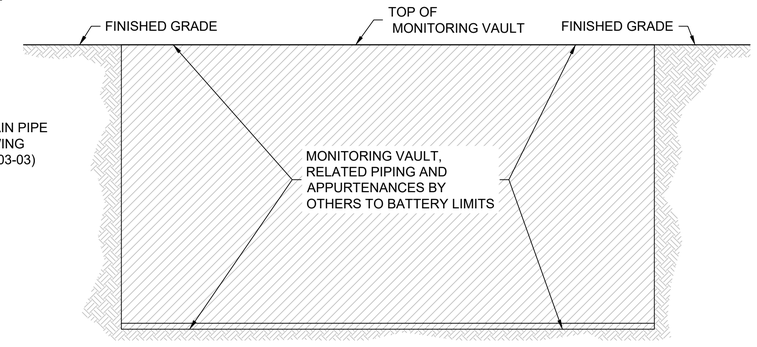
THIS BAR MEASURES 100 mm AT FULL SIZE ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-05-05.dwg Layout: EGHLF-XD-05-05 Plot Date: Oct 26 17 Time: 2:45 PM



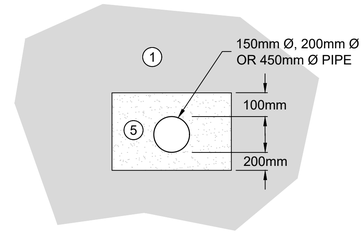
MONITORING VAULT – PLAN VIEW 39 05-06

SCALE = N.T.S.



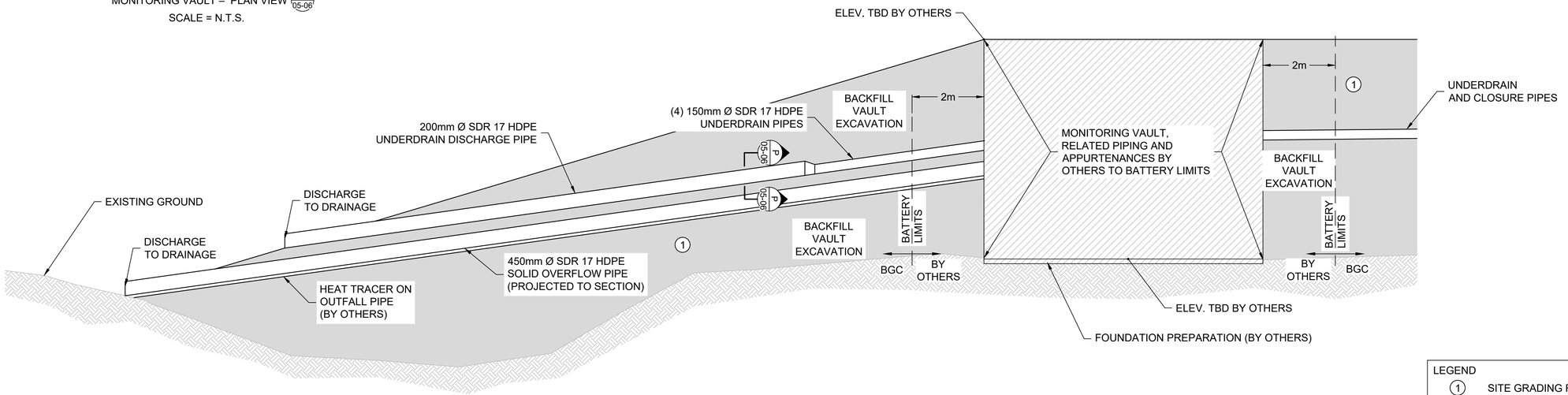
CLOSURE OUTLET VAULT SECTION N 05-06

SCALE = N.T.S.



TYPICAL PIPE TRENCH DETAIL P 05-06

SCALE = N.T.S.



MONITORING VAULT – PROFILE VIEW O 05-06

SCALE = N.T.S.

LEGEND

1	SITE GRADING FILL
5	SELECT DRAIN FILL

ISSUED FOR CONSTRUCTION

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. MONITORING VAULT TO BE DESIGNED BY OTHERS AND SHOWN HERE FOR REFERENCE ONLY. BATTERY LIMITS FOR BGC DESIGN ARE 2 m FROM OUTSIDE OF MONITORING VAULT. DESIGN OUTSIDE TETRA TECH BATTERY LIMITS ARE FOR REFERENCE ONLY..

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
0	17	09	08	DAG	TLM	MEH	TLM	ISSUED FOR CONSTRUCTION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: MONITORING VAULT DETAILS

SCALE:	DWG No.:	REV.:
N.T.S.	EGHLF-XD-05-06	0

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\07792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-05-06.dwg Layout: EGHLF-XD-05-06 Plot Date: Oct 26 17 Time: 2:47 PM

PLS PIPE CONTROL POINTS				
CP#	EASTING (m)	NORTHING (m)	ELEVATION (m)	DESCRIPTION
1	459,580.1	7,101,926.9	972.7	PLS
2	459,886.8	7,102,098.5	1043.9	PLS
3	459,749.9	7,102,260.8	1041.6	PLS

PHASE 1 INTERCEPTOR DITCH

PLS COLLECTOR DRAIN PIPE
250 mm Ø CORRUGATED &
PERFORATED HDPE SDR 11 (TYP.)

100 mm Ø CORRUGATED &
PERFORATED ADS N-12 PE
PRIMARY DRAIN PIPE AT 17 m
SPACING MAX. (NOTE 4)

100 mm Ø CORRUGATED &
PERFORATED ADS N-12 PE
PRIMARY DRAIN PIPE AT 12 m
SPACING MAX. (NOTE 4)

FIRST 3m OF COLLECTORS TO BE
100 mm Ø SDR 11 HDPE (TYP.)

HEADER PLS DRAIN PIPE
450 mm Ø SDR 11 HDPE

(4) HEADER PLS DRAIN PIPE
450 mm Ø SDR 11 HDPE

PLS SUMP

SEE DETAIL 49 06-02
SEE DETAIL 42 06-02
SEE DETAIL 40 06-02
SEE DETAIL 43 06-02
SEE DETAIL 45 06-02
SEE DETAIL 41 06-02
SEE DETAIL 25 05-03

PROCESS PLANT
(BY OTHERS)

IN-HEAP POND SPILLWAY

EVENT POND

DUBLIN GULCH

HEAP CONFINING EMBANKMENT

SCALE 1:2,000
50 0 50 100 150
METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED.
ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE
BASED ON ORIGINAL FORMAT DRAWINGS.

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. ALL PIPE CONNECTIONS SHALL BE FORMED USING MANUFACTURER SUPPLIED TEES, WYES AND COUPLERS. ALL PIPE CONNECTIONS SHALL BE SECURED TO THE PIPE USING WIRE TIES AROUND BOTH ENDS OF THE CONNECTIONS. ALL SOLUTION COLLECTION PIPEWORK CONNECTED WITH SPLIT COUPLERS SHALL HAVE THE COUPLER SEAM ROTATED TO THE SIDE OF THE PIPE.
3. WHERE CPT SOLUTION PIPES TERMINATE, THEY SHALL BE FITTED WITH MANUFACTURE SUPPLIED END CAPS. ALL PIPEWORK, INCLUDING TERMINATION POINTS, SHALL BE SURVEYED FOR FUTURE IDENTIFICATION.
4. THE PRIMARY SOLUTION DRAIN PIPES (100mm DIAMETER) SHALL BE SPACED AS SHOWN. GENERALLY PAD SLOPES GREATER THAN 2.5H:1V REQUIRE A PRIMARY DRAIN PIPE SPACING OF 17 m (MAXIMUM) AND SLOPES LESS THAN 2.5H:1V REQUIRE A SPACING OF 12 m (MAXIMUM).

LEGEND
- 17m O.C. SPACING FOR PRIMARY DRAIN PIPES
- 12m O.C. SPACING FOR PRIMARY DRAIN PIPES

ISSUED FOR CONSTRUCTION

REVISION INFORMATION																
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS	REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW									
0	17	09	08	DAG	TLM	MEH	TLM	ISSUED FOR CONSTRUCTION									
1	17	10	23	DAG	TLM	MEH	TLM	REVISE PIPES									

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

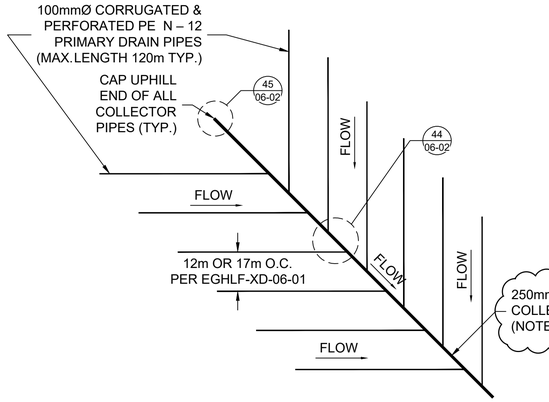
CLIENT: StrataGold Corporation

PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: PHASE 1 PLS RECOVERY PIPING PLAN VIEW

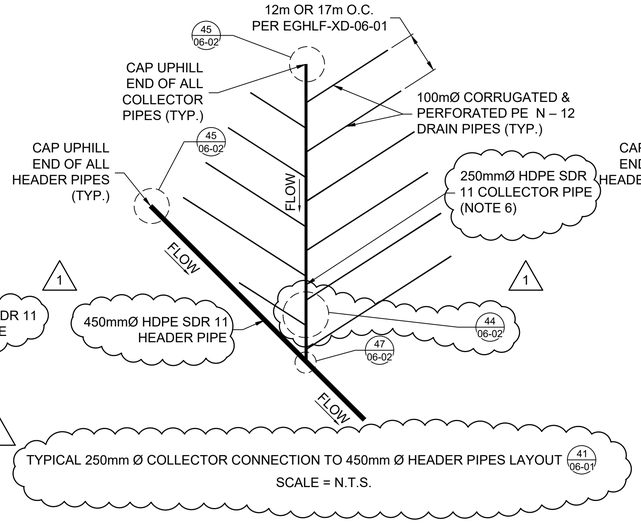
SCALE:	DWG No.:	REV.:
1:2,000	EGHLF-XD-06-01	1

X:\Projects\07792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-06-01.dwg Layout: EGHLF-XD-06-01 Plot Date: Oct 23 17 Time: 5:44 PM



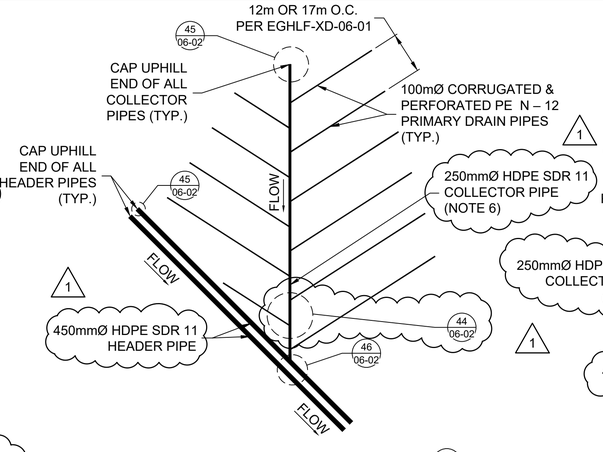
TYPICAL PRIMARY 100mm Ø PRIMARY DRAIN PIPE LAYOUT 40 06-01

SCALE = N.T.S.



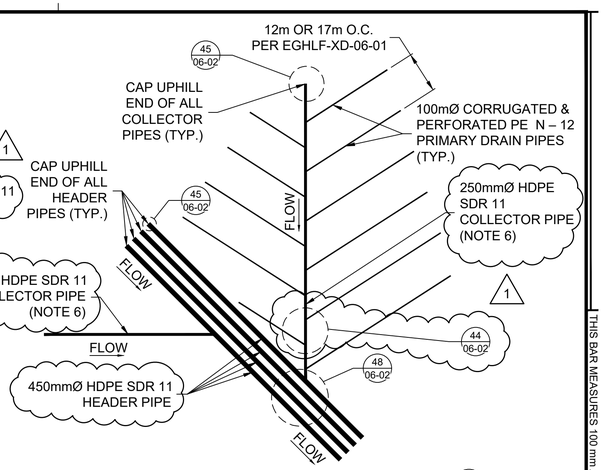
TYPICAL 250mm Ø COLLECTOR CONNECTION TO 450mm Ø HEADER PIPES LAYOUT 41 06-01

SCALE = N.T.S.



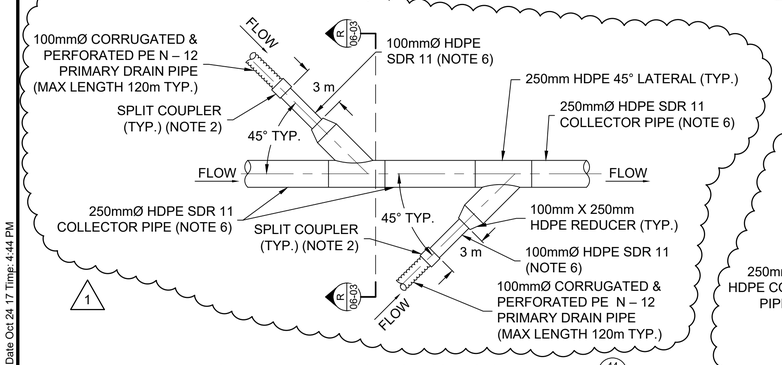
TYPICAL DOUBLE HEADER PIPE LAYOUT 42 06-01

SCALE = N.T.S.



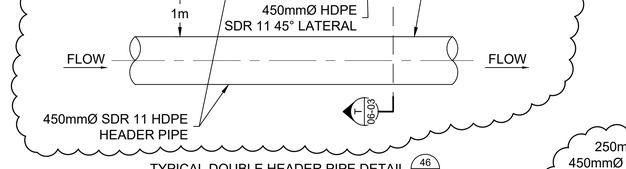
TYPICAL MULTIPLE HEADER PIPE LAYOUT 43 06-01

SCALE = N.T.S.



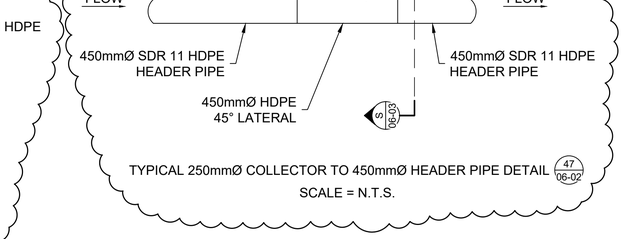
TYPICAL PRIMARY DRAIN TO SINGLE COLLECTOR PIPE DETAIL 44 06-02

SCALE = N.T.S.



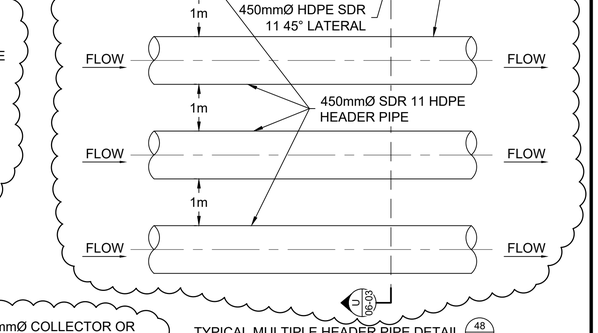
TYPICAL DOUBLE HEADER PIPE DETAIL 46 06-02

SCALE = N.T.S.



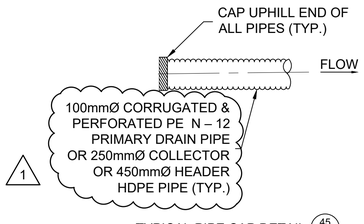
TYPICAL 250mmØ COLLECTOR TO 450mmØ HEADER PIPE DETAIL 47 06-02

SCALE = N.T.S.



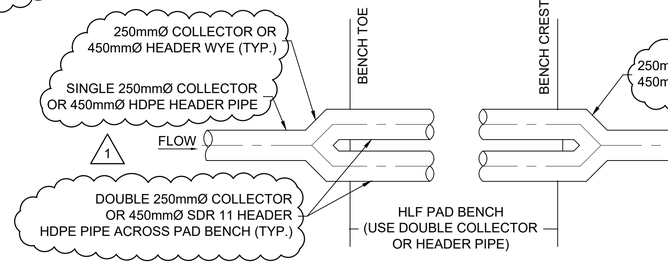
TYPICAL MULTIPLE HEADER PIPE DETAIL 48 06-02

SCALE = N.T.S.



TYPICAL PIPE CAP DETAIL 45 06-02

SCALE = N.T.S.



TYPICAL COLLECTOR OR HEADER PIPE AT BENCH DETAIL 49 06-02

SCALE = N.T.S.

NOTES:

1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. ALL PIPE CONNECTIONS SHALL BE FORMED USING MANUFACTURER SUPPLIED TEES, WYES AND COUPLERS. ALL PIPE CONNECTIONS SHALL BE SECURED TO THE PIPE USING WIRE TIES AROUND BOTH ENDS OF THE CONNECTIONS. ALL SOLUTION COLLECTION PIPEWORK CONNECTED WITH SPLIT COUPLERS SHALL HAVE THE COUPLER SEAM ROTATED TO THE SIDE OF THE PIPE.
3. WHERE CPT SOLUTION PIPES TERMINATE, THEY SHALL BE FITTED WITH MANUFACTURER SUPPLIED END CAPS. ALL PIPEWORK, INCLUDING TERMINATION POINTS, SHALL BE SURVEYED FOR FUTURE IDENTIFICATION.
4. OVERLINER DRAIN FILL THICKNESS SHALL BE 0.6 m (MINIMUM) IN UPPER PAD AREAS AND 1 m (MINIMUM) IN THE IN-HEAP POND WITH A MINIMUM 0F 0.5 m COVER DEPTH OR TWICE THE PIPE DIAMETER, WHICH EVER IS LARGER, OVER TOP OF ALL PIPES.
5. CAP UPHILL END OF ALL PIPES.
6. THE FIRST 3 m OF ALL PRIMARY DRAIN PIPE OFF OF COLLECTORS WILL BE 100mmØ HDPE SDR 11, THEN WILL TRANSITION TO 250mmØ HDPE SDR 11. 1

ISSUED FOR CONSTRUCTION

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
0	17	09	08	DAG	TLM	MEH	TLM	ISSUED FOR CONSTRUCTION
1	17	10	24	DAG	TLM	MEH	TLM	REVISE PIPE DETAILS AND MATERIALS, REVISE NOTE 6

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

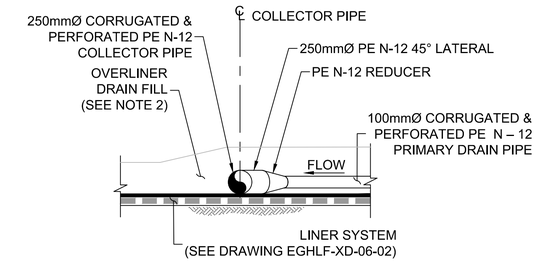
DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

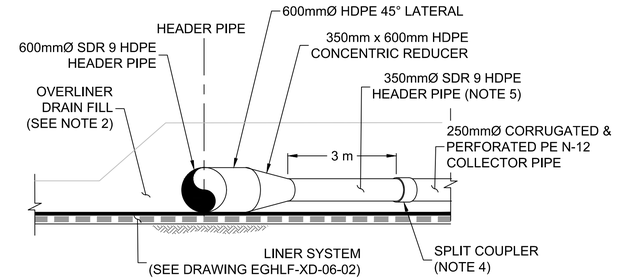
PROJECT:	EAGLE GOLD - HEAP LEACH FACILITY
TITLE:	PHASE 1 PLS RECOVERY PIPING DETAILS SHEET 1 OF 2
SCALE: N.T.S.	DWG No.: EGHLF-XD-06-02
REV.:	1

X:\Projects\07792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-06-02.dwg Layout: EGHLF-XD-06-02 Plot Date Oct 24 17 Time: 4:44 PM



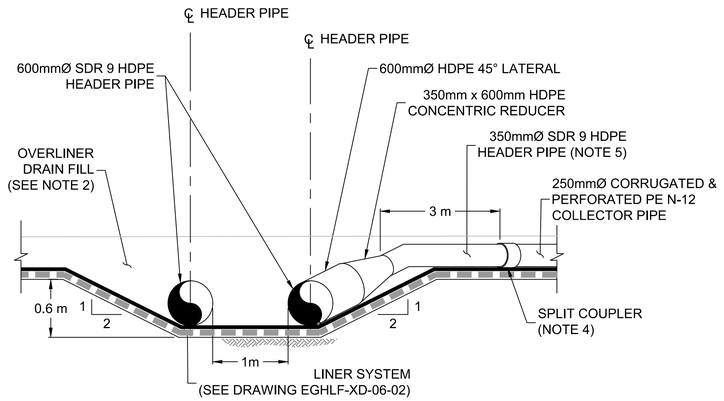
TYPICAL PRIMARY DRAIN TO SINGLE COLLECTOR CROSS SECTION (R 06-03)

SCALE = N.T.S.



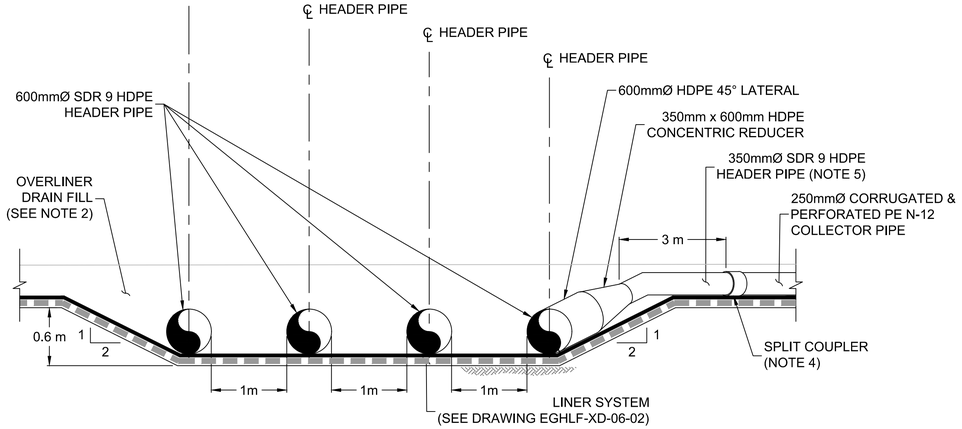
TYPICAL 350mmØ COLLECTOR TO 600mmØ HEADER CROSS SECTION (S 06-03)

SCALE = N.T.S.



TYPICAL DOUBLE DRAIN PIPE CROSS SECTION (T 06-03)

SCALE = N.T.S.



TYPICAL MULTIPLE DRAIN PIPE CROSS SECTION (U 06-03)

SCALE = N.T.S.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. OVERLINER DRAIN FILL THICKNESS SHALL BE 0.6 m (MINIMUM) IN UPPER PAD AREAS AND 1 m (MINIMUM) IN THE IN-HEAP POND WITH A MINIMUM 0F 0.5 m COVER DEPTH OR TWICE THE PIPE DIAMETER, WHICH EVER IS LARGER, OVER TOP OF ALL PIPES.
3. CAP UPHILL END OF ALL PIPES.
4. ALL PIPE CONNECTIONS SHALL BE FORMED USING MANUFACTURER SUPPLIED TEES, WYES AND COUPLERS. ALL PIPE CONNECTIONS SHALL BE SECURED TO THE PIPE USING WIRE TIES AROUND BOTH ENDS OF THE CONNECTIONS. ALL SOLUTION COLLECTION PIPEWORK CONNECTED WITH SPLIT COUPLERS SHALL HAVE THE COUPLER SEAM ROTATED TO THE SIDE OF THE PIPE.
5. THE FIRST 3 m OF ALL COLLECTORS OFF OF HEADERS WILL BE 350mmØ HDPE SDR 9, THEN WILL TRANSITION TO 250mmØ PE N-12. MOST, IF NOT ALL, PRIMARY TO COLLECTOR CONNECTIONS WILL BE N-12 TO N-12.

ISSUED FOR CONSTRUCTION

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
0	17	09	08	DAG	TLM	MEH	TLM	ISSUED FOR CONSTRUCTION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: PHASE 1 PLS RECOVERY PIPING DETAILS SHEET 2 OF 2

SCALE:	DWG No.:	REV.:
N.T.S.	EGHLF-XD-06-03	0

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\0792 Victoria Gold\CAD\Production\VFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-06-03.dwg Layout: EGHLF-XD-06-03 Plot Date: Oct 26 17 Time: 2:48 PM

EVENT POND FINISHED GROUND CONTROL POINTS				
CP#	EASTING (m)	NORTHING (m)	ELEVATION (m)	DESCRIPTION
1	458,879.2	7,101,205.9	895.6	CREST
2	459,325.2	7,101,282.3	895.6	CREST
3	459,307.6	7,101,385.3	895.6	CREST
4	458,861.6	7,101,308.9	895.6	CREST
5	458,883.3	7,101,211.6	895.5	CREST
6	459,319.4	7,101,286.3	895.5	CREST
7	459,303.5	7,101,379.5	895.5	CREST
8	458,867.3	7,101,304.8	895.5	CREST
9	458,916.0	7,101,257.8	879.5	TOE
10	458,937.1	7,101,261.4	879.5	TOE
11	459,284.2	7,101,311.3	883.6	TOE
12	459,278.5	7,101,344.2	883.6	TOE
13	458,934.7	7,101,275.7	879.5	TOE
14	458,913.5	7,101,272.1	879.5	TOE
15	458,938.6	7,101,260.4	880.0	TOE
16	458,935.7	7,101,277.2	880.0	TOE

BOX CULVERT
IN-HEAP POND SPILLWAY
(SEE DRAWING EGHLF-XD-08-01)
ACCESS ROAD
HEAP CONFINING EMBANKMENT
SEE DETAIL 60 / 07-04
SPILLWAY OUTLET
DRIVEABLE SPILLWAY
BALLAST ON TOP LINER
(TYP, NOTE 5)
SEE DETAIL 58 / 07-04
5 m WIDE ACCESS ROAD (TYP.)
RUB SHEET
(NOTE 6)
SEE DETAIL 51 / 07-03
EVENT POND LDRS PUMP RISER
RUB SHEET FOR
ROLLING PUMP
SYSTEM (NOTE 4)
EVENT POND
SUMP
EVENT POND
UNDERDRAIN
SYSTEM
(SEE DRAWING
EGHLF-XD-03-03)
EVENT POND
CREST ELEV: 895.5
SEE DETAIL 53 / 07-03
RUB SHEET FOR
CASING (NOTE 4)
EVENT POND INSTRUMENTATION RISER
SEE DETAIL 62 / 07-06
EMERGENCY SPILLWAY
DRIVEABLE SWALE
EMERGENCY SPILLWAY
(SEE DRAWING EGHLF-XD-07-05)
UNDERDRAIN
DISCHARGE
2.0H:1V
2.5H:1V
2.6H:1V
1.0%
N 7,101,500
N 7,101,250
E 459,000
E 459,250
E 458,750
E 459,500
E 458,500
E 459,750
E 459,000
E 459,250
E 459,500

SCALE 1:1,000
25 0 25 50 75
METRES

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. LDRS PUMP AND MONITORING CASING TO BE PROTECTED AT POND CREST BY BOLLARDS (SEE DRAWING EGHLF-XD-07-03 FOR LDRS DETAILS).
3. EVENT POND PUMPING AND PIPING BY OTHERS (NOT SHOWN).
4. RUB SHEET FOR LINER PROTECTION SHALL CONSIST OF A SINGLE LAYER OF 2 mm (80 mil) DOUBLE-SIDED TEXTURED HDPE GEOMEMBRANE EXTRUSION WELDED TO TOP LINER OR LINER BENEATH LDRS PUMP CASING RESPECTIVELY.
5. FABRIC FORMED CONCRETE STRINGS USED FOR LINER BALLAST SHALL BE SPACED A MAXIMUM OF 15m ON CENTER. SPECIFIC FABRIFORM SIZING AND SPACING CAN VARY, BUT MUST PRODUCE A MINIMUM OF 15kg/m² ON POND SIDE SLOPES. PROPOSED CONFIGURATION IS SUBJECT TO ENGINEER APPROVAL.
6. RUB SHEET FOR LINER PROTECTION SHALL CONSIST OF A DOUBLE LAYER OF 2 mm (80 mil) DOUBLE-SIDED TEXTURED HDPE GEOMEMBRANE EXTRUSION WELDED TO TOP LINER.

ISSUED FOR CONSTRUCTION

REVISION INFORMATION	REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
	A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
	0	17	10	24	DAG	TLM	MEH	TLM	ISSUED FOR CONSTRUCTION, REVISE NOTE 5

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE:
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

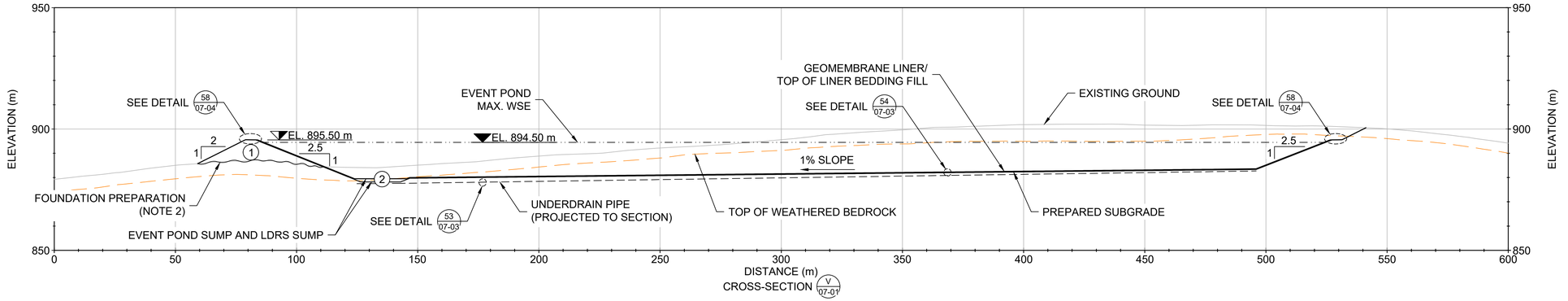
CLIENT: StrataGold Corporation

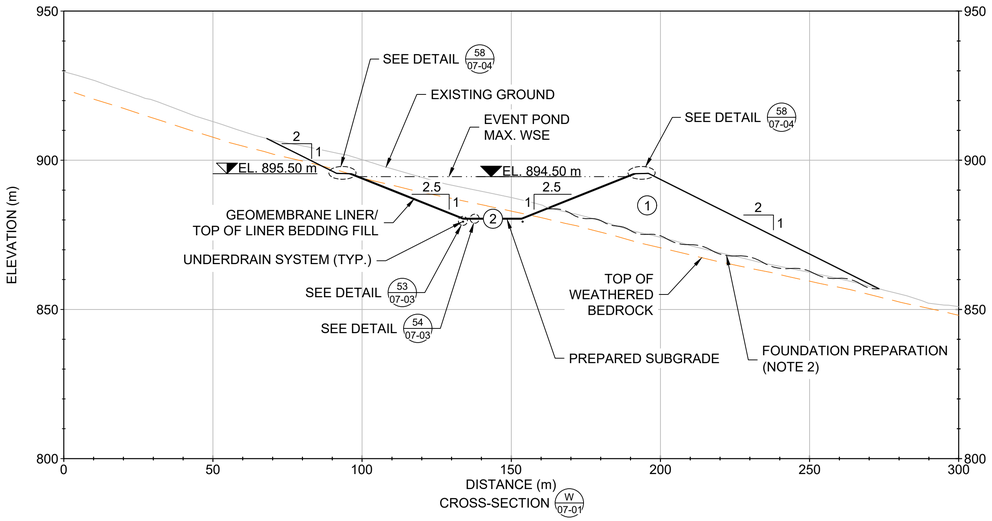
PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

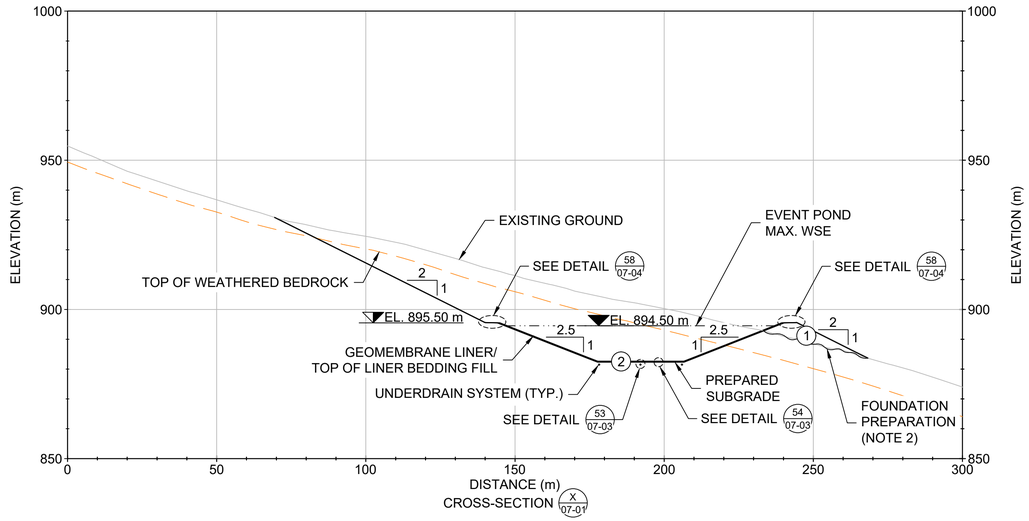
TITLE: EVENT POND PLAN VIEW

SCALE:	DWG No.:	REV.:
1:1,000	EGHLF-XD-07-01	0

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-07-01.dwg Layout: EGHLF-XD-07-01 Plot Date: Oct 24 17 Time: 4:22 PM







SCALE 1:1,000

25 0 25 50 75

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. FOUNDATION PREPARATION BELOW FILLS SHALL FOLLOW THE PROJECT TECHNICAL SPECIFICATIONS AND SHALL INCLUDE REMOVAL OF LOOSE, FROZEN, OR UNSUITABLE MATERIAL AND BENCHING ON SLOPES TO PROVIDE WORK PLATFORM FOR PLACEMENT OF THE HORIZONTAL FILL LIFTS. .

DRAFT

NOT FOR CONSTRUCTION

LEGEND
1 SITE GRADING FILL
2 SELECT FILL

REVISION INFORMATION

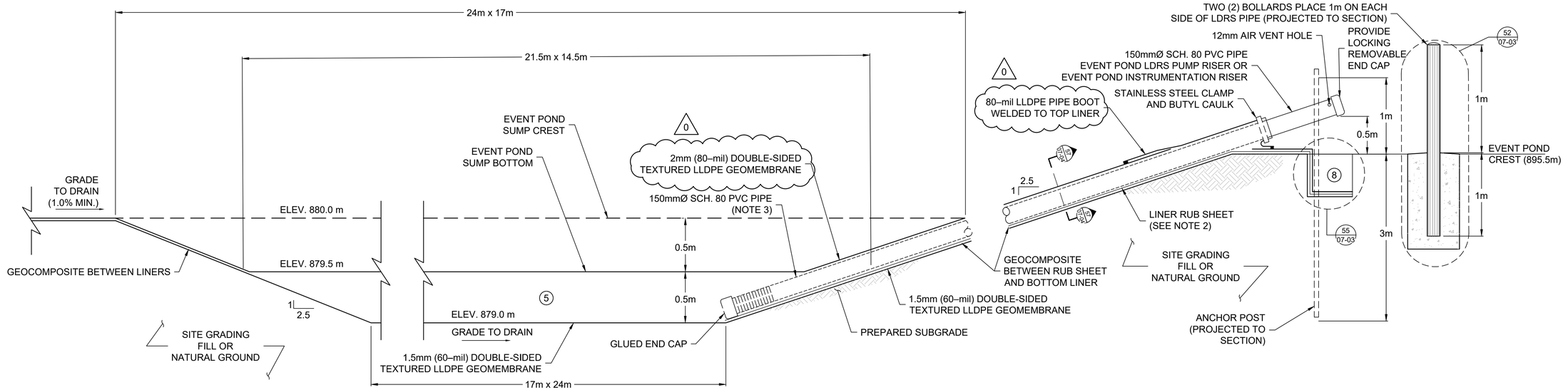
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: EVENT POND CROSS-SECTIONS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: 1:1,000 / DWG No.: EGHLF-XD-07-02 / REV.: A
PROJECT MANAGER: TLM	APPROVAL DATE: -		

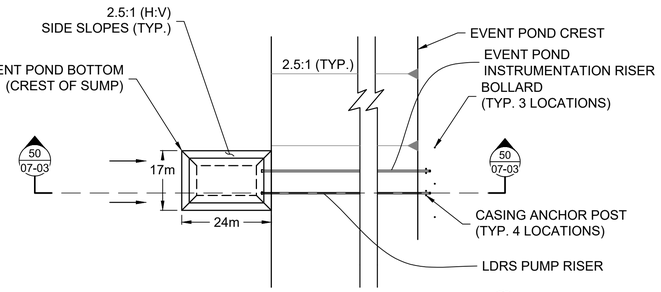
THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-07-02.dwg Layout: EGHLF-XD-07-02 Plot Date: Oct 26 17 Time: 2:55 PM



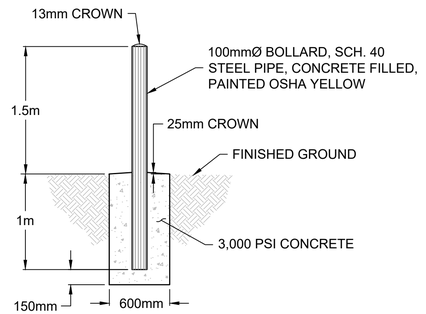
LEAK DETECTION AND RECOVERY SUMP DETAIL (50 / 07-03)

SCALE = N.T.S.



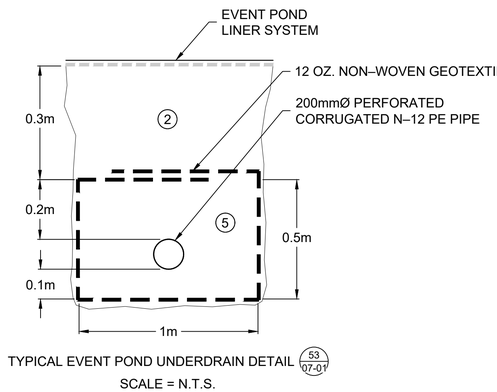
EVENT POND LEAK DETECTION SUMP PLAN – TYPICAL DETAIL (51 / 07-01)

SCALE = N.T.S.



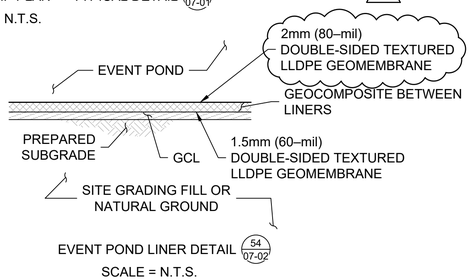
TYPICAL BOLLARD DETAIL (52 / 07-03)

SCALE = N.T.S.



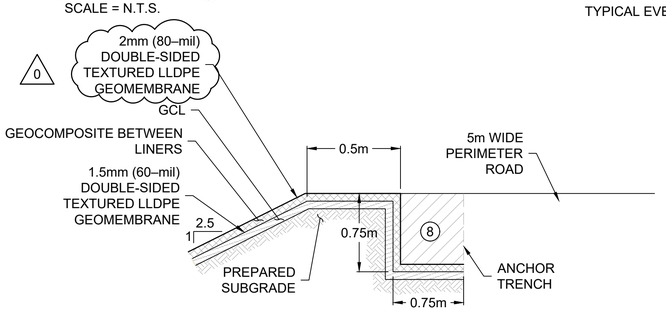
TYPICAL EVENT POND UNDERDRAIN DETAIL (53 / 07-01)

SCALE = N.T.S.



EVENT POND LINER DETAIL (54 / 07-02)

SCALE = N.T.S.



EVENT POND GEOMEMBRANE ANCHOR DETAIL (55 / 07-02)

SCALE = N.T.S.

LEGEND

2	SELECT FILL
5	SELECT DRAIN FILL
8	ANCHOR TRENCH FILL

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. RUB SHEET SHALL CONSIST OF A SINGLE LAYER OF 2 mm (80-mil) DOUBLE-SIDED TEXTURED HDPE GEOMEMBRANE EXTRUSION WELDED TO LINER BENEATH LDRS PUMP CASING.
3. THE BOTTOM 1m OF EVENT POND LDRS PUMP RISER AND EVENT POND INSTRUMENT RISER SHALL BE SLOTTED. SLOTTING IN THE PVC PIPE SHALL BE 2mm WIDE BY 50mm LONG (MEASURED PERPENDICULAR TO PIPE FLOW) SPACED 100mm ON CENTER AROUND THE PIPE. MINIMUM PIPE WALL THICKNESS SHALL BE SCH 80.
4. FABRIC FORMED CONCRETE STRINGS USED FOR LINER BALLAST SHALL BE SPACED A MAXIMUM OF 15m ON CENTER. SPECIFIC FABRIFORM SIZING AND SPACING CAN VARY, BUT MUST PRODUCE A MINIMUM OF 15kg/m² ON POND SIDE SLOPES. PROPOSED CONFIGURATION IS SUBJECT TO ENGINEER APPROVAL.

0

ISSUED FOR CONSTRUCTION

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

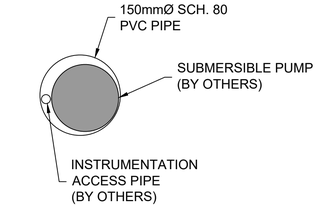
REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	31	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW
0	17	10	24	DAG	TLM	MEH	TLM	ISSUED FOR CONSTRUCTION, REVISE LINER MATERIAL, ADD NOTE 4

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

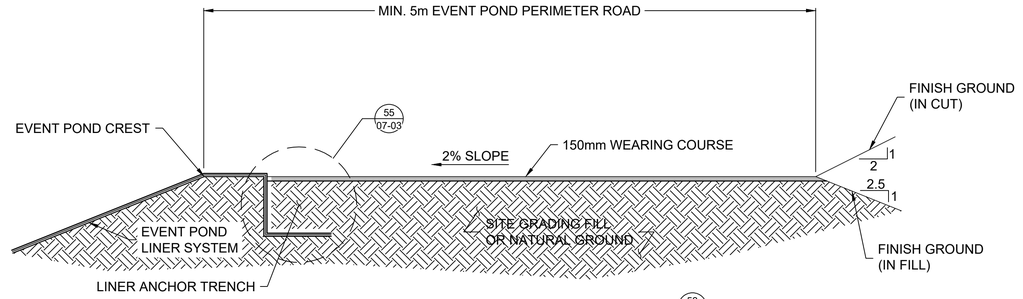
DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: EVENT POND DETAILS SHEET 1 OF 2
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: N.T.S. / DWG No.: EGHLF-XD-07-03 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

X:\Projects\07792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-07-03.dwg Layout: EGHLF-XD-07-03 Plot Date: Oct 24 17 Time: 4:28 PM



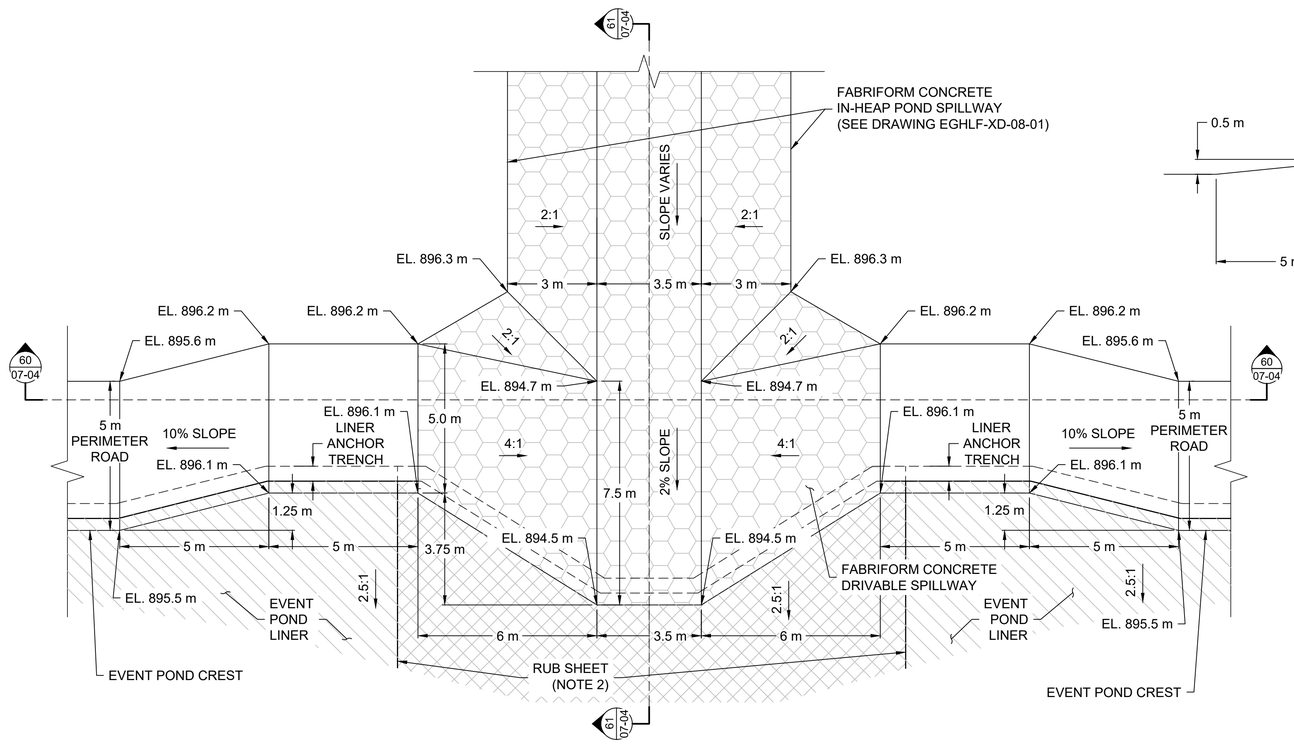
EVENT POND LDRS PUMP CASING (57 / 07-03)

SCALE = N.T.S.



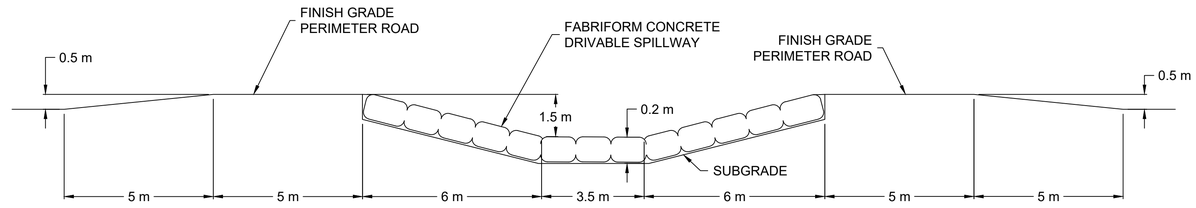
EVENT POND PERIMETER ROAD – TYPICAL DETAIL (58 / 07-01)

SCALE = N.T.S.



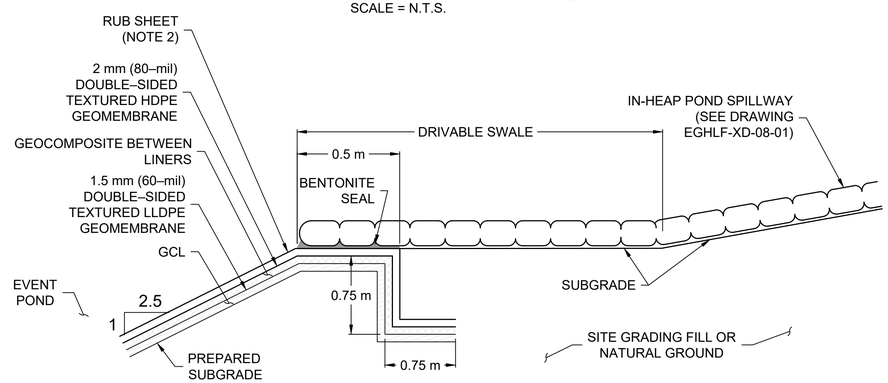
IN-HEAP POND SPILLWAY DRIVEABLE SWALE DETAIL (59 / 07-01)

SCALE = N.T.S.



IN-HEAP POND SPILLWAY DRIVEABLE SWALE DETAIL (60 / 07-04)

SCALE = N.T.S.



IN-HEAP POND SPILLWAY DRIVEABLE SWALE DETAIL (61 / 07-04)

SCALE = N.T.S.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. RUB SHEET SHALL CONSIST OF A DOUBLE LAYER OF 2 mm (80-mil) DOUBLE-SIDED TEXTURED HDPE GEOMEMBRANE EXTRUSION WELDED TO LINER BELOW SPILLWAY.
3. ALL ELEVATIONS SHOWN ON THIS DRAWING REPRESENT FINISHED GRADE.

NOT FOR CONSTRUCTION

DRAFT

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

REVISION INFORMATION

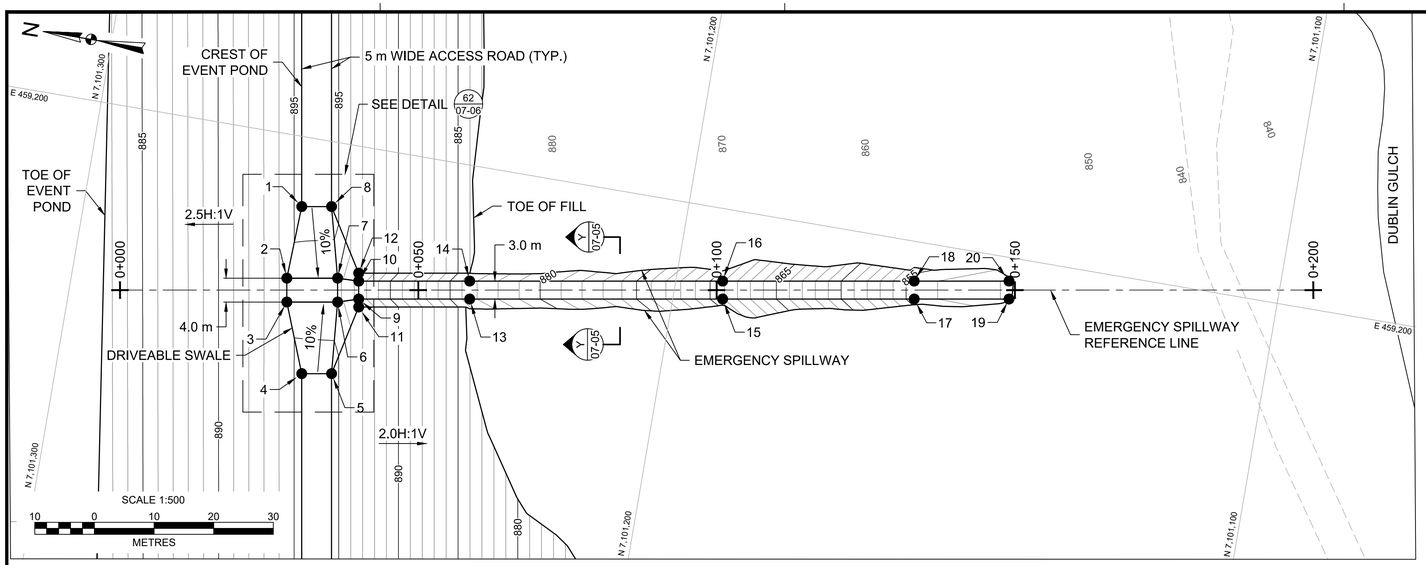
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

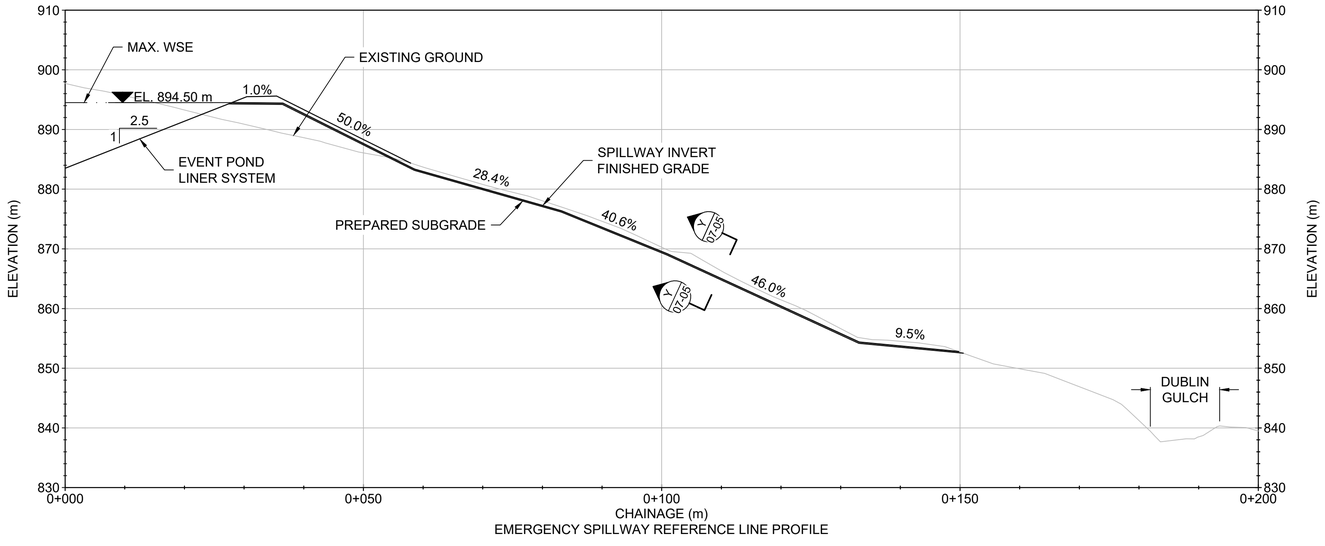
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: EVENT POND DETAILS SHEET 2 OF 2
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: N.T.S. / DWG No.: EGHLF-XD-07-04 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

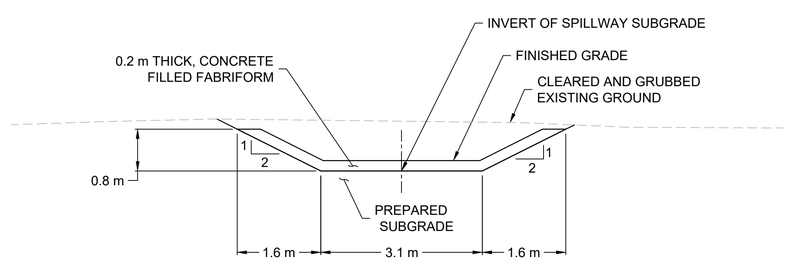
X:\Projects\07792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-07-04.dwg Layout: EGHLF-XD-07-04 Plot Date: Oct 26 17 Time: 2:57 PM





EMERGENCY SPILLWAY REFERENCE LINE PROFILE

EVENT POND EMERGENCY SPILLWAY FINISHED GROUND CONTROL POINTS				
CP#	EASTING (m)	NORTHING (m)	ELEVATION (m)	DESCRIPTION
1	459,188.4	7,101,263.9	895.5	CREST
2	459,176.1	7,101,264.3	894.5	CREST
3	459,172.2	7,101,263.7	894.5	CREST
4	459,160.8	7,101,259.2	895.5	CREST
5	459,161.6	7,101,254.2	895.6	CREST
6	459,173.6	7,101,255.3	894.3	TOE
7	459,177.6	7,101,256.0	894.3	TOE
8	459,189.2	7,101,259.0	895.6	CREST
9	459,174.7	7,101,251.9	892.7	TOE
10	459,177.7	7,101,252.4	892.7	TOE
11	459,173.4	7,101,251.6	893.3	CREST
12	459,179.0	7,101,252.6	893.3	CREST
13	459,177.9	7,101,233.5	883.4	TOE
14	459,180.8	7,101,234.0	883.4	TOE
15	459,185.0	7,101,191.7	869.1	TOE
16	459,188.0	7,101,192.2	869.1	TOE
17	459,190.4	7,101,160.1	854.4	TOE
18	459,193.4	7,101,160.6	854.4	TOE
19	459,193.1	7,101,144.4	852.9	TOE
20	459,196.1	7,101,144.9	852.9	TOE



TYPICAL EMERGENCY SPILLWAY SECTION Y 07-05

SCALE = N.T.S.

SCALE 1:500

METRES

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

DRAFT

NOT FOR CONSTRUCTION

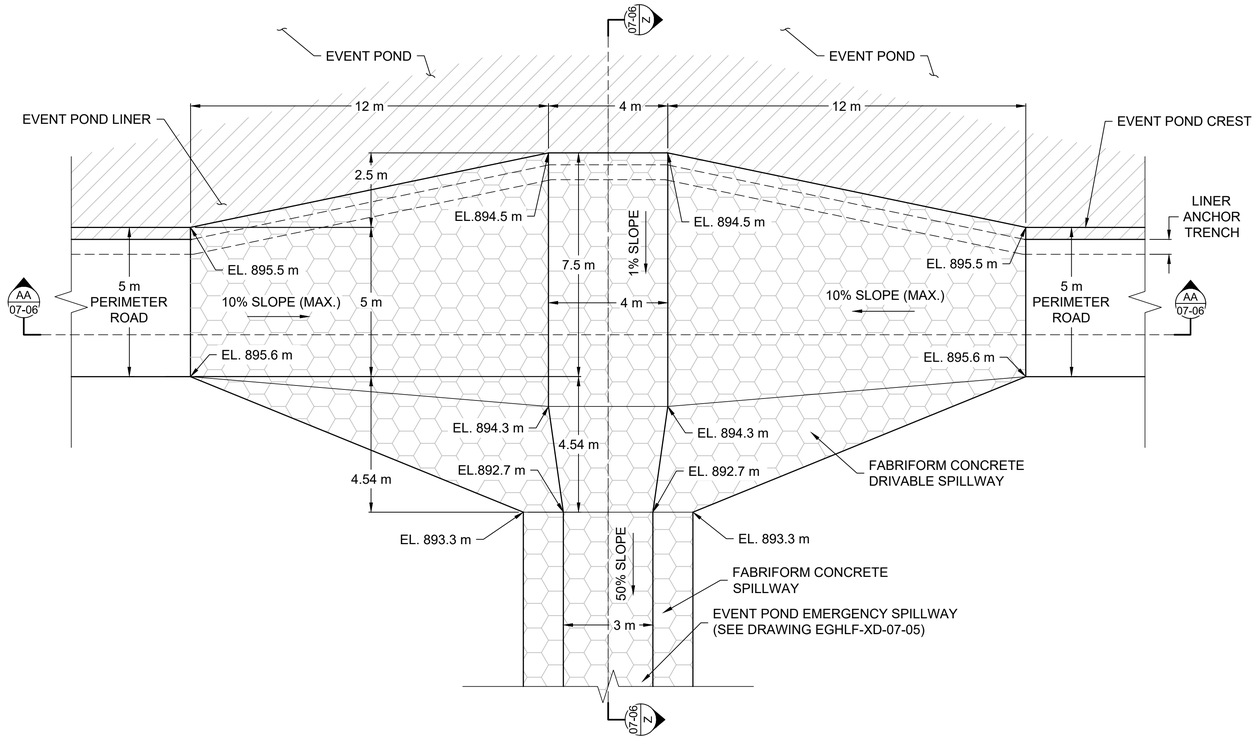
NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.

REVISION INFORMATION	REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
	A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

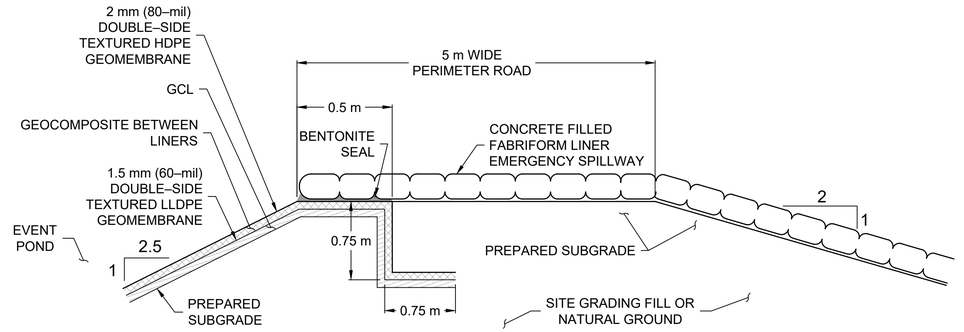
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: EVENT POND SPILLWAY PLAN AND PROFILE
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: 1:500 / DWG No.: EGHLF-XD-07-05 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

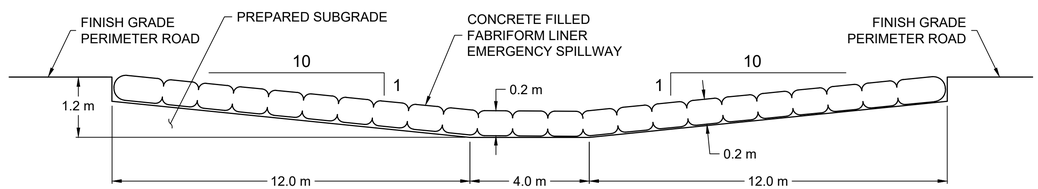
X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-07-05.dwg Layout: EGHLF-XD-07-05 Plot Date: Oct 26 17 Time: 2:58 PM



EMERGENCY SPILLWAY DRIVEABLE SWALE DETAIL (62 / 07-06)



EMERGENCY SPILLWAY DRIVEABLE SWALE SECTION (Z / 07-06)
SCALE = N.T.S.



TYPICAL EMERGENCY SPILLWAY SECTION VIEW (AA / 07-06)
SCALE = N.T.S.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.

NOT FOR CONSTRUCTION

DRAFT

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

REVISION INFORMATION	REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
	A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT
DESIGN BY: TLM	CHECK DESIGN: MEH
LEAD ENGINEER: DEH	APPROVAL DATE: -
PROJECT MANAGER: TLM	APPROVAL DATE: -

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: StrataGold Corporation

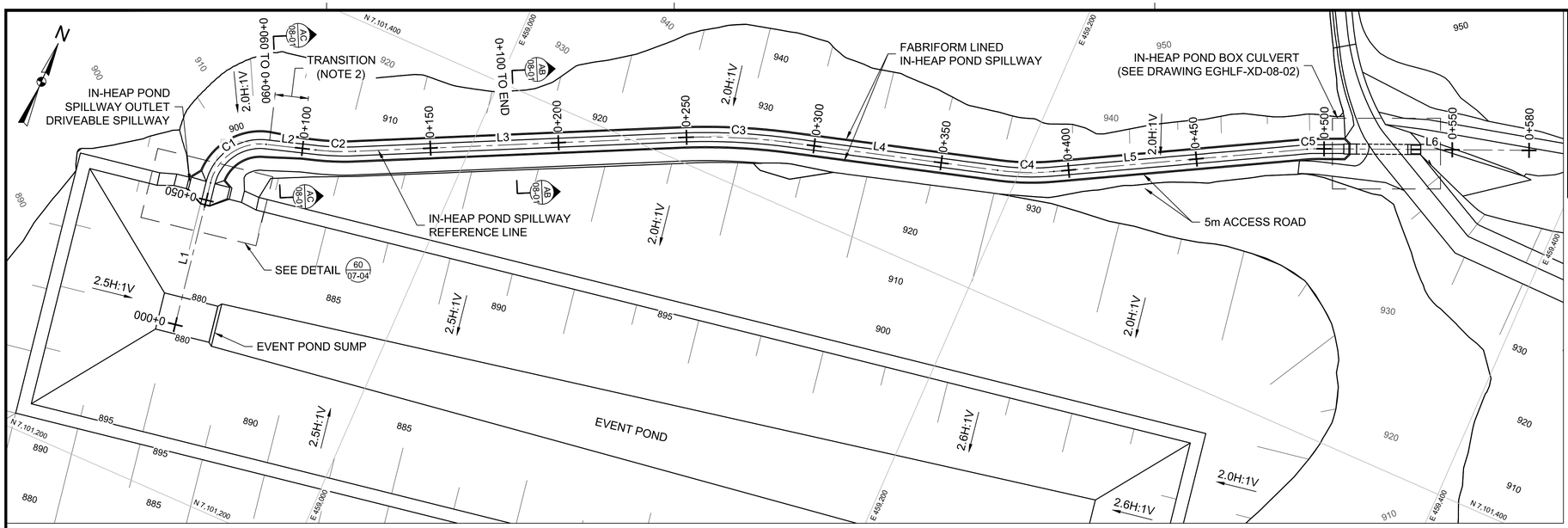
PROJECT: EAGLE GOLD - HEAP LEACH FACILITY

TITLE: EVENT POND SPILLWAY TYPICAL SECTIONS AND DETAILS

SCALE:	DWG No.:	REV.:
N.T.S.	EGHLF-XD-07-06	0

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\07792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-07-06.dwg Layout: EGHLF-XD-07-06 Plot Date: Oct 26 17 Time: 3:00 PM



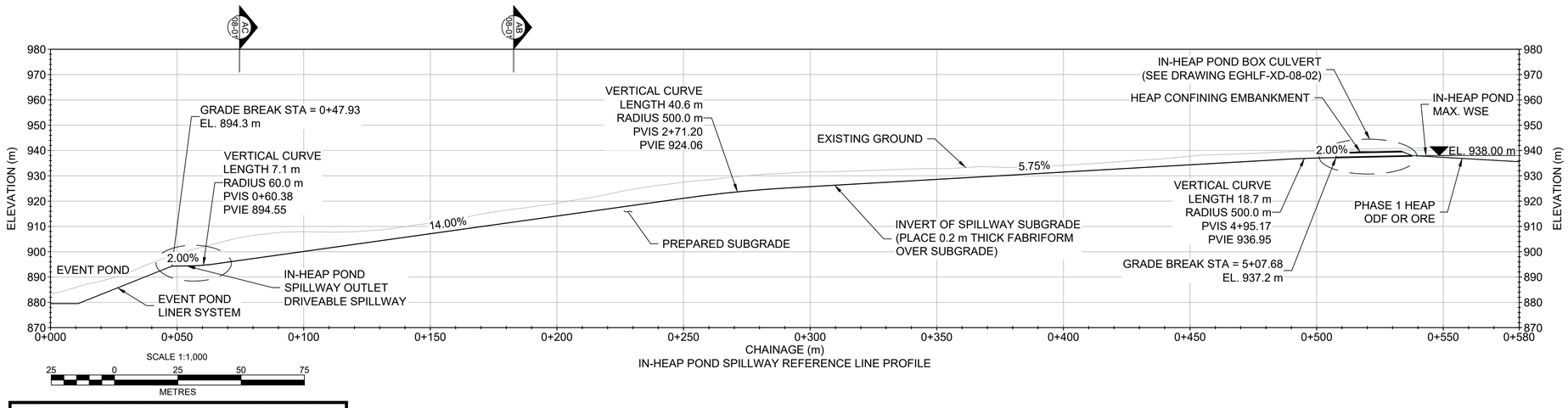
SCALE 1:1,000

25 0 25 50 75

METRES

CURVE TABLE				
C#	RADIUS (m)	LENGTH (m)	START POINT (E,N)	END POINT (E,N)
C1	20.000	28.783	(458912.7218,7101318.5973)	(458926.5005,7101341.0726)
C2	100.000	15.479	(458945.1056,7101346.8534)	(458959.4739,7101352.5698)
C3	250.000	43.629	(459072.8301,7101408.1747)	(459113.4737,7101423.8822)
C4	100.000	21.976	(459191.9473,7101446.5778)	(459212.2208,7101454.9448)
C5	50.000	4.752	(459299.1752,7101502.5946)	(459303.4448,7101504.6770)

LINE TABLE			
L#	LENGTH (m)	START POINT (E,N)	END POINT (E,N)
L1	56.883	(458922.3235,7101262.5309)	(458912.7218,7101318.5973)
L2	19.482	(458926.5005,7101341.0726)	(458945.1056,7101346.8534)
L3	126.260	(458959.4739,7101352.5698)	(459072.8301,7101408.1747)
L4	81.690	(459113.4737,7101423.8822)	(459191.9473,7101446.5778)
L5	99.154	(459212.2208,7101454.9448)	(459299.1752,7101502.5946)
L6	81.912	(459303.4448,7101504.6770)	(459378.6896,7101537.0461)

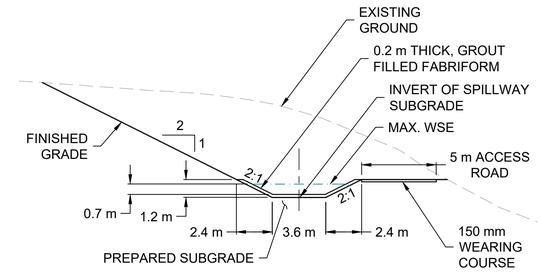


IN-HEAP POND SPILLWAY REFERENCE LINE PROFILE

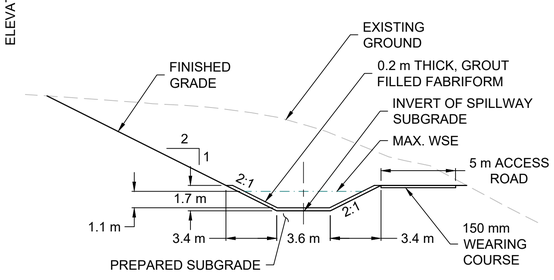
SCALE 1:1,000

25 0 25 50 75

METRES



TYPICAL IN–HEAP POND SPILLWAY SECTION (AB 08-01)
STA. 1+00 TO END
SCALE = N.T.S.



TYPICAL IN–HEAP POND SPILLWAY SECTION (AC 08-01)
STA. 0+60 TO 0+90
SCALE = N.T.S.

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

DRAFT

NOT FOR CONSTRUCTION

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. TRANSITION SPILLWAY GEOMETRY FROM DETAIL AC TO AB BETWEEN STATION 0+090 TO 0+100.

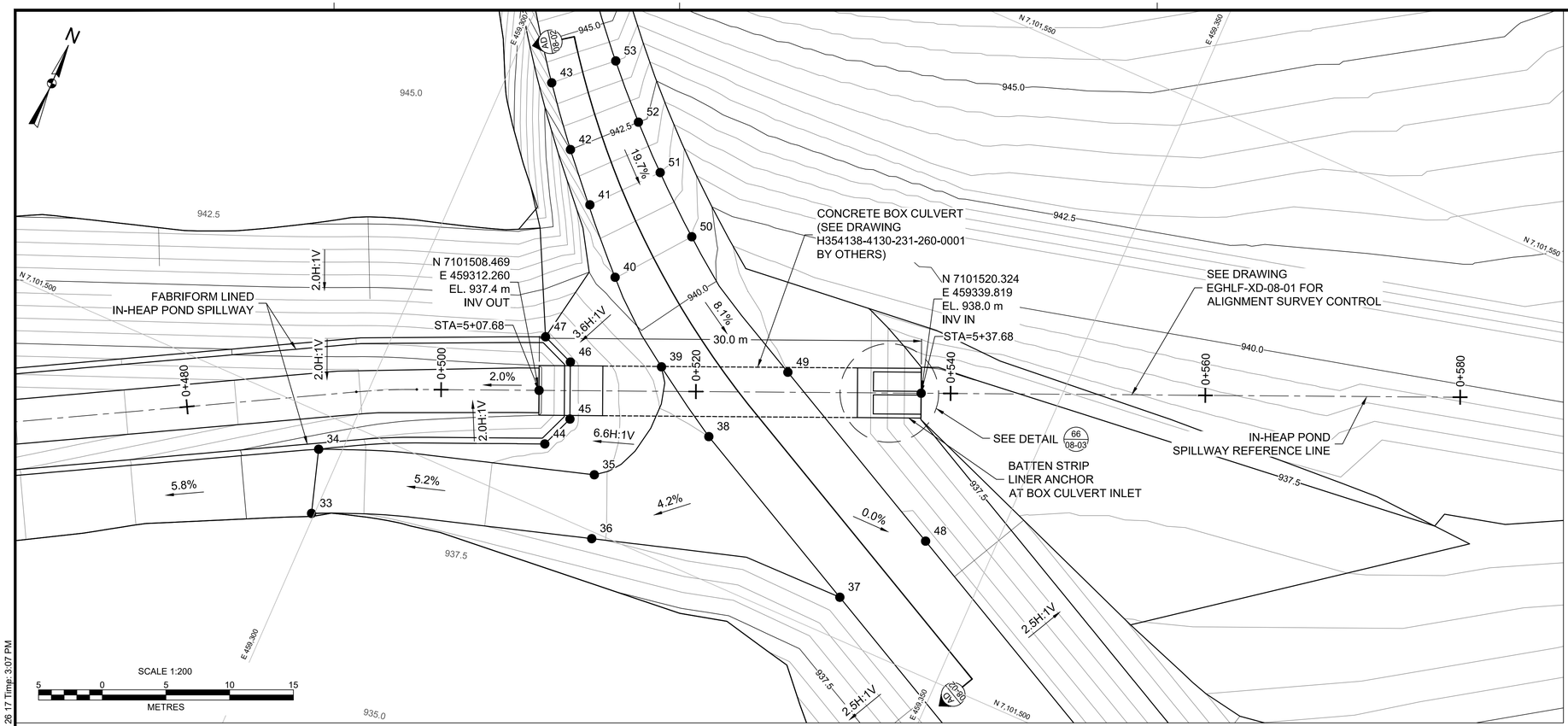
REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

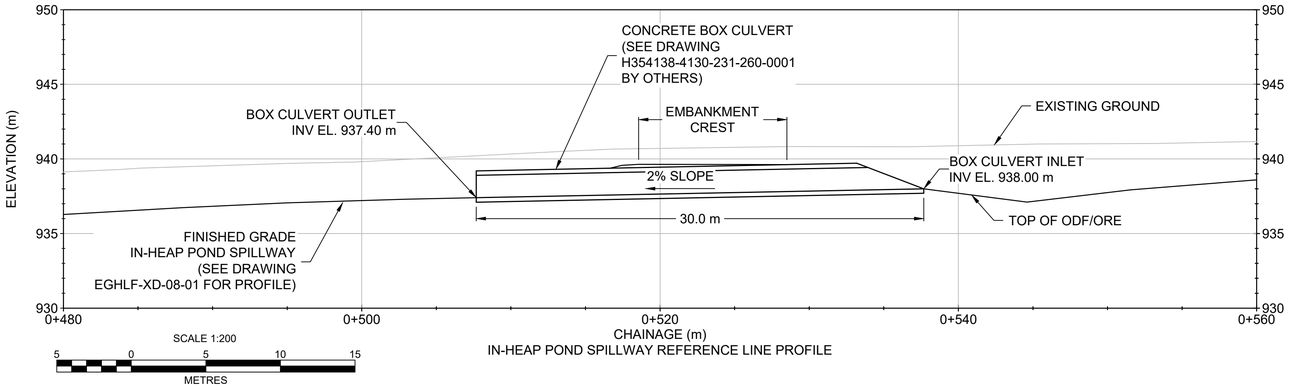
DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: IN-HEAP POND SPILLWAY PLAN AND PROFILE
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: 1:1,000 / DWG No.: EGHLF-XD-08-01 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-08-01.dwg Layout: EGHLF-XD-08-01 Plot Date: Oct 26 17 Time: 3:02 PM

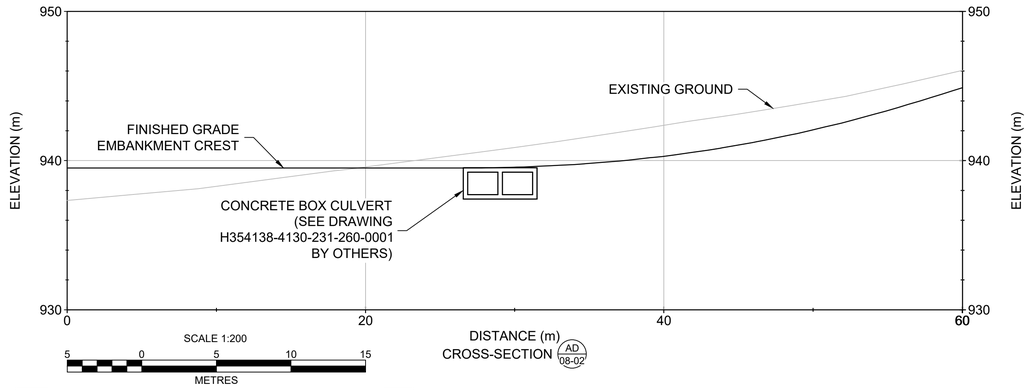


BOX CULVERT FINISHED GROUND CONTROL POINTS				
CP#	EASTING (m)	NORTHING (m)	ELEVATION (m)	DESCRIPTION
33	459,299.8	7,101,492.4	937.8	CREST
34	459,298.3	7,101,497.3	937.8	CREST
35	459,318.9	7,101,504.1	938.9	CREST
36	459,320.7	7,101,499.5	938.9	CREST
37	459,340.4	7,101,503.1	939.5	CREST
38	459,325.9	7,101,510.5	939.5	CREST
39	459,320.3	7,101,514.0	939.8	CREST
40	459,314.2	7,101,519.0	940.5	CREST
41	459,310.1	7,101,523.4	941.5	CREST
42	459,306.9	7,101,526.8	942.5	CREST
43	459,303.5	7,101,531.0	944.0	CREST
44	459,314.4	7,101,504.8	938.4	GB
45	459,315.4	7,101,507.4	938.4	GB
46	459,313.6	7,101,511.5	938.4	GB
47	459,311.0	7,101,512.5	938.4	GB
48	459,344.8	7,101,509.8	939.5	CREST
49	459,329.6	7,101,517.6	939.5	CREST
50	459,318.4	7,101,524.3	940.5	CREST
51	459,314.1	7,101,527.9	941.5	CREST
52	459,310.9	7,101,530.9	942.5	CREST
53	459,307.4	7,101,534.6	944.0	CREST

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.



IN-HEAP POND SPILLWAY REFERENCE LINE PROFILE



CROSS-SECTION AD 08-02

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

DRAFT

NOT FOR CONSTRUCTION

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.

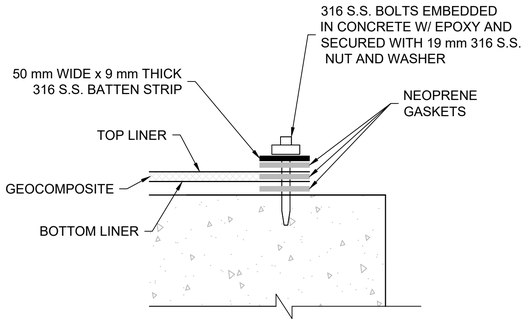
REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

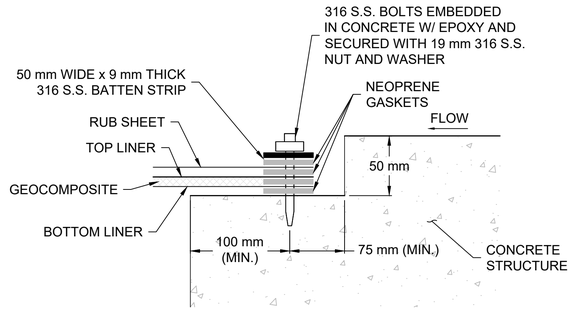
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: IN-HEAP POND SPILLWAY BOX CULVERT PLAN AND PROFILE
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: 1:200 / DWG No.: EGHLF-XD-08-02 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

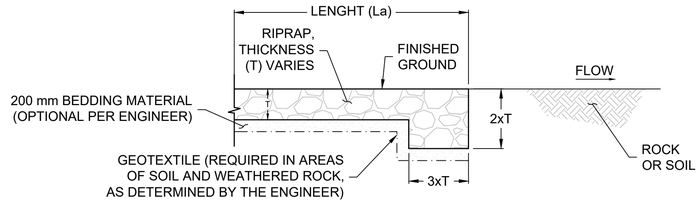
X:\Projects\0792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-08-02.dwg Layout: EGHLF-XD-08-02 Plot Date: Oct 26 17 Time: 3:07 PM



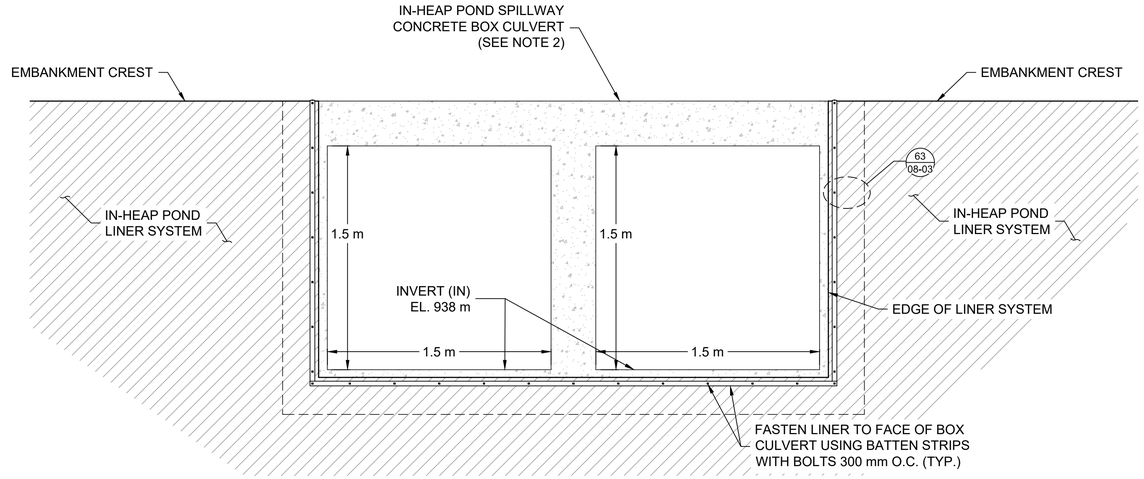
BATTEN STRIP DETAIL (63 / 08-03)
SCALE = N.T.S.



RECESSED BATTEN STRIP DETAIL (64 / 05-04)
SCALE = N.T.S.



RIPRAP TRANSITION TO ROCK CUT OR SOIL (65 / 08-03)
SCALE = N.T.S.



BOX CULVERT LINER ANCHOR DETAIL (66 / 08-02)
SCALE = N.T.S.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. SEE DRAWING H354138-4130-231-260-0001 FOR STRUCTURAL DETAILS FOR IN-HEAP POND SPILLWAY CONCRETE, REINFORCING, NOTES AND SPECIFICATIONS.

NOT FOR CONSTRUCTION

DRAFT

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED.
ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE
BASED ON ORIGINAL FORMAT DRAWINGS.

REVISION INFORMATION

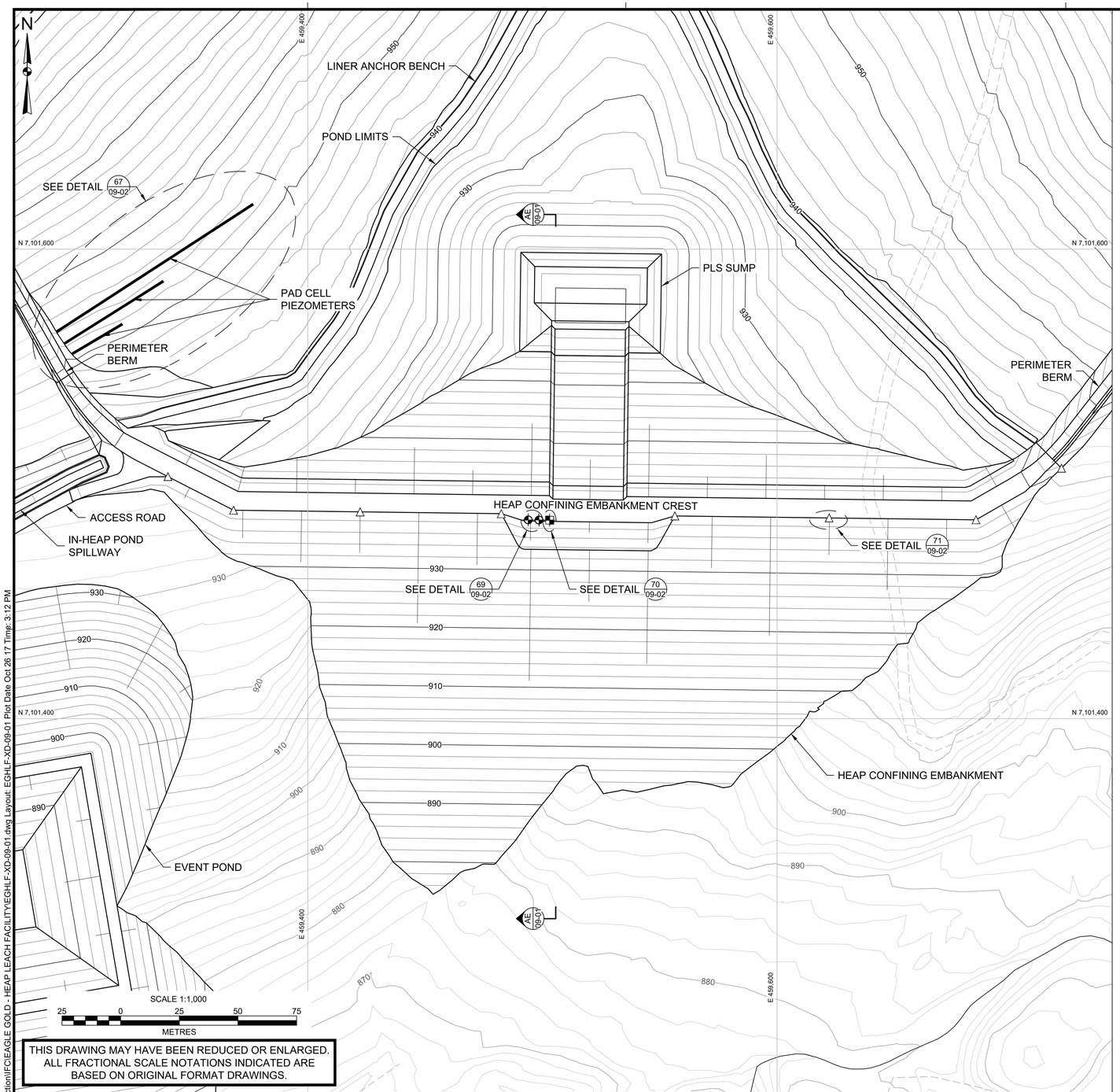
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

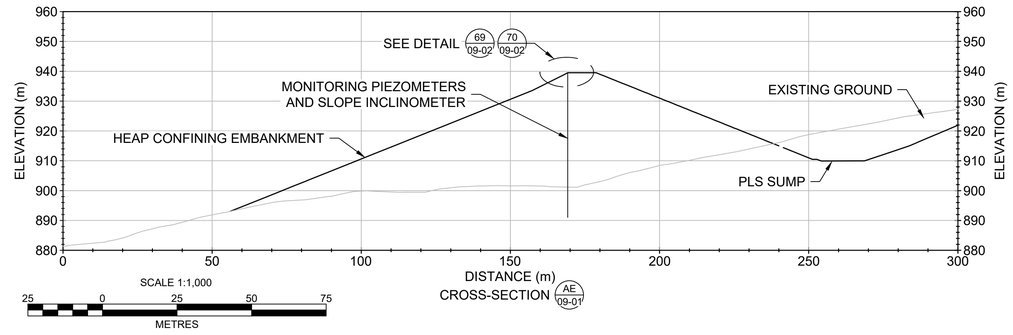
REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: IN-HEAP POND SPILLWAY DETAILS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: N.T.S. / DWG No.: EGHLF-XD-08-03 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\07792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-08-03.dwg Layout: EGHLF-XD-08-03 Plot Date: Oct 26 17 Time: 3:09 PM





THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

NOTES:
1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. THE OWNER'S ENGINEER SHALL OVERSEE INSTALLATION OF ALL INSTRUMENTATION AND SETUP OF ALL RELAY AND DATALOGGER EQUIPMENT.

DRAFT

NOT FOR CONSTRUCTION

LEGEND
- △ PLANNED SURVEY MONUMENT
- ⊕ PLANNED EMBANKMENT PIEZOMETER
- ▪ SLOPE INCLINOMETER

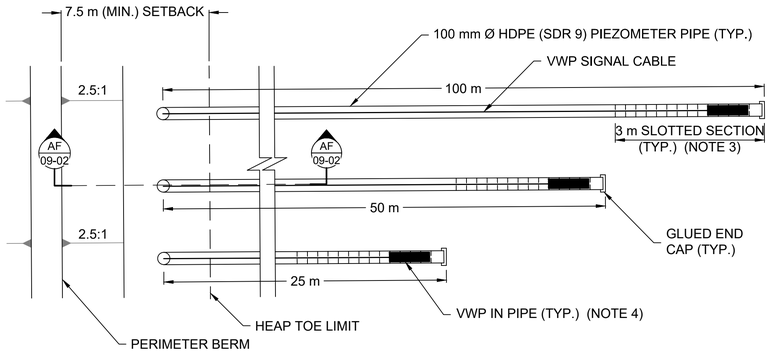
REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: INSTRUMENTATION PLAN
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: AS-SHOWN / DWG No.: EGHLF-XD-09-01 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

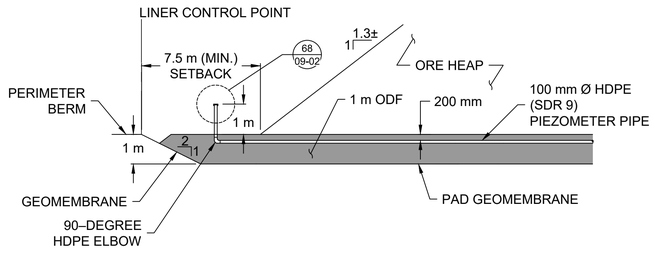
X:\Projects\0792 Victoria Gold\CAD\Production\FC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-09-01.dwg Layout: EGHLF-XD-09-01 Plot Date: Oct 26 '17 Time: 3:12 PM



PAD CELL PIEZOMETERS TYPICAL LAYOUT (67 / 09-01)

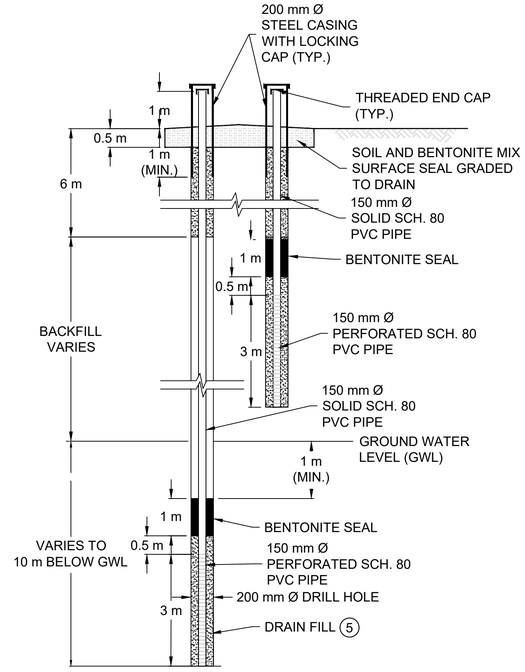
SCALE = N.T.S.

(NOTE 1)



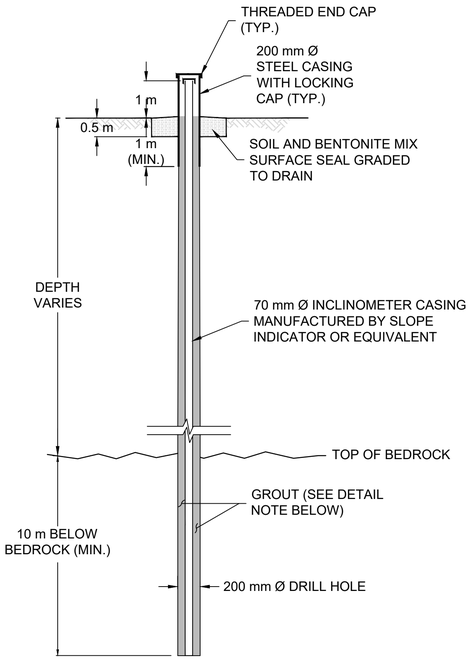
PAD CELL PIEZOMETERS PIPE SECTION (AF / 09-02)

SCALE = N.T.S.



MONITORING PIEZOMETERS DETAIL (69 / 09-01)

SCALE = N.T.S.



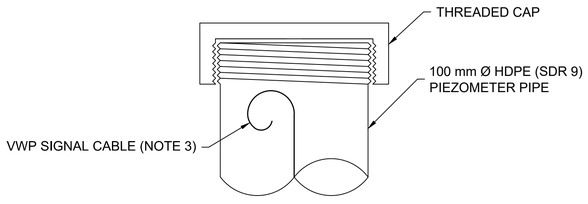
NOTE: THE ANNULUS BETWEEN THE BOREHOLE AND INCLINOMETER CASING SHOULD BE FILLED WITH GROUT AS SPECIFIED BELOW:

GROUT MIX TABLE		
MATERIALS	WEIGHT	RATIO BY WEIGHT
PORTLAND CEMENT	94 LB (1 BAG)	1
WATER	30 GALLONS	2.5
BENTONITE	+/- 25 LBS. *	0.3

* MIX CEMENT WITH WATER FIRST. THEN MIX IN THE BENTONITE. ADJUST THE AMOUNT OF BENTONITE TO PRODUCE A GROUT WITH THE CONSISTENCY OF HEAVY CREAM. IF THE GROUT IS TOO THIN, THE SOLIDS AND THE WATER WILL SEPARATE.

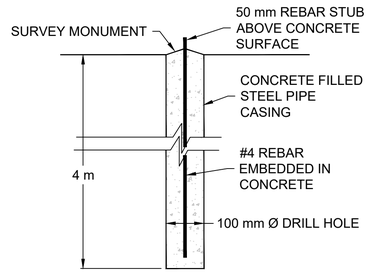
INCLINOMETER DETAIL (70 / 09-01)

SCALE = N.T.S.



PIEZOMETER PIPE CAP DETAIL (68 / 09-02)

SCALE = N.T.S.



SURVEY MONITORING DETAIL (71 / 09-01)

SCALE = N.T.S.

LEGEND

(5) SELECT DRAIN FILL

NOTES:

1. SEE DRAWING EGHLF-XD-00-02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND FILL TYPES.
2. LOCATE PIEZOMETER PIPES WITH THE PIPE OUTLETS NEAR THE ACCESS ROAD. PIPES SHALL BE INSTALLED HALF WAY BETWEEN PLS DRAIN PIPES AND EXTEND INTO THE PAD ALONG ITS FLATTEST GRADE.
3. SLOTS SHALL BE AT CROWN OF PIPE AND SHALL BE EQUALLY SPACED AT 75 mm CENTRES. SLOTS DIMENSIONS SHALL BE 3 mm WIDE BY 38 mm LONG.
4. VIBRATING WIRE PIEZOMETERS (VWPs) SHALL BE GEOKON MODEL 4500AL/ALV-170kPa OR APPROVED EQUIVALENT. VWP INSTRUMENTS SHALL BE INSTALLED IN A GLYCOL BATH FOR FROST PROTECTON.

NOT FOR CONSTRUCTION

DRAFT

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

REVISION INFORMATION

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS
A	17	07	-	DAG	TLM	MEH	TLM	ISSUED FOR REVIEW

REV. NO.	YY	MM	DD	DRAWN	DESIGN	CHECK	APPROVED	REVISION / ISSUED DESCRIPTIONS

DRAWN BY: DAG	CHECK DRAWING: CJT	BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY	PROJECT: EAGLE GOLD - HEAP LEACH FACILITY
DESIGN BY: TLM	CHECK DESIGN: MEH		TITLE: INSTRUMENTATION DETAILS
LEAD ENGINEER: DEH	APPROVAL DATE: -	CLIENT: StrataGold Corporation	SCALE: N.T.S. / DWG No.: EGHLF-XD-09-02 / REV.: 0
PROJECT MANAGER: TLM	APPROVAL DATE: -		

THIS BAR MEASURES 100 mm AT FULL SIZE. ALL SCALES REFERENCED TO FULL SIZE.

X:\Projects\07792 Victoria Gold\CAD\Production\IFC\EAGLE GOLD - HEAP LEACH FACILITY\EGHLF-XD-09-02.dwg Layout: EGHLF-XD-09-02 Plot Date: Oct 26 17 Time: 3:13 PM

APPENDIX A
SUPPORTING INFORM ATION

APPENDIX A-1
2011 GEOTECHNICAL INVESTIGATION

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

VICTORIA GOLD CORPORATION

EAGLE GOLD PROJECT
DUBLIN GULCH, YUKON

2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

PROJECT NO:	0792-006
DATE:	January 20, 2012
DOCUMENT NO:	

DISTRIBUTION:	
VICTORIA GOLD:	2 copies
WARDROP:	1 copy
BGC:	1 copy

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
#500-1045 Howe Street
Vancouver, B.C.
Canada V6Z 2A9
Tel: 604.684.5900
Fax: 604.684.5909

January 23, 2012
Project No: 0792-006

Mike Padula, Project Manager
Victoria Gold Corporation
584 – Bentall #4
1055 Dunsmuir Street, PO Box 49215
Vancouver, BC, V7X 1K8

Dear Mr. Padula,

Re: EAGLE GOLD PROJECT: 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

Please find attached the final version of the aforementioned report. Should you have any questions or comments, please do not hesitate to contact the undersigned.

Yours sincerely,

BGC ENGINEERING INC.
per:

Pete Quinn, Ph.D., P.Eng.
Senior Geotechnical Engineer

EXECUTIVE SUMMARY

This report summarizes the findings of geotechnical site investigation work conducted in the summer of 2011 at the Eagle Gold Project, at Dublin Gulch, located near Mayo, Yukon. Several areas on site were previously explored as part of a pre-feasibility study for development of an open pit heap leach gold mine. BGC is providing engineering recommendations for foundations, waste rock storage areas, open pit slopes and pit depressurization under separate cover. The present report addresses investigations conducted in 2011 in support of a Feasibility Study for proposed mine site infrastructure other than the open pit, including: the heap leach pad; waste rock storage areas; crushers and conveyors; water diversion structures; plant site buildings; solution and water management ponds; and other miscellaneous buildings and facilities.

The 2011 geotechnical investigation program involved the excavation of ninety-six test pits, advancement of forty-six drill holes (29 Diamond holes and 17 Auger holes), and mapping of fifty-nine outcrops (natural exposures, existing road cuts and drill pads cuts) to characterize subsurface conditions relevant for foundation and earthworks design. Samples were taken from select test pits and boreholes for index testing of soil and rock. Bulk samples of rock and placer tailings were also analyzed for a range of parameters related to the potential for re-use as select fill or aggregate. This report presents factual data only, and does not include any engineering interpretation of the data nor engineering recommendations in relation to the proposed mine facilities.

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... **i**
TABLE OF CONTENTS ..... **ii**
LIST OF TABLES ..... **iv**
LIST OF DRAWINGS ..... **iv**
LIST OF APPENDICES ..... **v**
LIMITATIONS ..... **vi**
1.0 INTRODUCTION **1**
1.1. General **1**
1.2. Project description **1**
1.3. Previous Investigations **1**
1.4. Scope of Work **3**
2.0 SITE CONDITIONS **4**
2.1. Surficial Geology **4**
2.2. Bedrock Geology **4**
3.0 GEOTECHNICAL INVESTIGATION **6**
3.1. Overview **6**
3.2. Outcrop Mapping **7**
3.3. Test Pitting **7**
3.4. Geotechnical Borehole Drilling **7**
3.4.1. General 7
3.4.2. Diamond Drilling 8
3.4.3. Auger Drilling 8
3.5. Field Testing **9**
3.5.1. Penetration Testing 9
3.5.1.1. SPT N-blow count 10
3.5.1.2. Dynamic Cone Penetrometer (DCPT) 10
3.5.1.3. Wildcat Penetrometer 10
3.5.2. Geophysics 11
3.5.2.1. Seismic Refraction 11
3.5.2.2. Downhole Seismic Profiling 11
3.5.3. Plate Load Testing 12
3.5.4. Thermistors 12
3.6. Groundwater Investigation **12**
3.6.1. Groundwater Levels 12
3.6.1.1. Standpipe Piezometers 13
3.6.1.2. Vibrating Wire Piezometers (VWP) 13
3.6.2. Slug Testing 13

3.6.3. Seep Observations 13
3.7. Sampling and Laboratory Testing 13
3.7.1. Soil Testing 14
3.7.2. Rock Strength Testing 14
3.7.2.1. UCS and Brazilian Tensile Strength 14
3.7.2.2. Point Load Testing 15
3.7.3. Borrow Source Testing 15
3.7.3.1. Silt Borrow 15
3.7.3.2. Aggregate Testing 16
3.8. Placer Tailings Inventory 18
4.0 OBSERVED SUBSURFACE CONDITIONS 19
4.1. Summarized Data 19
4.1.1. Penetration Data 19
4.1.2. Plate Load Testing 19
4.1.3. Temperatures 20
4.1.4. Groundwater Observations 21
4.1.4.1. Water Level 21
4.1.4.2. Permeability 23
4.1.5. Point Load Test 24
4.1.6. Concrete Aggregate Testing results 26
4.1.7. Material Testing Commissioned by Tetra Tech for the Heap Leah Facility 27
4.2. Material Descriptions 29
4.2.1. General 29
4.2.2. Overburden 29
4.2.2.1. Organics 29
4.2.2.2. Colluvium 30
4.2.2.3. Fill 30
4.2.2.4. Alluvium 31
4.2.2.5. Debris Flow Deposits 31
4.2.2.6. Glacial Till 31
4.2.2.7. Highly to Completely Weathered Bedrock 31
4.2.3. Bedrock 32
4.2.4. Frozen Ground 33
5.0 CLOSURE 34
REFERENCES 35

LIST OF TABLES

Table 3-1. Summary of Soil Samples Tested 14
Table 3-2. Summary of Rock Samples Tested 14
Table 3-3. Summary of tests conducted on potential silt borrow materials 16
Table 3-4. Summary of Aggregate testing 17
Table 4-1. Summary of Penetration Data 19
Table 4-2. Summary of Plate Load Test Results 20
Table 4-3. Summary of 2011 Thermistor Readings 21
Table 4-4. Summary of Water Level Readings for data collected in 2011 site investigation 22
Table 4-5. Summary of Hydraulic Conductivity Results by Tested Formation 24
Table 4-6. Summary of Point Load Test Results by Rock Type 25
Table 4-7. Summary of Aggregate Testing Results 27
Table 4-8. Summary of Testing Commissioned by Tetra Tech for the Heap Leah Facility 28

LIST OF DRAWINGS

Drawing 01 General Site Location
Drawing 02 Proposed General Arrangement
Drawing 03 Historical Field Investigations (1995 – 2010)
Drawing 04 Surficial Geology
Drawing 05 Test hole Location Plan
Drawing 06 2011 Penetration Testing
Drawing 07 2011 Borehole Installations
Drawing 08 Plate Load Test Location Map
Drawing 09 Ground and Surface Water Observations
Drawing 10 Placer Tailings Visual Classification of Surficial Materials
Drawing 11 2011 Frozen Ground Observations

LIST OF APPENDICES

APPENDIX A TERMINOLOGY FOR OUTCROP MAPPING AND TEST HOLE LOGS
APPENDIX B OUTCROP MAPPING
APPENDIX C TEST PIT LOGS
APPENDIX D TEST PIT PHOTOS
APPENDIX E BOREHOLE LOGS
APPENDIX F BOREHOLE PHOTOS
APPENDIX G PENETRATION TESTING
APPENDIX H GEOPHYSICS
APPENDIX I PLATE LOAD TESTS
APPENDIX J THERMISTORS
APPENDIX K GROUNDWATER INVESTIGATIONS
APPENDIX L LABORATORY REPORTS
APPENDIX M LABORATORY TESTING RESULTS PLOTS AND TABLES
APPENDIX N POINT LOAD TESTING
APPENDIX O PLACER TAILINGS INVENTORY

LIMITATIONS

BGC Engineering Inc. (BGC) prepared this document for the account of Victoria Gold Corporation (VIT). The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves, all documents and drawings are submitted for the confidential information of our client for a specific project. Authorization for any use and/or publication of this document or any data, statements, conclusions or abstracts from or regarding our documents and drawings, through any form of print or electronic media, including without limitation, posting or reproduction of same on any website, is reserved pending BGC's written approval. If this document is issued in an electronic format, an original paper copy is on file at BGC and that copy is the primary reference with precedence over any electronic copy of the document, or any extracts from our documents published by others.

1.0 INTRODUCTION

1.1. General

Victoria Gold Corporation (VIT), with assistance from Wardrop Engineering Inc. (WEI) is completing a feasibility study (FS) for development of the proposed Eagle Gold mine at Dublin Gulch, Yukon. BGC Engineering Inc. (BGC) was contracted by VIT to complete geotechnical investigations for mine site infrastructure. This report presents factual data resulting from geotechnical investigations performed between June and August 2011. This work was conducted to investigate subsurface conditions at the proposed locations for the mine site infrastructure, other than the open pit, including: the heap leach pad; waste rock storage areas; crushers and conveyors; water diversion structures; plant site buildings; solution and water management ponds; and other miscellaneous buildings and facilities.

1.2. Project description

The Eagle Gold property is located approximately 40 km north of Mayo, and 15 km northwest of Elsa, as illustrated in Drawing 01. The mine will comprise an open pit and heap leach pad; haul roads; waste rock storage areas; process plant; crushers and conveyors; truck shop; camp; water diversion structure; process water ponds; drainage ditches; sediment control structures and various ancillary facilities.

The current layout for the proposed mine facilities, as received from Wardrop on November 23, 2011, is illustrated in Drawing 02. The field investigation plan was made on the basis of an earlier general arrangement received from Wardrop on June 14, 2011, and was updated during execution of the field work as the layout was adjusted on August 10, 2011. Geotechnical engineering recommendations will be provided at a later date under separate cover in a foundation design report.

1.3. Previous Investigations

Site conditions at the Eagle Gold site have been partially described in several reports as follows, and Drawing 03 shows the location of all the historic holes within the area of interest:

- Report on 1995 Geotechnical Investigations for Four Potential Heap Leach Facility Site Alternatives, First Dynasty Mines, Dublin Gulch Property. (Knight Piésold, 1996a).
- Report on Feasibility Design of the Mine Waste Rock Storage Area, First Dynasty Mines, Dublin Gulch Property. (Knight Piésold, 1996b).
- Field Investigation Data Report, Dublin Gulch Project, New Millennium Mining. (Sitka Corp, 1996).
- Hydrogeological Characterization and Assessment, Dublin Gulch Project, New Millennium Mining. (GeoEnviro Engineering, 1996).
- BGC Engineering Inc. 2009. Site Facilities Geotechnical Investigation Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.

- Stantec. 2010. Project Proposal for Executive Committee Review. Pursuant to the Yukon Environmental and Socio-Economic Assessment Act. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2011a. 2010 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.

Knight Piésold completed a feasibility level geotechnical study to evaluate the surficial materials and bedrock conditions at four potential heap leach pad locations, two potential waste rock storage areas, and the open pit. Groundwater wells and two thermistors were installed in selected drillholes at that time. Test pitting and diamond drilling were completed from June to September 1995 at upper Bawn Bay Gulch, lower Dublin Gulch, the north side of Lynx Creek, and at the confluence of Haggart and Lynx Creeks.

In 1996, Sitka Corp completed test pits and diamond drillholes in Bawn Bay Gulch, Eagle Pup, Stewart Gulch, and Platinum Gulch for preliminary design of the heap leach and waste rock facilities. Auger holes were drilled in Gill Gulch to evaluate it as a potential borrow source of silt material for use as a liner for the heap leach facility. Monitoring wells were installed in Bawn Bay Gulch and Eagle Pup. Eight thermistor strings were installed.

In 2009, BGC was engaged to gather factual data describing subsurface conditions at the proposed heap leach and waste rock storage facility locations. The work involved the excavation of sixty-nine test pits and advancement of seven boreholes. Thermistor strings were installed in three boreholes to gather temperature data. Dynamic cone penetration profiles were obtained at two borehole locations to obtain information about material density. Dynamic cone soundings were attempted in two other holes and met with refusal. Groundwater monitoring wells were installed by Stantec in two of the seven BGC boreholes. In addition, Stantec supervised the logging and installation of several other monitoring wells around the site.

In 2010, Stantec presented a Project Proposal which included general site conditions such as regional geology, physiography, drainage, climate and seismicity. Air-photo based terrain mapping and an evaluation of geological hazards affecting the project area were both also described in this report.

In 2010, BGC was engaged to develop a geotechnical site investigation program in support of the FS for proposed mine site infrastructure. A total of forty-nine test pits and twenty-five drill holes were completed to characterize the overburden material and bedrock conditions. Additionally, three cut slopes were logged for exposed soil and rock conditions, and core from one client-drilled condemnation hole was logged for geotechnical purposes. Laboratory testing was completed on selected samples for moisture content, and representative samples were also tested for Atterberg Limits and grain size analysis. Various other lab tests were also completed on bulk samples of placer tailings being considered for potential use as select fill or aggregate.

Several engineering reports were also issued in draft by BGC in early 2011, with preliminary foundation and earthworks recommendations for a number of key facilities.

1.4. Scope of Work

BGC was engaged to provide further geotechnical investigation work to address gaps in the data required in support of FS design for mine site infrastructure. The 2011 site investigation program was conducted between June and August 2011 and the field activities involved the excavation of ninety-six test pits, advancement of forty-six drill holes (29 Diamond holes and 17 Auger holes), and mapping of fifty-nine outcrops (natural exposures, existing road cuts and drill pads cuts) to characterize subsurface conditions relevant for foundation and earthworks design. Samples were taken from select test pits and boreholes for index testing of soil and rock. Bulk samples of rock and placer tailings were also analyzed for a range of parameters related to the potential for re-use as select fill or aggregate.

2.0 SITE CONDITIONS

2.1. Surficial Geology

The surficial geology of the Dublin Gulch area has been mapped by Bond (1998) and is illustrated in Drawing 04. Pleistocene and Holocene colluvial deposits are abundant in the project area and generally consist of diamicton, gravel, shattered bedrock, and lenses of sand and silt derived from bedrock and surficial materials by a variety of chemical and physical weathering processes. Transport of surface material occurs as creep, sheetwash, and mass wasting and is common on all slopes in the area.

Glacial till is infrequently observed because the valley is aligned transverse to the regional Cordilleran ice flow. Where till does occur, it is generally either a silty or sandy clay matrix with some proportion of larger clasts up to cobble size. The valley bottom is dominated by alluvium and placer mining tailings. The north facing uplands are covered by an apron or blanket of colluvium over bedrock, as compared with the southern facing uplands, where bedrock is nearer to surface and covered by a thinner veneer of colluvium. The Haggart Creek Valley to the west of the project site is filled with a mix of alluvial deposits and placer tailings. A till blanket has been mapped along the east side of Haggart Creek, south of its confluence with Dublin Gulch.

The project site is located in a region of discontinuous permafrost. Permafrost distribution within the project area is controlled by factors such as soil texture, soil moisture, aspect, vegetation and snow depth. Permafrost occurs typically on north- and east-facing slopes at higher elevations, and within poorly drained valley bottoms.

Frozen ground, when observed, is generally encountered immediately below the organic cover, although frozen organics are also encountered on north-facing slopes and under a dense spruce forest canopy. The distribution of frozen ground is highly variable across the site. Permafrost was confirmed with temperature measurements from thermistors installed on site by Knight Piesold, Sitka Corp and BGC. However, in all cases of confirmed permafrost, the measured ground temperatures showed the permafrost to be relatively warm, between 0°C and -1°C.

2.2. Bedrock Geology

The Eagle Gold mineral deposit is located in a granodiorite intrusion at the western limit of the Dublin Gulch property at its narrowest extent. It is hosted within Upper Proterozoic to Lower Cambrian aged metasedimentary rocks of the Hyland group. The metasedimentary clastic rocks consist of intercalated and deformed quartzites, and phyllites, and to a lesser degree, schists and carbonates. The dominant feature in the Dublin Gulch deposit area is the Potato Hills stock which outcrops above Haggart Creek and consists of a medium-grained phaneritic granodiorite intrusive dated at approximately 93 million years (Smit et al., 1995). The stock is elongated 70°E and is roughly 2 km wide by 5.5 km long. The long axis of the stock coincides with the axis of the Dublin Gulch anticline. Sheet-like sills of

granodiorite extend from the stock and cut the meta-sedimentary strata at low angles. The intrusive-meta-sedimentary contact dips shallowly to steeply to the north on the northern side of the intrusive, and steeply to the north or south along its southern margin.

The Dublin Gulch Property is located in the northern portion of the Selwyn Basin. The Selwyn Basin is a fault controlled epicratonic basin that is underlain by four main metasedimentary units. Dominantly clastic, these units are, from oldest to youngest, the Proterozoic Hyland Group, the Paleozoic Upper Schist, and the Mesozoic Lower Schist and Keno Hill Quartzites.

These units have been juxtaposed by Cretaceous-aged laterally extensive, northward directed thrust sheets. There are three main thrust sheets, from east to west: the Dawson, Tombstone and Robert Service.

Four generations of deformation are documented; however, two initial events are responsible for the dominant structural orientation. The first resulted in widespread development of foliation that was subsequently deformed by gentle, regional-scale folding. The second deformational event resulted in east-trending, south-plunging anticlines within the Dublin Gulch area which are the dominant structures at the Eagle Gold occurrence.

At least four periods of faulting have occurred in the Dublin Gulch area, including two low angle thrust and bedding plane faults, NW trending faults, NE trending faults, E trending faults, and N-S trending faults. It is the latter that may have the most significant impact on mineralization, which appears to displace the Dublin Gulch stock.

The Dublin Gulch area is characterized by four intrusive episodes. The most significant is the occurrence of Cretaceous aged granodiorite which has intruded the Hyland Group metasediments near their contact with the underlying Upper Schist. Quartz diorite, quartz monzonite, leucogranite and aplite comprise the younger intrusive phases that occur predominantly as dikes and sills, and cut both the granodiorite and surrounding country rocks.

The meta-sedimentary rocks are the product of greenschist-grade regional metamorphism, and proximal to the Dublin Creek area have undergone metasomatism and contact metamorphism. A hornfels thermal aureole surrounds the deposit and within which the coarse clastic components of the Hyland Group have been altered to quartz-biotite, the argillaceous components to sericite-biotite-chlorite schist, and the carbonates to marble, wollastonite-quartz skarn and pyroxenite skarn. The aureole extends from 800 to 2,000 m outward from the intrusive.

3.0 GEOTECHNICAL INVESTIGATION

3.1. Overview

The field work for this project was conducted between June and August, 2011. The site investigation involved a number of different components which are listed below and are described in detail in the following sub-sections and corresponding appendices:

- Mapping of natural cut slopes, existing cut roads and drill pad cuts;
- Excavation of test pits;
- Geotechnical borehole drilling using solid stem auger, hollow stem auger, CRREL barrel (Cold Regions Research and Engineering), and triple tube diamond drill coring;
- Field Testing:
  - Penetration testing;
  - Downhole geophysics;
  - Plate load testing;
  - Thermistors and ground ice classification;
  - Point load testing;
- Groundwater investigation:
  - Standpipe piezometers;
  - Vibrating wire piezometers (VWP);
  - Slug Testing;
  - Seep observations;
- Laboratory Testing:
  - Soil index testing;
  - Rock strength testing;
  - Modified Proctor and permeability testing;
  - Aggregate testing;

The geographic coordinates and elevations of most of the boreholes were surveyed with differential GPS by Underhill in September 2011. Boreholes BH-BGC11-39, -40A, -41, -61, -65 and -67 were not surveyed by Underhill and thus their location and ground elevation were estimated using a handheld GPS unit, as was also done with all test pits and outcrop mapping locations. This test hole location information should be considered approximate.

Visual classification and description of overburden materials was done according to the Unified Soil Classification System (USCS, ASTM D24887), frozen soils were classified according to ASTM D4083, and intact rock and rock mass characterization was done following ISRM (1981) and other industry recognized classification systems such as Rock Mass Rating (RMR, Bienawski, 1976) and Geological Strength Index (GSI, Hoek and

Marinos, 2000; Cai et al., 2004). Appendix A provides a basic legend describing most of the parameters observed during soil and rock description.

3.2. Outcrop Mapping

A total of fifty-nine natural outcrops, road cuts and platform cuts were mapped in detail and are presented in Appendix B. The location of these cut slopes is shown on Drawing 05 and Table B-1 summarizes the rock mass characteristics of the cut slopes.

Geological mapping on existing road cuts, drill pad cuts and natural slope cuts was undertaken to describe the exposed rock mass and characterize its expected engineering behavior according to the type and orientation of the structures and intact rock strength. The presence of mapped outcrops paired with drilled boreholes provides the opportunity to compare the rock mass as seen in the borehole with that of the nearby outcrop and give insights of its strength when recovery was poor near the surface. The information gathered during the outcrop mapping included an overburden characterization (soil description and classification) and detailed lithological and structural description of the bedrock, together with a rock mass characterization.

3.3. Test Pitting

In 2011 a total of ninety-six test pits were excavated throughout the project area using a 325D Cat excavator. All test pit locations are illustrated on Drawing 05 and test pit logs are included in Appendix C and are summarized in Table C-1. Selected test pit photographs are included in Appendix D.

The test pit program was designed to develop an understanding of the engineering properties of the overburden materials across the site and to allow collection of disturbed soil samples for laboratory testing. Paired test pits and boreholes were conducted in areas where poor recovery from the diamond holes was expected. Test pits were also tailored to provide additional data and samples within the proposed silt borrow areas. In addition, plate load tests were conducted at the bottom of two test pits in the proposed plant site.

Observations of material compactness were inferred from excavator performance and from penetration resistance of the side walls of shallow pits. All frozen ground encountered was classified for ice content in the field. All test pits were terminated due to refusal on bedrock or frozen ground, sloughing/collapse of side walls, or due to the limits of excavator reach.

3.4. Geotechnical Borehole Drilling

3.4.1. General

The borehole drilling program was planned to characterize overburden and bedrock conditions at selected key facility locations. The drilling was focused on determining depth to, and competence of, bedrock, as well as characterizing the nature of overburden soils with respect to bearing capacity and potential settlements, or for design of cut slopes. Two

different drilling methods were used; auger drilling tailored to the soil unit characterization, and diamond drilling tailored to the rock characterization.

3.4.2. Diamond Drilling

In 2011 a total of twenty-nine diamond drill holes were drilled within the proposed Heap Leach pad, the Dublin Gulch valley bottom, the proposed plant site, the proposed Eagle Pup Waste Rock Storage Area, the proposed Platinum Gulch Waste Rock Storage Area, and the Crushers. All diamond drill hole locations are illustrated on Drawing 05 and diamond borehole logs are included in Appendix E and summarized in Table E-1. Selected diamond drill core photographs are included in Appendix F.

Diamond drilling was conducted by Lyncorp of Smithers, BC using a skid mounted diamond drill rig equipped with HQ3 drill rods. During the program two different rigs were used, the CS10 (June-July) and the CS1000 (August). The drill used a triple-tube core barrel, in which the inner tube was isolated from the drill fluid and had a split (longitudinal) sleeve. The split sleeve allowed the core to be recovered and viewed in a relatively undisturbed state. The diamond holes were typically drilled with a mix of water and polymer as drilling fluid.

Previous investigations met significant challenges getting good core recovery in the overburden materials and highly weathered bedrock. The 2011 site investigation was planned to make best efforts to improve core recoveries. Where poor recoveries were anticipated, the diamond drill holes were paired with test pits to provide some information about the shallow overburden characteristics. The same idea was applied whenever an outcrop was mapped in the vicinity of a borehole, as detailed in section 3.2. Diamond drill holes ranged in completed depth from 20.1 m to 50.5 m.

Installations in completed diamond drill holes included slotted PVC pipe standpipe piezometers (seventeen boreholes), vibrating wire piezometer (one borehole) and solid PVC casing for down-hole geophysics (ten boreholes). Standpipe piezometers typically included 3 m slotted pipe screened intervals near the bottom of the hole, using coarse sand/fine gravel quartz as the sand pack material, plugged with bentonite, grouted to the surface using a cement-bentonite grout and capped with bentonite. PVC pipe for downhole geophysics was grouted in place using a cement-bentonite grout, with the grout mixture proportioned to achieve a finished stiffness in the grout similar to that of the surrounding formation. The typical grout mix was 0.3:1:2.5 (bentonite:cement:water) by weight. All piezometers and PVC pipe for downhole geophysics were 50 mm diameter PVC.

3.4.3. Auger Drilling

In 2011 a total of seventeen auger holes were drilled, located in the Dublin Gulch valley bottom, proposed silt borrow area, proposed truck shop, proposed Eagle Pup Waste Rock Storage Area, and the proposed Plant Site. All auger test hole locations are illustrated on Drawing 05 and auger logs are included in Appendix E and summarized in Table E-1. Selected auger hole photographs are included in Appendix F.

Auger drilling was conducted by Midnight Sun Drilling of Whitehorse, Yukon, using a MARL 4CT track-mounted rig. Three techniques, solid stem augering, hollow stem augering and coring with the CRREL barrel were used depending on the purpose of the drilling and nature of the formation. Solid stem was used for the majority of the drilling, with grab samples obtained from the auger flights. The hollow stem was used as casing to conduct standard penetration testing (SPT) testing or to install standpipe piezometers. The CRREL barrel was used for core sampling of frozen ground, and also to obtain core of completely weathered rock at one hole. Auger holes were advanced to the target depth, limits of drilling capability (i.e. the length of auger flights available) or to refusal on boulders or bedrock.

Holes ranged in completed depth from 9.2 m to 28.2 m, with three short holes of 2.7 m, 4.3 m and 6.9 m which were drilled either in weathered bedrock or placer tailings, and due to the coarse nature of the formation they met refusal at shallow depths. SPT was completed at selected intervals in the auger holes to obtain some measure of in-situ density of the soils. The tests were conducted in all the areas where auger drilling was conducted, with the exception of the proposed Eagle Pup waste rock storage area where frozen ground was encountered.

Soil identification was based on observations of material retained on the auger flights, in split spoon samples from the SPT, and extruded from the CRREL barrel. SPT samples were typically taken at 1.5 m to 3 m intervals. Auger flights, SPT samples, and CRRL barrel core samples were photographed and logged at the rig and selected samples were collected for laboratory testing. Auger drilling was typically completed in 1.5 m runs and CRREL barrel drilling was typically completed in 0.6 m to 0.75 m runs.

Installations in completed auger holes included slotted PVC pipe standpipe piezometers (four boreholes), vibrating wire piezometer (one borehole), solid PVC casing for down-hole geophysics (one borehole), and solid PVC casing for installation of thermistor strings (seven boreholes). Installations in the auger holes for downhole seismic and VWP followed the same methodology as described previously for the diamond holes. Installations for standpipe piezometers and thermistor strings were completed with bentonite chips use to backfill between the casing and the formation to the surface.

3.5. Field Testing

3.5.1. Penetration Testing

Three types of penetration testing were completed as part of the drilling and test pitting program. Standard Penetration Testing (SPT) was performed in twelve of the sixteen auger holes completed, Dynamic Cone Penetration Testing (DCPT) was completed in one location adjacent to BH-BGC11-67/69 at the proposed plant site, and Wildcat Penetrometer testing was completed at 23 locations, most of them within the Dublin Gulch valley bottom. Some SPT and DCPT tests were completed using an instrumented rod and SPT Energy Analyzer (Pile Dynamics Inc., Cleveland, Ohio) to measure the energy transferred (ETR) from the hammer to the rods, allowing corrections of field data to a standard energy value (N_{60}).

Appendix G contains a detailed description of the different tests, Table G-1 summarizes all penetration testing completed, and Drawing 06 illustrates the location of the different tests.

3.5.1.1. SPT N-blow count

SPT testing was completed at selected intervals in the auger holes to obtain some measure of in-situ density of the formation materials. SPT testing was completed from the auger rig using standard SPT equipment: 34.9 mm (1 3/8") diameter split spoon, 63.5 kg (140 lb) automatic trip hammer, and 762 mm (30") drop height.

Previous observations of the placer tailings, colluvium, and weathered bedrock indicated the presence of a large fraction of cobbles and boulders reducing the applicability of SPT testing. During the 2011 field investigation, in an attempt to identify interference by coarse materials, SPT blowcounts were typically recorded for each inch (25 mm) during the SPT tests. Coarse particles sometimes interfered with the tests, causing the tests to reach refusal before the end of the 450 mm test interval. In this situation, a 'corrected' N and consequently 'corrected' N_{60} value was estimated for the sandier portion of the test. For detailed information on the methodology followed to calculate corrected N-values, refer to Appendix G and Tables G-2 and G-3.

SPT tests were carried out in all boreholes where soil conditions allowed, with a total of 77 tests (Drawing 06). From the entire suite of tests completed, thirty were considered invalid either because they were performed in frozen ground (seven), recoveries were less than 150 mm (eighteen), or were influenced by coarse clasts (five).

3.5.1.2. Dynamic Cone Penetrometer (DCPT)

Dynamic cone penetration testing (DCPT) involves a cone driven into the formation at the base of a borehole. The number of blows needed to achieve this penetration is taken as an indicator of the density or consistency of the formation material. DCPT testing was completed with the auger rig and the same automatic trip hammer as was used for SPT testing. The DCPT tests were also monitored using the SPT energy analyzer. Blows were counted in 150 mm increments.

A total of four DCPT tests were completed adjacent to BH-BGC11-67/69 in the proposed plant site (Drawing 06). Refusal was met at 2.5 m, 3.2 m, 0.5 m and 0.6 m in the four tests. Refer to Appendix G and Table G-4 for detailed information on the DCPT testing.

3.5.1.3. Wildcat Penetrometer

Wildcat penetrometer testing is conducted with a hand operated penetration testing tool. The device consists of a safety hammer, rods, a sacrificial cone tip and a lubricating system. The falling portion of the hammer weighs 15.9 kg (35 lbs) and the drop height is 0.377 m (15 inches). The rods are 1 m long and 2.8 cm (1.1 inches) in diameter. The rods are grooved every 10 cm to allow blow counts to be recorded in 10 cm increments. Testing is completed when refusal is met (considered to be 50 blows in one 10 cm increment).

A total of 25 Wildcat penetrometer tests were completed mostly within Dublin Gulch and a few in the crusher area, 100 day Storage area and along the road to Platinum Gulch (Drawing 06). Of the 25 tests, three were terminated at the maximum length of rods available. The remaining tests were terminated at refusal. For detailed information on testing results and methodology followed refer to Appendix G and Tables G-5 and G-6.

3.5.2. Geophysics

Frontier Geosciences Inc. of Vancouver, B.C. was engaged to complete seismic refraction and down-hole seismic testing between August 24 and September 8, 2011. The surface investigation was supplemented with downhole surveys, including eleven compression wave and shear wave soundings in completed boreholes. A detailed summary of the geophysical investigation program and results (seismic refraction, shear and compression wave velocities) is presented in Appendix H.

3.5.2.1. Seismic Refraction

The work included approximately 5.4 km of seismic refraction surveying along and across the Dublin Gulch valley bottom, and to the east of Anne Gulch, up in the northern side of Dublin Gulch valley within the proposed Heap Leach footprint (Drawing 05).

Seismic refraction involves the use of small explosive charges to create a shock wave at one end of a series of geophones, which are placed on the ground surface at even intervals. The time taken for the shock wave to arrive at each geophone can be interpreted to make inferences of compression wave velocity with depth between instruments. This information can be used to infer the contact between different geological units, providing additional spatial information between (or in the absence of) test holes. The main purpose for this work was to identify the transition from overlying overburden to undisturbed bedrock within the Dublin Gulch valley and obtain an indication of material stiffness over an extended area.

3.5.2.2. Downhole Seismic Profiling

This work included shear wave (S-wave) and compressional wave (P-wave) profiling in eleven boreholes, all of them selected within key proposed facilities as follows: plant site (one), Dublin Gulch valley bottom (four), Heap Leach (three), and Crushers (three). Drawing 07 illustrates the location of all the boreholes where downhole seismic profiling was conducted.

The surveying was carried out in drillholes lined with PVC casing. Data was obtained at 0.5 m intervals for approximately the full depth of each borehole (ranging between 21.3 m to 50.3 m) using surface energy sources (typically a sledgehammer blow to the end of a heavy timber in firm contact with the ground surface) and a down-hole triaxial geophone package held to the wall of the casing by a spring steel carrier.

The main purpose of this work was to obtain S-wave velocity profiles, which provide an indirect indication of the shear strength of the formation. The P-wave velocity data can be used for other related purposes, for example estimating excavatability of rock.

3.5.3. Plate Load Testing

Plate load tests were carried out by BGC personnel in August 2011 to assess the stiffness properties of different exposed subgrade materials. Plate load tests were conducted in two excavated test pits located in the proposed plant site (TP-BGC11-103, TP-BGC11-105) and at one excavation in the proposed secondary crusher area (Drawing 08). Four different plate sizes were used: 1.2 m, 0.76 m, 0.53 m, and 0.3 m, and at each test location at least two different plate sizes were tested. The purpose of this testing program was to:

- Measure the modulus of subgrade reaction of different rock types; and,
- Test various diameters of plate to estimate the variation of material stiffness with bearing pressure and investigate the influence of plate size for extrapolation of results to full size footings.

A detailed description of the test methodology is presented in Appendix I and a summary of test locations, characteristics and results is presented on Tables I-1 to I-4.

3.5.4. Thermistors

Seven thermistor strings were installed during the site investigation program. The thermistors were located in areas where visible ice was observed during drilling and frozen ground conditions were expected to be found at depth (Drawing 07). The targeted areas were:

- Proposed silt borrow, two 10 m long thermistor strings (one broken) and one 25 m-long thermistor string;
- proposed truck shop, two 10 m long thermistor strings; and,
- ice-rich colluvium at Eagle Pup, two 25 m long thermistor strings.

For installation details and temperature readings refer to Appendix J and Tables J-1 and J-2.

3.6. Groundwater Investigation

3.6.1. Groundwater Levels

Groundwater observations were made throughout the site and consisted of: measuring water levels in standpipe and vibrating wire piezometers installed in 2009 and 2011 by BGC and installed by others in previous years; estimating the hydraulic conductivity of different soil units and weathered bedrock by means of slug testing in selected 2011 BGC standpipes; and, recording details of surface seepage locations throughout the site, when observed. Details of the groundwater investigation can be found in Appendix K and summary tables K-1 to K-5. Ground and surface water observations are illustrated in Drawing 09.

3.6.1.1. Standpipe Piezometers

Standpipe piezometers were installed to enable observations of groundwater elevations and also to support estimates of the hydraulic conductivity of formation materials through slug tests. During the 2011 investigation, twenty-two slotted PVC standpipe piezometers were installed in both auger and diamond drill holes (Drawings 07 and 09). Water levels in select standpipes installed by others were measured on July 3rd and July 4th, 2011. Water levels in standpipes installed by BGC in 2011 along with select standpipes installed by others were read between August 25th and August 29th, 2011.

3.6.1.2. Vibrating Wire Piezometers (VWP)

A total of two VWPs were installed during the 2011 site investigation, one in an auger hole in the proposed Eagle Pup Waste Rock Storage Area and the other in an inclined diamond hole in the proposed plant site (Drawings 07 and 09). Water levels in VWPs installed by BGC in 2011 were read between August 25th and August 29th, 2011.

3.6.2. Slug Testing

Five slug tests were conducted in selected boreholes in the Dublin Gulch valley bottom (BH-BGC11-32, -33, -34, -39 and -52) (Drawings 07 and 09). The hydraulic conductivity of weathered bedrock and placer tailings was assessed by conducting rising head tests in these monitoring wells. The tests were completed after water levels had stabilized following drilling and piezometer installation. Three iterations of a 1L rising head slug test were performed for each well; a standard 1L bailer was used to remove each slug. Water level measurements were recorded with a down-hole data logger, with manual observations as a check of instrument records. Data logger measurements were corrected with a barometric pressure logger.

3.6.3. Seep Observations

Within the area of interest, twenty-eight locations of surface seepage were observed. The spatial coordinates of each seep were noted and the approximate seepage rate was estimated if possible. A complete list of the observations can be found in Table K-5 in Appendix K, and the locations are shown in Drawing 09.

3.7. Sampling and Laboratory Testing

Laboratory testing conducted on select samples collected in 2011 included soil index testing, compaction testing and permeability testing, rock strength testing, and aggregate testing. Two labs were engaged: Golder Associates from Burnaby, BC, which conducted some of the soil index testing and all of the rock strength testing, and GeoNorth, from Prince George, BC, which conducted soil index testing, compaction testing and permeability testing, and aggregate testing. The original lab testing reports are included in Appendix L, and for summary plots and tables of tabulated test results refer to Appendix M.

3.7.1. Soil Testing

Samples for soil testing were recovered as SPT samples, auger grab samples, CRREL barrel core samples, and grab samples from test pit walls. Table 3-1 below provides a summary of soil tests performed in the work.

Table 3-1. Summary of Soil Samples Tested

Laboratory Test	Testing Standard	Number of Tests
Grain size	ASTM C136	147
Moisture Content	ASTM 2216	193
Hydrometer	ASTM 422	81
Atterberg Limits	ASTM 4318	93
Specific Gravity - Soil	ASTM 854	4
Soluble Sulphate in Soil	CSA A23.2-3B	3
Modified Proctor	ASTM 698	4
Permeability Testing	ASTM D5856	4

3.7.2. Rock Strength Testing

3.7.2.1. UCS and Brazilian Tensile Strength

Nine rock core samples from the proposed Heap Leach (BH-BGC11-29, -34), crushers (BH-BGC11-40A, -40B, -62), Plant Site (BH-BGC11-69), and Platinum Gulch Waste Rock Storage Area (BH-BGC11-43, -45, -46) were selected for laboratory testing to perform Unconfined Compressive Strength (UCS) testing with strain measurements, Brazilian tensile strength, and specific gravity. Table 3-2 provides a summary of tests performed on rock samples.

Table 3-2. Summary of Rock Samples Tested

Laboratory Test	Testing Standard	Number of Tests
UCS with Strain Measurement	ASTM D7012	8
Brazilian Tensile Strength	ASTM D3967	17
Specific Gravity - Rock	C127	9

3.7.2.2. Point Load Testing

During the 2011 Site Investigation Program a total of 320 core samples of rock were tested using a point load tester to estimate the intact rock strength of the metasedimentary and intrusive rock. These samples were taken from rock core obtained from twenty-seven boreholes at the site. From the 320 core samples, 117 were invalid, as outlined by ISRM (1985), due to incomplete development of the fracture surface. Therefore, 203 valid tests were performed. For more details on the point load testing procedure and a complete record of the samples tested refer to Appendix N and tables N-1 to N-28.

3.7.3. Borrow Source Testing

Several bulk samples were obtained from different locations identified as potential borrow areas suitable for construction material. The lab testing was tailored to aid in the characterization of the materials according to the requirements of each potential borrow source.

3.7.3.1. Silt Borrow

Fine grained soil materials may be required to construct liners for the heap leach facility or ponds. Previous investigations (see BGC 2011b) identified potential sources of silt borrow, and this component of the work was executed to determine if sufficient quantities of low permeability material are available on site. Five test pits (TP-BGC11-82, -119, -120, -121, and -122) and four boreholes (BH-BGC11-44, -47, -49, and -51) were sampled, with selected materials identified for testing for grain size, moisture content, Atterberg limits, Modified Proctor moisture-density relationship, and permeability testing (at 95 % Modified Proctor). Table 3-3 below summarizes the testing completed for potential silt borrow materials.

Table 3-3. Summary of tests conducted on potential silt borrow materials

Hole ID	Northing (m)	Easting (m)	Number of Soil Samples Tested					
			Grain Size	Moisture Content	Hydrometer	Atterberg Limit	Modified Proctor	Permeability Testing
			ASTM C136	ASTM 2216	ASTM 422	ASTM 4318	ASTM 698	ASTM D5856
Test Pits								
TP-BGC11-82	7100691	458604	5	5	2	5	--	--
TP-BGC11-119	7100548	458587	--	1	--	1	1	1
TP-BGC11-120	7100484	458511	--	1	--	1	1	1
TP-BGC11-121	7100588	458502	--	1	--	1	1	1
TP-BGC11-122	7100707	458684	--	1	--	1	1	1
Boreholes								
BH-BGC11-44	7100547	458690	5	10	5	8	--	--
BH-BGC11-47	7100699	458812	5	6	4	3	--	--
BH-BGC11-49	7100636	458747	5	6	5	5	--	--
BH-BGC11-51	7100744	458644	3	11	2	5	--	--

Notes:

1. Location for BGC test pits from handheld GPS measurements, and location of BGC boreholes from Underhill survey dated September, 2011.
2. Coordinates in UTM NAD 83, Zone 8N.

3.7.3.2. Aggregate Testing

Samples of silicified metasediments (5 x 20L pails) and granodiorite (5 x 20L pails) within the footprint of the open pit, grab samples of cobbles from the placer tailings (10 x 20L pails), and 1 x 20L pail with rock samples from the Steiner outcrop were obtained for the purpose of testing the material for potential use as concrete aggregate or other high quality aggregate. The samples from the open pit were combined and crushed to form one composite sample that was later tested; a similar procedure was followed with the samples from the placer tailings. Table 3-4 provides a summary of the aggregate testing.

Table 3-4. Summary of Aggregate testing

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Comments	Sample Testing
CONC-BGC11-01	7101270	459788	888	Single composite sample prepared by combining placer tailings oversize materials obtained from indicated locations	• Clay lumps (CSA A23.2-3A) • Low Density Granular Materials (CSA A23.2-4A) • Material Finer than 80 µm, fine aggregate (CSA A23.2-2A&5A) • $MgSO_4$ soundness of coarse aggregate (CSA A23.2-9A) • $MgSO_4$ soundness of fine aggregate (CSA A23.2-9A) • Flat and elongated particles (CSA A23.2-13A) • Micro-Deval, fine aggregate (CSA A23.2-23A) • Micro-Deval, coarse aggregate (CSA A23.2-29A) • Unconfined Freeze thaw (CSA A23.2-24A) • LA Abrasion, small size coarse aggregate (CSA A23.2-16A) • Relative Density SDD & Absorption, fine aggregate (CSA A23.2-6A) • Sulphate in soil (CSA A23.2-3B) • Detection of Alkali-Silica Reactive Aggregate by Accelerated Expansion of Mortar Bars (CSA A23.2-25A) • Petrographic No., coarse aggregate (CSA A23.2-15A)
CONC-BGC11-02	7101200	459716	886		
CONC-BGC11-03	7101160	459626	881		
CONC-BGC11-04	7101220	459484	859		
CONC-BGC11-16	7100940	458852	826		
CONC-BGC11-GRD	7099352	460190	1285	Single composite sample prepared by combining samples of granodiorite and quartzite clasts obtained from two indicated locations	• Clay lumps (CSA A23.2-3A) • Low Density Granular Materials (CSA A23.2-4A) • Material Finer than 80 µm (%), fine aggregate (CSA A23.2-2A&5A) • MgSO4 soundness of coarse aggregate (CSA A23.2-9A) • MgSO4 soundness of fine aggregate (CSA A23.2-9A) • Flat and elongated particles (CSA A23.2-13A) • Micro-Deval, fine aggregate (CSA A23.2-23A) • Micro-Deval, coarse aggregate (CSA A23.2-29A) • Unconfined Freeze thaw (CSA A23.2-24A) • Small coarse aggregate LA abrasion (CSA A23.2-16A) • Relative Density SDD & Absorption, fine aggregate (CSA A23.2-6A) • Sulphate in soil (CSA A23.2-3B) • Detection of Alkali-Silica Reactive Aggregate by Accelerated Expansion of Mortar Bars (CSA A23.2-25A) • Petrographic No., coarse aggregate (CSA A23.2-15A)
CONC-BGC11-SSED	7099338	460188	1284		
BGC-Steiner	7100278	459034	907	Single sample using material from the Steiner outcrop only	• Micro-Deval, coarse aggregate (CSA A23.2-29A) • Relative Density SDD & Absorption, fine aggregate (CSA A23.2-6A)

Notes:

1. Location for BGC samples from hand held GPS measurements.

2. Coordinates in UTM NAD 83, Zone 8N.

3.8. Placer Tailings Inventory

A visual reconnaissance of the reworked valley bottom placer tailings of Dublin Gulch and Haggart Creek was completed to develop opinions as to their potential for use as construction materials in development of the proposed mine. The placer tailings materials excavated in the course of foundation preparation may comprise a useful construction material, as a potential source for general fill, structural fill, concrete aggregate or heap overliner material, if suitably selected and processed through screening, crushing, and/or washing. Appendix O contains a description of the placer tailings encountered in Dublin Gulch and Haggart Creek, and Drawing 10 illustrates the locations of material observations per area. Visual observations of surficial materials in the Dublin Gulch valley bottom are summarized in Table O-1, and visual observations of surficial materials in the Haggart Creek valley bottom are summarized in Table O-2.

4.0 OBSERVED SUBSURFACE CONDITIONS

4.1. Summarized Data

Summary tables with key data results are tabulated below.

4.1.1. Penetration Data

Detailed observations of penetration resistance are presented in Appendix G, and raw blowcount data are displayed on the borehole logs in Appendix D. These results are summarized for the various geological units in Table 4-1, below.

Table 4-1. Summary of Penetration Data

Borehole	# of Valid Tests	Average N_{60}	Max N_{60}	Min N_{60}	Standard Deviation N_{60}
Placer Tailings					
BH-BGC11-39	11	39	67	1	20
BH-BGC11-65	5	27	36	17	7
Alluvium					
BH-BGC11-44	5	50	99	9	33
BH-BGC11-47	2	10	15	5	-
BH-BGC11-49	1	10	-	-	-
BH-BGC11-51	5	18	26	8	6
Till					
BH-BGC11-53	4	44	55	23	13
	Colluvium				
BH-BGC11-55	6	20	35	14	7
BH-BGC11-56	2	44	62	26	-
BH-BGC11-57	3	83	100	71	-
Weathered Metasedimentary Rock					
BH-BGC11-55	1	86	-	-	-
BH-BGC11-57	1	98	-	-	-

Notes:

BH-BGC11-58 and BH-BGC11-60 had no valid SPT tests.

BH-BGC11-57 has one SPT test where the calculated N60 value is 128, this is reported as 100 as N60 values are truncated at 100.

4.1.2. Plate Load Testing

Detailed results of the plate load testing are presented in Appendix I. Key results from the testing are summarized in Table 4-2, below.

Table 4-2. Summary of Plate Load Test Results

Location	Test #	Depth Below Grade (m)	Plate Diameter (m)	Vertical Subgrade Reaction Modulus (kPa/mm)	
				Virgin Curve, k_v	Rebound Curve, $k_{v(u-r)}$
Plant Site (TP-BGC11-103)	PT-BGC11-01	5.5	0.76	130	220
Plant Site (TP-BGC11-103)	PT-BGC11-02	5	0.76	140	310
Plant Site (TP-BGC11-103)	PT-BGC11-03	5	0.53	130	290
Plant Site (TP-BGC11-103)	PT-BGC11-04	5	0.3	540	1170
Plant Site (TP-BGC11-103)	PT-BGC11-05	5.5	0.53	130	250
Plant Site (TP-BGC11-105)	PT-BGC11-06	8.5	1.2	30	60
Plant Site (TP-BGC11-105)	PT-BGC11-07	8.5	0.76	40	80
Plant Site (TP-BGC11-105)	PT-BGC11-08	8.5	0.76	50	120
Plant Site (TP-BGC11-105)	PT-BGC11-09	8.5	0.53	40	120
Secondary Crusher	PT-BGC11-10	3.2	0.53	190	600
Secondary Crusher	PT-BGC11-11	3.2	0.3	640	1600
Secondary Crusher	PT-BGC11-12	3.2	0.53	200	500
Secondary Crusher	PT-BGC11-13	3.8	0.3	220	1000
Secondary Crusher	PT-BGC11-14	4.2	0.53	400	1040

4.1.3. Temperatures

Detailed observations of ground temperature measurements are presented in Appendix J. Key observations are summarized in Table 4-3, below.

Table 4-3. Summary of 2011 Thermistor Readings

Borehole	Location	Readings Dates	Depth of Frozen Ground (m)	Temperature of Frozen Ground (°C)
BH-BGC09-STU-3	Lower Stuttle Gulch	11 July 25-29 August	4 m to >10 m	0 to -0.3
BH-BGC09-STU-4	Lower Stuttle Gulch	11 July 25-29 August	4 m to >10 m	0 to -0.2
BH-BGC09-AG-3	Lower Ann Gulch/ Valley Bottom	7 July	10m	0.6
BH-BGC10-07[1]	Between Stuttle Gulch and Eagle Pup	11 July 29-30 August	10 m	0.0
BH-BGC11-42	Proposed Eagle Pup Waste Rock Storage Area	29-30 August	5 m to >25 m	-0.1 to -0.4
BH-BGC11-63	Proposed Eagle Pup Waste Rock Storage Area	29-30 August	1.2 m to >25	0 to -0.3
BH-BGC11-44	Proposed Silt Borrow Area	11 July 29-30 August	7 m to >10 m	0 to -0.1
BH-BGC11-47	Proposed Silt Borrow Area	11 July 29 August	7 m to >10 m	0 to -0.1
BH-BGC11-49	Proposed Silt Borrow Area	11 July	4 m to >10 m	0
BH-BGC11-51	Proposed Silt Borrow Area	26-29-30 August	15 m to >25 m	-0.1
BH-BGC11-57	Proposed Truck Shop	29-30 August	1.5 m to >10 m	-0.1 to -0.2
BH-BGC11-58	Proposed Truck Shop	30 August	1 m to >10 m	-0.1 to -0.7

[1]: Thermistor consisted of a single thermocouple at 10m depth

4.1.4. Groundwater Observations

Groundwater observations have been divided into groundwater level readings and permeability testing results.

4.1.4.1. Water Level

Detailed observations of groundwater have been presented in Appendix K. Groundwater elevations observed at selected monitoring well locations in summer 2011 are summarized in Table 4-4, below.

Table 4-4. Summary of Water Level Readings for data collected in 2011 site investigation

Hole ID	Elevation (masl)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC11-26	1139.6	27-Aug-11	16.4	Standpipe
BH-BGC11-29	1045.3	27-Aug-11	7.8	Standpipe
BH-BGC11-30	952.0	27-Aug-11	16.3	Standpipe
BH-BGC11-32	818.7	24-Aug-11	10.8	Standpipe
BH-BGC11-33	833.0	26-Aug-11	4.2	Standpipe
BH-BGC11-34	848.3	24-Aug-11	8.3	Standpipe
BH-BGC11-35	986.3	27-Aug-11	24.6	Standpipe
BH-BGC11-36	1002.5	27-Aug-11	19.9	Standpipe
BH-BGC11-38	1013.0	25-Aug-11	26.3	Standpipe
BH-BGC11-39	804	24-Aug-11	9.8	Standpipe
BH-BGC11-40B	1049.8	25-Aug-11	8.5	Standpipe
BH-BGC11-45	1354.4	27-Aug-11	8.4	Standpipe
BH-BGC11-46	1246.1	27-Aug-11	15.3	Standpipe
BH-BGC11-48	1140.0	27-Aug-11	31.3	Standpipe
BH-BGC11-52	909.0	25-Aug-11	4.1	Standpipe
BH-BGC11-54	883.8	29-Aug-11	11.8	Vibrating Wire
BH-BGC11-55	881.0	27-Aug-11	dry	Standpipe
BH-BGC11-57	859.2	27-Aug-11	dry	Standpipe
BH-BGC11-59	883.7	27-Aug-11	29.4	Standpipe
BH-BGC11-60	859.2	27-Aug-11	dry	Standpipe
BH-BGC11-62	1017.9	27-Aug-11	20.2	Standpipe
BH-BGC11-63	1100.7	29-Aug-11	18.1	Vibrating Wire
GT96-26	n/a	3-Jul-11	30.1	Standpipe
GT96-35	n/a	27-Aug-11	3.4	Standpipe
MW09-AG1	1017	25-Aug-11	15.7	Standpipe
MW09-AG2	1009	27-Aug-11	12.7	Standpipe
MW09-DG1	840	4-Jul-11	1.8	Standpipe
MW09-DG1	840	27-Aug-11	2.3	Standpipe
MW09-DG2	824	4-Jul-11	0.9	Standpipe
MW09-DG4	787	4-Jul-11	5.6	Standpipe
MW09-DG5	810	27-Aug-11	10.7	Standpipe
MW09-OG2	1332	3-Jul-11	2.2	Standpipe

Hole ID	Elevation (masl)	Date Collected	Depth (mbgs)	Piezometer Type
MW09-OG3	1065	3-Jul-11	0.4	Standpipe
MW09-STU1	967	4-Jul-11	14.3	Standpipe
MW09-STU1	967	27-Aug-11	14.4	Standpipe
MW09-STU2	857	4-Jul-11	2.1	Standpipe
MW10-DG06	859	3-Jul-11	2.2	Standpipe
MW10-OBS1	796	4-Jul-11	7.2	Standpipe
MW10-OBS2	793	4-Jul-11	5.3	Standpipe
MW96-01	1398	3-Jul-11	23.1	Standpipe
MW96-02	1394	3-Jul-11	8.1	Standpipe
MW96-03a	1384	3-Jul-11	1.9	Standpipe
MW96-04	1373	3-Jul-11	4.6	Standpipe
MW96-05	1363	3-Jul-11	2.7	Standpipe
MW96-06a	1405	3-Jul-11	2.6	Standpipe
MW96-07b	n/a	3-Jul-11	0.0	Standpipe
MW96-08	1339	3-Jul-11	4.9	Standpipe
MW96-09a	1361	3-Jul-11	4.5	Standpipe
MW96-09b	1361	3-Jul-11	6.7	Standpipe
MW96-10a	1367	3-Jul-11	2.2	Standpipe
MW96-10b	1368	3-Jul-11	2.0	Standpipe
MW96-13a	984	3-Jul-11	5.3	Standpipe
MW96-13b	984	3-Jul-11	14.9	Standpipe
MW96-14a	976	3-Jul-11	dry	Standpipe
MW96-14a	976	27-Aug-11	dry	Standpipe
MW96-14b	976	27-Aug-11	3.6	Standpipe
MW96-14b	976	3-Jul-11	3.6	Standpipe
MW96-15a	943	4-Jul-11	0.8	Standpipe
MW96-15a	943	27-Aug-11	1.5	Standpipe
MW96-26	1316	3-Jul-11	6.5	Standpipe
MW96-27	1308	3-Jul-11	9.3	Standpipe

4.1.4.2. Permeability

A detailed discussion of the in-situ permeability testing is provided in Appendix K. Estimated hydraulic conductivities are summarized in Table 4-5, below.

Table 4-5. Summary of Hydraulic Conductivity Results by Tested Formation

Hole ID	Elevation (masl)	Formation/Unit	Top and Bottom of sand pack (mbgs)	Average conductivity, k (m/sec)
BH-BGC11-32	819	Placer Tailings and Weathered Bedrock[1]	19.5 – 23.6	2.5×10^{-6}
BH-BGC11-33	833	Weathered Bedrock	36.3 – 41.4	1.1×10^{-7}
BH-BGC11-34	848	Weathered Bedrock	30.1 – 34.4	2.6×10^{-6}
BH-BGC11-39	804	Placer Tailings	14.6 – 18.6	8.1×10^{-5}
BH-BGC11-52	909	Weathered Bedrock	18.3 – 22.6	9.7×10^{-6}

Note:

Screened section of pipe was installed across two units, therefore the conductivity (k) is not representative of a specific lithological unit.

4.1.5. Point Load Test

Detailed observations from point load tests are provided in Appendix N. A summary of completed and valid tests is provided in Table 4-6, below.

Table 4-6. Summary of Point Load Test Results by Rock Type

Hole ID	Metasedimentary Rock				Intrusive Rock			
	Number of Tests		Is_{50} Values (MPa)		Number of Tests		Is_{50} Values (MPa)	
	V	IN	Range	Mean	V	IN	Range	Mean
BH-BGC11-24	9	4	0.4 - 2.9	1	0	0	N/A	N/A
BH-BGC11-25	6	5	0.5 - 2.9	1.8	0	0	N/A	N/A
BH-BGC11-26	5	3	1.1 - 4.3	1.9	0	0	N/A	N/A
BH-BGC11-27	4	3	0.8 - 3.0	2.1	0	0	N/A	N/A
BH-BGC11-28	10	5	0.3 - 3.1	1.5	0	0	N/A	N/A
BH-BGC11-29	13	4	0.3 - 11.9	2.2	0	0	N/A	N/A
BH-BGC11-30	5	3	0.4 - 1.3	0.8	0	0	N/A	N/A
BH-BGC11-31	2	0	0.3	0.3	0	0	N/A	N/A
BH-BGC11-33	2	3	0.3 - 0.5	0.4	0	0	N/A	N/A
BH-BGC11-34	5	5	0.4 - 2.1	1	0	0	N/A	N/A
BH-BGC11-35	5	4	0.4 - 7	3	0	0	N/A	N/A
BH-BGC11-36	12	6	0.3 - 8.6	1.9	0	0	N/A	N/A
BH-BGC11-37	9	5	0.3 - 5.7	2.3	0	0	N/A	N/A
BH-BGC11-38	8	5	0.2 - 1.9	1.9	0	0	N/A	N/A
BH-BGC11-40A	10	6	0.5 - 9.6	2.5	0	0	N/A	N/A
BH-BGC11-40B	12	6	0.4 - 6.5	2.2	0	0	N/A	N/A
BH-BGC11-43	2	2	5.6 - 8.7	7.2	7	1	7.5 - 10.8	9.4
BH-BGC11-45	12	7	0.2 - 18.5	3.7	0	0	N/A	N/A
BH-BGC11-46	2	0	3.0 - 6.4	4.7	7	2	0.7 - 10.3	4.9
BH-BGC11-48	2	1	0.2 - 0.3	0.2	2	0	0.4 - 0.9	0.7
BH-BGC11-50	7	7	1.3 - 6.1	3.9	1	0	7.5	7.5
BH-BGC11-52	5	2	0.3 - 4.7	2	0	0	N/A	N/A
BH-BGC11-54	9	3	0.3 - 0.9	0.4	0	0	N/A	N/A
BH-BGC11-59	3	5	0.3 - 1.6	0.7	0	0	N/A	N/A
BH-BGC11-62	11	7	0.3 - 1.6	0.9	0	0	N/A	N/A
BH-BGC11-64	0	0	N/A	N/A	1	2	1.3	1.3
BH-BGC11-66	0	0	N/A	N/A	9	6	0.6 - 8.1	5.3
BH-BGC11-69	6	5	0.3 - 2.2	1.1	0	0	N/A	N/A
Total	**176**	**106**	**0.2 -18.5**	**2**	**27**	**11**	**0.4 - 10.8**	**4.8**

Notes:

(1) Range and mean values only consider the valid tests.

(2) V: valid test; IN: invalid test; N/A: not applicable.

4.1.6. Concrete Aggregate Testing results

Results of aggregate testing are summarized in Table 4-7. Both the pit aggregate and the placer tailings aggregate samples failed two test parameters typically used for evaluation of materials proposed for concrete aggregate. The pit aggregate sample failed Flat and Elongated Particles (CSA A23.2-13A) and Material Finer than 80 μm for Fine Aggregate (CSA A23.2-5A), and the placer tailings aggregate sample failed Micro-Deval for Coarse Aggregate (CSA A23.2-29A) and Material finer than 80 μm for Fine Aggregate (CSA A23.2-5A).

The petrographic examination for both pit and placer tailings composite samples revealed that the aggregate material contained rock types with mineralogy that may have a potential for alkali silica reactivity (ASR). Alkali-silica reactivity tests through mortar bar expansivity testing (CSA A23.2–25A) showed that both samples may be classified as “non-reactive.” Both samples were observed to have a petrographic number within the recommended limits for use as normal concrete aggregate.

Aggregate testing performed in the BGC Steiner sample included only Relative Density and Absorption for fine aggregate (CSA A23.2-6A) and Micro Deval for coarse aggregate (CSA A23.2-29A) due to the small size of the sample. The Steiner aggregate sample passed the abovementioned tests.

Additional study will be necessary to confirm suitability of these aggregate sources for use as concrete aggregate.

Table 4-7. Summary of Aggregate Testing Results

Test Type	Test Method	Pit Aggregate	Placer Tailings Aggregate	BGC Steiner	Maximum Allowable Value
Clay Lumps (%)	CSA A23.2-3A	0.0	0.0	N/A	1.0
Low Density Granular Materials (%)	CSA A23.2-4A	0.0	0.0	N/A	0.5
Material Finer than 80 μm (%), fine aggregate	CSA A23.2-5A	***4.8***	***3.6***	N/A	3.0
$MgSO_4$ Soundness Loss, fine aggregate (%)	CSA A23.2-9A	3.16	3.86	N/A	16
$MgSO_4$ Soundness Loss, coarse aggregate (%)	CSA A23.2-9A	0.97	0.27	N/A	12
Flat and Elongated Particles (%)	CSA A23.2-13A	***35***	19	N/A	20
Micro-Deval, Fine Aggregate (%)	CSA A23.2-23A	13.3	11.6	N/A	20
Micro-Deval, Coarse Aggregate (%)	CSA A23.2-29A	12.9	***26.9***	11.0	17
Unconfined Freeze-Thaw Test	CSA A23.2-24A	0.9	1.2	N/A	6
LA Abrasion (%), small size coarse aggregate	CSA A23.2-16A	13.7	29.9	N/A	50
Relative Density, fine aggregate	CSA A23.2-6A	2.657	2.704	2.718	-
Absorption (%), fine aggregate	CSA A23.2-6A	0.999	1.399	1.122	-
Sulphate in Soil (%)	CSA A23.2-3B	0.0008	0.0004	N/A	0.1
Detection of Alkali-Silica Reactive Aggregate by Accelerated Expansion of Mortar Bars	CSA A23.2-25A	0.14	0.11	N/A	0.15
Petrographic No., Coarse Aggregate	CSA A23.2-15A	121	117	N/A	140

Notes:

1. Cells are highlighted when results doesn't meet the specification.

2. N/A: not applicable, test was not performed

4.1.7. Material Testing Commissioned by Tetra Tech for the Heap Leah Facility

Some material samples were obtained for laboratory tests relative to the heap leach facility design; testing of these was commissioned by Tetra Tech Inc. Samples tested included durable rock, silt, colluvium, placer tailings, and weathered rock. Golder Associates performed a variety of tests, which are summarized in Table 4-8. Test results are included in Appendix L.

Table 4-8. Summary of Testing Commissioned by Tetra Tech for the Heap Leach Facility

SAMPLE DESCRIPTION	LAB CRUSH	SIEVE ANALYSIS	MIN./MAX. DENSITY	RELATIVE DENSITY & ABSORPTION					UNCONFINED FREEZE & THAW (2)	LAB ABRASION/MICRO-DEVAL	SLAKE DURABILITY	POINT LOAD	PROCTOR COMPACT	SPECIFIC GRAVITY	HYDROMETER	ATTERBERG LIMITS
				50X37.5MM	37.5X25MM	25X12.5MM	12.5X4.75MM	MINS 4.75MM								
SECTION 1 – DURABLE ROCK (1)																
ODF, as received		X														
ODF, minus 50mm crushed	X	X	X	X	X	X	X	X			O					
ODF, minus 37.5mm crushed	X	X	X					X		X						
ODF, minus 25mm crushed	X	X	X			X	X	O								
SECTION 2 – SILT													X	X	X	X
SECTION 3 – COLLUVIUM		X							O	X			X	X	X	X
SECTION 4 – PLACER TAILS		X								X	O		X	X	X	X
SECTION 5 - WEATHERED ROCK									O	O	X	X				
	X = completed															
	O = still to do															

Notes:
1. Completed using ASTM standard test method
2. Freeze-thaw test uses CSA 24A.

4.2. Material Descriptions

4.2.1. General

Subsurface conditions within the project area can be generalized as comprising a thin cover of organic soil and vegetation underlain by colluvium and variably thick, variably altered/weathered bedrock. Often, alluvial sediments, glacial till or placer tailings (fill) were encountered in or near the valley bottom close to Dublin Gulch. Ground conditions around the project site were found to be highly variable and influenced by the degree of bedrock weathering, slope angles, ground elevation, and presence/absence of frozen ground.

Frozen ground was observed at many test hole locations, and its presence was observed to vary considerably with respect to the depth to frozen ground, thickness, and ground ice content. Excess ice was observed in some locations. The spatial distribution of observed frozen ground is illustrated in Drawing 11.

Groundwater observations in the valley bottom near Dublin Gulch varied between 0.8 m and 10.8 m, however, at higher elevations groundwater was encountered between 0.4 m and 31.3 m, with the shallower readings typically observed near secondary drainages. Two dry wells were drilled in the truck shop area (BH-BGC11-57, -60), and one dry well was drilled in the south abutment of the proposed Heap Leach embankment (BH-BGC11-55).

4.2.2. Overburden

Several types of overburden materials were encountered within the project site, as discussed below.

4.2.2.1. Organics

A thin organic cover is widespread across the project site overlying the other overburden units and primarily consists of vegetative rootmat, moss, silt and sand, and other organic matter in varying proportions. The typical observed thickness was in the order of 0.2 to 0.3 m, and was not usually encountered in previously disturbed areas containing fill materials, such as the placer tailings in the valley bottom. Buried layers or lenses of peat and/or organic silt were observed in the site within other overburden types, such as colluvium or alluvium. The most common areas where buried organics were noted are the proposed camp site (depths between 1.0 m to 6.5 m in TP-BGC11-123, -124, -128, and -129), silt borrow area (depths between 1.0 m to 7.5 m in BH-BGC11-44, -47; TP-BGC11-82, -119, and -143), proposed truck shop (depths between 0.3 m and 0.5 m in TP-BGC11-135, -136), and proposed diversion channel embankment in Dublin Gulch (depths between 0.1 m and 3.5 m in TP-BGC11-135, -136).

4.2.2.2. Colluvium

Colluvial materials were generally encountered on sloping ground throughout the site at or near the ground surface, below the organic cover. Colluvium was not typically observed near the valley bottom or in the previously disturbed areas in Dublin Gulch.

The relative density of the colluvium was variable and generally ranged from loose to compact. The gradation and thickness of the colluvium was observed to be highly variable, predominantly ranging from boulders and cobbles with some silt and sand to silty sand with gravel and some cobbles. The colluvium is typically derived from transported weathered metasedimentary and/or intrusive bedrock. Gravel, cobbles, and boulders were generally observed to be angular to subangular. Finer grained colluvium characterized by silt with trace sand and gravel is generally only encountered on the lower flanks of the north and west-facing slopes such as at the vicinity of the proposed truck shop, proposed Platinum Gulch pond, south abutment of the proposed heap leach embankment and conveyors.

According to the 2011 test hole information, a typical average colluvium thickness for the site is 3.0 m; however in the vicinity of the proposed crushers it could be as thick as 7.0 m or more. It must be noted that this average thickness is likely understated since some test holes didn't penetrate through the full thickness of the colluvium layer. The colluvium may also include variable amounts of organics as noted in section 4.2.2.1, which are often observed in distinct layers or lenses within the colluvium.

A distinct colluvial unit was observed within a lobate landform in the Eagle Pup drainage area, at BH-BGC11-42 and BH-BGC11-63. This material contains completely weathered rock fragments mixed with excess ice, including frequent inclusions of massive ice. The lobate landform containing this ice-rich colluvium is approximately 1 ha in plan area, and is tentatively interpreted to be a relict rock glacier, or similar peri-glacial creep feature.

4.2.2.3. Fill

The surficial materials in the valley bottom near Dublin Gulch and Haggart Creek have been reworked by several decades of placer mining activities. Old sedimentation ponds and stockpiles of variable washed sand and gravels, with varying proportions of cobbles and boulders, are present throughout this area.

The placer tailings consist of highly variable materials, with a wide range of grain size and density. The materials range from isolated deposits of cobbles and boulders, to gravelly sand or sandy gravel, to loose silty sand or soft sandy silt. The latter materials appear to be confined to specific areas, which are inferred from aerial photographs to have been sediment control ponds. The observed thickness of placer tailings at eight test holes had a mean value of about 11 m, with a range between 1.7 m and 19.8 m. Drawing 10 shows a rough classification and distribution of materials surveyed from surface observations. Subsurface observations of these materials were conducted by auger drilling and test pitting, and grab samples were obtained from the ground surface.

4.2.2.4. Alluvium

Alluvial deposits were encountered within the proposed laydown area and potential silt borrow area. These materials comprise frozen and occasionally ice-rich stratified low plastic silts to silty sands with trace gravel and some interlayers of silty gravels. None of the test holes that encountered alluvial deposits in the laydown area fully penetrated the deposit. The deepest test hole in the area is auger hole BH-BGC11-51 which drilled through 24.9 m of frozen alluvium and reached the targeted depth without exploring the full thickness of the unit.

There is some uncertainty in the geological interpretation of the materials encountered within the proposed laydown area. It is possible that glacial till may have been encountered at depth below alluvium; however the contact between the two units is not clearly defined, due to sample disturbance associated with the auger drilling method.

4.2.2.5. Debris Flow Deposits

Materials tentatively classified as debris flow deposits were observed around the area where Stewart Gulch meets Dublin Gulch (BH-BGC11-31, -52 and TP-BGC11-131, -134, -136) and within the area of the south abutment of the proposed Heap Leach embankment (BH-BGC11-55 and OC-BGC11-49). The deposits were generally observed below shallow colluvium or fill, and typically consisted of subrounded to subangular cobbles and boulders embedded in a silty sand matrix.

4.2.2.6. Glacial Till

Glacial till had been observed in previous investigations on the lower flanks of north and south facing slopes above Dublin Gulch, and can be described as a compact well graded sand and gravel with some silt and trace to some cobbles. Interpretations of glacial till materials were generally made in the field on the basis of the absence of angularity of gravel and cobble size clasts, and presence of mixed lithology, subrounded to rounded clasts (i.e. both granodiorite and metasediments). Subrounded to rounded materials are indicative of glacially transported soils in contrast to more locally transported colluvium, which tends to be more angular, as described previously. Glacial till was observed in TP-BGC11-103 and -104. In TP-BGC11-103 the glacial till was observed beneath approximately 3.5 m of colluvium and above weathered bedrock, while in TP-BGC11-104 it was observed beneath approximately 0.7 m, also overlying completely weathered bedrock.

4.2.2.7. Highly to Completely Weathered Bedrock

Colluvium was typically observed to be underlain by a horizon of variably-weathered rock. The weathering profile varies substantially across the site, depending on parent rock type and other local factors.

The metasedimentary rock (e.g. quartzite, schist) nearest the ground surface was often observed to be completely weathered to silt with some to trace gravel or sand and gravel

with cobbles and trace to some silt and clay. The gravel and cobble clasts tended to be friable, platy and exhibit a 'soapy' film due to the weathering/alteration. The transition from highly or completely weathered rock to a more competent, unweathered rockmass is highly variable; unweathered rock was generally not observed in test pits, and usually not observed at shallow depths in drill holes.

The near-surface granodiorite intrusive rock was often observed to be either completely weathered to a silty sand, or sandy silt, or highly weathered to a poorly graded sand. The thickness of the weathered horizon was highly variable.

Weathered rock is considered to be part of the overburden where it is completed weathered (i.e. W5) or residual soil (i.e. W6). Less weathered rock, including highly weathered (i.e. W4) rock, is considered for the purposes of this report to be part of the bedrock.

4.2.3. Bedrock

Two major rock types were encountered at the site below the overburden soils: metasedimentary and intrusive. The metasedimentary bedrock type was the most predominant bedrock type encountered during the 2011 field program, since the intrusive stock extends across the uplands, which were not a primary focus of investigation. However, some intrusive rock was encountered in boreholes and at outcrops in the Platinum Gulch and Eagle Pup valleys.

Completely weathered rock is included as part of the overburden soils, as discussed previously. Less weathered rock is considered part of the bedrock, which has been subdivided into three broad categories, or types, for the purpose of engineering classification.

"Type 3" rock is the first "rock-like" material underlying the overburden materials, and is defined as being rock that is highly or less weathered (i.e. W4 or better), and has intact strength greater than R0 (i.e. minimum UCS strength 1 MPa). It is expected that Type 3 rock can be excavated with normal excavating equipment.

"Type 2" rock is defined as rock with Geological Strength Index (GSI, Hoek and Marinos, 2000) or Rock Mass Rating (RMR, Bieniawski, 1976) of 30 or greater, and core recovery during drilling of 50 % or greater. Alternatively, where GSI and RMR data are unavailable, average Rock Quality Designation (RQD) of 10 or greater serves as an equivalent criterion. It is expected that Type 2 rock will require ripping.

"Type 1" rock is defined as having GSI, RMR or average RQD exceeding 40. It is expected that Type 1 rock may require blasting.

The outcrop logs in Appendix B and borehole logs in Appendix E provide descriptive data that may be used to infer bedrock "type" as just described.

4.2.4. Frozen Ground

Frozen ground was encountered at 48 test locations (13 boreholes and 35 testpits) in the 2011 field program. Frozen soil was generally encountered immediately within the upper 2.0 m beneath the surficial organic cover; however, frozen ground was encountered to depths of up to 23 m below grade at the ice-rich colluvium lobate feature (BH-BGC11-42 and BH-BGC11-63) and the proposed silt borrow area (BH-BGC11-51). Observations of frozen ground are illustrated on Drawing 11, which also shows frozen ground observations from previous exploration programs. It should be noted that the presence of shallow frozen ground at the time of investigation does not automatically imply the presence of permafrost, since the maximum thaw may occur later in the year than the time of exploration; however, the presence of frozen ground does indicate that frost will likely persist at the observed locations until sometime late in the construction season.

5.0 CLOSURE

We trust the above satisfies your requirements at this time. Should you have any questions or comments, please do not hesitate to contact us.

Yours sincerely,

BGC ENGINEERING INC.
per:

Daniela Welkner, M.Sc.,
Engineering Geologist

Pete Quinn,Ph.D., P.Eng.,
Senior Geotechnical Engineer

Reviewed by:

Thomas G. Harper, P.E
Senior Civil Engineer

REFERENCES

BGC Engineering Inc. 2009. Site Facilities Geotechnical Investigation Factual Data Report. Eagle Gold Project, Victoria Gold Corporatation.

BGC Engineering Inc. 2011a. 2010 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.

BGC Engineering Inc. 2011b. Eagle Gold – Borrow Evaluation Report. Eagle Gold Project, Victoria Gold Corporation.

Bieniawski, Z.T. 1976. Rock mass classification in rock engineering. In Exploration for Rock Engineering, proc. of the symp., (ed. Z.T. Bieniawski) 1, 97-106. Cape Town: Balkema.

Bond, J.D. 1998. Surficial Geology of Dublin Gulch, Central Yukon. Geoscience Map 1998-6. Indian and Northern Affairs Canada, Exploration and Geological Services Division, Yukon Region.

Cai, M., Kaiser, P.K., Uno, H., Tasaka, Y., Minami, M. International Journal of Rock Mechanics& Mining Sciences 41, 2004, p3-19.

GeoEnviro Engineering. 1996. Hydrogeological Characterization and Assessment, Dublin Gulch Project, New Millennium Mining.

Hoek, E, and P G Marinos. 2000. Predicting tunnel squeezing problems in weak heterogeneous rock masses. *Tunnels and Tunnelling International* 132, no. 11: 45-51.

Knight Piésold. 1996a. Report on 1995 Geotechnical Investigations for Four Potential Heap Leach Facility Site Alternatives, First Dynasty Mines, Dublin Gulch Property.

Knight Piésold. 1996b. Report on Feasibility Design of the Mine Waste Rock Storage Area, First Dynasty Mines, Dublin Gulch Property.

Scott Wilson Mining. 2010. Pre-Feasibility Study on the Eagle Gold Project, Yukon Territory, Canada. Victoria Gold Corp.

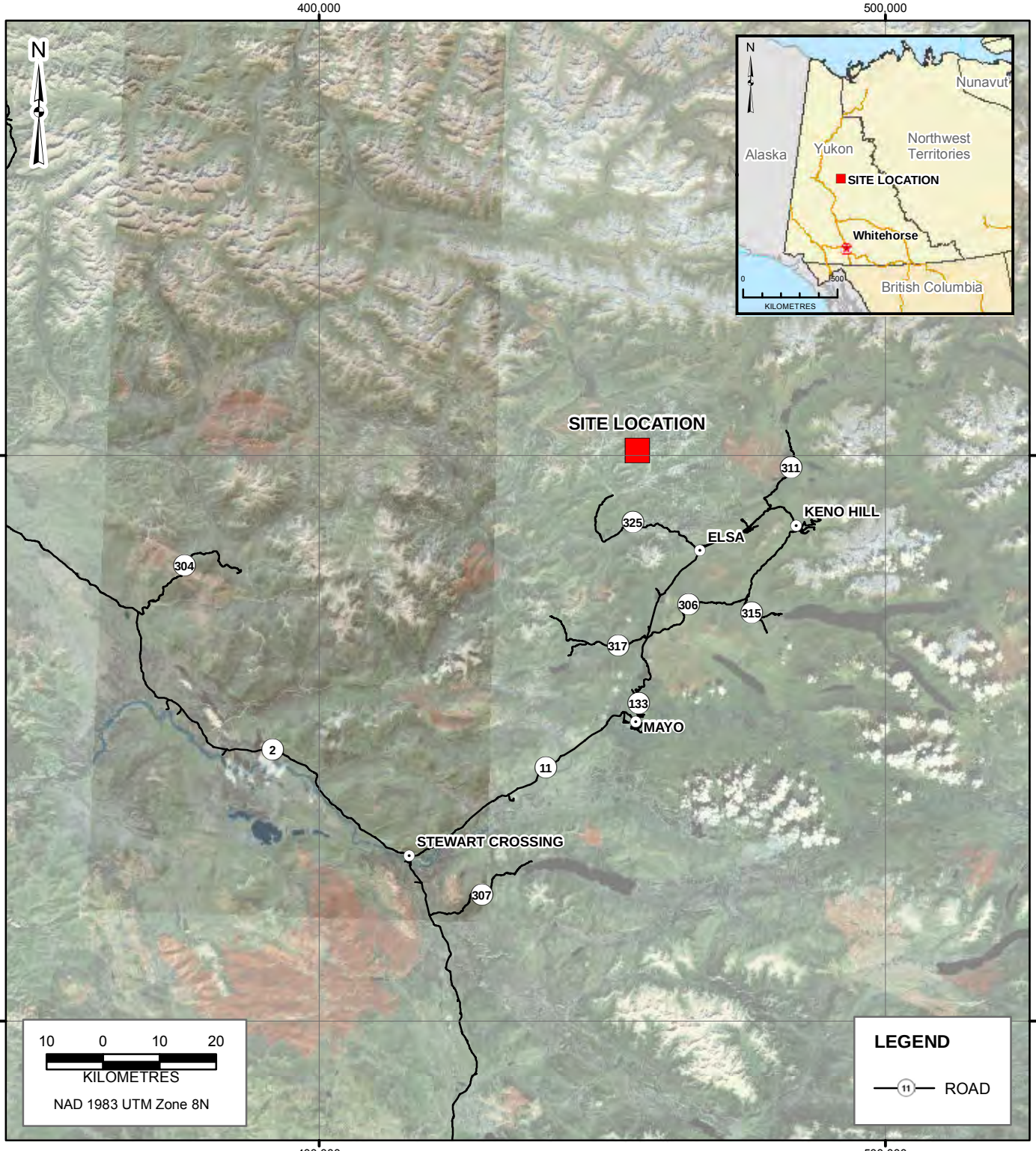
Sitka Corp. 1996. Field Investigation Data Report, Dublin Gulch Project, New Millennium Mining.

Smit, J. Sieb, M. and Swanson, C., 1995. Summary Information on the Dublin Gulch Project, Yukon Territory. In: Yukon Exploration and Geology, 1995, Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 33-36.

Stantec. 2010. Project Proposal for Executive Committee Review. Pursuant to the Yukon Environmental and Socio-Economic Assessment Act. Eagle Gold Project, Victoria Gold Corporation.

DRAWINGS

DRAWINGS



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	1:1,000,000	DESIGNED:	DW
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	LL	APPROVED:	PQ

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT:
VICTORIA GOLD CORPORATION

PROJECT:
EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE
FACTUAL DATA REPORT

TITLE:
GENERAL SITE LOCATION

PROJECT No.:	DWG No.:	REV.:
0792-006	01	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012

X:\Projects\0792 Victoria Gold\006\Workspace\20111128_REPORT_2011_Geotechnical_Investigation_for_Minesite_Infrastructure_Factual_Data_Report\01_General_Site_Location.mxd Date: Wednesday, December 14, 2011 Time: 11:02 AM



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE:	1:15,000
DATE:	JAN 2012
DRAWN:	LL
DESIGNED:	DW
CHECKED:	DW
APPROVED:	PQ

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: PROPOSED GENERAL ARRANGEMENT

PROJECT No.:	DWG No.:	REV.:
0792-006	02	0

X:\Projects\0792 Victoria Gold\0006\Workspace\20111128_REPORT_2011_Geotechnical_Investigation_for_Minesite_Infrastructure_Factual_Data_Report\02_Proposed General Arrangement.mxd Date: Thursday, January 05, 2012 Time: 10:01 AM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012

7,103,000 | 7,102,000 | 7,101,000 | 7,100,000 | 7,099,000 | 7,098,000

461,000 | 460,000 | 459,000 | 458,000

N

LEGEND

- DIAMOND DRILL HOLE (2009 OR 2010)
- BGC AUGER HOLE (2009 OR 2010)
- BGC TEST PIT (2009 OR 2010)
- BOREHOLE BY OTHERS
- TESTPIT BY OTHERS
- PROPOSED INFRASTRUCTURE LAYOUT
- EXISTING ROAD
- STREAM
- 25 M CONTOUR

PROPOSED 99 Mt HEAP LEACH OUTLINE

99 Mt PIT OUTLINE

66 Mt PIT OUTLINE

EAGLE PUP WASTE ROCK STORAGE AREA

PLATINUM GULCH WASTE ROCK STORAGE AREA

PIT AREA

HEAP LEACH FACILITY 66 Mt

DUBLIN GULCH DIVERSION

SECONDARY CRUSHER

PRIMARY CRUSHER

TERTIARY CRUSHER

CONVEYOR

100 DAY STORAGE

HEAP EMBANKMENT

PLANT SITE AREA

EVENTS PONDS

TRUCK SHOP AREA

LAYDOWN AREA

EXPLOSIVE MAGAZINES

Eagle Gulch | Dublin Gulch | Swan Gulch | Oke Gulch | Fall Gulch | Slate Gulch | Gill Gulch | Hyatt Creek | Return Creek | Fefer Gulch | Ethel

100 50 0 100 200 300

METRES

NAD 1983 UTM Zone 8N

NOTES:
1. GENERAL ARRANGEMENT RECEIVED FROM WARDROP NOV.23, 2011.

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012

AS A DIGITAL PROTECTION OF OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. NO UNDERSTANDING OR AGREEMENT EXISTS FOR THE USE OF THE INFORMATION BY ANY OTHER PARTY AND NO OTHER PARTY IS ENTITLED TO RELY ON THE INFORMATION CONTAINED IN THE REPORT WITHOUT LIMITATION, NEITHER OF REPRODUCTION OR OF SALE OR USE OF DIGITAL OR PAPER COPIES. IN THE EVENT OF A DISCREPANCY BETWEEN DIGITAL AND PAPER COPIES, THE LATTER SHALL GOVERN. IN ADDITION TO BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT. NO UNAUTHORIZED ALTERATIONS TO THE DOCUMENT, WHETHER ELECTRONIC OR PAPER COPIES, SHALL BE MADE BY ANY PERSON OR ENTITY. THE CLIENT AND ANY OTHER AUTHORIZED USERS SHALL INDEMNIFY AND HOLD HARMLESS BGC ENGINEERING INC. AND ITS AFFILIATED CORPORATIONS AND PROFESSIONAL EMPLOYEES FROM AND AGAINST ANY AND ALL LOSSES, CLAIMS, ACTIONS, DAMAGES, LIABILITIES AND EXPENSES IN CONNECTION WITH OR ARISING OUT OF ANY ALTERATIONS MADE BY ANY PERSON OR ENTITY OR ANY REUSE OR DISTRIBUTION OF THE DOCUMENT FOR ANY PURPOSE OTHER THAN THE ORIGINAL PURPOSE FOR WHICH IT WAS PREPARED.

REV	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE:	1:5,000
DATE:	JAN 2012
DRAWN:	LL
DESIGNED:	DW
CHECKED:	DW
APPROVED:	PQ

PROFESSIONAL SEAL:

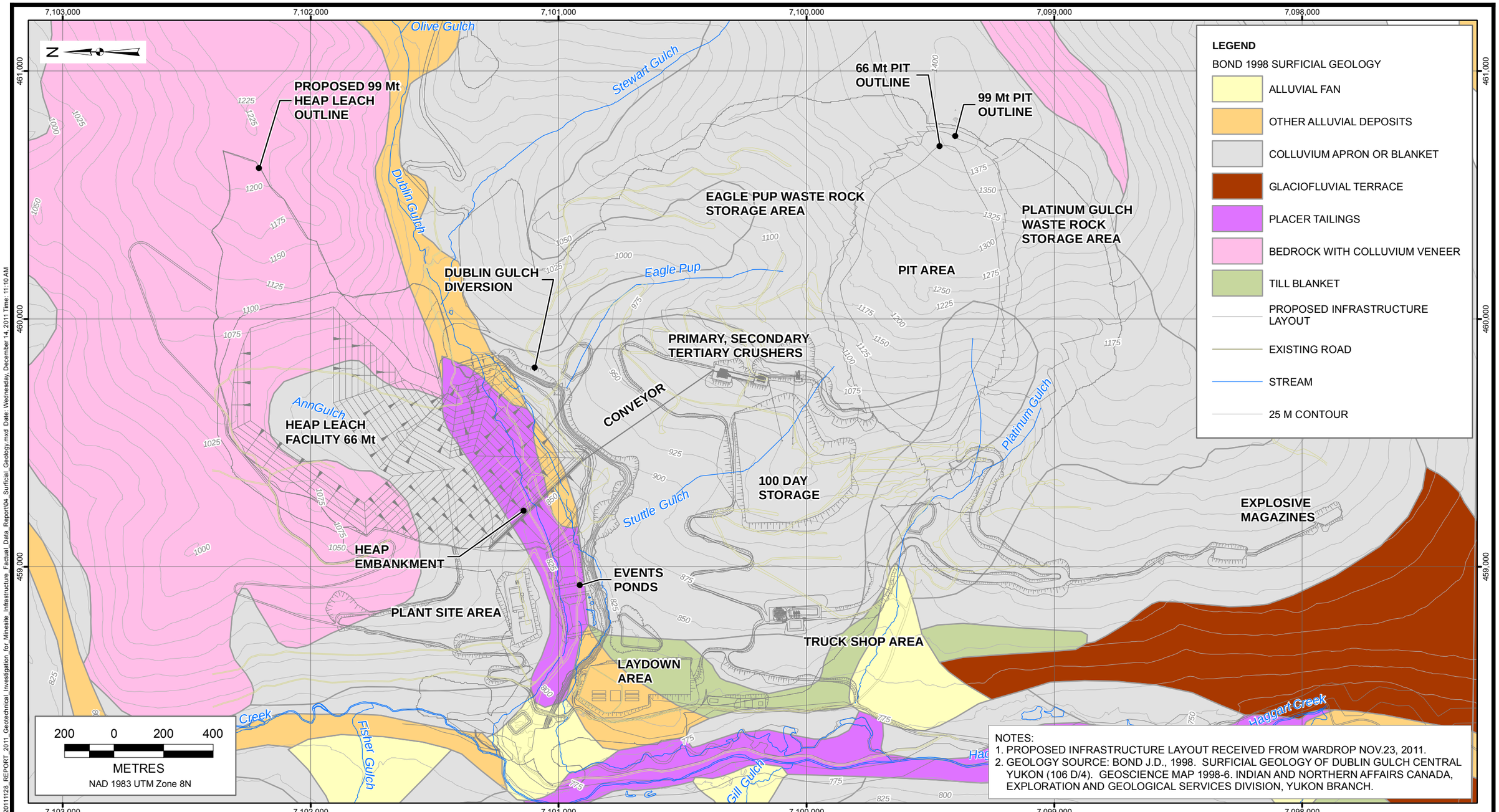
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT 2011
GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: HISTORICAL FIELD INVESTIGATIONS (1995 TO 2010)

PROJECT No.:	DWG No.:	REV.:
0792-006	03	0



NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP NOV.23, 2011.
2. GEOLOGY SOURCE: BOND J.D., 1998. SURFICIAL GEOLOGY OF DUBLIN GULCH CENTRAL YUKON (106 D/4). GEOSCIENCE MAP 1998-6. INDIAN AND NORTHERN AFFAIRS CANADA, EXPLORATION AND GEOLOGICAL SERVICES DIVISION, YUKON BRANCH.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE: 1:15,000
DATE: JAN 2012
DRAWN: LL
DESIGNED: DW
CHECKED: DW
APPROVED: PQ

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: SURFICIAL GEOLOGY

PROJECT No.:	DWG No.:	REV.:
0792-006	04	0

X:\Projects\0792 Victoria Gold\006\Workspace\20111128_REPORT_2011_Geotechnical_Investigation_for_Minesite_Infrastructure_Factual_Data_Report\04_Surficial_Geology.mxd Date: Wednesday, December 14, 2011 Time: 11:10 AM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012

7,103,000 | 7,102,000 | 7,101,000 | 7,100,000 | 7,099,000 | 7,098,000

461,000 | 460,000 | 459,000 | 458,000

N

LEGEND

- BGC 2011 DIAMOND DRILL HOLE
- BGC 2011 AUGER HOLE
- BGC 2011 TEST PIT
- BGC OUTCROP

EXISTING TESTHOLES

- BGC BOREHOLE
- BGC TESTPIT
- BOREHOLE BY OTHERS
- TESTPIT BY OTHERS
- SEISMIC REFRACTION BY FRONTIER GEOPHYSICS
- PROPOSED INFRASTRUCTURE LAYOUT
- EXISTING ROAD
- STREAM
- 25 M CONTOUR

PROPOSED 99 Mt HEAP LEACH OUTLINE

99 Mt PIT OUTLINE

66 Mt PIT OUTLINE

EAGLE PUP WASTE ROCK STORAGE AREA

PLATINUM GULCH WASTE ROCK STORAGE AREA

PIT AREA

DUBLIN GULCH DIVERSION

SECONDARY CRUSHER

PRIMARY CRUSHER

TERTIARY CRUSHER

CONVEYOR

HEAP LEACH FACILITY 66 Mt

HEAP EMBANKMENT

100 DAY STORAGE

EXPLOSIVE MAGAZINES

PLANT SITE AREA

EVENTS PONDS

TRUCK SHOP AREA

LAYDOWN AREA

Eagle Gulch | Dublin Gulch | Basin Gulch | Sluice Gulch | Ann Gulch | Harper Creek | Gill Gulch

100 50 0 100 200 300

METRES

NAD 1983 UTM Zone 8N

NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP NOV.23, 2011.

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. NO PUBLICATION OF ANY REPORT, STATEMENT, OPINION, FOR THE RE-REPRODUCTION OF SAME ON ANY WEBSITE, IS PERMITTED FROM THE CONTROLLING AUTHORITY WITHOUT ANY FORM OF WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT. NO ANY ESTRATTO PUBLISHED BY OTHERS.

REV	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT. 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE: 1:5,000
DATE: JAN 2012
DRAWN: LL
DESIGNED: DW
CHECKED: DW
APPROVED: PQ

PROFESSIONAL SEAL:

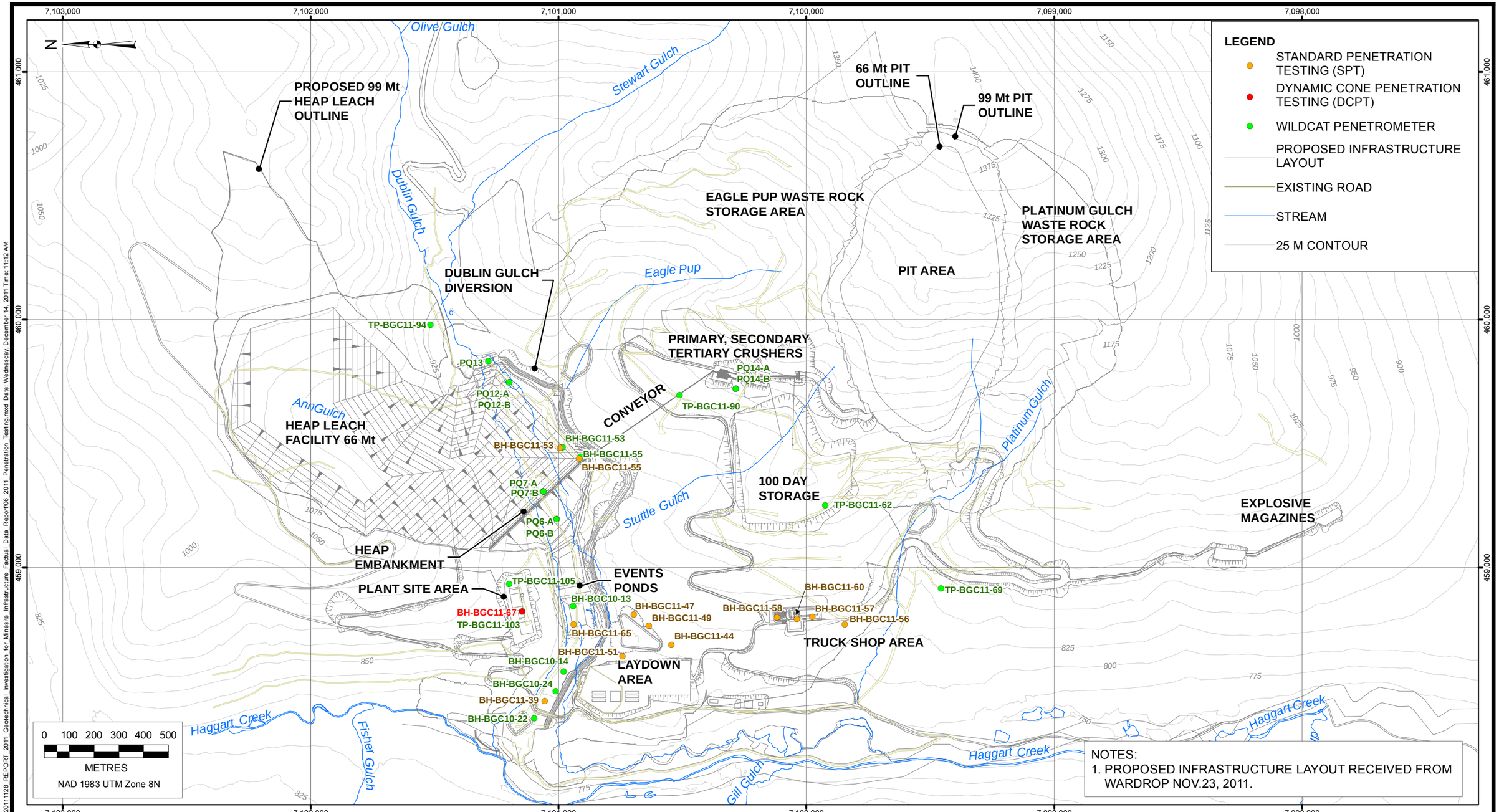
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT 2011
GEOTECHNICAL INVESTIGATION FOR MINE SITE
INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: TEST HOLE LOCATION PLAN

PROJECT No.: 0792-006 | DWG No.: 05 | REV.: 0



NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP NOV.23, 2011.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE: 1:15,000
DATE: JAN 2012
DRAWN: LL
DESIGNED: KH
CHECKED: DW
APPROVED: PQ

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

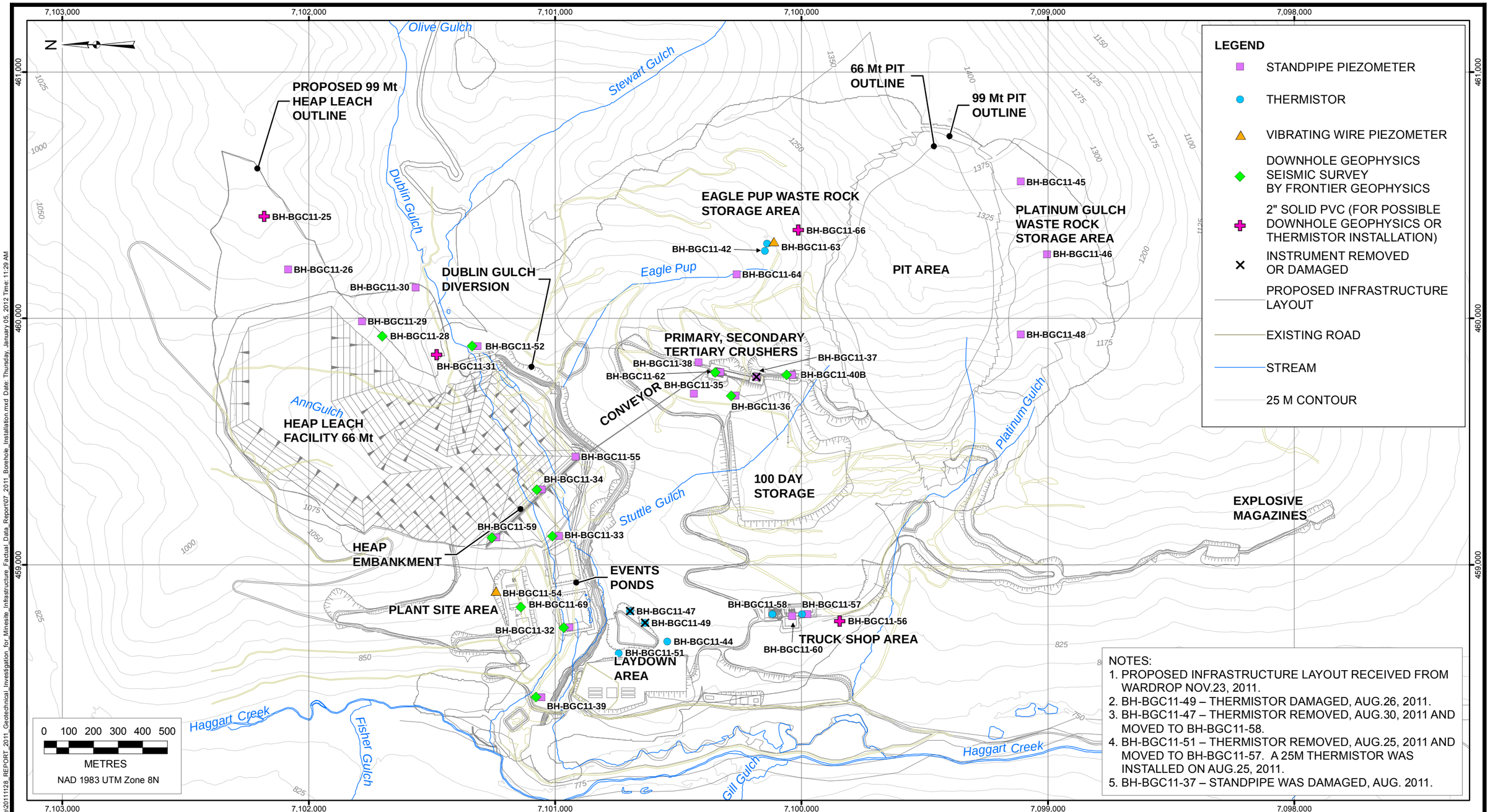
PROJECT: EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: 2011 PENETRATION TESTING

PROJECT No.:	DWG No.:	REV.:
0792-006	06	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012

X:\Projects\0792 Victoria Gold\006\Workspace\20111128_REPORT_2011_Geotechnical_Investigation_for_Minesite_Infrastructure_Factual_Data_Report\06_2011_Penetration_Testing.mxd Date: Wednesday, December 14, 2011 Time: 11:12 AM



NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP NOV.23, 2011.
2. BH-BGC11-49 – THERMISTOR DAMAGED, AUG.26, 2011.
3. BH-BGC11-47 – THERMISTOR REMOVED, AUG.30, 2011 AND MOVED TO BH-BGC11-58.
4. BH-BGC11-51 – THERMISTOR REMOVED, AUG.25, 2011 AND MOVED TO BH-BGC11-57. A 25M THERMISTOR WAS INSTALLED ON AUG.25, 2011.
5. BH-BGC11-37 – STANDPIPE WAS DAMAGED, AUG. 2011.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE: 1:15,000
DATE: JAN 2012
DRAWN: LL
DESIGNED: KH
CHECKED: DW
APPROVED: PQ

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

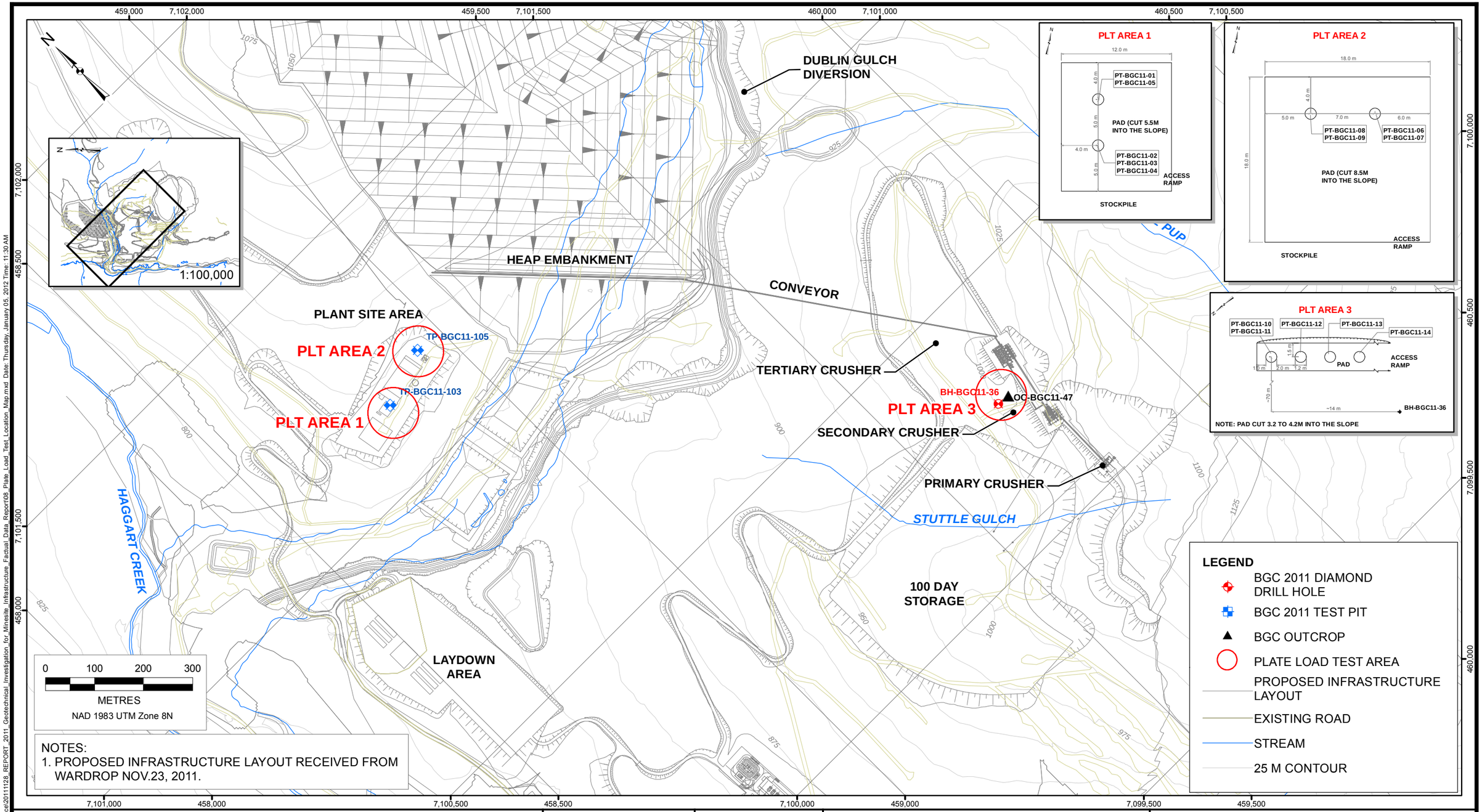
PROJECT: EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: 2011 BOREHOLE INSTALLATIONS

PROJECT No.:	DWG No.:	REV.:
0792-006	07	0

X:\Projects\0792 Victoria Gold\006\Workspace\20111128_REPORT_2011_Geotechnical_Investigation_for_Minesite_Infrastructure_Factual_Data_Report\07_2011_Borehole_Installation.mxd Date: Thursday, January 05, 2012 Time: 11:29 AM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012



NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP NOV.23, 2011.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE:	1:7,500
DATE:	JAN 2012
DRAWN:	LL
DESIGNED:	LT
CHECKED:	DW
APPROVED:	PQ

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT:
VICTORIA GOLD CORPORATION

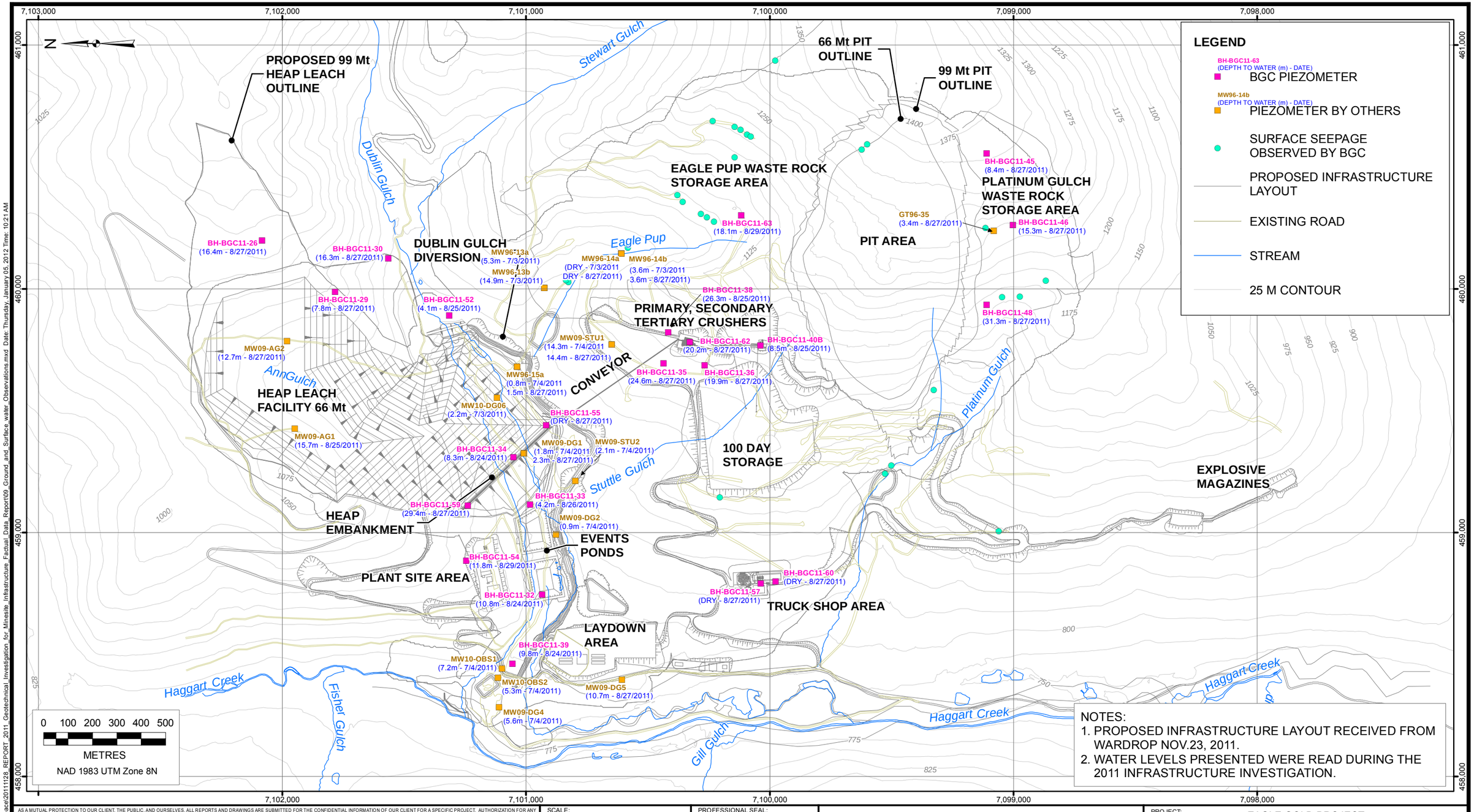
PROJECT:
EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
PLATE LOAD TEST LOCATION MAP

PROJECT No.:	DWG No.:	REV.:
0792-006	08	0

X:\Projects\0792 Victoria Gold\006\Workspace\20111128_REPORT_2011_Geotechnical_Investigation_for_Minesite_Infrastructure_Factual_Data_Report\08_Plate_Load_Test_Location_Map.mxd Date: Thursday, January 05, 2012 Time: 11:30 AM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012



NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP NOV.23, 2011.
2. WATER LEVELS PRESENTED WERE READ DURING THE 2011 INFRASTRUCTURE INVESTIGATION.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE:	1:15,000
DATE:	JAN 2012
DRAWN:	LL
DESIGNED:	KH
CHECKED:	DW
APPROVED:	PQ

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

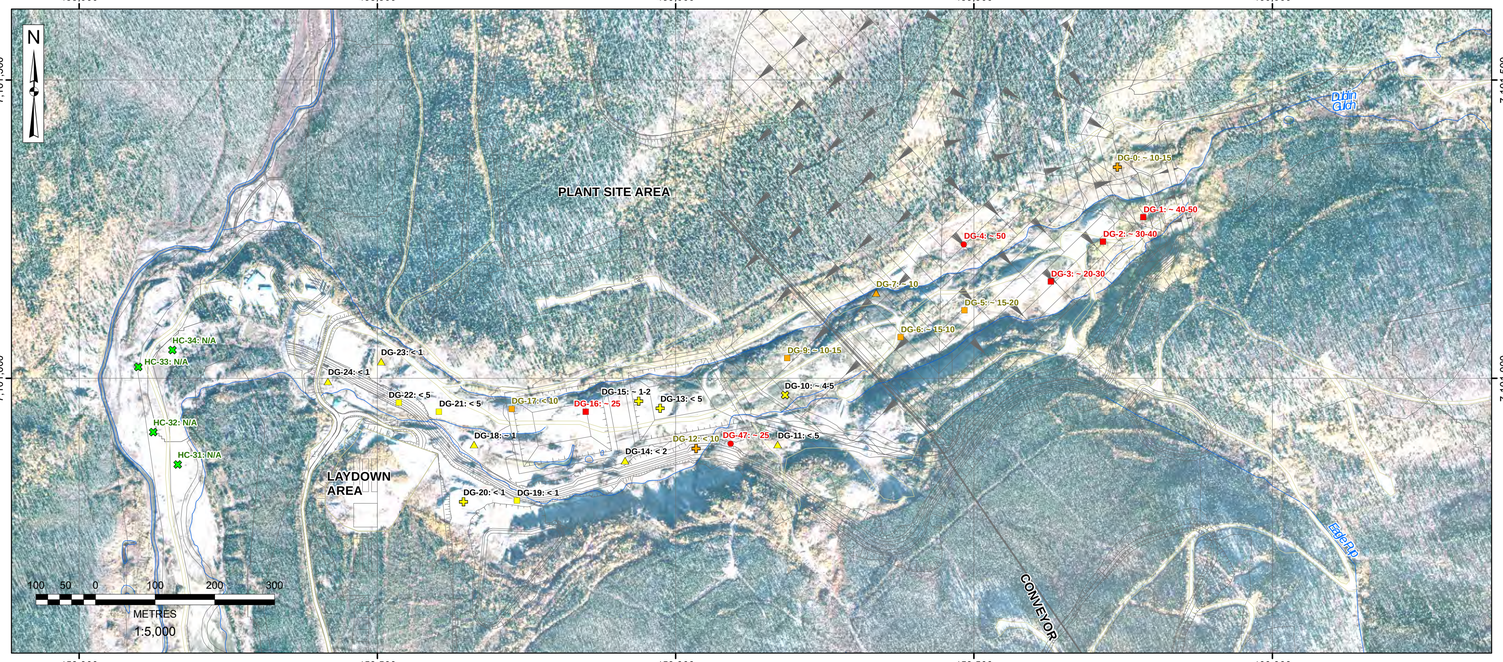
TITLE: GROUND AND SURFACE WATER OBSERVATIONS

PROJECT No.:	DWG No.:	REV.:
0792-006	09	0

X:\Projects\0792 Victoria Gold\006\Workspace\20111128_REPORT_2011_Geotechnical_Investigation_for_Mineslte_Infrastructure_Factual_Data_Report\09_Ground_and_Surface_water_Observations.mxd Date: Thursday, January 05, 2012 Time: 10:21 AM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012

DUBLIN GULCH



LEGEND

ESTIMATED % OF OVERSIZE PARTICLES (>75 MM)

- N/A
- 0-5 %
- 5-20 %
- >20 %

SOIL CLASSIFICATION BY UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

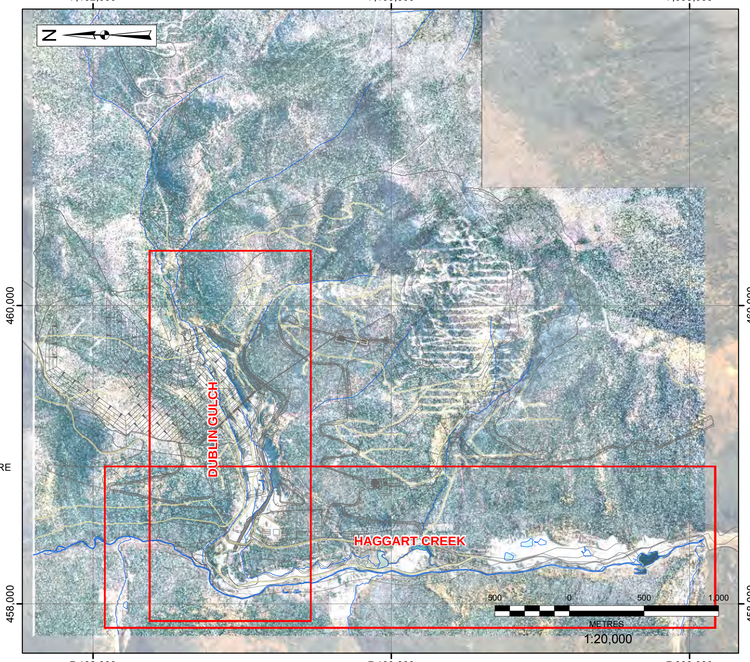
- GP - POORLY GRADED GRAVEL
- GW - WELL GRADED GRAVEL
- SM - SILTY SAND

EXAMPLE: HC-22: < 2

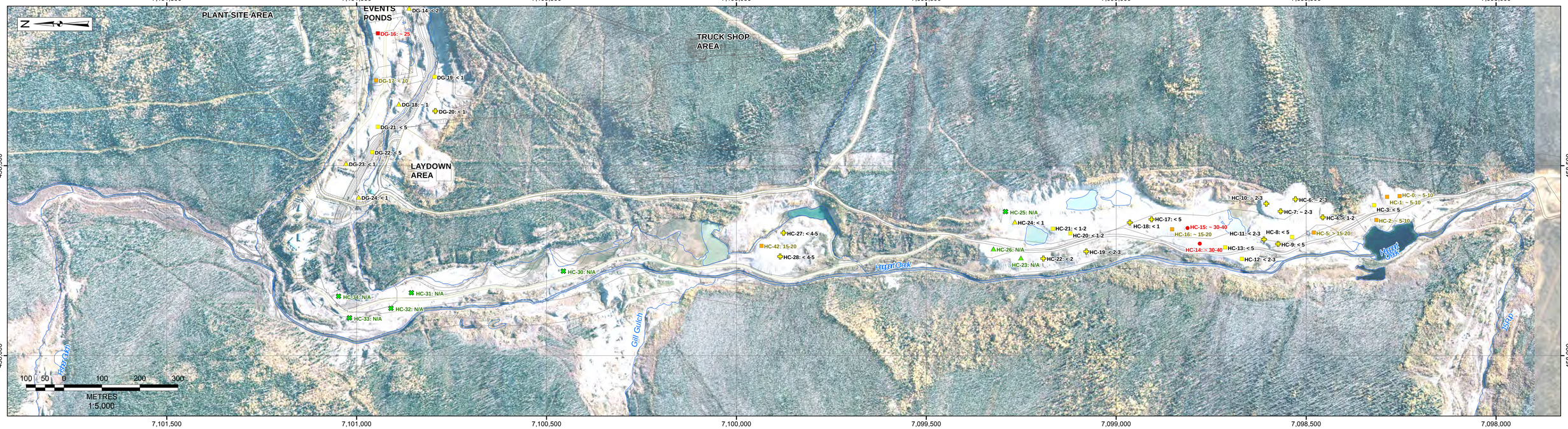
HAGGART CREEK SAMPLE N#22: <2% OF AGGREGATE IS GREATER THAN 75MM.

- PROPOSED INFRASTRUCTURE LAYOUT
- EXISTING ROAD
- STREAM

OVERVIEW MAP



HAGGART CREEK



NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP NOV.23, 2011.

NAD 1983 UTM Zone 8N

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REFERRING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE: AS SHOWN
DATE: JAN 2012
DRAWN: LL
DESIGNED: LT
CHECKED: DW
APPROVED: PQ

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

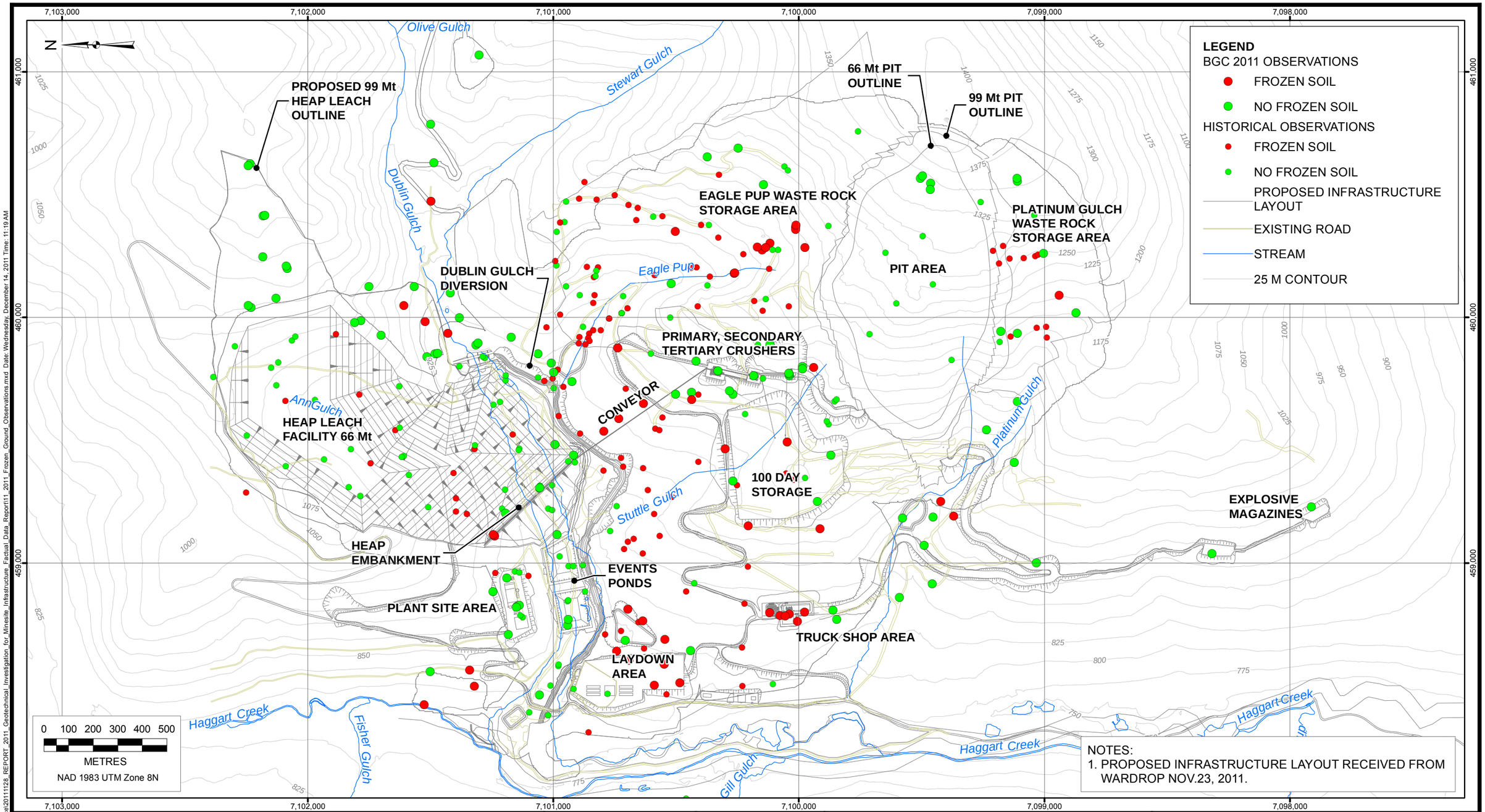
PROJECT: EAGLE GOLD PROJECT 2011
GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: PLACER TAILINGS VISUAL CLASSIFICATION OF SURFICIAL MATERIALS

PROJECT No.: 0792-006
DWG No.: 10
REV.: 0

K:\Projects\0792 Victoria Gold\600\Workspace\20111124_REPORT_2011_Geotechnical_Investigation_for_Minesite_Infrastructure_Factual_Data_Report\10_Placer Tailings Visual Classification of Surficial Materials.mxd Date: Tuesday, January 03, 2012 Time: 10:44 AM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012



NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP NOV.23, 2011.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	JAN 2012	ISSUED WITH FINAL REPORT	LL	DW	PQ
A	OCT 2011	ISSUED FOR COMMENT	LL	DW	PQ

SCALE:	1:15,000
DATE:	JAN 2012
DRAWN:	LL
DESIGNED:	LT
CHECKED:	DW
APPROVED:	PQ

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: 2011 FROZEN GROUND OBSERVATIONS

PROJECT No.:	DWG No.:	REV.:
0792-006	11	0

X:\Projects\0792 Victoria Gold\006\Workspace\20111128_REPORT_2011_Geotechnical_Investigation_for_Minesite_Infrastructure_Factual_Data_Report\11_2011_Frozen_Ground_Observations.mxd Date: Wednesday, December 14, 2011 Time: 11:19 AM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED JANUARY 2012

APPENDIX A
TERMINOLOGY FOR OUTCROP MAPPING AND TEST HOLE LOGS

TERMINOLOGY FOR TEST HOLE AND OUTCROP MAPPING LOGS

1.0 INTRODUCTION

This appendix provides references used for describing the properties of soil and rock as they appear in the test hole and outcrop mapping logs included in Appendices B, C and E.

2.0 SOILS

The following section presents the references used for the classification of soils as described in the logs. The presented descriptors have been used for the logging of the soil portion of diamond drill holes, auger holes, test-pits and the overburden part of the outcrops/cut slopes. References in this section have been organized so as to follow typical order of description used in BGC's standard practice. It should be noted that descriptors for fine and coarse grained soil material have been combined and presented in their general order of appearance so as to avoid redundancy. Material is described as a soil if it is a transported soil, or if it is rock weathered in place with weathering grade greater than highly weathered (W4, Table 19) and with an extremely weak Unconfined Compressive Strength (UCS) (R0, Table 18).

Table 1. USCS Classification

Major Divisions			Group Symbol	Group Name
Coarse grained soils more than 50% retained on No.200 (0.075 mm) sieve	Gravel > 50% of coarse fraction retained on No.4 (4.75 mm) sieve	Clean gravel < 5% smaller than #200 sieve	GW	Well graded gravel, fine to coarse gravel
			GP	Poorly graded gravel
		Gravel with > 12% fines	GM	Silty gravel
			GC	Clayey gravel
	Sand ≥ 50% of coarse fraction passes No.4 sieve	Clean sand	SW	Well graded sand, fine to coarse sand
			SP	Poorly-graded sand
		Sand with >12% fines	SM	Silty sand
			SC	Clayey sand
Fine grained soils more than 50% passes No.200 sieve	Silt and clay liquid limit ≥ 50	Inorganic	ML	Silt
			CL	Clay
		Organic	OL	Organic silt, organic clay
	Silt and clay liquid limit ≥ 50	Inorganic	MH	Silt of high plasticity
			CH	Clay of high plasticity
		Organic	OH	Organic clay, organic silt
Highly organic soils			Pt	Peat

Table 2. Classification by Particle Size

Classification by Particle Size			
	Size Range		
		US Standard Sieve	
Name	(mm)	Retained	Passing
Boulders	> 200	8 inch	-
Cobbles	75-200	3 inch	8 inch
Gravel:			
Coarse	19 - 75	0.75 inch	3 inch
Fine	4.75 - 19	No. 4	0.75 inch
Sand:			
Coarse	2 - 4.75	No. 10	No. 4
Medium	0.43 - 2	No. 40	No. 10
Fine	0.075 – 0.43	No. 200	No. 40
Fines (silt or clay)	< 0.0.75	-	No. 200

Table 3. Proportion of Minor Components by Weight

Proportion of Minor Components by Weight	
“and”	40% - 50%
“y/ey”	25% - 40%
“some”	10$ - 25%
“trace”	0% - 10%



Figure 1. Gradation Classification

Table 4. Classification for Density of Granular Soils

Density of Granular Soils		
Description	**SPT "N"**	**Field Test/Identification**
V. Loose	0 – 4	None
Loose	4 – 10	Easily penetrated by 13 mm rod pushed by hand
Compact	10 – 30	Easily penetrated by 13 mm rod driven by hammer
Dense	30 – 50	Penetrated by 13 mm rod driven by hammer
V. Dense	> 50	Penetrated few cm's by 13 mm rod driven by hammer

Table 5. Classification for Consistency of Fine Soils

Strength of Cohesive Soils				
Grade	**Description**	**Field Identification**	**SPT "N"**	**Undrained Shear Strength (kPa)**
S1	Very soft	Easily penetrated several inches by fist	< 2	< 12
S2	Soft	Easily penetrated several inches by thumb	2 – 4	12 – 25
S3	Firm	Can be penetrated by thumb with moderate effort	4 – 8	25 – 50
S4	Stiff	Can be penetrated by thumb but penetrated only with great effort	8 – 15	50 – 100
S5	Very stiff	Readily indented by thumbnail	15 – 30	100 – 200
S6	Hard	Indented with difficulty by thumbnail	> 30	> 200

Table 6. Classification for Angularity of Coarse Grained Particles

Angularity of Coarse-Grained Particles	
Description	**Criteria**
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular	Particles are similar to angular description but have rounded edges
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges
Rounded	Particles have smoothly curved sides and no edges

Table 7. Classification for Particle shape

Particle Shape	
Flat	Particle width/thickness > 3
Elongated	Particles with length/width > 3
Flat and elongated	Particles meet criteria for both flat and elongated

Table 8. Classification for Plasticity of Soils

Plasticity of Cohesive Soils			
Description	**Silt**	**Clay**	**Criteria**
High	$W_L > 50$	$W_L > 50$	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit
Medium	-	$30 < W_L < 50$	The thread is easy to roll and not much time is required to reach the plastic limit. The lump crumbles when drier than the plastic limit.
Low	$W_L < 50$	$W_L < 30$	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Non-Plastic	NP	-	A 1/8 inch (3mm) thread cannot be rolled at any water content.

Where: W_L = Liquid Limit (%)

Table 9. Classification for Cementation of Soils

Cementation	
Description	**Criteria**
Weak	Crumbles or breaks with handling or little finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

Table 10. Classification for Soil Structure

Description	Criteria
Stratified	Alternating layers of varying material or color with layers at least 6 mm thick; note thickness
Laminated	Alternating layers of varying material or color with the layers less than 6 mm thick; note thickness
Fissured	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided	Fracture planes appear polished or glossy, sometimes striated
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness
Homogeneous	Same color and appearance throughout

Table 11. Classification for Description of Dry Strength in Soils

None	Dry Specimen crumbles upon handling
Low	Crumbles into powder with some finger pressure
Medium	Crumbles with considerable finger pressure
High	Can't be broken with fingers; will break between thumb and hard surface
Very High	Cannot be broken between thumb and hard surface

Note: Assessed on natural soil pieces or moulded balls about 12 mm diameter that have been air-dried, or oven dried at less than 60 ^{o}C

Table 12. Classification for Dilatancy in Soil

Description	Criteria
None	No visible change in the specimen
Slow	Water appears slowly on the surface of the specimen during shaking and does not disappear or disappears slowly upon squeezing
Rapid	Water appears quickly on the surface of the specimen during shaking and disappears quickly upon squeezing

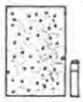
Table 13. Ice Description

Criteria	Descriptors
Colour	Colourless, white, stained, etc.
Clarity	Clear, transparent, cloudy, opaque, etc.
Bubble Content	Visually estimate percent
Bubble Size	In mm
Bubble Shape	Round, elongate, tubular Note: If the elongated bubbles have a preferential direction compared to the ground surface
Sediment inclusions or lenses	Visually estimate percent and thickness of lenses
Any other inclusions	Such as organics

Note: Massive ice description (ice greater than 1" or 2.5 cm)

Table 14. Classification for Description of Frozen Ground

ICE NOT VISIBLE

GROUP SYMBOL	SUBGROUP SYMBOLS	SUBGROUP DESCRIPTION	
N	Nf	Poorly bonded or friable	
	Nbn	No excess ice, well bonded	
	Nbe	Excess ice, well bonded	

VISIBLE ICE LESS THAN 2.5cm THICK

V	Vx	Individual ice crystals or inclusions	
	Vc	Ice coatings on particles	
	Vr	Random or irregularly oriented ice formations	
	Vs	Stratified or distinctly oriented ice formations	

VISIBLE ICE GREATER THAN 2.5cm THICK

ICE	ICE + soil type	Ice with soil inclusions	
	ICE	Ice without soil inclusions	

(Modified from Guide to Field Description of Permafrost for Engineering Purposes, NRC. Technical Memorandom 79)

NOTE 1) Dual symbols are used to indicate borderline or mixed ice classifications

2) Visual estimates of ice content as indicated on borehole logs are ± 5%

LEGEND  Soil or Ice

Source: American Society for Testing and Materials. Standard D4083: Standard Practice for Description of Frozen Soils (Visual-Manual Procedure). Developed by Sub-Committee D18.03. West Conshohocken, PA. 6

Table 15 Symbols for Augering Techniques

Technique Acronym	Description
SSA	Solid Stem Auger
HSA	Hollow Stem Auger
CRREL	Coring barrel compatible with auger rigs originally designed by the Cold Regions Research and Engineering Laboratory for the purpose of coring and sampling frozen ground

3.0 ROCK

Rock logs were generated to present collected information for any untransported rock material that was described as highly weathered or less (<W5, Table 19) and of an Unconfined Compressive Strength (UCS) greater than extremely weak (R0, Table 18). Although not applicable in every case, the following rock descriptors were used for the diamond drillholes core logging, for the bottom of various test-pits and for the outcrops/cut slopes.

The general organization of this section follows the BGC standard logging order for lithological descriptions and is completed with details of measurements and criteria that apply to the rock structural mass description and cut slope logging.

Table 16. Classification for Grain Size: describes the grains size(s) present in the rock

Term	Particle Size	Examples
Very Coarse	> 60 mm	Porphyries – w/ measureable grains
Coarse	2 – 60 mm	Breccia, Gneiss – w/ measurable grains
Medium	0.06 – 2 mm	Sandstone, Granite, Schist – having clearly visible grains
Fine	0.002 – 0.06 mm	Tuff, Siltstone, Claystone, Mudstone, Basalt.
Very Fine	< 0.002 mm	

Table 17. Classification for Rock Structure

Igneous	Sedimentary	Metamorphic
Massive	Massive	Massive
Banded	Clast-Supported	Banded
Disturbed / Seamy	Matrix-Supported	Foliated
Disintegrated	Bedded	Disturbed / Seamy
	Laminated	Disintegrated
	Disturbed / Seamy	
	Disintegrated	

Table 18. Unconfined Compressive Strength / Hardness Classification for Rock (after CFEM 2006)

	Grade	Description	Field Identification	UCS (MPa)	Point Load Index (MPa)
Rock Hardness	R6	Extremely Strong	Specimen can only be chipped with flat end geological hammer.	> 250	> 10
	R5	Very Strong	Specimen requires many blows with flat end geological hammer to fracture.	100-250	4-10
	R4	Strong	Specimen requires more than one blow of flat end geological hammer to fracture.	50-100	2-4
	R3	Medium Strong	Cannot be scraped or peeled with pocket knife; can be fractured with single firm blow of flat end geological hammer.	25-50	1-2
	R2	Weak	Can be peeled by a pocket knife with difficulty; shallow indentation made by firm blow with point geologic hammer.	5-25	-
	R1	Very Weak	Crumbles under firm blows with point of geological hammer.	1-5	-
	R0	Extremely Weak	Indented by thumbnail.	< 1	-

Table 19. Classification for Weathering Grades of Rock

Grade	Description	Field Identification
A1 / W1	Fresh and Unweathered	Parent rock showing no discoloration, loss of strength or any other weathering effects.
		Strength may be increased by some alteration types.
A2 / W2	Slightly Weathered or Altered	Rock may be slightly discolored, particularly adjacent to discontinuities, which may be open and will have slightly discolored surfaces; the intact rock is may be weaker than the fresh rock.
A3 / W3	Moderately Weathered or Altered	Rock is discolored; discontinuities may be open and have discolored surfaces with alteration starting to penetrate inwards; intact rock is noticeably weaker than W1/A1 rock of the same unit.
A4 / W4	Highly Weathered or Altered	Rock is discolored; discontinuities may be open and have discolored surfaces, and the original fabric of the rock near the discontinuities may be altered; alteration penetrates deeply inwards. The ratio of original rock to weathered rock should be estimated where possible.
A5 / W5	Completely Weathered or Altered	Rock is discolored and decomposed/ friable or changed completely to a soil, but original fabric is visible. The properties of the soil depend in part on the nature of the parent rock.
A6 / W6	Residual Soil	Original rock fabric is completely destroyed.

Table 20. Classification for Description of Discontinuity Aperture in Rock

Aperture	Description	
< 0.1 mm 0.1 – 0.25 mm 0.25 – 0.5 mm	Very tight Tight Partly open	"Closed" features
0.5 – 2.5 mm 2.5 – 10 mm > 10 mm	Open Moderately wide Wide	"Gapped" features
1 – 10 cm 10 – 100 cm 1 m	Very wide Extremely wide Cavernous	"Open" features

Table 21. Codification for Discontinuity Infill Description in Rock

Code	Type	Description
BX	Broken Rock	Fractures ≤ 50 mm to 10 mm, rock fragments maintain intact rock strength
CX	Crushed Rock	Rock has been disintegrated
DX	Decomposed Rock	Clay altered and chemically weathered zones
CL	Clay	Very finely grained, cannot be brushed off hands when dry, no dilatancy, describe in comments
SM	Silt	Fine grained, can be brushed off hands when dry, dilates rapidly, estimate plasticity in comment form
SA	Sand	Non-cohesive infill; visible particles > 0.06 to 2 mm in diameter
FB	Fault Breccia	Clast supported, in matrix of gouge or mineral infill. Can be partially or completely healed
FG	Fault Gouge	Unconsolidated, matrix supported clay, sand and gravel sized rock fragments
ST	Surface Staining	* Record color
FE	Iron Oxides/ Staining	Red/orange/brown; can be scratched with a knife, may be slightly magnetic
TC	Talc	Typically white, slippery feel, lowest hardness (1); can be scratched with fingernail
CH	Chlorite	Green; low hardness (2-2.5) can be scratched with fingernail; non elastic; vitreous; streak colorless
SE	Sericite	White/grey/pale green, fine grained mica; variety of muscovite; occurs in small scales/flakes; silky luster
GY	Gypsum	Low hardness (2); can be scratched with fingernail; cleaves perfectly in one plane
CA	Calcite	Low hardness (3); cannot be scratched by fingernail, but can be scratched with a penny; 3 perfect cleavages; reacts strongly to acid without crushing
PY	Pyrite	White to yellow, shiny, may have block/cubic crystals
AN	Anhydrite	Semi hard (3-3.5); white, greyish, bluish, vitreous, rectangular cleavage fragments
KF	Potassium Feldspar	Light pink to red colour, associated with Potassic alteration, moderate hardness, can be scratched with steel knife with difficulty
QZ	Quartz	White to dark grey, glassy luster; moderate to high hardness (7); cannot be scratched with steel knife (hardness of 6.5); conchoidal fracture

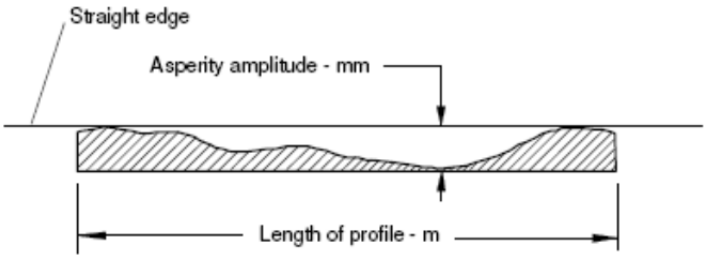


Figure 2. Descriptive Criteria for Joint Roughness Coefficient (JRC)

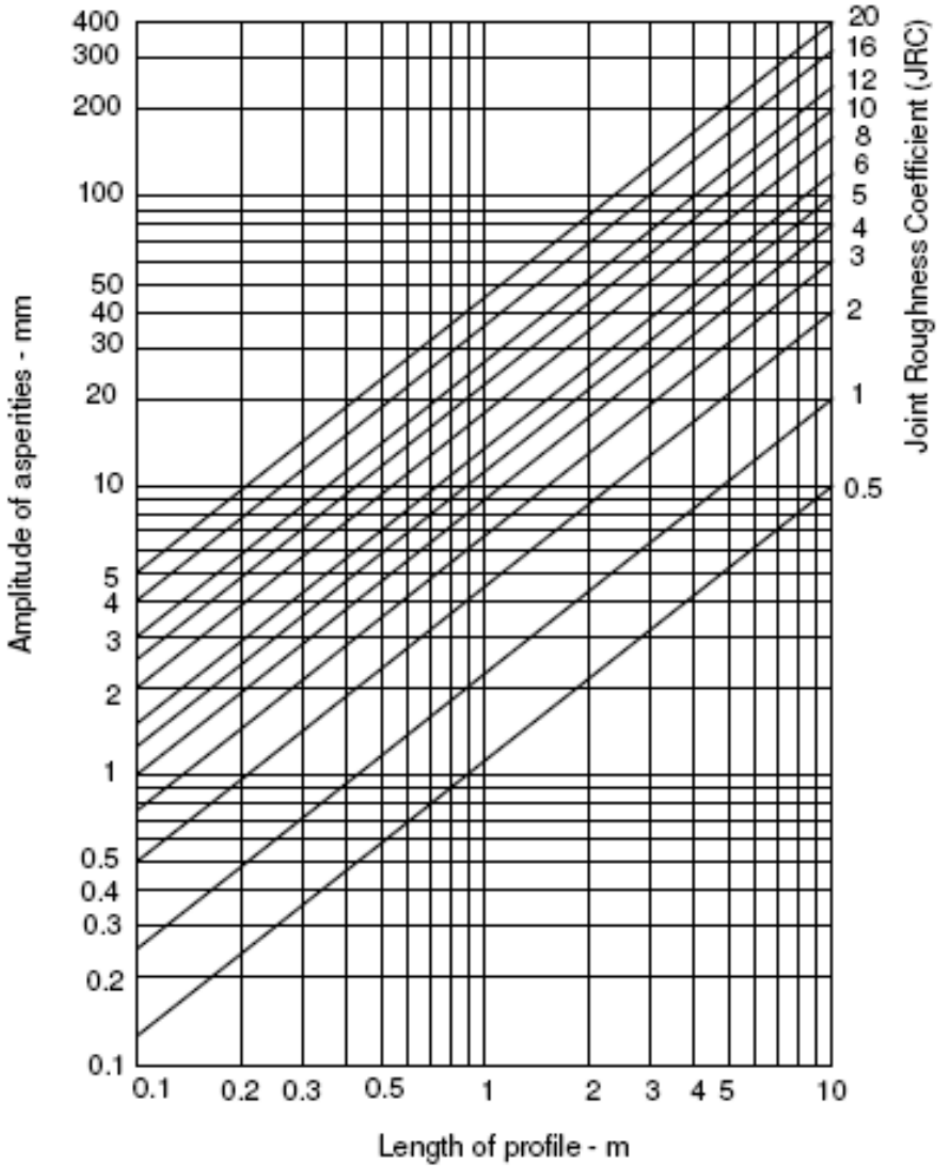


Figure 3. Chart for Determination of the Joint Roughness Coefficient (JRC) in Rock (after Barton et al., 1974)

Table 22. Classification for Discontinuity Spacing in Rock

Description	Discontinuity Spacing
Extremely Close Spacing	< 20 mm
Very Close Spacing	20 – 60 mm
Close Spacing	60 – 200 mm
Moderate Spacing	200 – 600 mm
Wide Spacing	600 – 2000 mm
Very Wide Spacing	2000 – 6000 mm
Extremely Wide Spacing	> 6000 mm

Table 23. Classification for Persistence of Structural Set in the Rock Mass

Description	Discontinuity Persistence
Very Low Persistence	< 1 m
Low Persistence	1 – 3 m
Medium Persistence	3 – 10 m
High Persistence	10 – 20 m
Very High Persistence	> 20 m

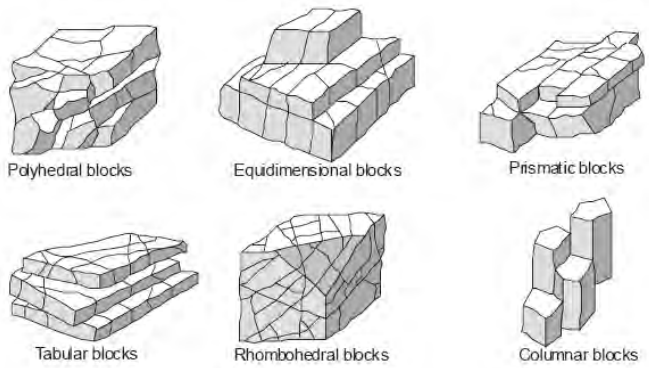


Figure 4. Classification for Block Shape in the Rock Mass Description

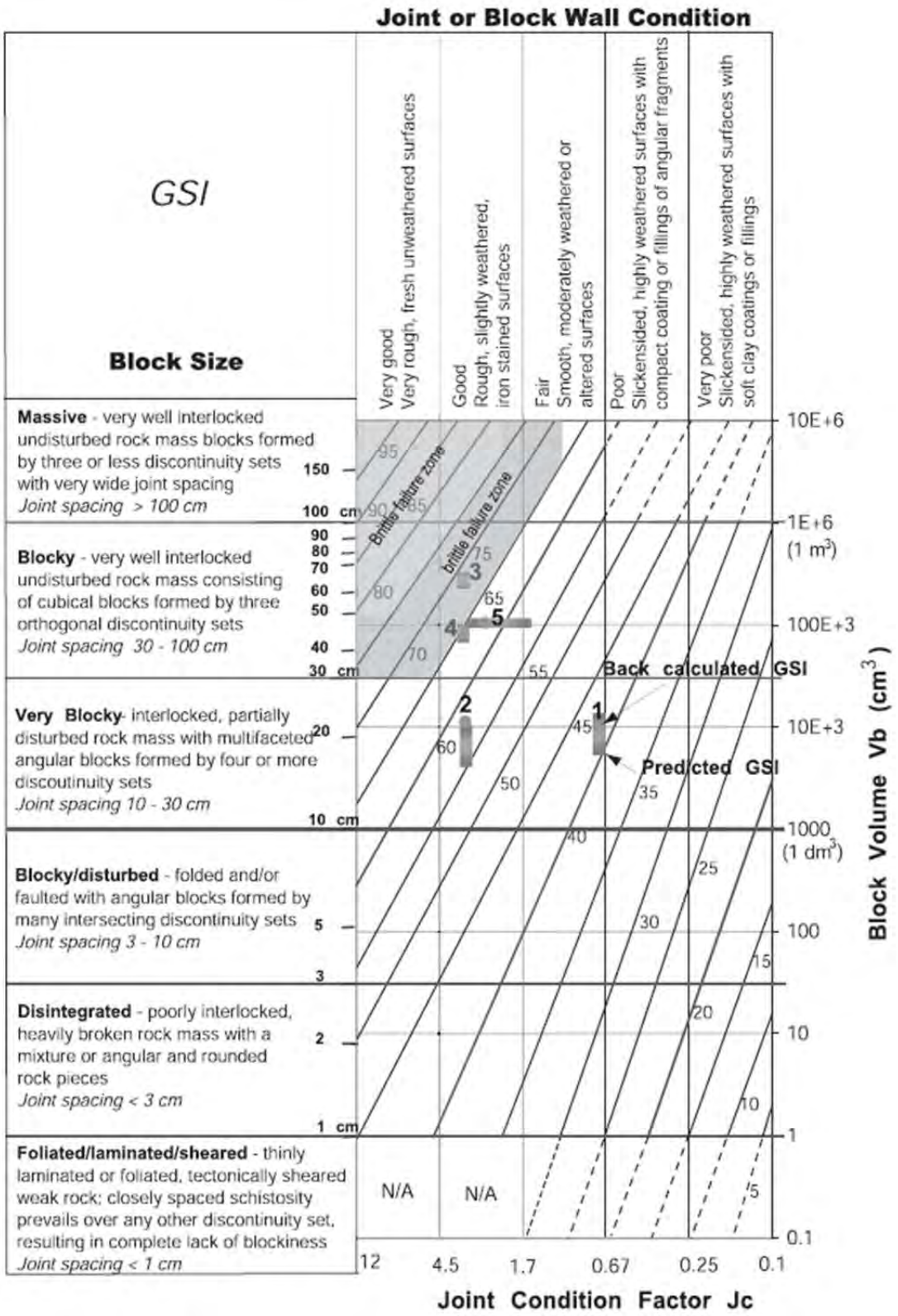


Figure 5. Chart for Geological Strength Index (GSI) Determination (after M. Cai, P.K. Kaiser, H. Uno, Y. Tasaka, M. Minami, International Journal of Rock Mechanics& Mining Sciences 41, 2004, p3-19)

Joint Wall Compressive Strength: Measure of how the strength of the joint wall compares to the intact strength of the rock and is based on the UCS intact hardness grade.

Rock Quality Designation (RQD):

$$RQD = \frac{\Sigma \text{ Length of core pieces} > 10 \text{ cm}}{\text{Total length of core run}} \times 100\%$$

Fracture Intercept (m): Fracture intercept is the average length between fractures in meters.

Natural Discontinuity No.: Number of discontinuities per drilling interval. When fault infill or broken rock zones were encountered, 1 extra discontinuity for each 10mm was counted. When intervals were found to have closely spaced discontinuities too numerous to count, (discs of core or rubble) the length of the zone was divided by the average particle size to obtain the number of discontinuities, for example a 30 cm zone with average 6 cm diameter rock fragments would add 5.

Rock Mass rating (RMR, Bieniawski, 1976):

The processing of the data highlighted two issues arising within the fractured and weathered rock intervals were the drilling process affected the recoveries: the fracture count became less consistent with the rest of the data and Rock Mass Strength values were being assigned to drilling intervals that were partly unknown. To support the reporting accuracy, RMR values were only calculated for drilling intervals with a core recovery greater than 50%.

Cut Slopes and Outcrops:

Slope Angle: average inclination angle to a horizontal plane.

Slope Direction: average dipping direction of the face of the cut slope or outcrop.

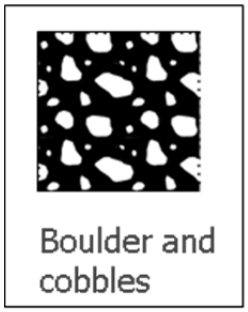
Dip: inclination angle of a rock structural set along the steepest line to a horizontal plane.

Dip direction: azimuth of the dip line, clockwise from North, local declination taken into account (23.5°E).

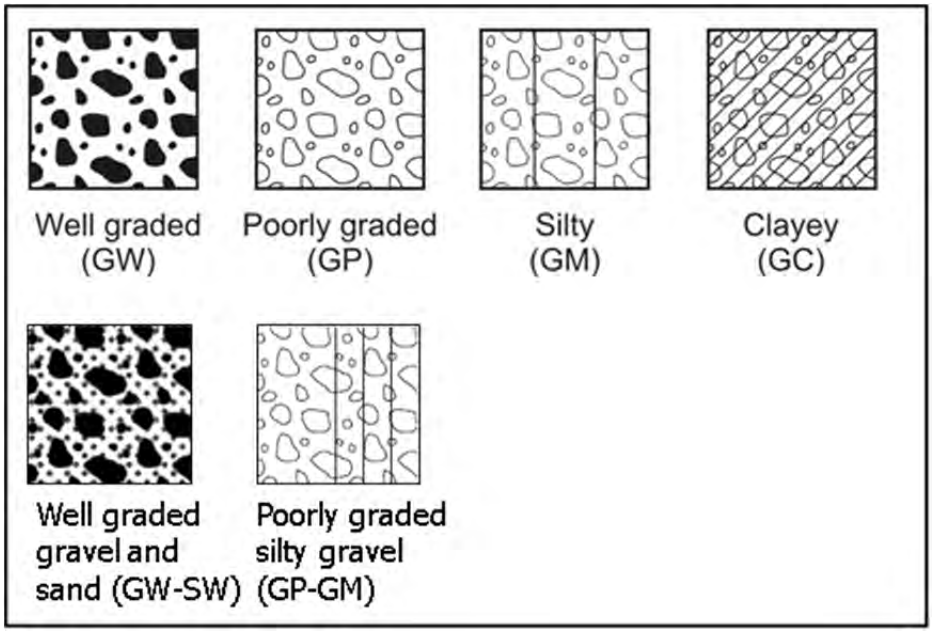
GRAPHIC SYMBOLS LEGEND FOR TEST HOLE LOGS

SOIL TYPES – COARSE-GRAINED

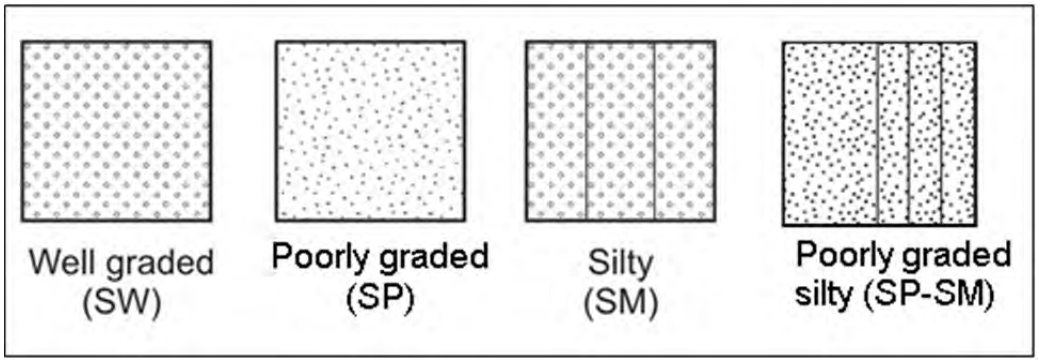
Boulders and cobbles



Gravel

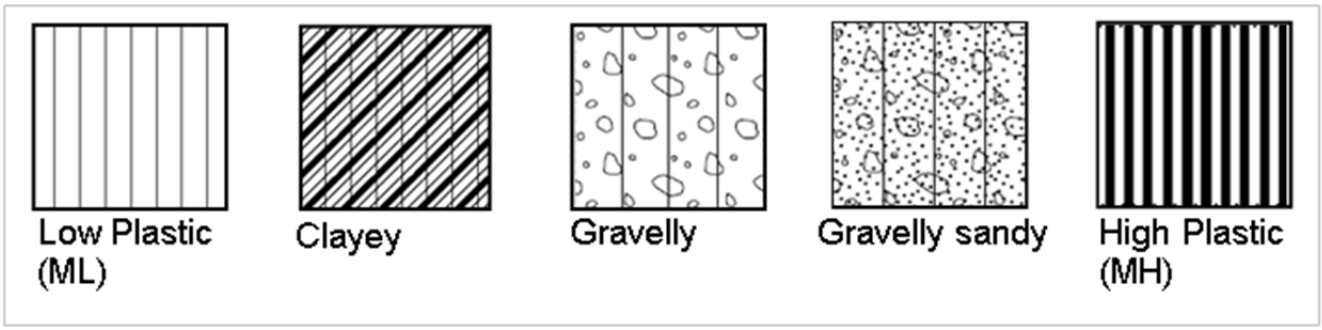


Sand

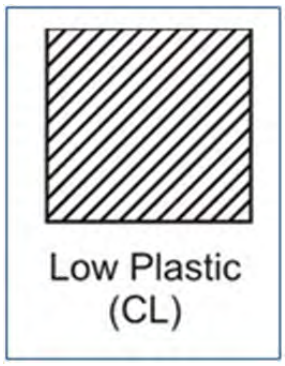


SOIL TYPES – FINE-GRAINED

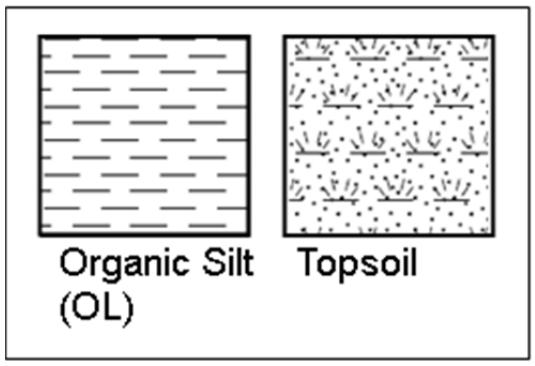
Silt



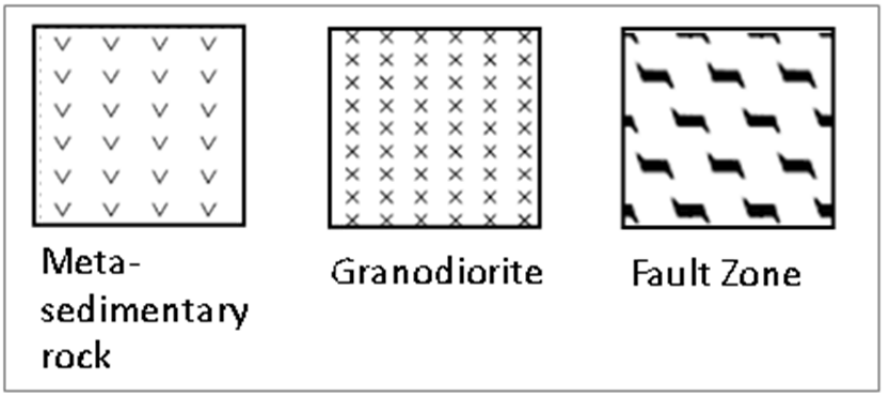
Clay



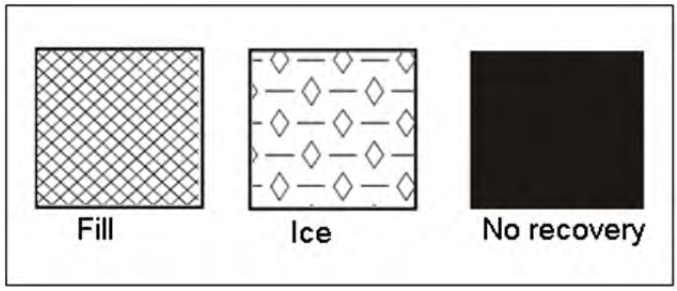
Organics



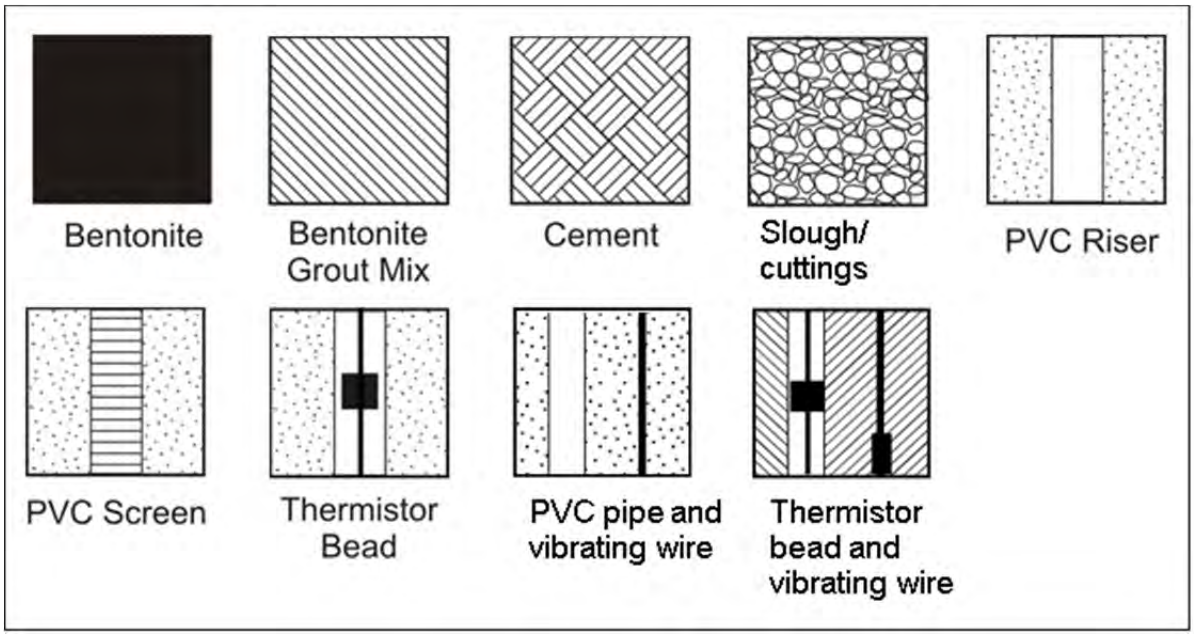
ROCK TYPES



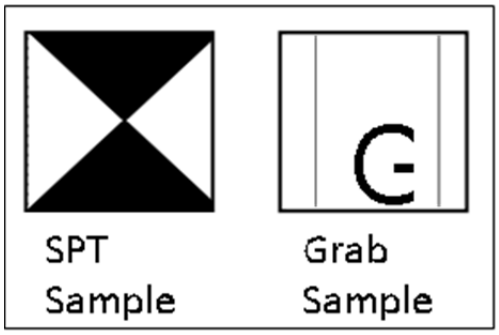
OTHERS



INSTALLATIONS



SAMPLES



APPENDIX B
OUTCROP MAPPING

OUTCROP MAPPING

Table B- 1: Summary of Outcrop Maps

Outcrop	Northing (m)	Easting (m)	Elevation (masl)	RockType	UCS Rock Strength (R)[3]	Weathering Grade (W)[4]	Avgerage Block Size (m)[4]	Average GSI[5]
OC-BGC11-01	7099238	459344	954	Intrusive	3	2.5	0.3	45
OC-BGC11-02	7099143	459342	1067	Intrusive	3.5	2	0.2	45
OC-BGC11-03	7099041	459553	1047	Quartzite	4.5	1.5	0.1	40
OC-BGC11-04	7099026	459019	1036	Quartzite	4	1.5	0.5	50
OC-BGC11-05	7099094	459678	1053	Intrusive	4.5	2	0.5	65
OC-BGC11-06	7099075	459709	1054	Quartzite	4	2	0.3	55
OC-BGC11-07	7102198	460361	1192	Quartzite	4	2	0.07	40
OC-BGC11-08	7102198	460361	1191	Quartzite	3.5	2	0.07	40
OC-BGC11-09	7102205	460436	1200	Quartzite	--	--	0.2	50
OC-BGC11-10	7099875	460024	1146	Quartzite	2	2	0.2	45
OC-BGC11-11	7099815	460157	1198	Intrusive	4.5	1.5	0.3	60
OC-BGC11-12	7099828	460151	1188	Intrusive	4.5	1.5	0.2	55
OC-BGC11-13	7099824	460176	1195	Intrusive	3	2	0.4	60
OC-BGC11-14	7101532	461754	1206	Intrusive	4.5	2	0.25	55
OC-BGC11-15	7101570	461526	1151	Quartzite	2	4	0.05	28.5
OC-BGC11-16	7099341	460701	1406	Quartzite	5	2	0.6	65
OC-BGC11-17	7099403	460865	1403	Quartzite	5	2	0.4	65

Outcrop	Northing (m)	Easting (m)	Elevation (masl)	RockType	UCS Rock Strength (R)[3]	Weathering Grade (W)[4]	Avgerage Block Size (m)[4]	Average GSI[5]
OC-BGC11-18	7099473	460332	1303	Quartzite	4.5	2	0.25	50
OC-BGC11-19	7099996	459794	1068	Quartzite	3	3	0.15	37.5
OC-BGC11-20	7100213	460060	1105	Quartzite	3	3	0.1	37.5
OC-BGC11-21	7099879	459852	1091	Quartzite	4	2	0.15	45
OC-BGC11-22	7099590	459880	1160	Intrusive	6	2	0.15	55
OC-BGC11-23	7100289	460110	1111	Quartzite	3.5	1.5	0.08	40
OC-BGC11-24	7100089	460221	1069	Intrusive	3	2	0.5	55
OC-BGC11-25	7100350	460142	1033	Quartzite	4.5	2	0.2	45
OC-BGC11-26	7099104	459656	1045	Quartzite	3	2	0.1	40
OC-BGC11-27	7099534	459343	971	Quartzite	3	2	0.07	42.5
OC-BGC11-28	7099610	459302	948	Quartzite	3.5	2	0.1	45
				Quartzite	2	2.5	0.03	35
OC-BGC11-29	7099512	459444	983	Quartzite	2.5	2.5	0.03	32
OC-BGC11-30	7099467	459387	947	Intrusive	4	2	0.2	55
				Intrusive	4	2	0.2	55
OC-BGC11-31	7099768	459788	1087	Quartzite	3.5	1.5	0.1	50
OC-BGC11-32	7099753	460179	1176	Intrusive	4.5	1.5	0.3	55
OC-BGC11-33	7099961	460143	1160	Quartzite	3.5	2	0.08	40
				Intrusive	3.5	2	0.15	55
OC-BGC11-34A	7099344	460193	1266	Quartzite	4.5	1.5	0.2	55
OC-BGC11-34B	7099344	460193	1266	Quartzite	4.5	1.5	0.2	55
OC-BGC11-35	7100175	459768	1023	Quartzite	3.5	2	0.15	50

Outcrop	Northing (m)	Easting (m)	Elevation (masl)	RockType	UCS Rock Strength (R)[3]	Weathering Grade (W)[4]	Avgerage Block Size (m)[4]	Average GSI[5]
OC-BGC11-36	7100272	459698	1009	Quartzite	3	2	0.1	45
OC-BGC11-37	7100383	460067	1052	Quartzite	3.5	2	0.25	52
OC-BGC11-38	7100968	460124	997	Quartzite	4	1.5	0.2	55
OC-BGC11-39	7100395	460382	1057	Quartzite	4.5	2	0.2	55
OC-BGC11-40	7101809	459981	1051	Phyllite	1	2.5	0.005	20
				Quartzite	2	2	0.05	35
OC-BGC11-41	7102064	459915	1048	Phyllite	0.5	3	0.005	15
				Quartzite	3	2	0.1	40
OC-BGC11-42	7101893	459188	1072	Phyllite	1	2	0.02	15
OC-BGC11-43	7101403	459686	913	Phyllite	2	2.5	0.05	30
OC-BGC11-44	7101327	459852	895	Quartzite	2.5	2	0.07	35
OC-BGC11-45	7101136	459318	848	Quartzite	3.5	2	0.07	43
OC-BGC11-46	7101078	459173	839	Quartzite	4	1.5	0.1	50
OC-BGC11-47	7100272	459725	993	Quartzite	2	3	0.05	30
OC-BGC11-48A	7101009	458635	807	Quartzite	3	2	0.05	35
OC-BGC11-48B	7101022	458616	805	Quartzite	3	2	0.1	45
OC-BGC11-49	7101020	459452	859	Soil	--	--	--	--
OC-BGC11-50	7101140	458828	859	Phyllite	2	2.5	0.02	25
OC-BGC11-51	7101187	458932	885	Quartzite	0.5	4	0.005	--
OC-BGC11-52	7101039	459097	849	Phyllite	2	3	0.05	25
OC-BGC11-53	7099996	459359	1009	Quartzite	4	1.5	0.15	55

Outcrop	Northing (m)	Easting (m)	Elevation (masl)	RockType	UCS Rock Strength (R)[3]	Weathering Grade (W)[4]	Avgerage Block Size (m)[4]	Average GSI[5]
OC-BGC11-54	7099871	460694	1288	Intrusive	5.5	1.5	0.7	65
OC-BGC11-55A	7100389	460728	1248	Intrusive	4.5	1.5	0.5	60
OC-BGC11-55B	7100373	460719	1239	Intrusive	4.5	1.5	0.4	60

NOTES:
1. Location from handheld GPS measurements.
2. Coordinates in UTM NAD 83, Zone 8N.
3. Unconfined Compressive Strength / Hardness Classification for Rock (after CFEM 2006) - Appendix A
4. See Appendix A.
5. Geological Strength Index - See Appendix A.

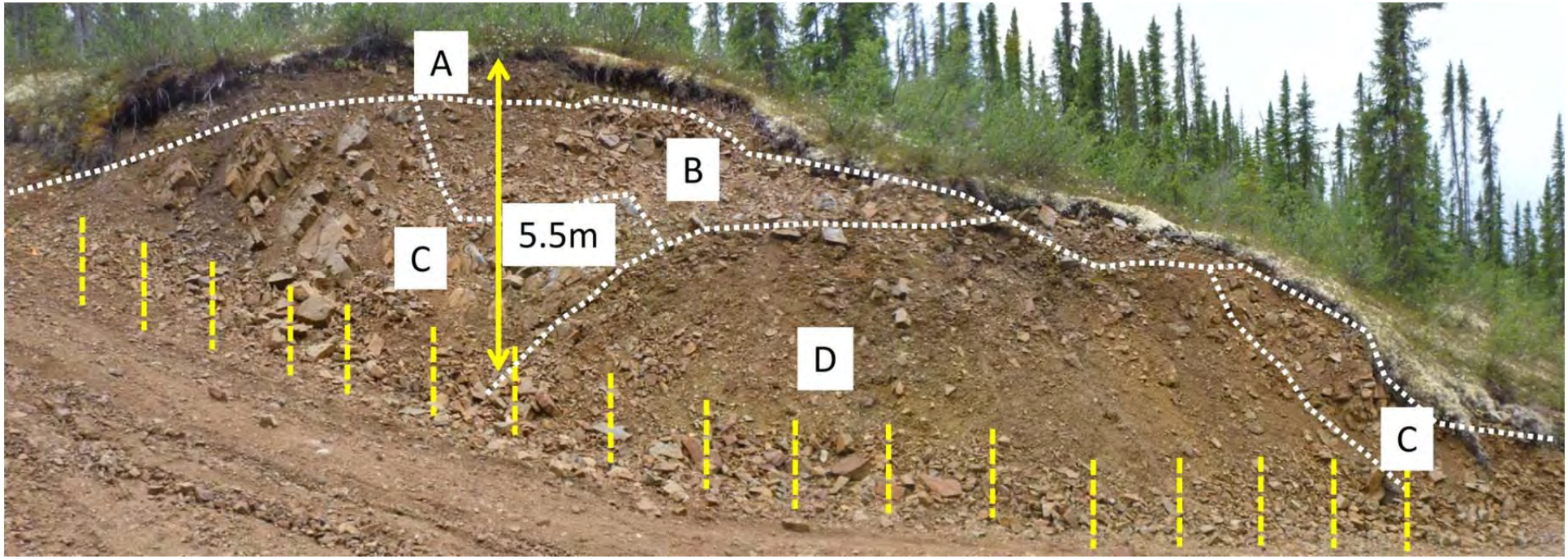
Outcrop OC-BGC11-01

Location: Platinum Gulch
Facility: Platinum WRSA
Outcrop type: Man-made (Road cut)

Northing: 7099238
Easting: 459344
Elevation: 954 m
Survey type: Handheld GPS

Slope Angle:
Slope Direction:
Date logged: 6/26/2011
Logged by: LGT/SP

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: GRAVEL: Sandy, some cobbles and trace silt (GW). Brown, moist, loose, nonplastic, and homogeneous. Clasts are granodiorite, R2-R3, angular, equidimensional to elongated, max particle size = 120 mm. [COLLUVIUM]

B: Pinkish brown, medium- to coarse-grained GRANODIORITE. Slightly to moderately weathered and iron-stained (W2.5), medium strong (R3). Blocks are polyhedral. GSI structure = blocky/disturbed, GSI surface = Good to Fair, GSI range = 40-50.

C: Pinkish grey, medium- to coarse-grained GRANODIORITE. Faintly weathered and iron-stained (W1.5), medium strong (R3). Blocks are rhombohedral.

D: Outcrop obscured by ravelled colluvium.

Outcrop OC-BGC11-01

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT C

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	34	232	1		6-15		0.15	2	J
2	48	82	1		6-15		0.15	2	J
3	50-75	314-344	1		6-15		0.15	2	J

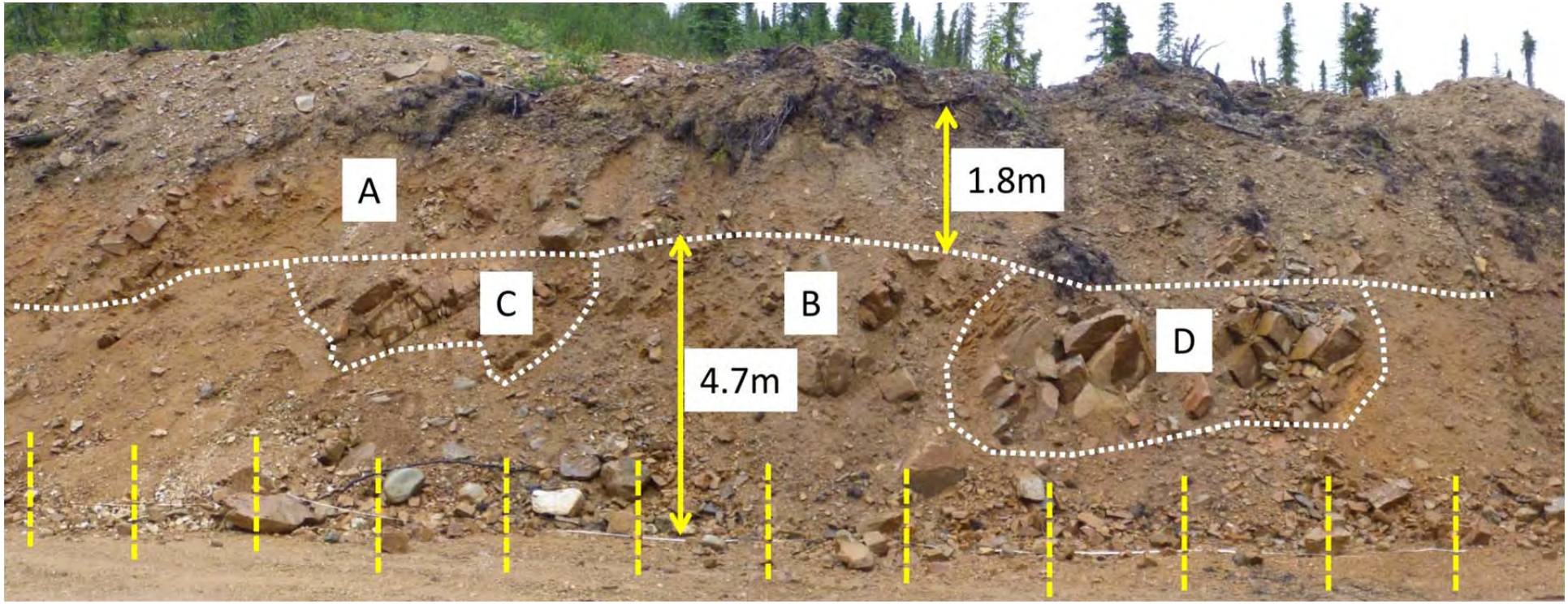
Outcrop OC-BGC11-02

Location: Platinum Gulch
Facility: Platinum WRSA
Outcrop type: Man-made (Road cut)

Northing: 7099143
Easting: 459342
Elevation: 1067 m
Survey type: Handheld GPS

Slope Angle:
Slope Direction:
Date logged: 6/27/2011
Logged by: SP/LGT

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: GRAVEL: Sandy, some cobbles, well-graded (GP-SW). Non-plastic, brown, moist, loose, homogeneous. Sand is well-graded, fine to medium. Clasts are granodiorite and metasediments, R3-R4, angular, equidimensional to elongated, max particle size = 80 mm. [COLLUVIUM]

B: Ravelled COLLUVIUM covering face of outcrop.

C: Brownish grey medium- to coarse-grained GRANODIORITE. Slightly to moderately weathered (W2-2.5), weak to medium strong (R2-R3). Blocks are rhombohedral. GSI structure = Blocky/disturbed, GSI surface = Good, GSI range = 35-45.

D: Medium- to coarse-grained orangish grey GRANODIORITE. Slightly weathered (W2), strong (R4). Blocks are rhombohedral, ~40 cm. GSI structure = Blocky, GSI surface = Good, GSI range = 50-60.

Outcrop OC-BGC11-02

PHOTO OF STRUCTURE – UNIT D

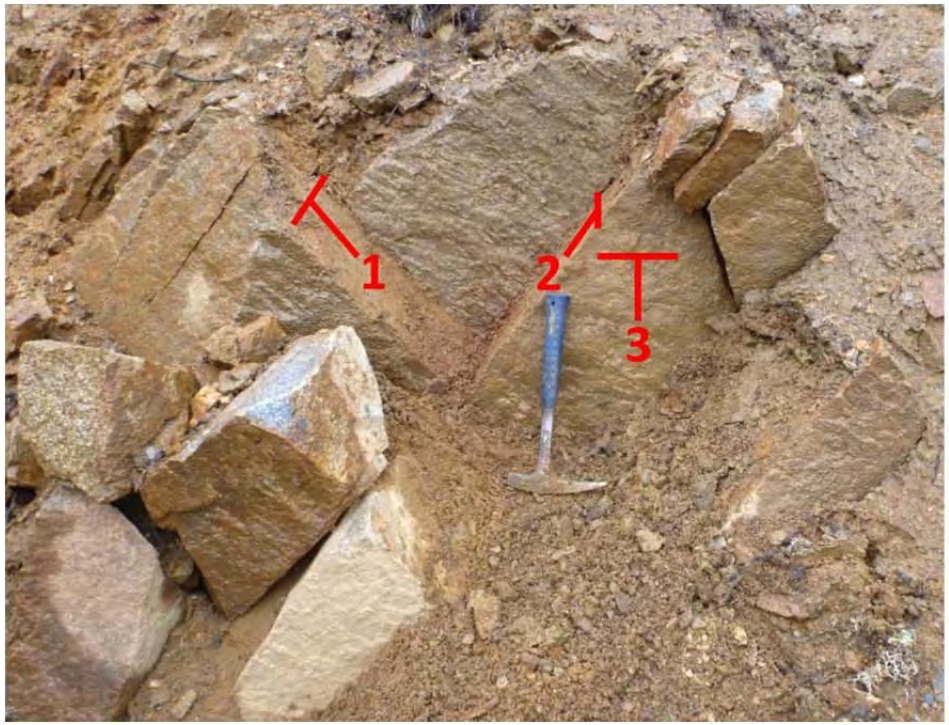
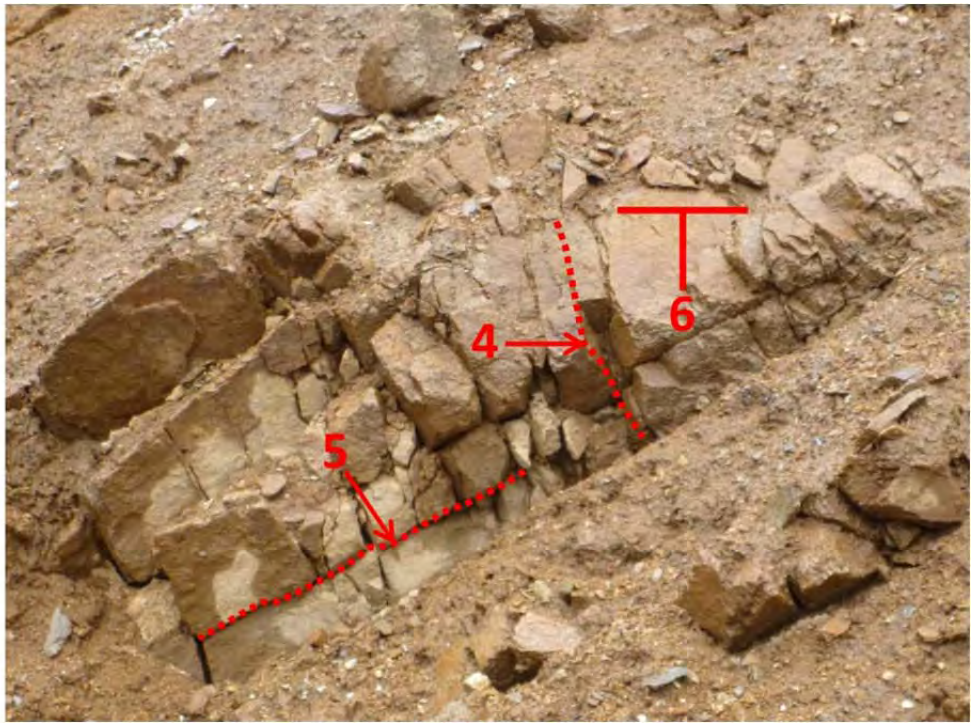


PHOTO OF STRUCTURE – UNIT C



DISCONTINUITY TABLE – UNITS C/D

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	51	34	2	SM-SA	4	3	0.3	>1.5m	J
2	42	59	2	SM-SA	4	3	0.4	>3.5m	J
3	68	144	2	SM-SA	5	3	0.4	>1.5m	J
4	29	76	2	SM-SA	14	3	0.1	>1m	J
5	88	333	3	SM-SA	14	3	0.1	>4m	J
6	54	280	3	SM-SA	14	3	0.1	>0.4m	J

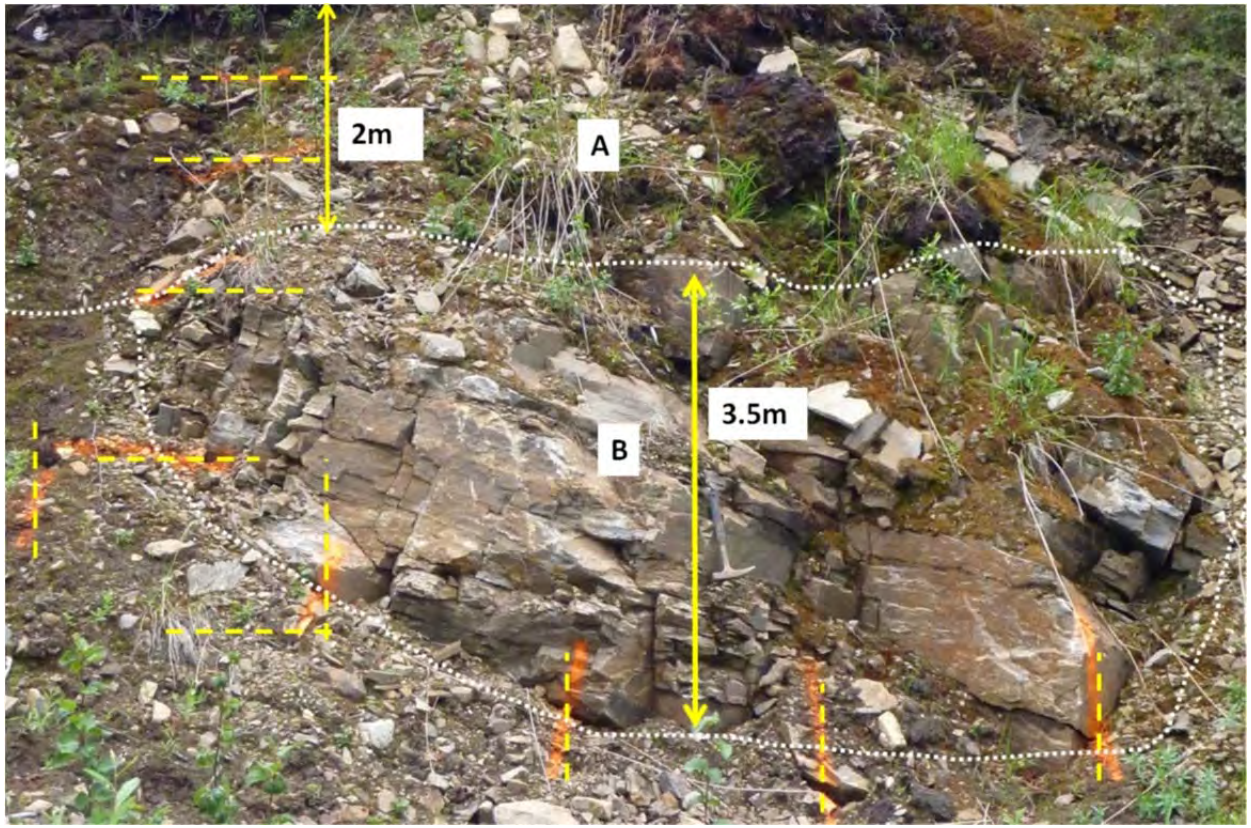
Outcrop OC-BGC11-03

Location: Platinum Gulch
Facility: Platinum WRSA
Outcrop type: Man-made (old road cut)

Northing: 7099041
Easting: 459553
Elevation: 1047 m
Survey type: Handheld GPS

Slope Angle:
Slope Direction:
Date logged: 6/28/2011
Logged by: LGT/SP

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: SAND: Gravelly, some cobbles, trace silt, some boulders, well-graded (SW-GW). Non plastic, brown, moist, loose, homogeneous Clasts are metasedimentary with trace granodiorite, angular, elongated, medium strong (R3-R4); max particle size is 300 mm. [COLLUVIUM]

B: Brownish grey, fine to medium grained QUARTZITE. Foliated, faintly weathered (W1.5), strong to very strong (R4-5). Blocks are tabular to rhombohedral. GSI structure = Very Blocky to Blocky/disturbed, GSI surface = Fair, GSI range = 35-45.

Outcrop OC-BGC11-03

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	20	238	5	SM-SA-FE	6	4	0.1	>3m	JO
2	65	30	1	NV	12	4	0.4	>1.5m	J
3	83	168	4	SM-SA-FE	6	4	0.45	>0.5m	J

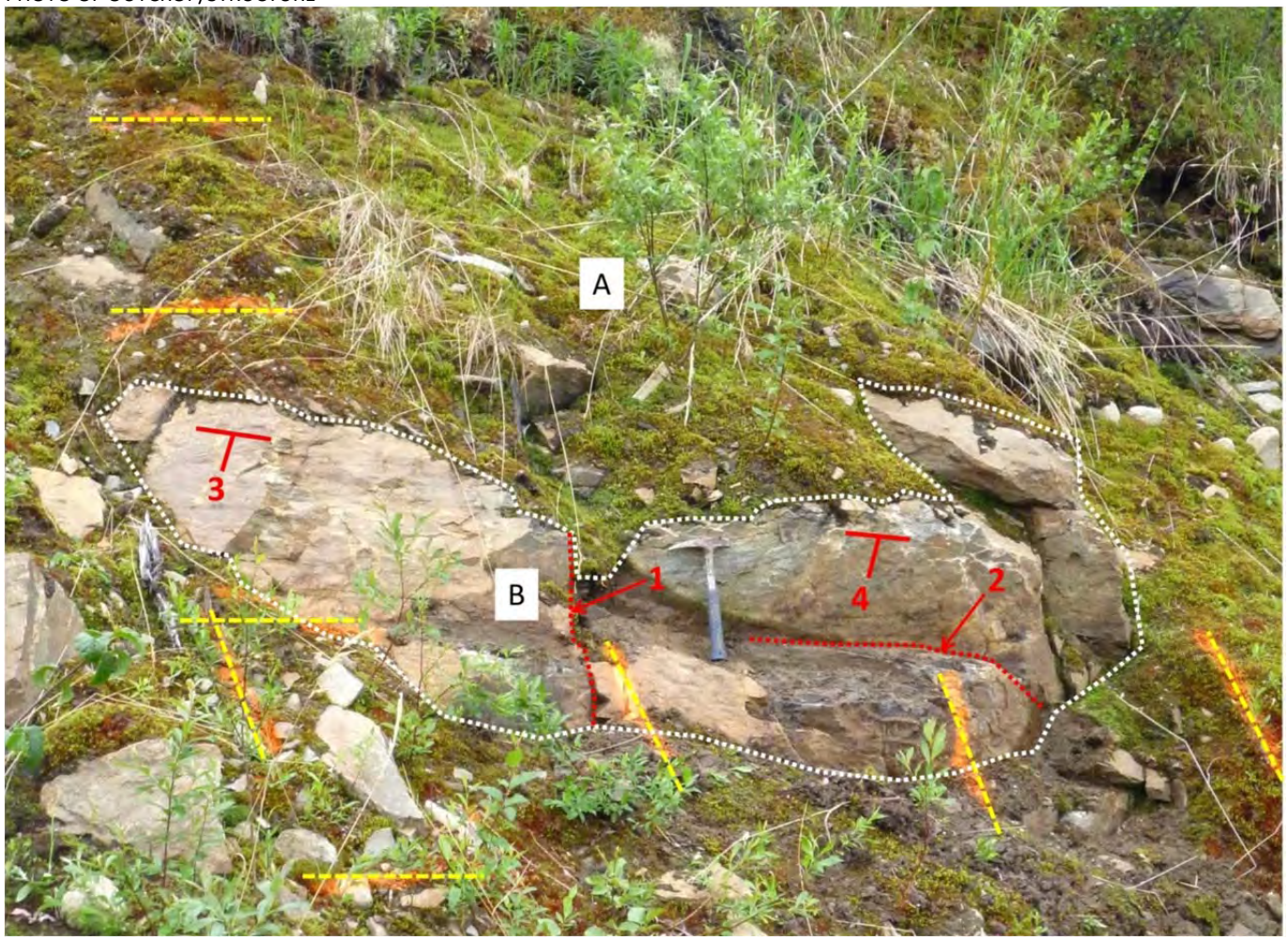
Outcrop OC-BGC11-04

Location: South of Platinum Gulch
Facility: Platinum WRSA
Outcrop type: Man-made (Old road cut)

Northing: 7099026
Easting: 459019
Elevation: 1036 m
Survey type: Handheld GPS

Slope Angle: 50°
Slope Direction: 225°
Date logged: 6/28/2011
Logged by: LGT/SP

PHOTO OF OUTCROP/STRUCTURE



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-04

DESCRIPTION OF MATERIALS

A: SAND: Gravelly, some cobbles, trace silt (GW-SW). Non plastic, brown, moist to wet, and homogeneous. Clasts are metasedimentary with trace granodiorite, angular, elongated, medium strong (R3-R4), slightly weathered (W2). [COLLUVIUM]

B: Brownish grey, fine- to medium-grained QUARTZITE. Strong (R4), faintly to slightly weathered (W1.5-W2). Discontinuities moderately to widely spaced. GSI structure = massive, GSI surface = Good to Fair, GSI range = 55-65.

DISCONTINUITY TABLE

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	84	266	5	CX-SM-FE	14	4	1.2	>1m	J
2	10	308	NV	NV	8 (1m)	4	NV	>1m	J
3	50	10	NV	NV	8 (1m)	4	NV	>0.4m	J
4	88	317	0.5	SA-SM	6 (0.4m)	4	0.35	>0.7m	J

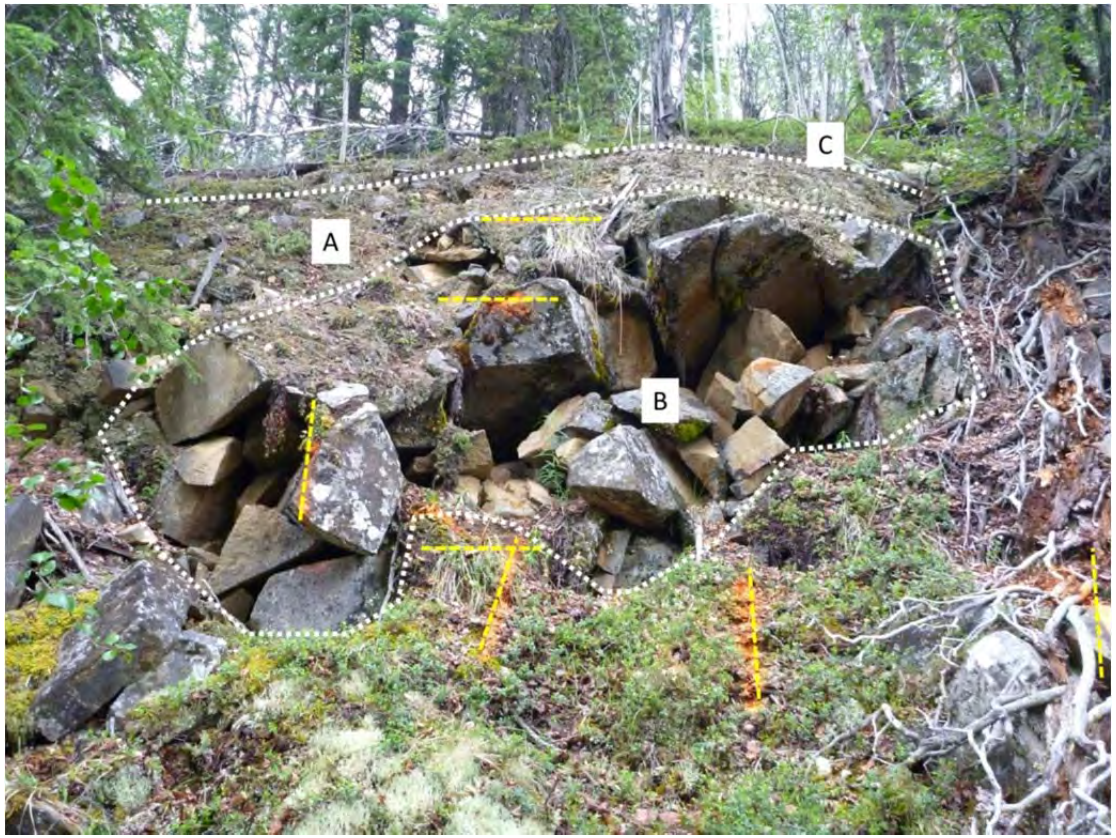
Outcrop OC-BGC11-05

Location: Platinum Gulch
Facility: Platinum WRSA
Outcrop type: Natural

Northing: 7099094
Easting: 459678
Elevation: 1053 m
Survey type: Handheld GPS

Slope Angle: 65°
Slope Direction: 215°
Date logged: 6/28/2011
Logged by: LGT/SP

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: GRAVEL: medium to coarse, sandy, some cobbles, trace silt, and trace boulders (GW). Sand is orange-brown, and moist. Clasts are angular, elongated, medium strong to strong (R3-R4), slightly weathered (W2). Max particle size= 350 mm. [COLLUVIUM]

B: Pinkish-brown, medium- to coarse-grained GRANODIORITE. Strong to very strong (R4-5), slightly to moderately weathered (W1.5-W2). Blocks are rhomboidal to tabular. GSI structure = Blocky, GSI surface = Good, GSI range = 60-70. Some evidence of contact with metasedimentary rock above the outcrop.

Outcrop OC-BGC11-05

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	26	3	50	FE	6 (1m)	4	0.5	>1.5	J
2	54	125	20	FE	6 (1m)	4	0.4	>1.5	J

Outcrop OC-BGC11-06

Location: Platinum Gulch
Facility: Platinum WRSA
Outcrop type: Natural

Northing: 7099075
Easting: 459709
Elevation: 1054 m
Survey type: Handheld GPS

Slope Angle: 46°
Slope Direction: 200°
Date logged: 6/28/2011
Logged by: SP/LGT

PHOTO OF OUTCROP



DESCRIPTION OF MATERIALS

A (3 to 10 m above base of outcrop): Grey to pinkish grey, fine- to medium-grained QUARTZITE. Faintly to slightly weathered (W1.5-W2), Strong (R4). Blocks are rhomboidal to tabular. GSI structure = Blocky, GSI surface = Good, GSI range = 55-65.

B (10 to 41 m above base of outcrop): Grey to pinkish grey, fine- to medium-grained QUARTZITE. Slightly weathered (W2), strong (R4). GSI structure = Very Blocky, GSI surface = Good to Fair, GSI range = 45-55.

Outcrop OC-BGC11-06

PHOTOS OF STRUCTURE, UNITS A/B (NUMBERS ABOVE PHOTOS GIVE THEIR LOCATION IN TERMS OF HEIGHT ABOVE OUTCROP BASE)

32 to 41 m



27 to 32 m



10-18 m



3-8 m



DISCONTINUITY TABLE

Height from base of outcrop (m)	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
	83	170			10 to 20	4	NV		J
41	65	260			2 to 16	4	NV		J
	60	65			2 to 16	4	0.2 to 1	>4m	J
27	60	70			2 to 16	4	0.2 to 2	>4m	J
	82	302			10 to 20	4	1	>4m	J
18	80	180			10 to 20	4	1	>6m	J
	86	136			10 to 20	4	NV		J
13	46	255			2 to 16	4	1 to 1.4		J
	59	210			2 to 16	4	NV		J
	72	170	2 to 40	CX	10 to 20	4	0.25 to 1.2	>4m	J
7	74	290			10 to 20	4	NV		J

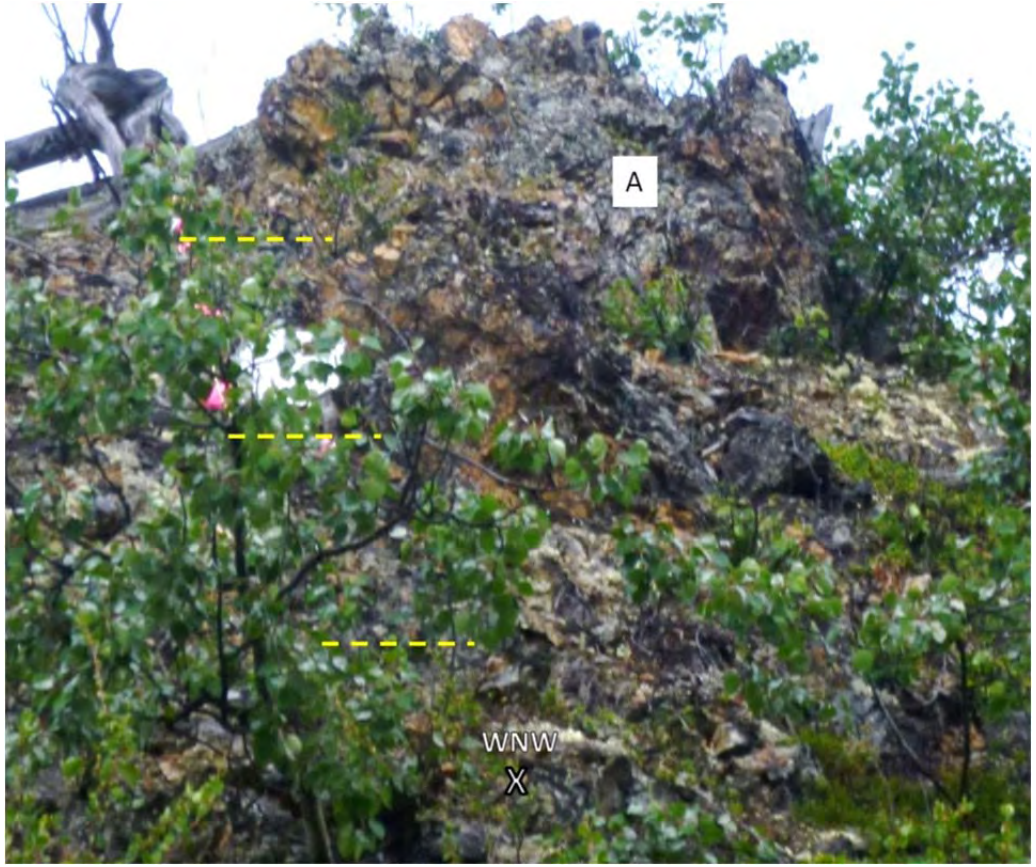
Outcrop OC-BGC11-07

Location: Ann Gulch
Facility: Heap leach pad
Outcrop type: Natural

Northing: 7102198
Easting: 460361
Elevation: 1192 m
Survey type: Handheld GPS

Slope Angle: 35°
Slope Direction: 145°
Date logged: 6/30/2011
Logged by: EB/SP/LGT

PHOTO OF OUTCROP



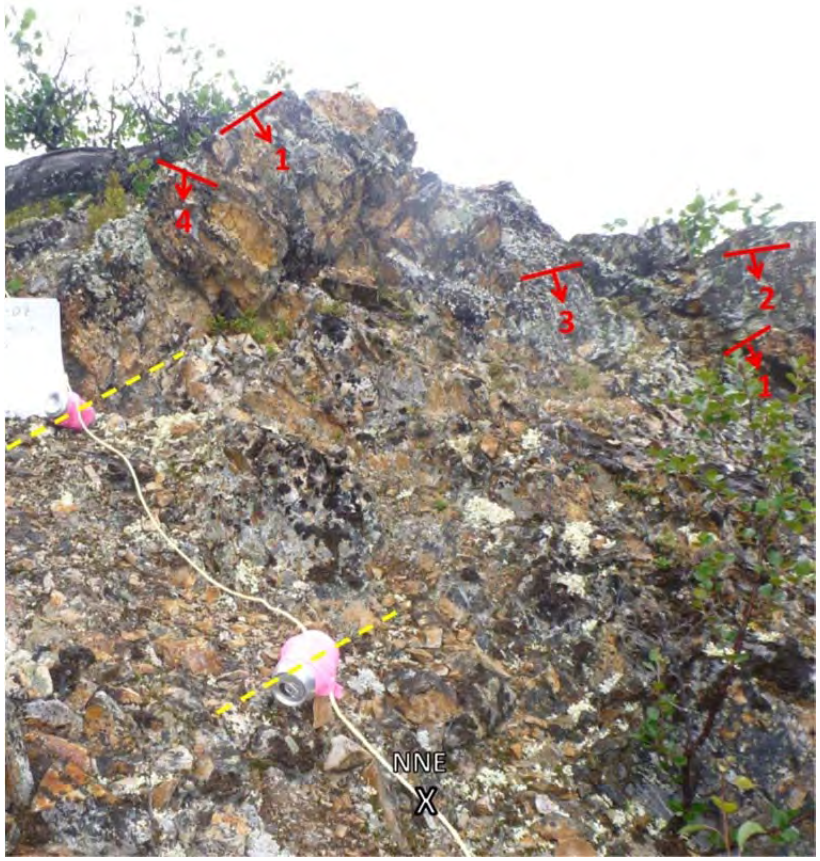
1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Brownish grey, fine- to medium-grained QUARTZITE. Slightly weathered (W2), moderately strong to strong (R4). Blocks are rhombohedral; discontinuities are very closely spaced. GSI structure = Blocky/disturbed, GSI surface = Good to Fair, GSI range = 35-45.

Outcrop OC-BGC11-07

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	62	132	3-25	Bx-ML-SA	2-20 (1m)	4	0.1 to 0.4	1.5	J
2	88	280	2-10	Bx-ML-SA	2-20 (1m)	4		>1	J
3	58	210	0.2-0.5	Fe, Bx, SA	5 (0.1m)	4		>0.4	J
4	86	128	NV	NV		4			J

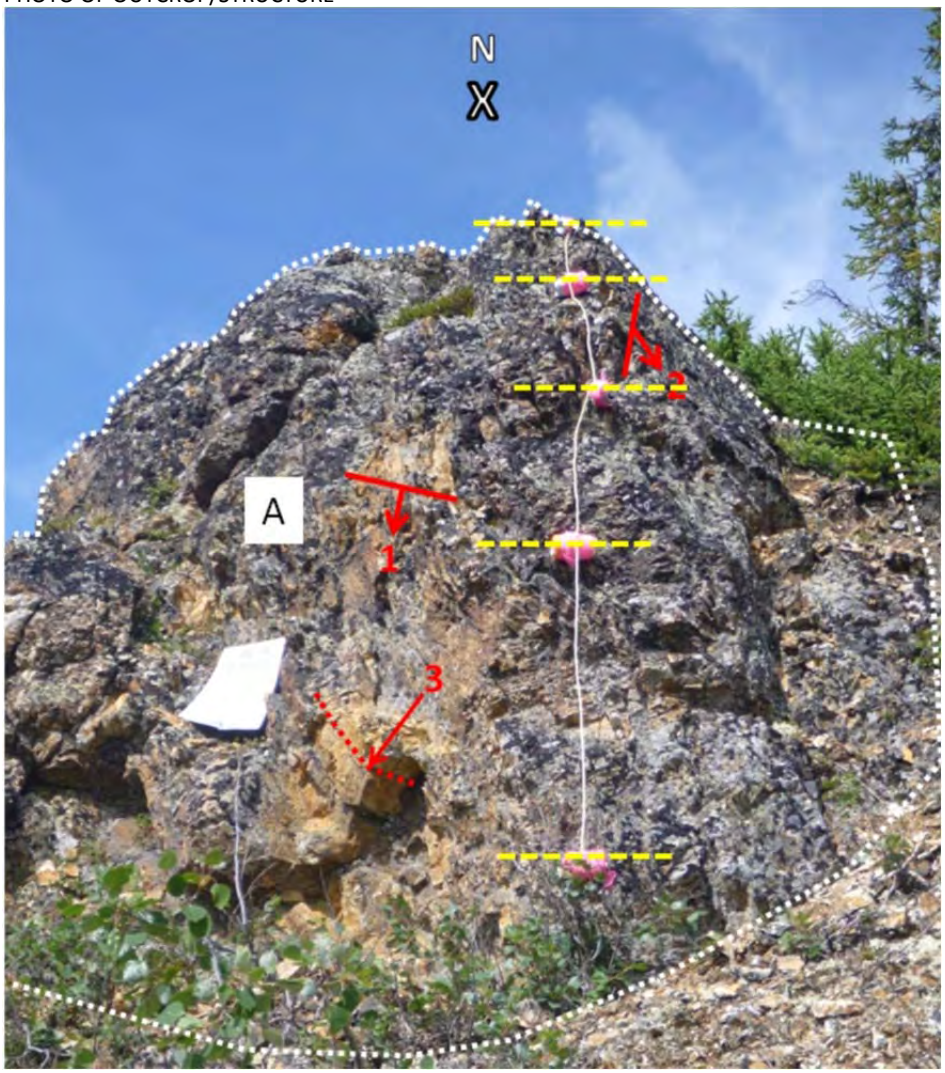
Outcrop OC-BGC11-08

Location: Ann Gulch
Facility: Heap leach pad
Outcrop type: Natural

Northing: 7102198
Easting: 460361
Elevation: 1191 m
Survey type: Handheld GPS

Slope Angle: 40°
Slope Direction: 145°
Date logged: 6/30/2011
Logged by: EB/SP/LGT

PHOTO OF OUTCROP/STRUCTURE



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-08

DESCRIPTION OF MATERIALS

A: Brownish grey, fine- to medium-grained QUARTZITE. Foliated, slightly weathered (W2), moderately strong to strong (R3 to R4). Blocks are polyhedral; discontinuities very closely spaced. GSI structure = Blocky/disturbed, GSI surface = Fair to Good, GSI range = 35-45.

DISCONTINUITY TABLE - UNIT A

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	83	66	10	BX-FE	12	4	2	2.5	J
2	41	191	5	CX-FE	12	4	0.2	2	J
3	43	324	5	CX-ML-SA	10	4	0.2	0.5	J

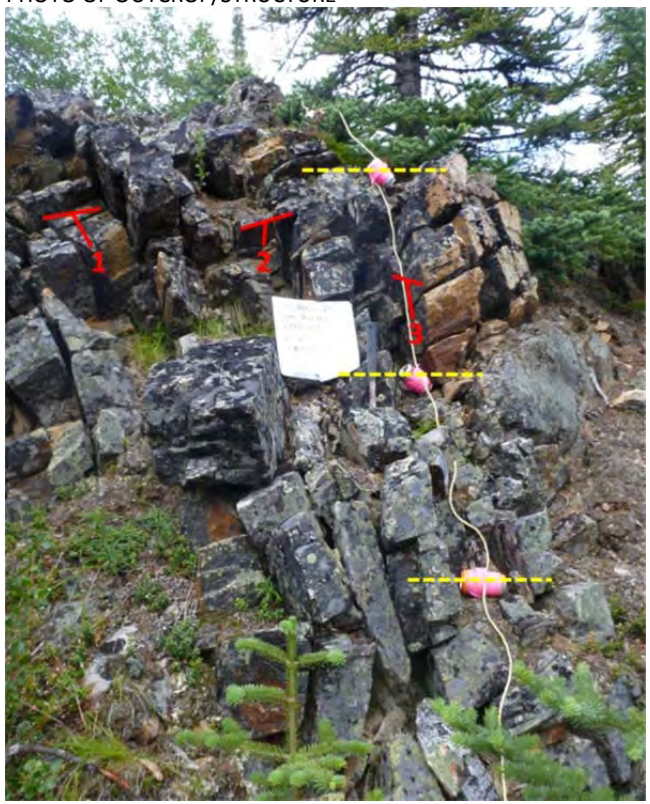
Outcrop OC-BGC11-09

Location: Ann Gulch
Facility: Heap leach pad
Outcrop type: Natural

Northing: 7102205
Easting: 460436
Elevation: 1200 m
Survey type: Handheld GPS

Slope Angle: 60°
Slope Direction: 225°
Date logged: 6/30/2011
Logged by: EB/SP/LGT

PHOTO OF OUTCROP/STRUCTURE



1m spacing along outcrop surface between yellow dashed lines.

DISCONTINUITY TABLE

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	80	202			10	4		6	J
2	25	279	15	FE-CX	4	4	0.3	1	J
3	37	346	15	FE-CX	4	4	0.3	1	J
4	85	92	90	FE-CX	10	4	0.6	3	J

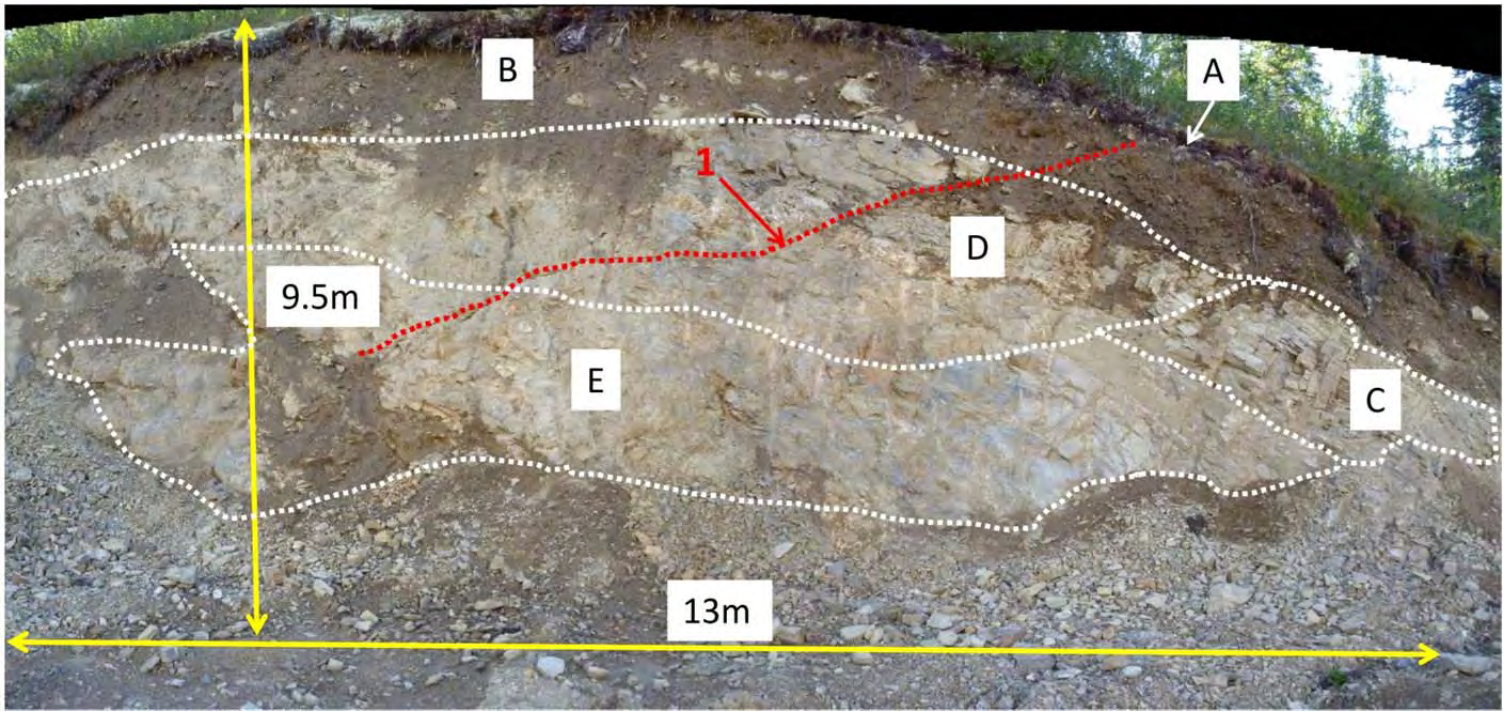
Outcrop OC-BGC11-10

Location: Pit area
Facility: Primary crusher
Outcrop type: Man-made (road cut)

Northing: 7099875
Easting: 460024
Elevation: 1146 m
Survey type: Handheld GPS

Slope Angle: 45-65°
Slope Direction: 285°
Date logged: 7/9/2011
Logged by: LGT

PHOTO OF OUTCROP



DESCRIPTION OF MATERIALS

A: Root mat and organic silt, 0.2 to 0.4m thick. [TOPSOIL]

B: SILT: Gravelly, some sand, trace cobbles and boulders (ML). Nonplastic, brown, moist, homogeneous. Maximum particle size is 300 mm. Clasts are elongated, angular, weak to strong (R2-R4). [COLLUVIUM]

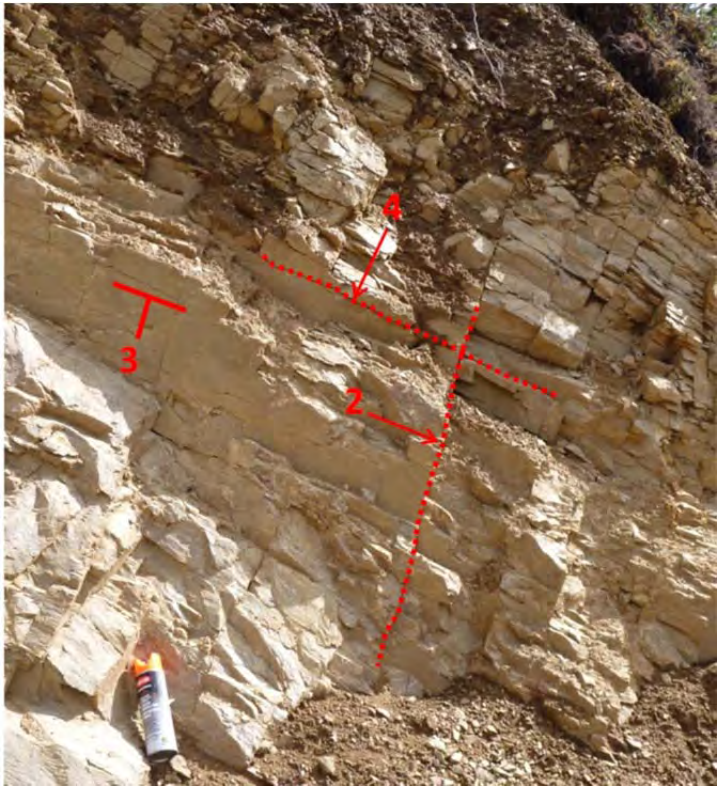
C: Light brownish grey, fine-grained QUARTZITE. Faintly weathered (W1.5), very weak to weak (R1.5). Blocks are prismatic, with 3 main discontinuity sets (2,3 and 4). GSI structure = Very Blocky, GSI surface = Good to Fair, GSI range = 35-45.

D: Brownish-grey, fine-grained QUARTZITE. Slightly to moderately weathered (W2-W3), very weak (R1), extremely closely fractured. GSI structure = Blocky/disturbed, GSI surface = Good to Fair, GSI range = 30-40.

E: Light brownish-grey, fine-grained QUARTZITE. Lightly weathered (W2); moderately strong (R3). Blocks are prismatic with 4 main sets (5 to 8). GSI structure = Very Blocky, GSI surface = Good, GSI range = 45-55.

Outcrop OC-BGC11-10

PHOTO OF STRUCTURE – UNIT C



DISCONTINUITY TABLE – UNITS C/D/E

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	28	78	78	SD-CX	20	R2		7	J
2	75	73	73	CX-SM	2	R3	0.15	2	J
2	63	69	69	CX-SM-SA	4	R3	0.3	2	J
3	60	322	322	FE-SM-SA	20	R3	0.3	3	J
4	24	300	300	FE-SM-SA	16	R3	0.3	3	J
5	45	150	150	SA	20	R3	0.25	1.5	J
6	59	305	305	FE-CX-SA	6	R3	0.4	4	J
7	25	235	235	FE-SM-SA	16	R3	0.12	1.5	JO
8	65	85	85	FE-SM-SD	8	R3	0.05	2	J

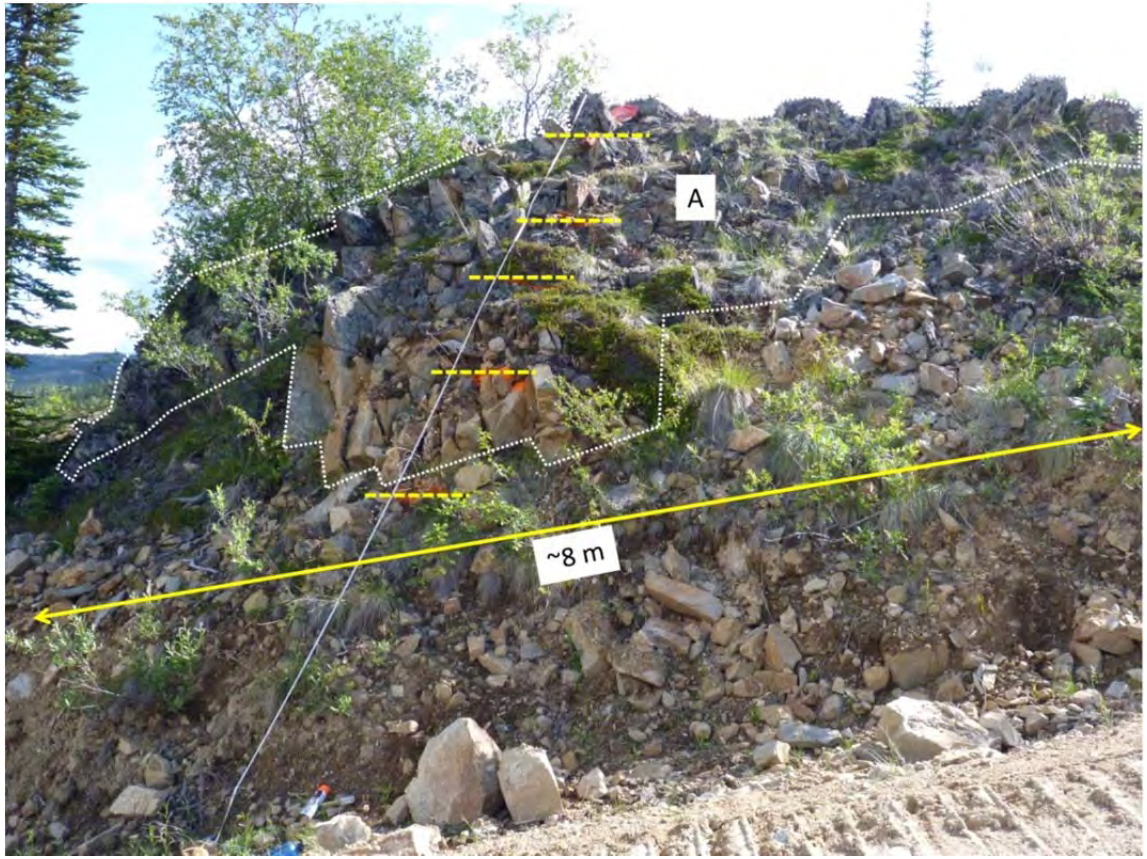
Outcrop OC-BGC11-11

Location: Pit area
Facility: Eagle Pup WRSA
Outcrop type: Natural, with road cut at its base

Northing: 7099815
Easting: 460157
Elevation: 1198 m
Survey type: Handheld GPS

Slope Angle: 35/65°
Slope Direction: 260-280°
Date logged: 7/10/2011
Logged by: LGT

PHOTO OF OUTCROP



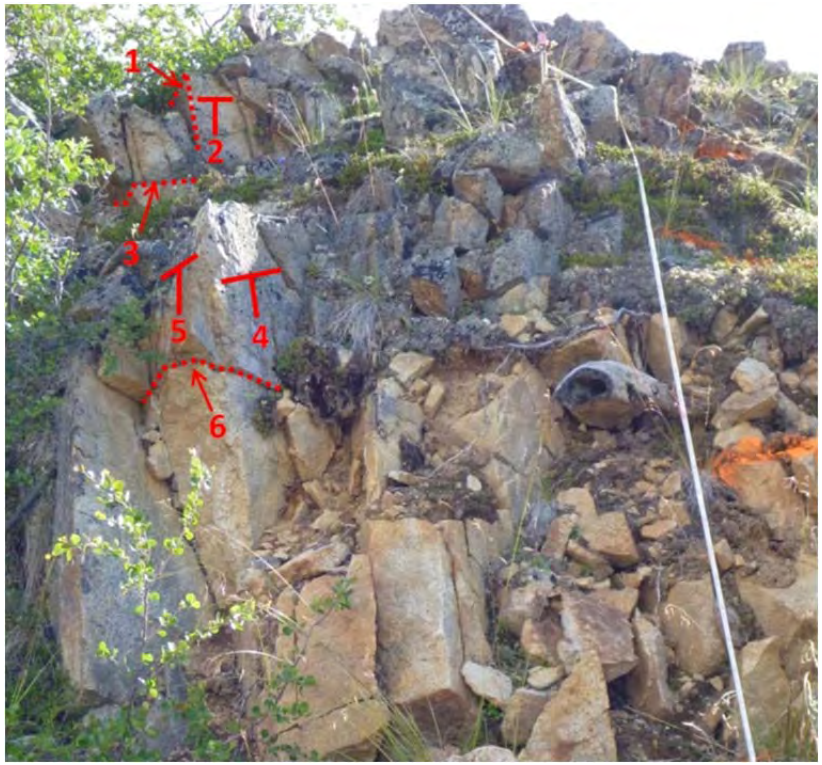
1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Light grey, black-speckled, medium- to coarse-grained GRANODIORITE. Faintly weathered (W1.5); strong to very strong (R4 to R5), fracture spacing 5 to 40cm. Open apertures 1 to 30cm reflect dilation due to toppling. GSI structure = blocky, GSI surface = Poor, GSI range = 40-50.

Outcrop OC-BGC11-11

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	75	154	20	CX-SM-SD	8	R4	0.3	1.5	J
2	87	236	25	CX-SM-SD	12	R4	0.45	6	J
3	12	267	18	CX-SM-SD	16	R4	0.45	1.5	J
4	75	200	10	CX-SD	20	R4	0.2	7	J
5	70	128	35	CX-SM-SD	12	R4	0.3	3	J
6	222	112	20	CX-SM-SD	20	R4	0.5	0.6	J
7	52	160	30	OG	7	R4	0.2	1.5	J
8	83	303	15	CX-SM-SD	20	R4	0.3	3	J

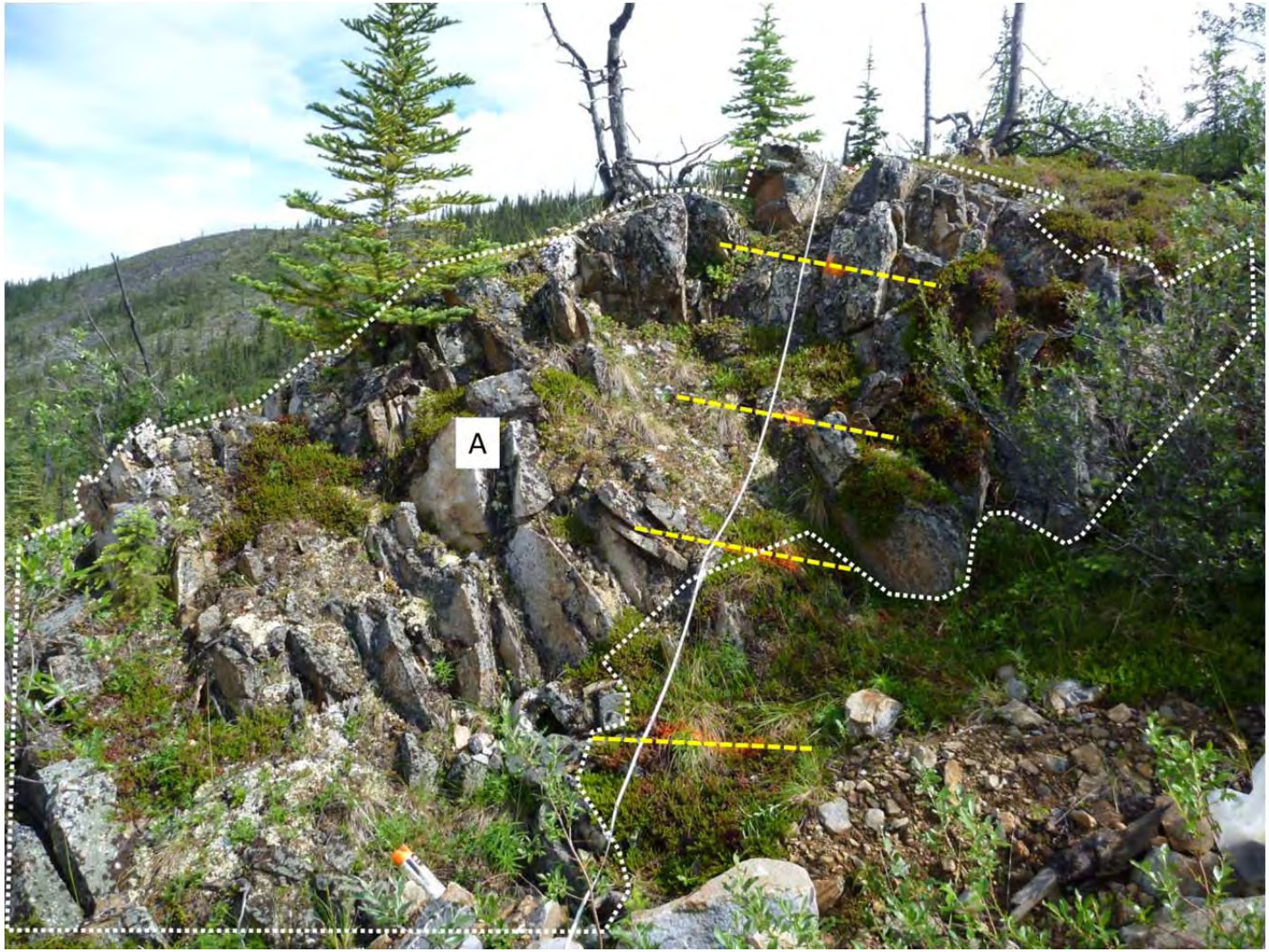
Outcrop OC-BGC11-12

Location: Pit area
Facility: Eagle Pup WRSA
Outcrop type: Natural

Northing: 7099828
Easting: 460151
Elevation: 1188 m
Survey type: Handheld GPS

Slope Angle: 52°
Slope Direction: 305°
Date logged: 7/10/2011
Logged by: LGT

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-12

DESCRIPTION OF MATERIALS

A: Light bluish grey medium- to coarse-grained GRANODIORITE. Slightly weathered (W1.5); strong to very strong (R4 to R5). Blocks are tabular, with closely to moderately spaced joints (1 main structural set). GSI structure = Very Blocky, GSI surface = Good, GSI range = 50-60.

DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	65	160	250	QZ	20	R4	0.15	3	J
2	78	29	12	BX-CX-SM-SA	16	R4	0.2	2	J
3	80	332	20	CX-SM-SA	8	R4	0.15	3	J
3	87	316	5	SM-SA-OG	4	R4	0.15	3	J
4	45	199		CX-SM-SA	16	R4	0.25	0.5	J

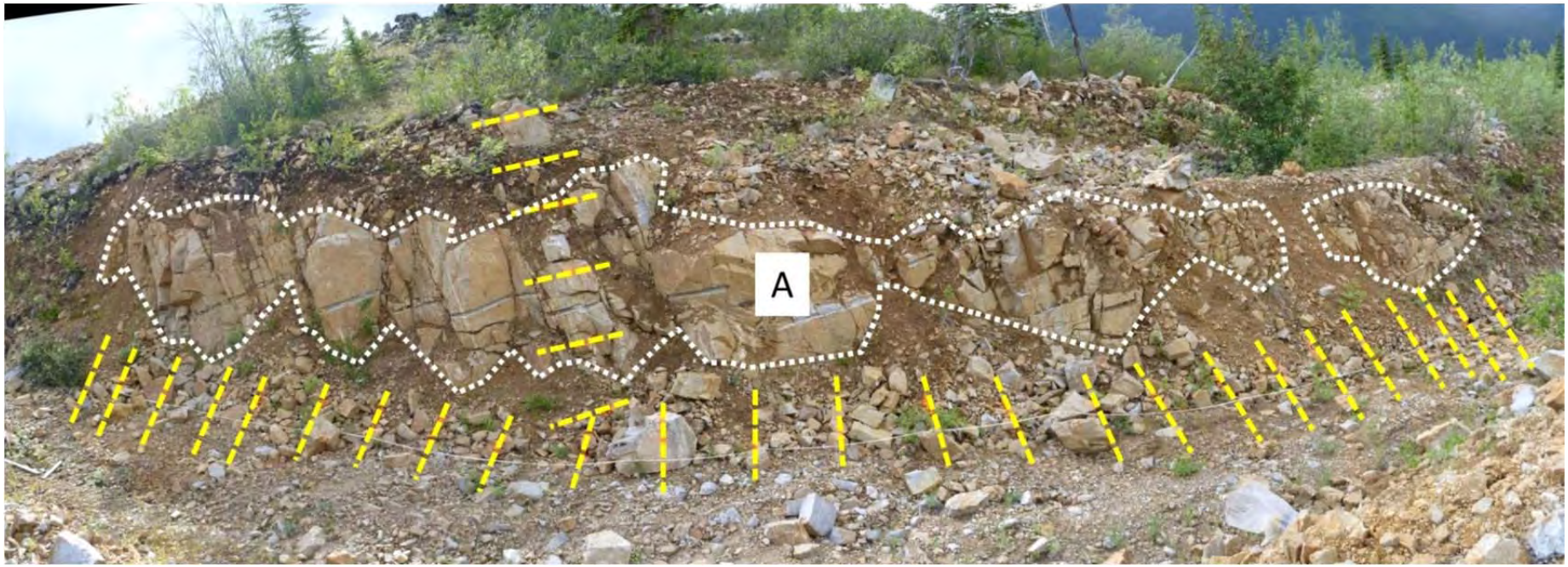
Outcrop OC-BGC11-13

Location: Pit area
Facility: Eagle Pup WRSA
Outcrop type: Man-made (exploaration trench)

Northing: 7099824
Easting: 460176
Elevation: 1195 m
Survey type: Handheld GPS

Slope Angle: 80°
Slope Direction: 080°
Date logged: 7/10/2011
Logged by: LGT

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Grey, medium- to coarse-grained GRANODIORITE. Slightly weathered (W2); medium strong (R3). Blocks are rhombohedral; ~ 50cm. GSI structure = Blocky, GSI surface = Good, GSI range = 55-65.

DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture (mm)	Infill	JRC	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	80-88	230-236	4	FE-ML	4-8	R3	0.1-0.2	2.5	J
2	60-68	218-230	0-1	FE-ML	4-13	R3	0.14	0.8	J

Outcrop OC-BGC11-14

Location: Olive Gulch
Facility: Road/Explosive Storage area
Outcrop type: Man-made (old exploaration road cut)

Northing: 7101532
Easting: 461754
Elevation: 1206 m
Survey type: Handheld GPS

Slope Angle: 57°
Slope Direction: 301°
Date logged: 7/21/2011
Logged by: EC/EB

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

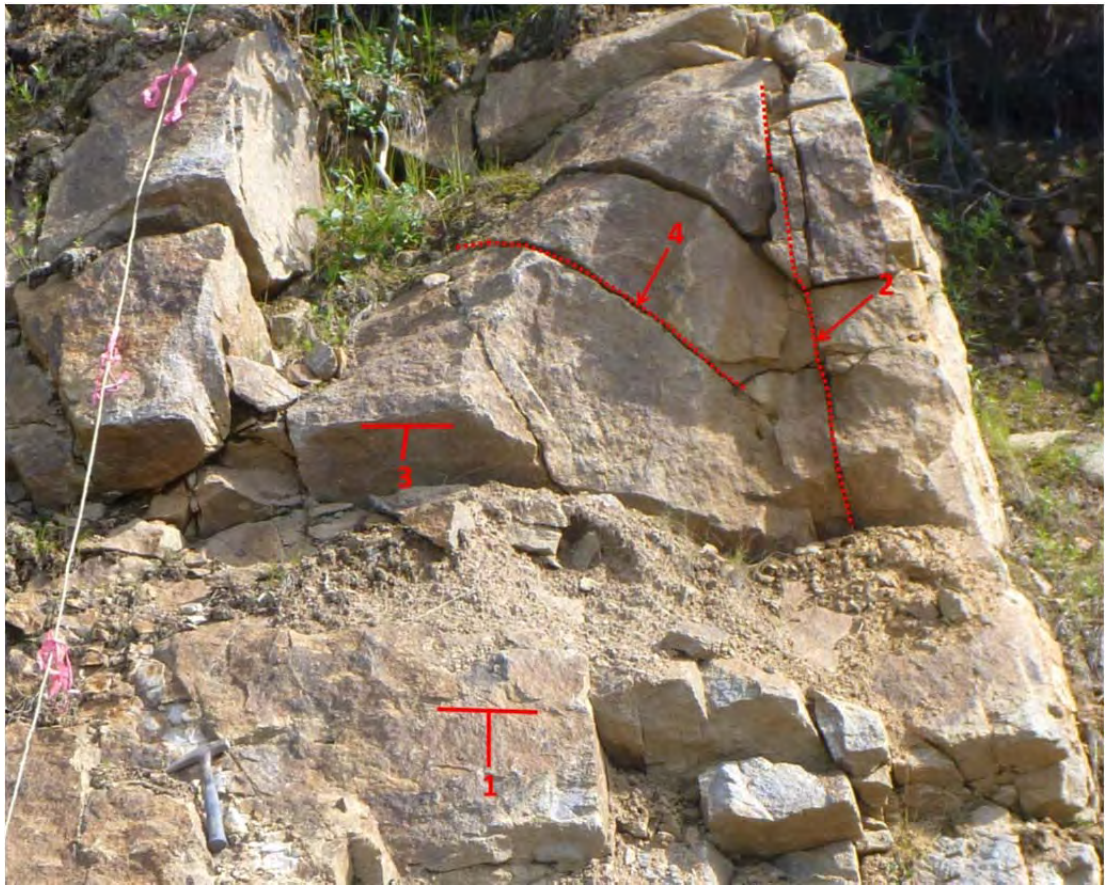
DESCRIPTION OF MATERIALS

A: Root mat and organic SILT. [TOPSOIL]

B: Grey-white (black grains), coarse-grained GRANODIORITE. Lightly to moderately weathered (W1.5 - W2); strong to very strong (R4-R5). Blocks are polyhedral. GSI structure = Very Blocky, GSI surface = Good, GSI range = 50-60.

Outcrop OC-BGC11-14

PHOTO OF STRUCTURE



DISCONTINUITY TABLE

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	41-64	300-348	0.5-20	SA-GW-FE	14-18	R4	0.5	1.5	J
2	67-74	210-214	2-8	SA-GW-FE	8-16	R4	0.2	1.5	J
3	54-60	73-92	10-50	SA-GW-FE	12-16	R4	1	1.5	J
4	41-45	180-190	5-30	SA-GW-FE	6-10	R4	1	1.5	J

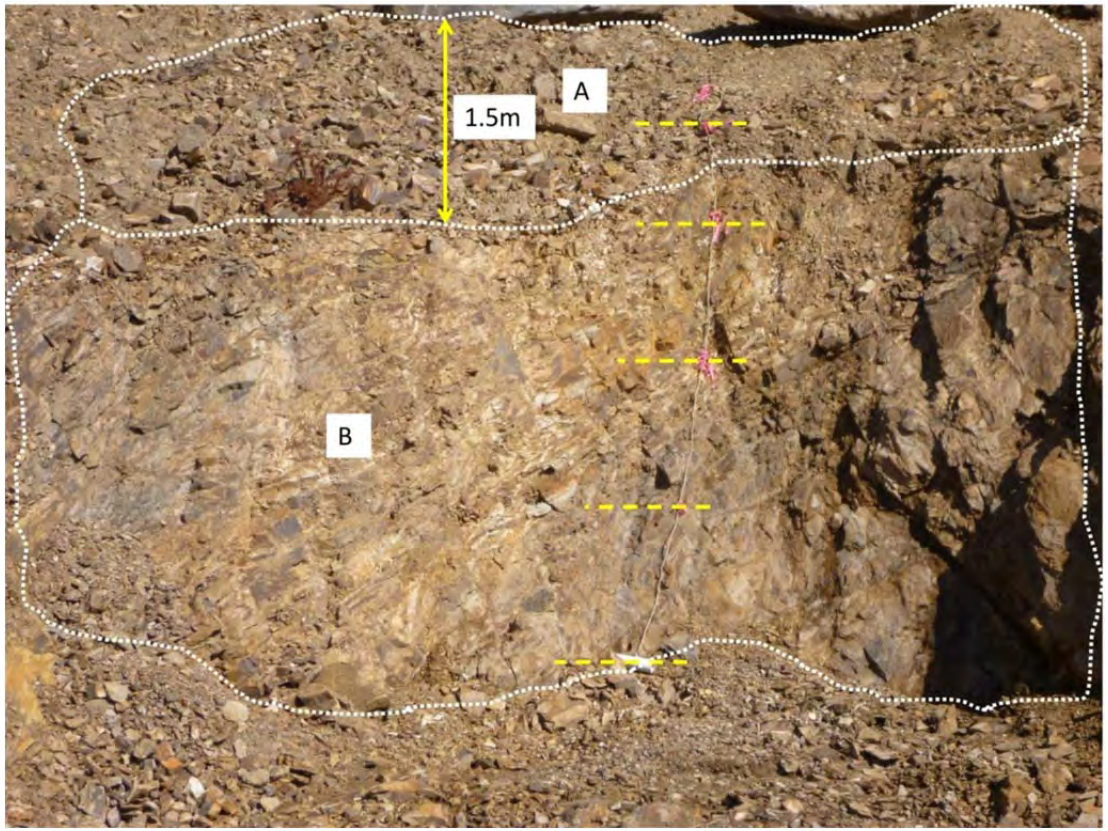
Outcrop OC-BGC11-15

Location: Olive Gulch
Facility: Road/Explosive Storage area
Outcrop type: Man-made (road cut)

Northing: 7101570
Easting: 461526
Elevation: 1151 m
Survey type: Handheld GPS

Slope Angle: 39°
Slope Direction: 054°
Date logged: 7/21/2011
Logged by: EC/EB

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: FILL, colluvium pushed over side for road. Not a natural feature.

B: Dark green to grey, fine-grained QUARTZITE. Foliated, highly weathered (W4) and heavily iron stained (some zones more so than others); weak(R1.5 to R2). Blocks equidimensional, ~ 0.05m. GSI structure = Blocky/Disturbed, GSI surface = Poor, GSI range = 22-35.

Outcrop OC-BGC11-15

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	32-42	308-325	5-10	FE-SA-SM	5-10	R1.5-R2	0.05	1	JO
2	51-67	177-182	1-3	FE-SA-SM	2-6	R1.5-R2	0.1	1	J
3	60-68	82-88	1-3	FE-SA-SM	2-6	R1.5-R2	0.15	1	J

Outcrop OC-BGC11-16

Location: Pit area
Facility: Open pit back wall
Outcrop type: Natural

Northing: 7099341
Easting: 460701
Elevation: 1406 m
Survey type: Handheld GPS

Slope Angle: 14°
Slope Direction: 217°
Date logged: 7/22/2011
Logged by: EC/EB

PHOTO OF OUTCROP



Outcrop OC-BGC11-16

DESCRIPTION OF MATERIALS

A: Sparse ORGANICS (<0.1m), mostly lichen, some moss, very dry.

B: Medium- to coarse-grained QUARTZITE. Heavily iron stained; colour is black with yellow-white lenses. Slightly weathered (W2); very strong to extremely strong (R5- R6). Blocks equidimensional, ~60 cm. GSI structure = Blocky, GSI surface = Good, GSI range = 55-75.

DISCONTINUITY TABLE – Unit B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	16-18	253-264	NA	None	16-18	R5	0.4	>4	JO
2	72-83	251-260	15-20	SM-SA	12-16	R5	0.6	>1	J
3	79-85	157-170	20	SM	8-10	R5	0.6	>0.7	J

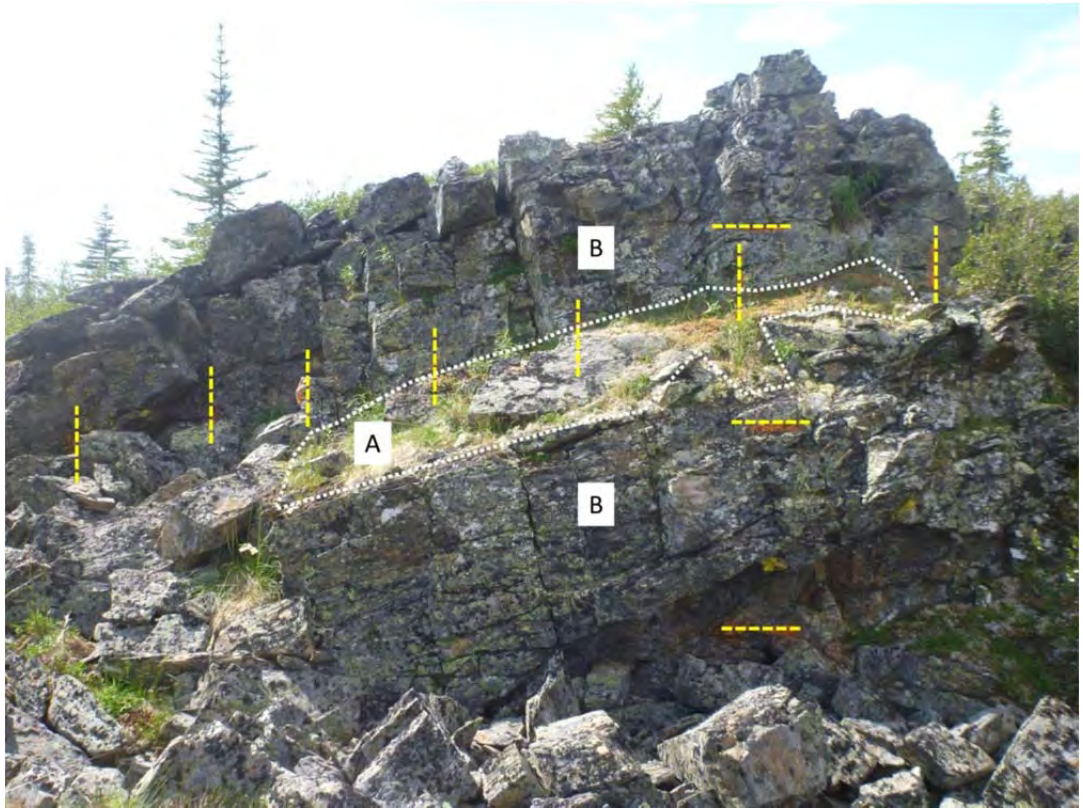
Outcrop OC-BGC11-17

Location: Eagle Pup
Facility: Open pit back wall
Outcrop type: Natural

Northing: 7099403
Easting: 460865
Elevation: 1403 m
Survey type: Handheld GPS

Slope Angle: 78°
Slope Direction: 082°
Date logged: 7/22/2011
Logged by: EC/EB

PHOTO OF OUTCROP



1m spacing between yellow dashed lines.

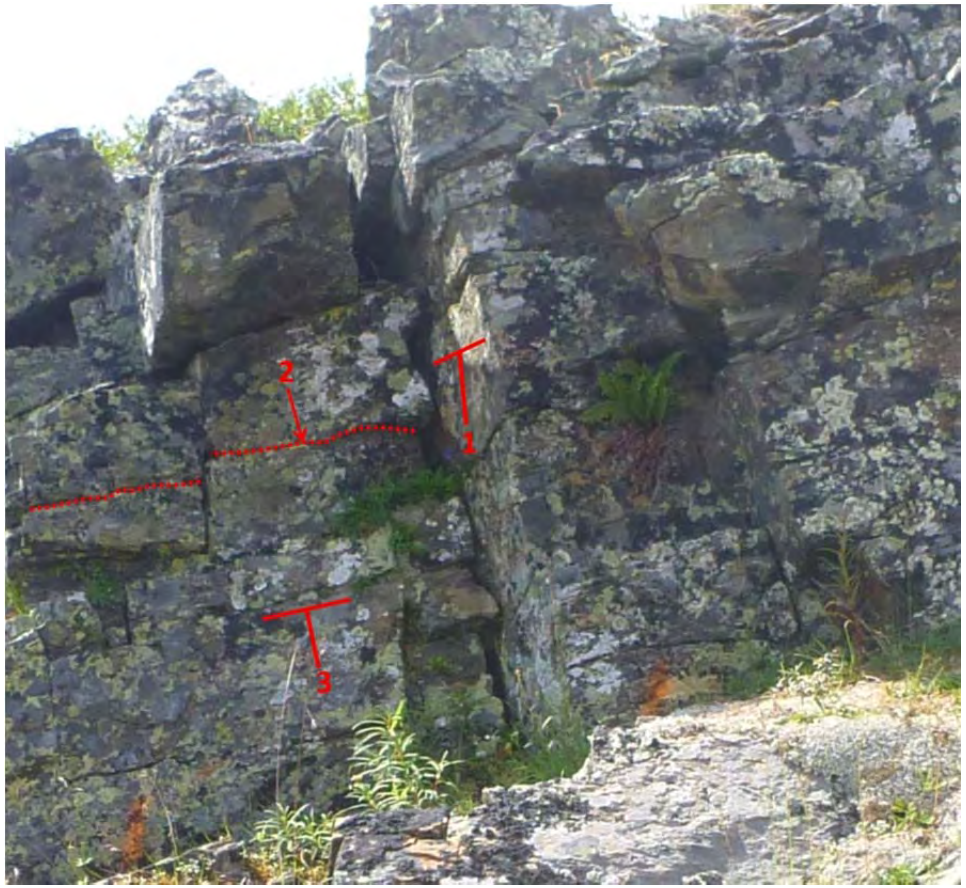
DESCRIPTION OF MATERIALS

A: Sparse ORGANICS, mostly lichen, some shrubs, some grass; very dry.

B: Medium to coarse-grained QUARTZITE. Heavily iron stained, coloured black with yellow-white lenses. Slightly weathered (W2); very strong to extremely strong (R5 to R6). Blocks equidimensional, ~ 40 cm. GSI structure = Blocky, GSI surface = Good, GSI range = 50-70.

Outcrop OC-BGC11-17

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	15-20	208-217	5-25	SM-SA	15-18	R5	0.4	3-10	JO
2	68-81	324-345	5-40	SA-SM	10-12	R5	0.3	>1	J
3	78-83	82-90	10-40	SA-SM	10-12	R5	0.4	NV	J

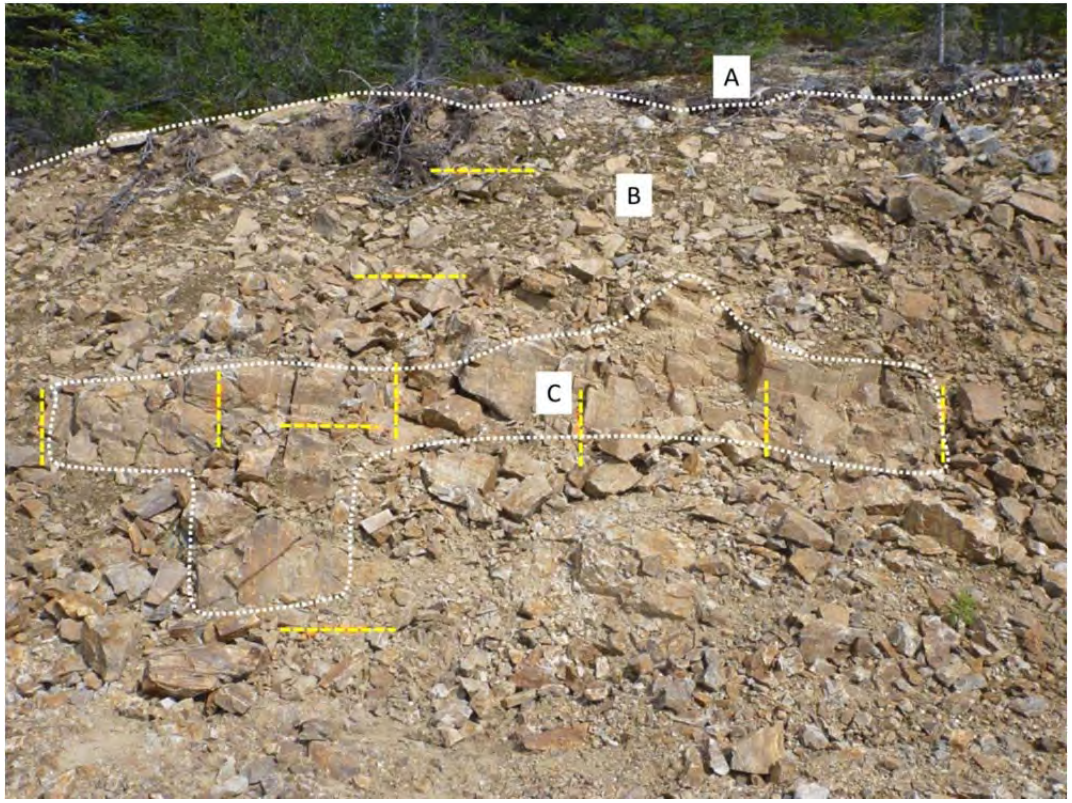
Outcrop OC-BGC11-18

Location: Pit area
Facility: Open pit
Outcrop type: Man-made (exploration drill pad cut)

Northing: 7099473
Easting: 460332
Elevation:
Survey type: Handheld GPS

Slope Angle: 34°
Slope Direction: 259°
Date logged: 7/22/2011
Logged by: EC/EB

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

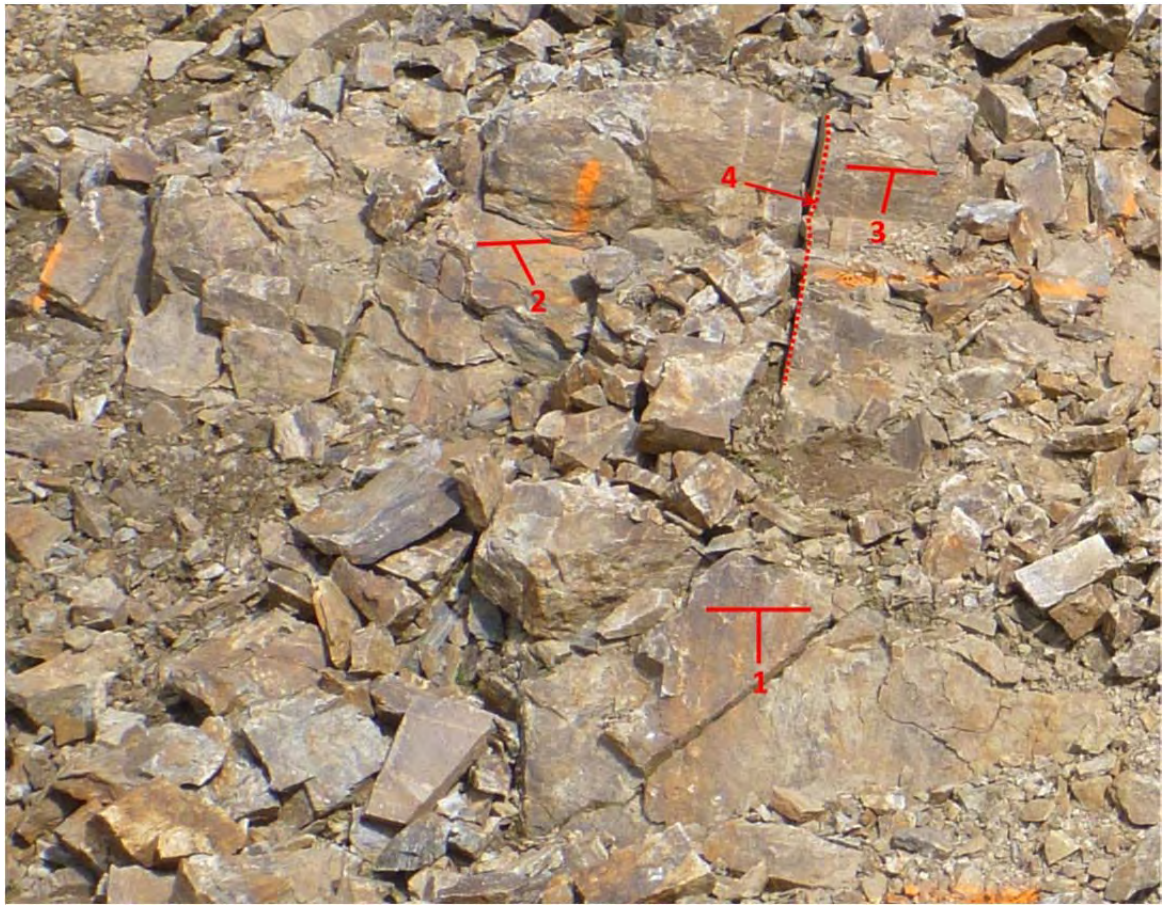
A: Vegetation, moss, root mat, 0.2 m thick. [TOPSOIL]

B: BOULDERS and COBBLES: Silty, some coarse gravel, greyish brown. Clasts equidimensional, angular, moderately weathered (W3), strong (R4); max size = 450 mm. [COLLUVIUM]

C: Grey, coarse-grained QUARTZITE. Slightly weathered (W2), strong to very strong (R4-R5). Blocks rhomboidal, ~ 25 cm. GSI structure = Very Blocky, GSI surface = Good, GSI range = 45-55.

Outcrop OC-BGC11-18

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT C

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	62-63	270-273	NV	NV	10-12	R4-R5		NA	J
2	22-35	213-226	3-15	SA-SM	8-10	R4-R5	0.2	NA	JO
3	77-81	069-080	2-20	SA-SM	8-10	R4-R5	0.3	NA	J
4	76-81	324-352	1-20	SA-SM	8-10	R4-R5	0.2	NA	J

Outcrop OC-BGC11-19

Location: Stuttle Gulch
Facility: Primary crusher
Outcrop type: Man-made (drill pad for BH-BGC11-50)

Northing: 7099996
Easting: 459794
Elevation: 1068
Survey type: Handheld GPS

Slope Angle: 38°
Slope Direction: 270°
Date logged: 7/23/2011
Logged by: EC

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Vegetation, moss, root mat. [TOPSOIL]

B: SILT (ML). Gravelly, low plasticity, low dry strength, no dilatancy, medium brown, moist.

C: Brownish-grey, fine-grained QUARTZITE. Moderately weathered (W3), weak to strong (R2-R4). Blocks are rhomboidal, ~ 15 cm. GSI structure = Very Blocky, GSI surface = Poor, GSI range = 30-45.

Outcrop OC-BGC11-19

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT C

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	23-34	284-296	1-10	SA, SM	6-10	R3-R4	0.1	>0.5m	JO
2	85-86	154-162	1-5	SA, SM	2-4	R3-R4	0.2	>0.5m	J
3	66-71	088-090	1-10	SA, SM	4-8	R3-R4	0.3	>0.3m	J
4	72-78	219-222	1-10	SA, SM	14-16	R3-R4	0.3	>0.3m	J

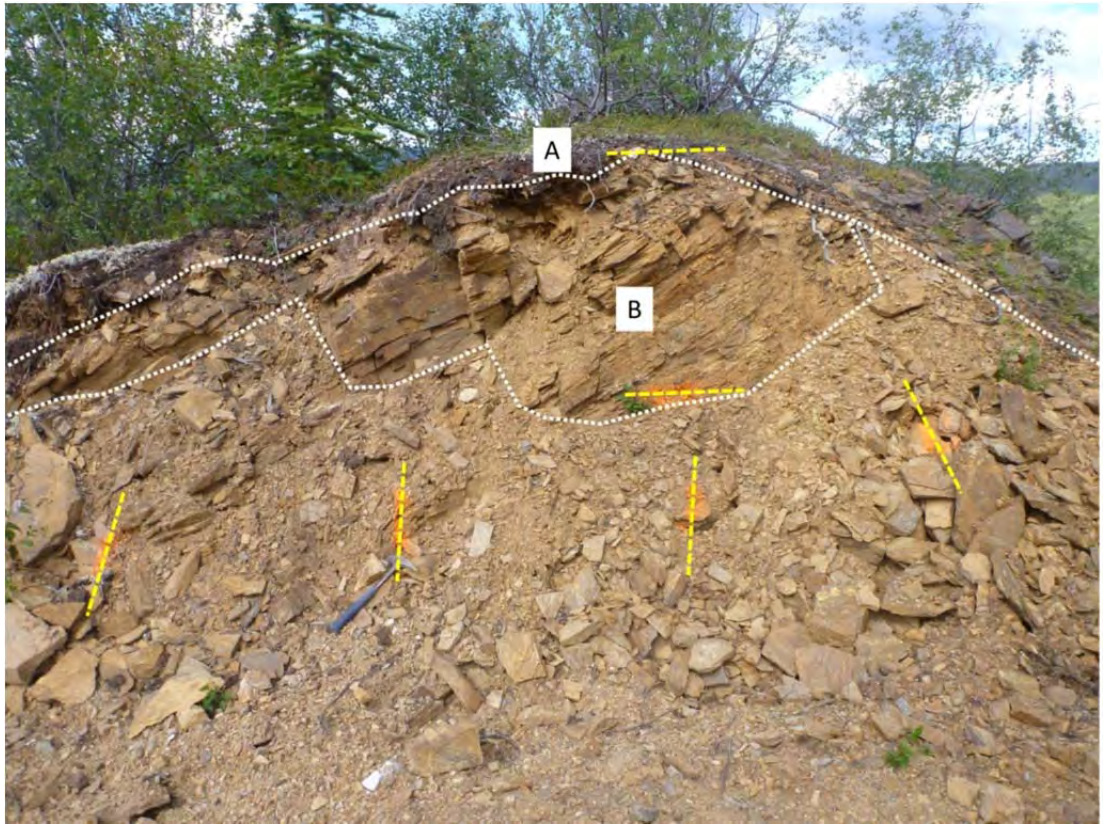
Outcrop OC-BGC11-20

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Man-made (road cut)

Northing: 7100213
Easting: 460060
Elevation: 1105 m
Survey type: Handheld GPS

Slope Angle:
Slope Direction:
Date logged: 7/23/2011
Logged by: EC

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

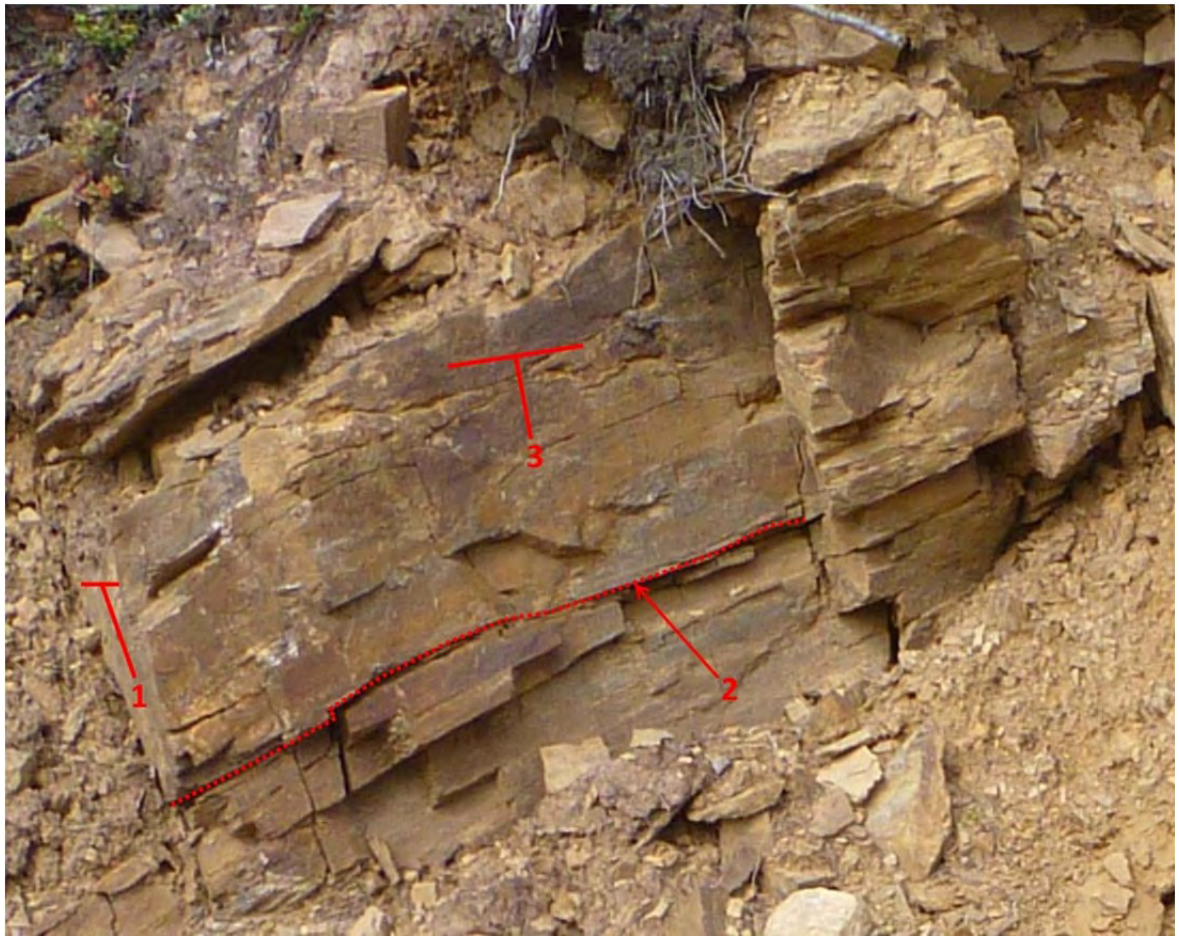
DESCRIPTION OF MATERIALS

A: Vegetation, moss, root mat (0.05 m). [TOPSOIL]

B: Dark grey, fine- to medium-grained QUARTZITE. Moderately weathered (W3), medium strong to strong (R3 to R4). Blocks are tabular, ~ 0.1 m, with low fracture persistence. GSI structure = Blocky/disturbed, GSI surface = Fair, GSI range = 40-50.

Outcrop OC-BGC11-20

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	78-83	84-93	0.5-5	SA, SM	10-14	R3-R4	0.2	>0.2m	J
2	78-80	174-188	NV	SA, SM	12-16	R3-R4	0.05	>1.0m	JO
3	36-37	312-318	0.5-2	SA, SM	10-14	R3-R4		>0.2m	J

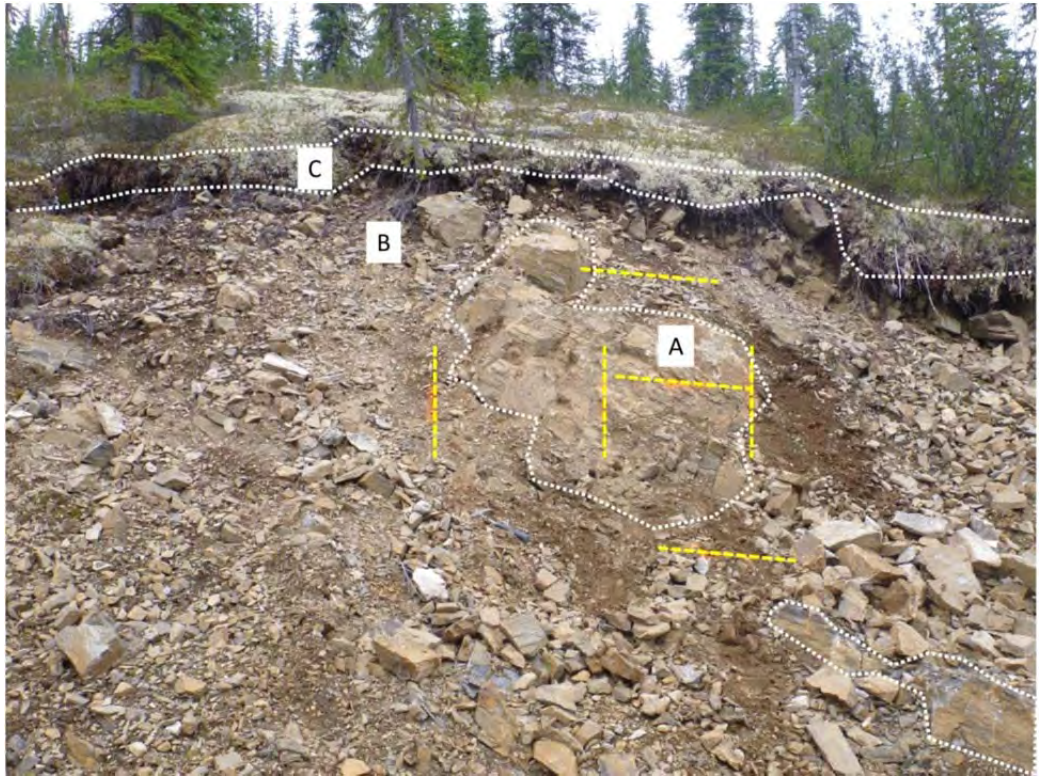
Outcrop OC-BGC11-21

Location: Stuttle Gulch
Facility: Primary crusher
Outcrop type: Man-made (Exploration drill pad cut)

Northing: 7099879
Easting: 459852
Elevation: 1091 m
Survey type: Handheld GPS

Slope Angle: 28°
Slope Direction: 332°
Date logged: 7/25/2011
Logged by: EB/EC

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Reddish-brown fine-grained QUARTZITE. Foliated and containing quartz veins, slightly to moderately weathered (W2-W3), strong (R4). Blocks rhomboidal, ~ 15 cm. GSI structure = Very Blocky, GSI surface = Fair, GSI range = 40-50.

B: GRAVEL (GW): Cobbly, some silt, trace sand, trace boulders, reddish-brown. Moist and heavily FE-stained. Clasts elongate, angular, medium strong (R3). Max particle size = 85 cm. [COLLUVIUM]

C: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-21

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture (mm)	Infill	JRC	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	83-89	320-339	0.5	FE	8-12	R4	0.2	1m+	J
2	41-47	340-342	0.5-10	SA,SM	12-16	R4	0.1	1m+	J
3	68-72	114-125	0.5-2	SA,SM	8-12	R4	0.11	1m+	J
4	67-71	202-203	1	SA,SM	10-20	R4	0.15	1m+	J
5	30-37	238-250	0.5-2	SA,SM	12-14	R4	0.05	1m+	JO

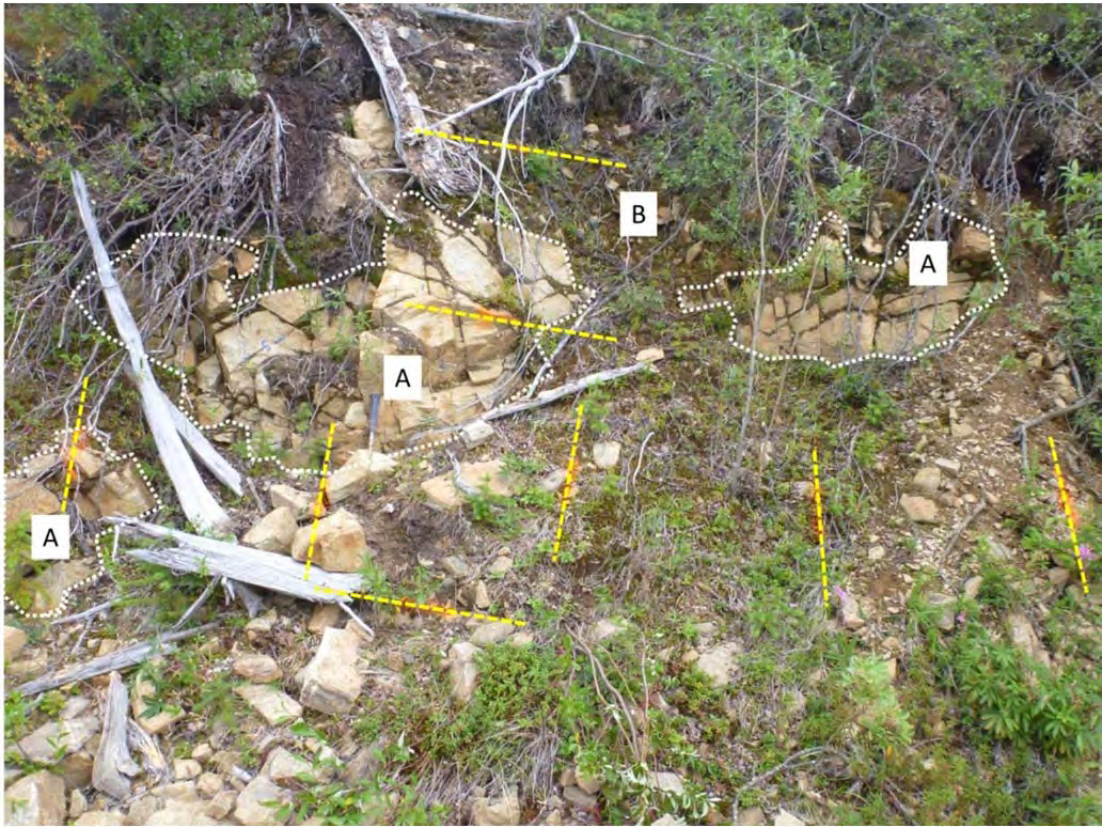
Outcrop OC-BGC11-22

Location: Pit area
Facility: Open pit
Outcrop type: Man-made (Exploration road cut)

Northing: 7099590
Easting: 459880
Elevation: 1160 m
Survey type: Handheld GPS

Slope Angle: 63°
Slope Direction: 252°
Date logged: 7/25/2011
Logged by: EB/EC

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

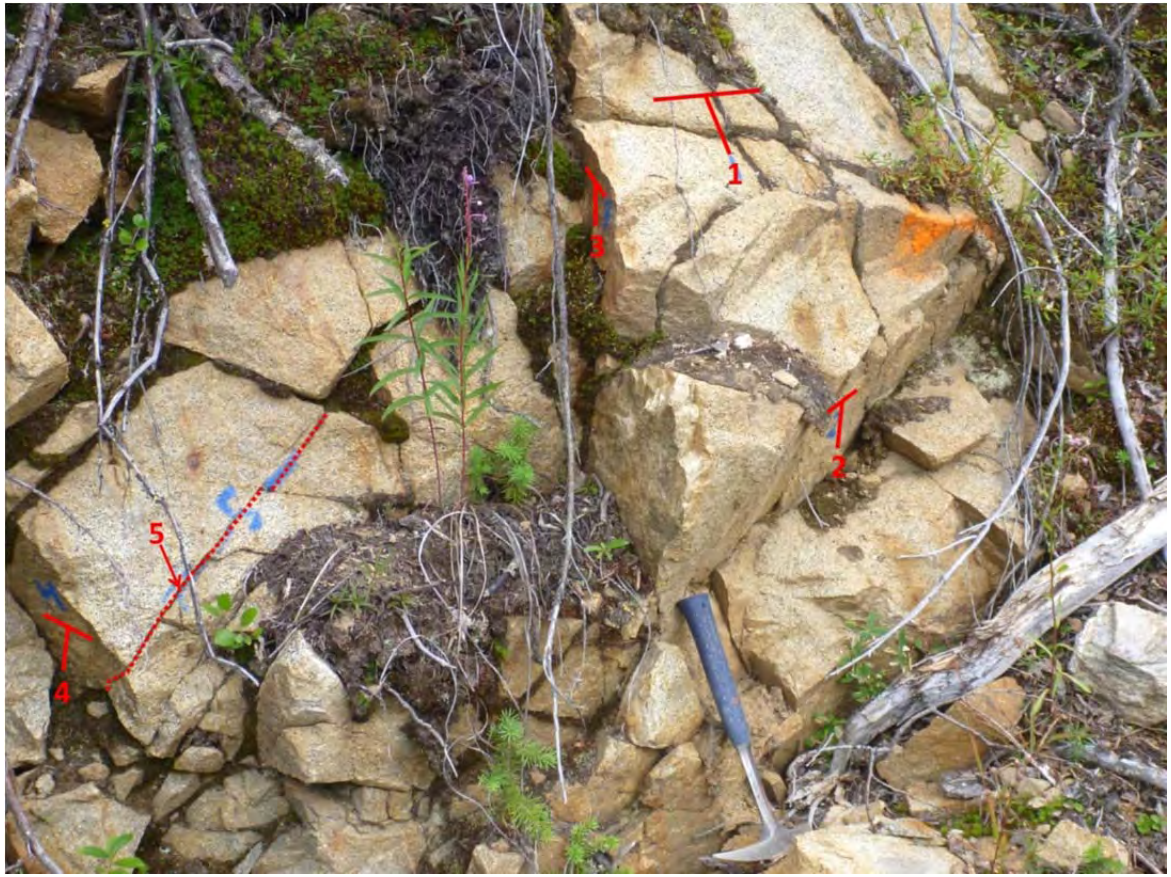
DESCRIPTION OF MATERIALS

A: Greyish-white, coarse-grained GRANODIORITE. Slightly weathered (W2); extremely strong (R6). Blocks ~ 15 cm; rhomboidal/polyhedral with low fracture persistence. GSI structure = Very Blocky, GSI surface = Good, GSI range = 50-60.

B: SILT (ML): Cobbly, bouldery, dark brown. Clasts equidimensional, angular to subangular, extremely strong (R6). Max particle size ~ 400 mm. Filled with organics/rootlets. [TOPSOIL]

Outcrop OC-BGC11-22

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture (mm)	Infill	JRC	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	62-75	220-227	NV	FE	16-18	R6	NV	0.5m+	J
2	65-68	028-042	10	SA, SM	14-16	R6	0.2	NV	J
3	82-85	334-339	150	SA, SM	8-16	R6	0.25	NV	J
4	60-74	120-149	1-40	SA, SM	10-12	R6	0.12	NV	J
5	40-48	332-338	1-25	SA, SM	8-16	R6	0.12	NV	J

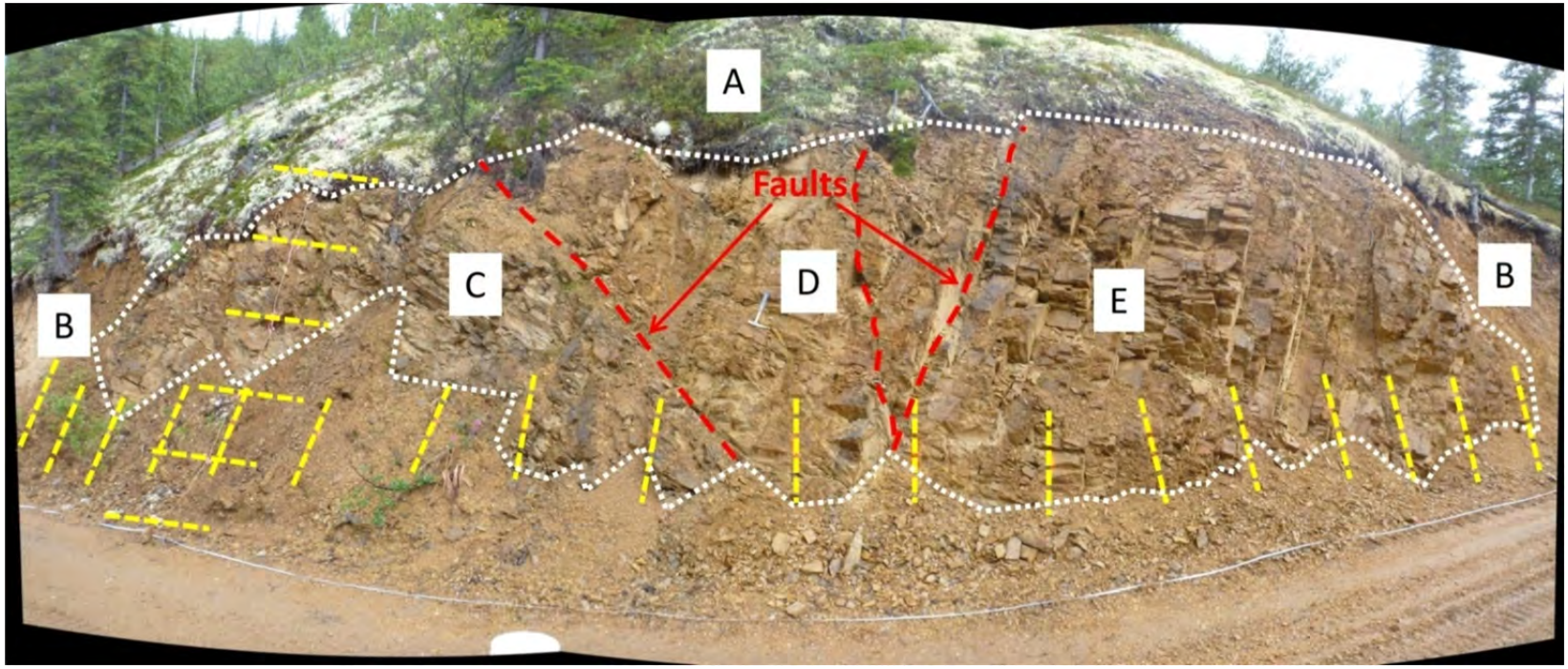
Outcrop OC-BGC11-23

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Man-made (road cut)

Northing: 7100289
Easting: 460110
Elevation: 1111 m
Survey type: Handheld GPS

Slope Angle: Natural 40° / Cut 80°
Slope Direction: 010°
Date logged: 8/1/2011
Logged by: LGT

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Root mat and organic silt. [TOPSOIL]

B: GRAVEL (GW): Some sand, some, cobbles, well graded. Yellowish brown, moist, homogenous. Clasts are metasedimentary , flat & platy, angular; max particle size ~200 mm. [COMPLETELY WEATHERED METASEDIMENTARY ROCK]

C: Yellowish-grey, fine-grained QUARTZITE. Faintly weathered (W1.5); medium strong to strong (R3-R4). Four main discontinuity sets spaced very to extremely closely; blocks are tabular. GSI structure = Blocky/disturbed, GSI surface = Good to Fair, GSI range = 30-50.

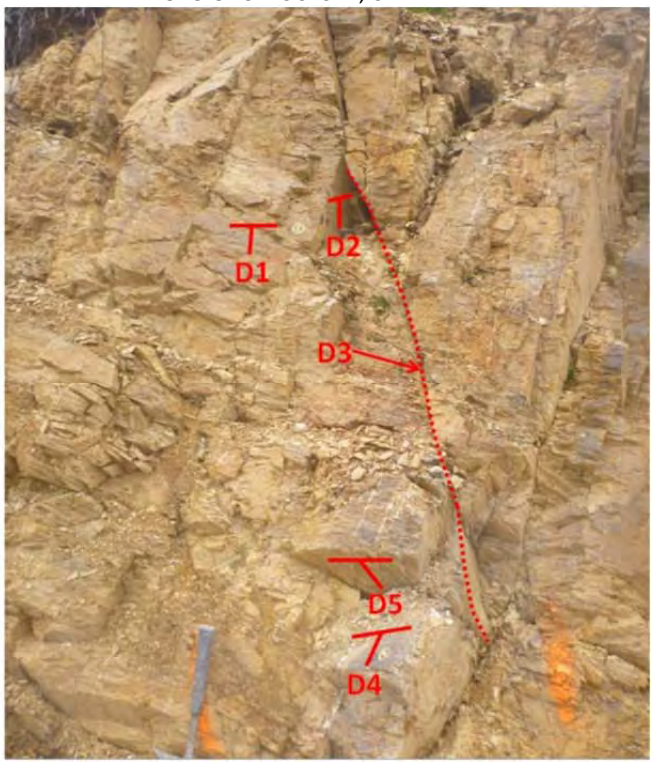
D/E: Same as above but pinkish yellow colour. D: Joints are extremely closely spaced, GSI 30-35. E: Joints are very closely spaced, good joint condition,GSI 40-50.

Outcrop OC-BGC11-23

PHOTO OF STRUCTURE, UNIT C



PHOTO OF STRUCTURE, UNIT D

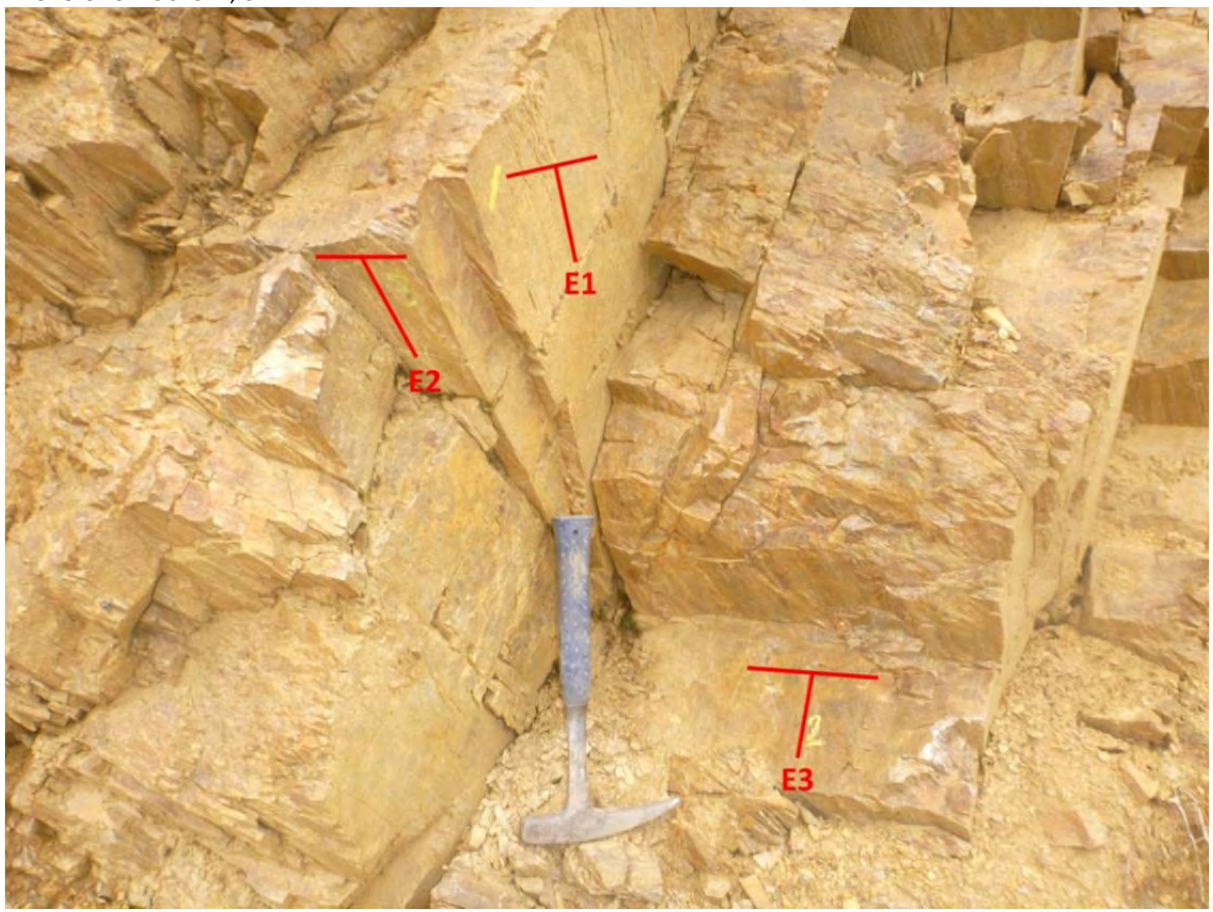


DISCONTINUITY TABLE, UNITS C/D

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
C1	25	260	0.1-15	CX, SA	20 (10 cm)	R3	0.1	>1m	JO
C2	59	093	1-2	CX, SA	6 (1m)	R4	0.3	1m	J
C3	75	061	NV	NV	20	R4		>1m	J
D1	71	231	NV	NV	20	R3		>4.9m	J
D2	76	170	0.2-4	CX	4	R4	0.2	1.5m	J
D3	74	335	5-15	CX	4	R4	0.3	>4m	J
D4	45	097	1	CX	16 (10 cm)	R4		>2.5m	J
D5	36	244	3-5	CX, SA	20 (10 cm)	R4	0.03	>1m	JO

Outcrop OC-BGC11-23

PHOTO OF STRUCTURE, UNIT E



DISCONTINUITY TABLE, UNIT E

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
E1	77	172	1-5	CX, None	4 (10 cm)	R4	0.2	>4.5m	J
E2	60	086	1-5	CX, SA	20 (10 cm)	R4	0.1	>2.5m	J
E3	38	267	0.5-1	CX	10 (10 cm)	R4	0.15	>1m	JO
E1 (Fault)	84	171	4	CX	1	R4		>4.5m	F

Outcrop OC-BGC11-24

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Man-made (road cut)

Northing: 7100089
Easting: 460221
Elevation: 1069 m
Survey type: Handheld GPS

Slope Angle: 48°
Slope Direction: 094°
Date logged: 7/31/2011
Logged by: SP

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Vegetation, moss, root mat (0.5 m). [TOPSOIL]

B: GRAVEL (GW). Well-graded. [COLLUVIUM]

C: Light brown to grey, medium- to coarse-grained GRANODIORITE. Lightly weathered and iron stained (W2); medium strong (R3). Blocks are rhomboidal, ~ 50 cm. GSI structure = Blocky, GSI surface = Good, GSI range = 55-65.

Outcrop OC-BGC11-24

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT C

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	78	261	0.1-5	CX, SA, FE	16 (1m)	R3		1m+	J
2	69	350	1-10	CX, BX, FE, SA	16 (10cm)	R3	0.5	0.5m+	J
3	32	156	10-100	BX, CX, SA, FE	12 (1m)	R3	0.6	1m+	J

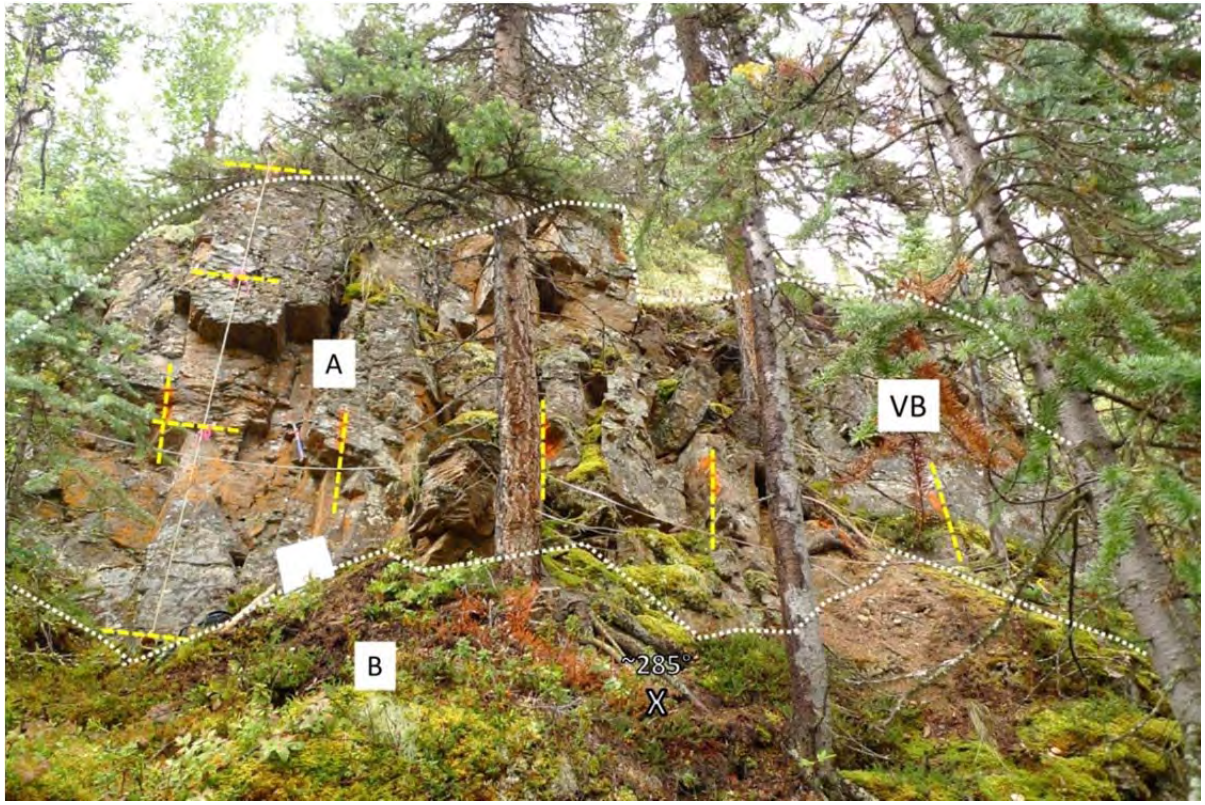
Outcrop OC-BGC11-25

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Natural

Northing: 7100350
Easting: 460142
Elevation: 1033 m
Survey type: Handheld GPS

Slope Angle: 60°
Slope Direction: 081°
Date logged: 8/13/2011
Logged by: GH/LGT

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

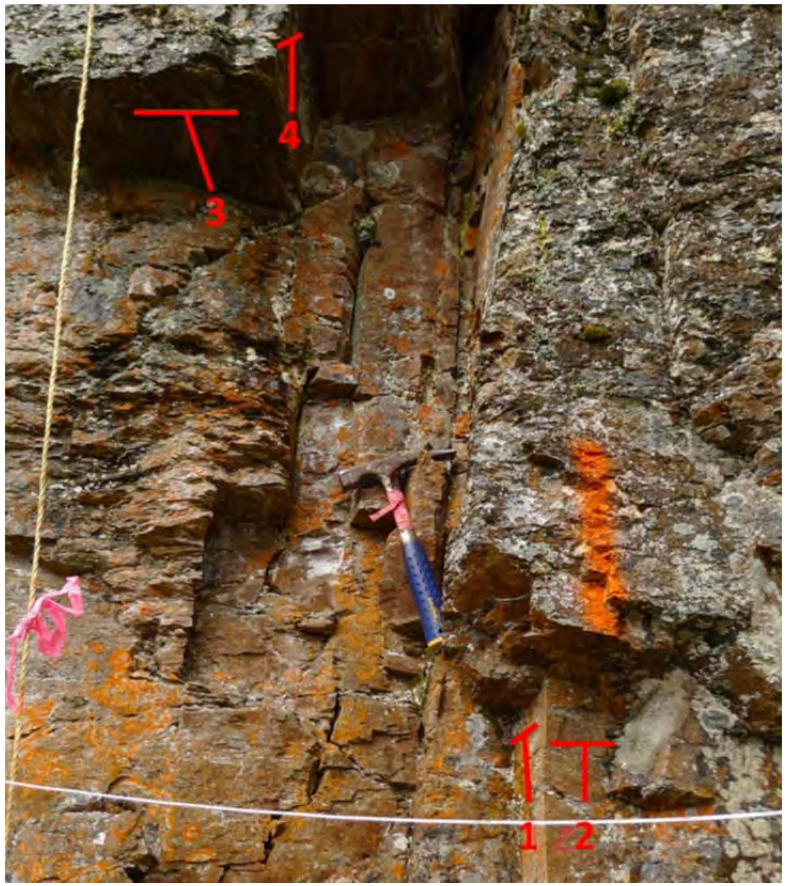
DESCRIPTION OF MATERIALS

A: Light brown, fine-grained QUARTZITE. Strong to Very Strong (R4-R5); lightly weathered (W2). Blocks tabular, ~ 20 cm. GSI structure = Blocky/disturbed (area marked VB = Very Blocky). Breaks readily on foliation. GSI surface condition = Fair, GSI = 40-50.

B: GRAVEL and organic silt with some sand (GM). Nonplastic, dark brown, soft, homogenous with organic odour. Clasts angular, medium strong (R3.5), flat and elongated, 20-100 mm; max particle size ~ 100 mm (200 mm under Very Blocky part of outcrop, marked VB). [COLLUVIUM]

Outcrop OC-BGC11-25

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC (scale)	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	74-80	163-184	0-5mm	None	8 (1 m)	R3.5	0.2	3m+	J
2	77-85	077-091	2 mm	None	6-8 (1 m)	R3.5	0.2	3m+	J
3	32-36	265-283	0-1mm	Mica on	12-14 (0.1 m)	R3.5	0.15	1m	JO
4	86-89	199-222	0-1mm	None	8 (1 m)	R3.5	0.5	1m	J

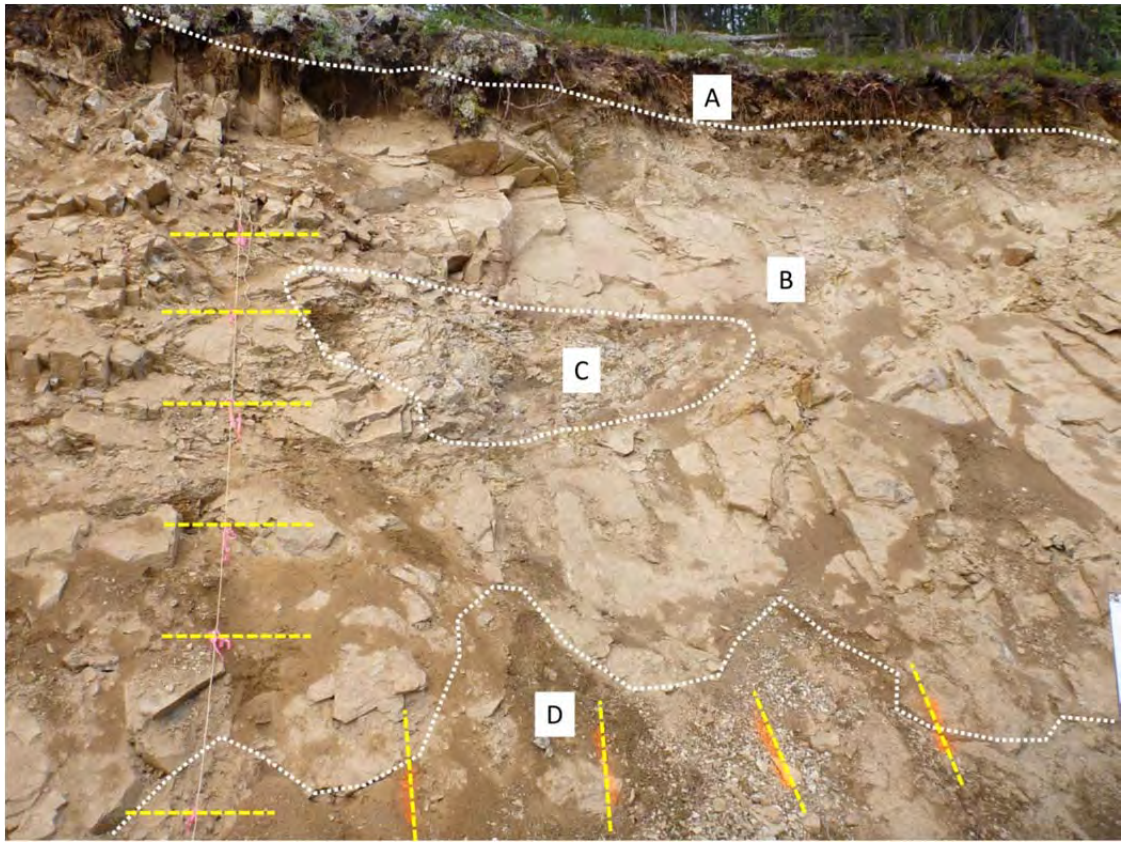
Outcrop OC-BGC11-26

Location: Platinum Gulch
Facility: Platinum Gulch WRSA
Outcrop type: Man-made (exploration road cut)

Northing: 7099104
Easting: 459656
Elevation: 1045 m
Survey type: Handheld GPS

Slope Angle:
Slope Direction:
Date logged: 8/2/2011
Logged by: SP

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Vegetation, moss, root mat. [TOPSOIL]

B: Light reddish brown QUARTZITE. Faintly to lightly weathered (W1.5-W2); medium strong (R3). Blocks rhombohedral; ~ 10 cm. GSI structure = Very Blocky, GSI surface = Fair, GSI range = 40-45.

C: Light grayish brown QUARTZITE. Moderately weathered (W3); weak (R2). Blocks rhomboidal; ~ 2 cm. GSI structure = Blocky/Distrubed to Disintegrated, GSI surface = Fair, GSI range = 25-35.

D: GRAVEL: Sandy, some cobbles, trace silt, well graded (GW). Nonplastic, dark reddish brown, moist, loose. Clasts angular to subangular, flat and elongated, medium strong (R2.5-R3); max particle size ~ 100 mm. [COLLUVIUM, SPALLED ROCK]

Outcrop OC-BGC11-26

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNITS B/C

Set	Orientation range		Aperture (mm)	Infill	JRC	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	53	259	1-10	SA, ML, FE	18	R3	0.3	1m+	JO
2	70	44	10-100	BX, ML, FE	12	R3	0.5	1m+	J
3	81	151	2-5	ML, SA, FE	10	R2.5-3	0.3	1m+	J

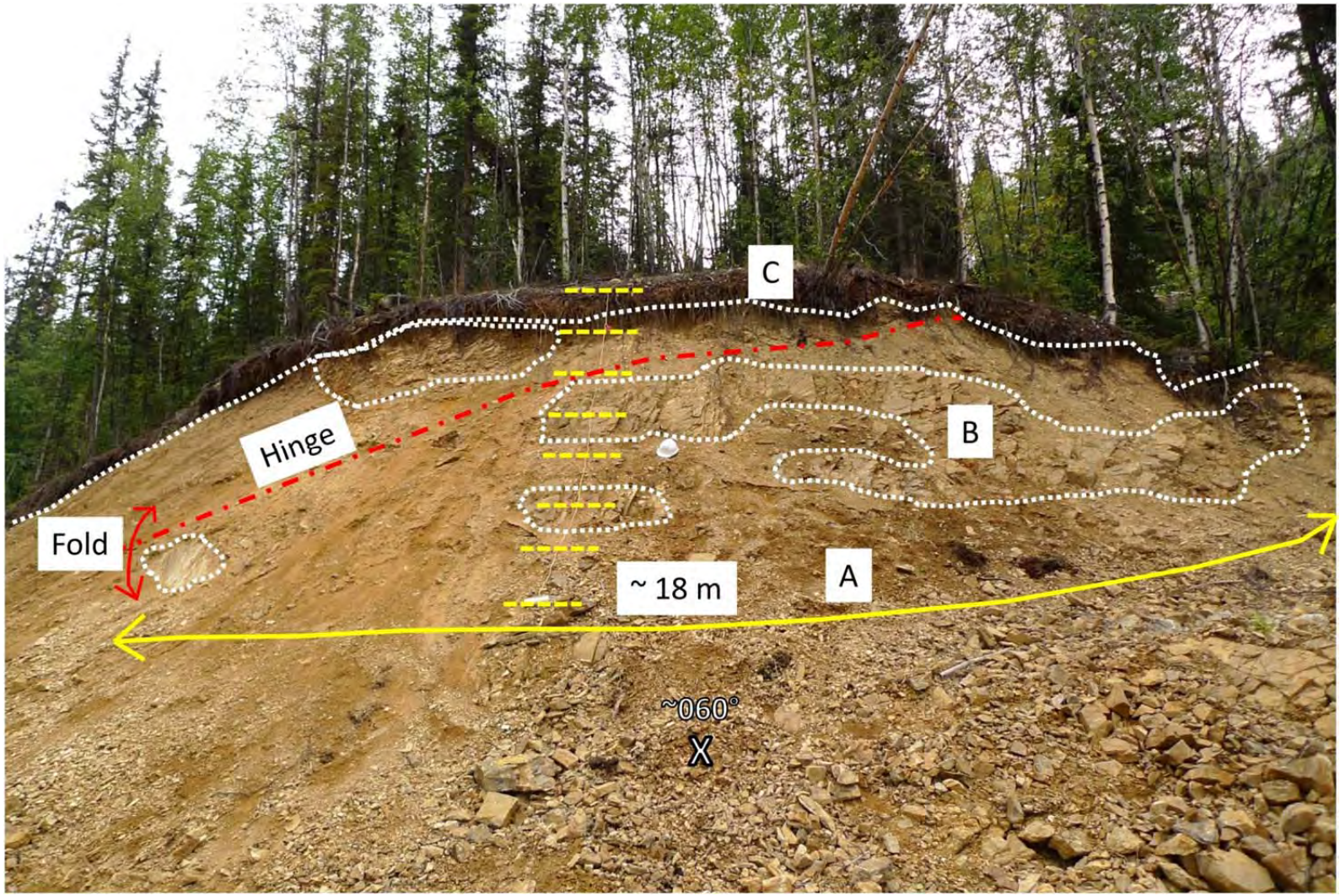
Outcrop OC-BGC11-27

Location: Platinum Gulch
Facility: Platinum Gulch WRSA
Outcrop type: Man-made (exploration drill pad cut)

Northing: 7099534
Easting: 459343
Elevation: 971 m
Survey type: Handheld GPS

Slope Angle: 41°
Slope Direction: 221-259°
Date logged: 8/13/2011
Logged by: GH/LT

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-27

PHOTO OF STRUCTURE – UNIT B (BELOW FOLD HINGE)



Outcrop OC-BGC11-27

DESCRIPTION OF MATERIALS

A: SAND and GRAVEL (SW). Well-graded, yellowish-brown, sand fine to medium. Clasts angular, flat/elongated , medium strong (R3). [COLLUVIUM]

B: Foliated, fissile fine-grained grey quartz schist, mostly weathered to yellowish brown.

	Above/near fold hinge:				Below fold hinge:	
Weathering	W3				W2	
Strength	R1				R3-R4	
Block size/shape	Crushed (5 cm to sand sized); tabular				5-10 cm; tabular	
GSI structure	Disintegrated				Lower Very Blocky	
GSI surface	Fair				Good-Fair	
GSI range	25-35				40-50	

C: Root mat and organic silt. [TOPSOIL]

DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	79-88	331-338	1-3	none	8 (0.1m)	R3	0.1	2m+	J
2	67-77	236-245		none	12 (1m)	R3	0.05	1m	JO
3	33-54	024-065		none	12 (0.1m)	R3	0.2	0.5m+	J
4	42-44	137-162		none	4-8 (1 m)	R3	1	2.5m	J
5	36-58	341-005		none	8 (1 m)	R3	0.5	1m+	J
6	32-47	021-040		none			0.03		JO

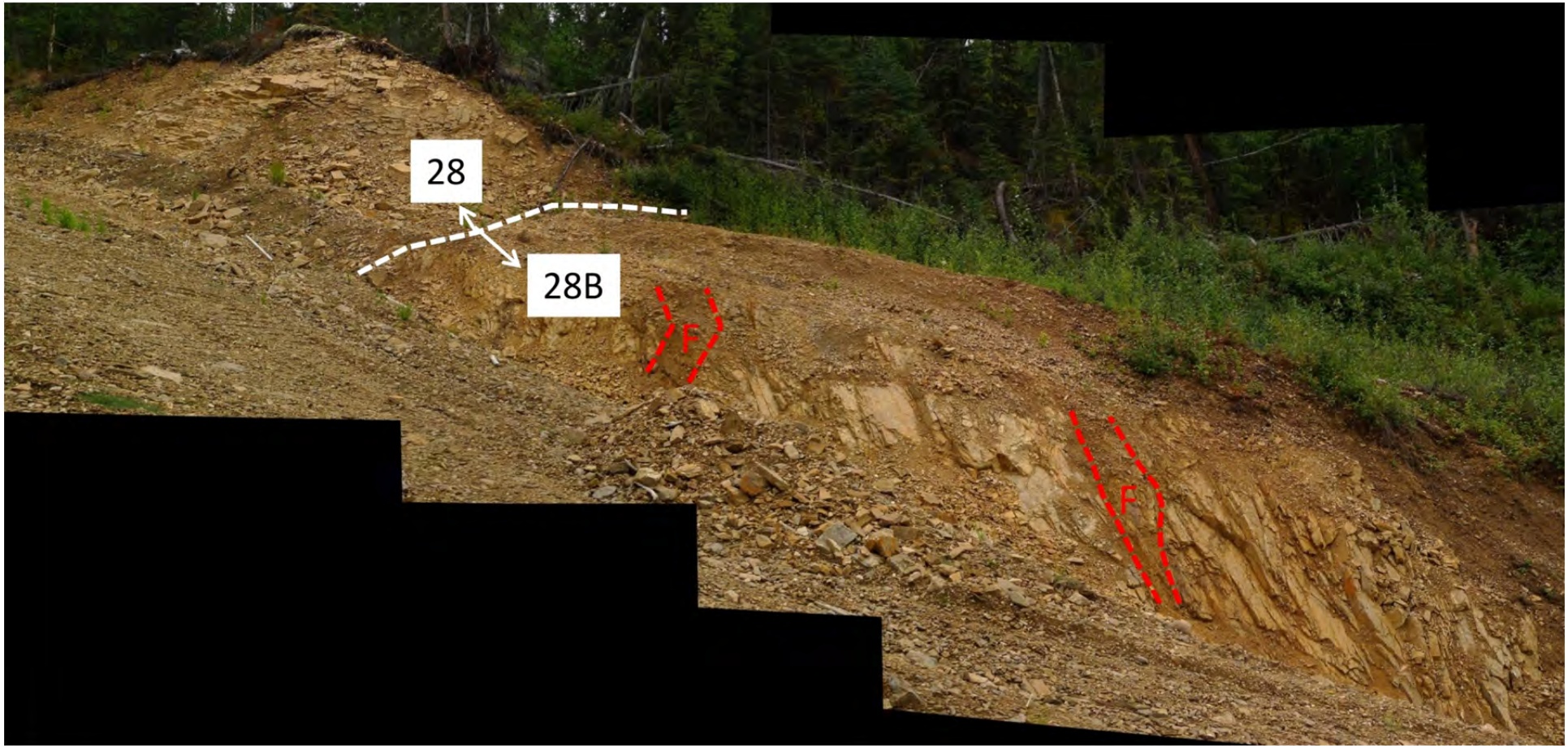
Outcrop OC-BGC11-28/28B

Location: Platinum Gulch
Facility: Platinum Gulch WRSA
Outcrop type: Man-made (exploration road/drill pad cut)

Northing: 7099610
Easting: 459302
Elevation: 948 m
Survey type: Handheld GPS

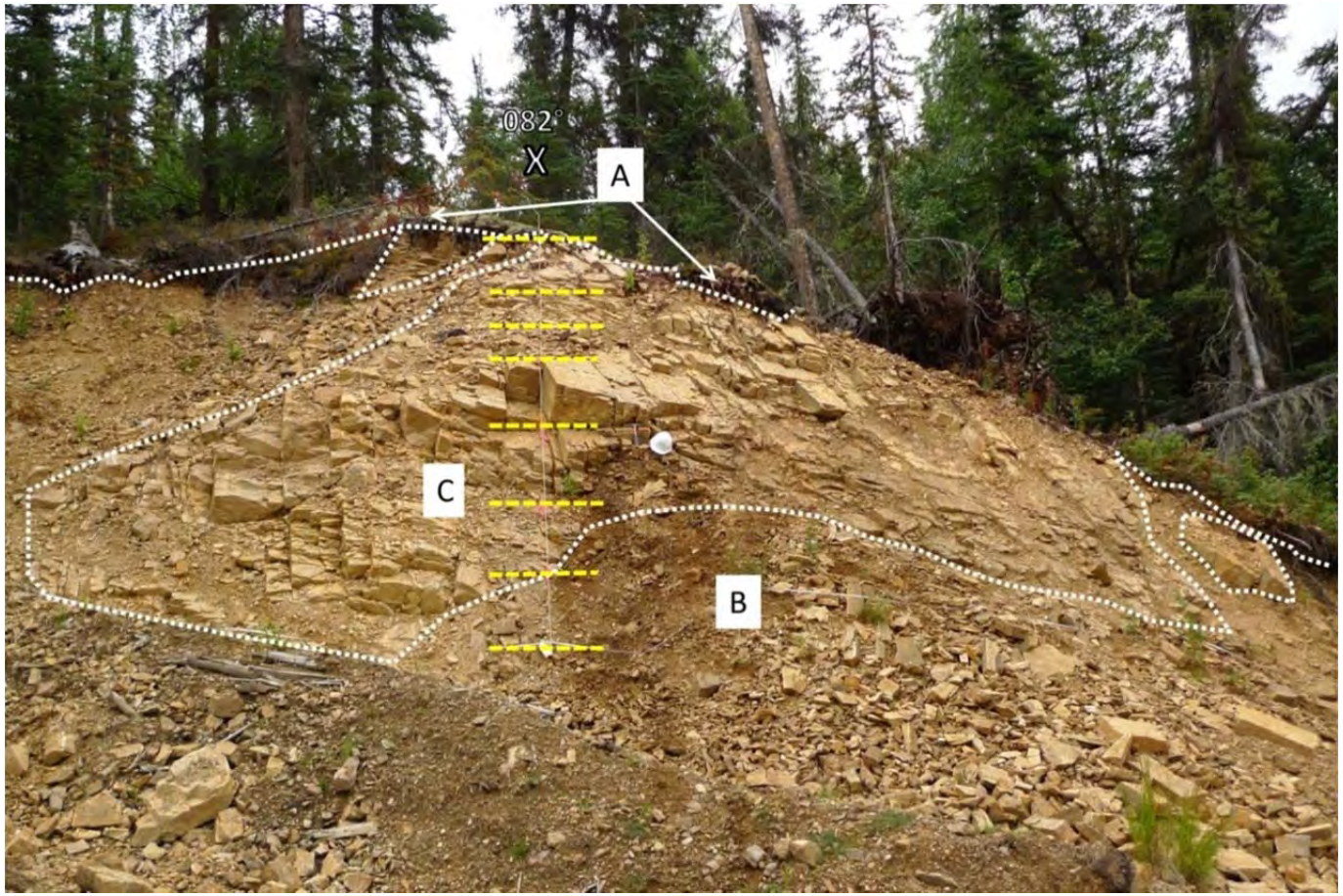
Slope Angle: 50°
Slope Direction: Curves 252-276°
Date logged: 8/14/2011
Logged by: GH

LARGE SCALE OF OUTCROP 28/28B, SHOWING LOCATION OF FAULTS



Outcrop OC-BGC11-28

PHOTO OF OUTCROP 28



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Moss, root mat, and organic silt [TOPSOIL]

B: GRAVEL: Sandy, brown, poorly-graded (GP). Clasts: Meta-sedimentary, angular, flat/elongated, medium strong (R3); max particle size ~ 150 mm. [COLLUVIUM] from local outcrop.

C: Brown, fine-grained QUARTZITE. Medium strong to strong (R3-R4) and lightly to moderately weathered (W2-W2.5), depending on biotite content. Blocks tabular, ~ 10 cm. GSI structure = Very blocky to Blocky/Disturbed, GSI surface = Good to Fair, GSI range = 40-50.

Outcrop OC-BGC11-28

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT C

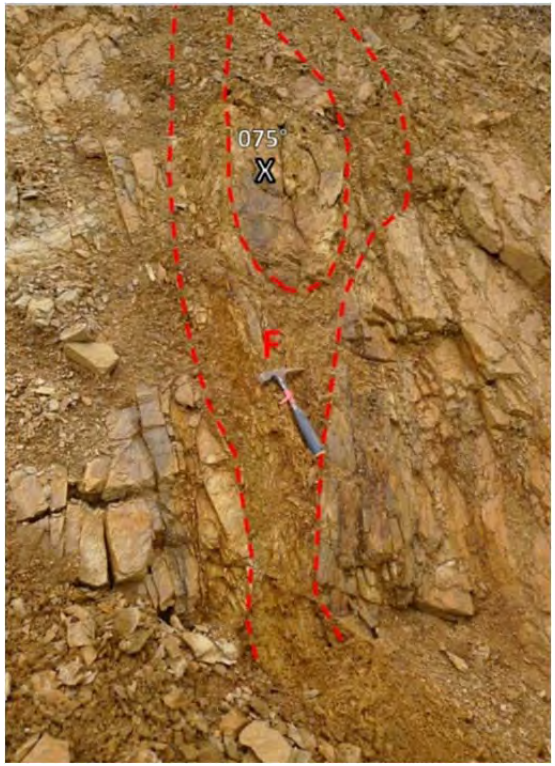
Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	40-43	239-251	0-3	None	8-10 (1m)	R2.5	0.1	2	JO
2	84-87	338-344	1-10	Qz, Fe	2-4(1m)	R2.5	0.15	5+	J
3	65-67	069-101	0-5	None	16(1m)	R3	0.25	1.5	J
4	61-70	110-118	5-10	Qz	6(1m)	R3	1.5	5+	J

Outcrop OC-BGC11-28B

Supplement to OC-BGC11-28

Small outcrop below OC-BGC11-28 with discontinuity sets 1, 2, and 4 from OC-BGC11-28 present. More highly fractured. Average strength = R2 (weak). Blocks 1-5 cm, GSI structure = Disintegrated, GSI surface = Fair, GSI range = 30-40. Contains 2 brittle sandy faults (see example below).

PHOTOGRAPH OF FAULT #2



DISCONTINUITY TABLE

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	55	240	0-5	None	10 (1m)	R3	0.05	2m+	JO
Fault #1	75	202	400	CX		R2.5			F
Fault #2	76	175	250	CX		R3			F

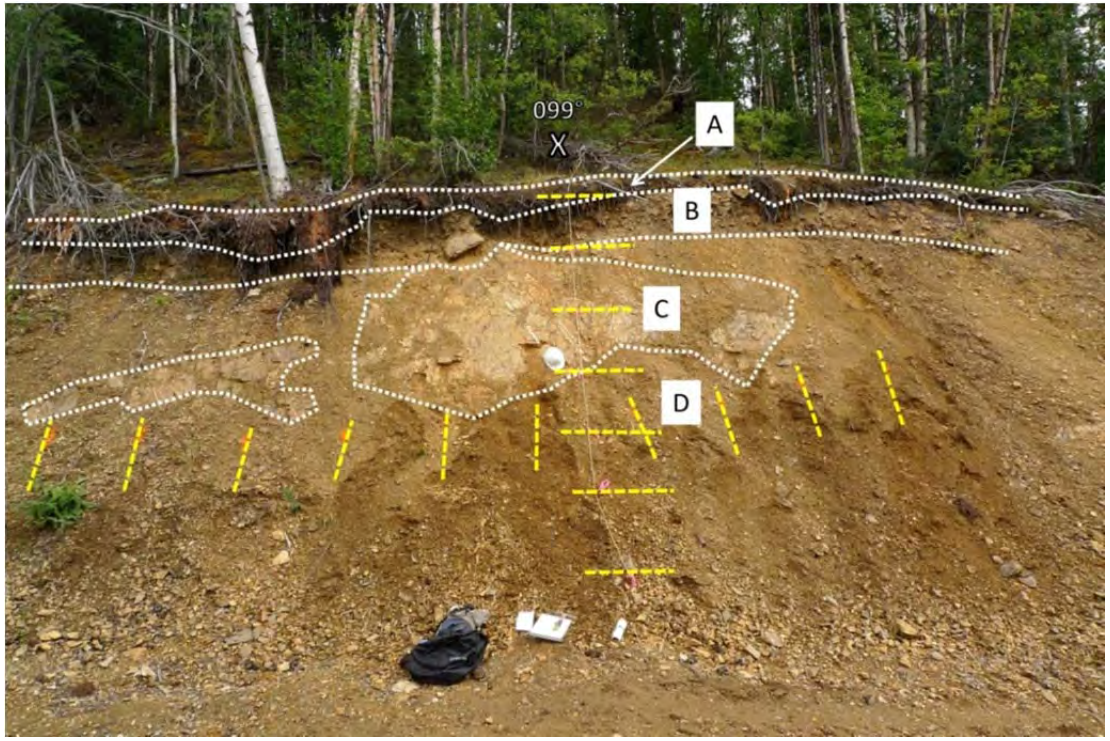
Outcrop OC-BGC11-29

Location: Pit area
Facility: Platinum Gulch WRSA
Outcrop type: Man-made (exploration road cut)

Northing: 7099512
Easting: 459444
Elevation: 983 m
Survey type: Handheld GPS

Slope Angle: 44°
Slope Direction: 270°
Date logged: 8/14/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Root mat organic silt. [TOPSOIL]

B: SAND: Gravelly/cobbly, some silt, trace boulders, trace rootlets (SW). Light brown, moist, homogenous. Clasts subangular to angular, equidimensional to elongated, medium strong to strong (R3-R4); max particle size ~ 400 mm. [COLLUVIUM]

C: Brown, fine-grained QUARTZITE. Slightly to moderately weathered (W2-W3); medium strong (R2-R3). Blocks tabular, 1-5 cm. GSI structure = Disintegrated, GSI surface = Fair, GSI range = 25-35.

D: Material ravelled from cut-slope. [COLLUVIUM]

Outcrop OC-BGC11-29

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT C

Set	Orientation range		Aperture	Infill	JRC (scale)	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	60-66	267-278	0-1	None	8-10 (0.1 m)	R2	0.03	2m+	JO
2	62-108	153-155	1-50	QZ	6-8 (1 m)	R2.5	0.1	2m+	J, V
3	36-39	078-089	0-2	None	10 (1 m)	R2.5	0.05	1m	J

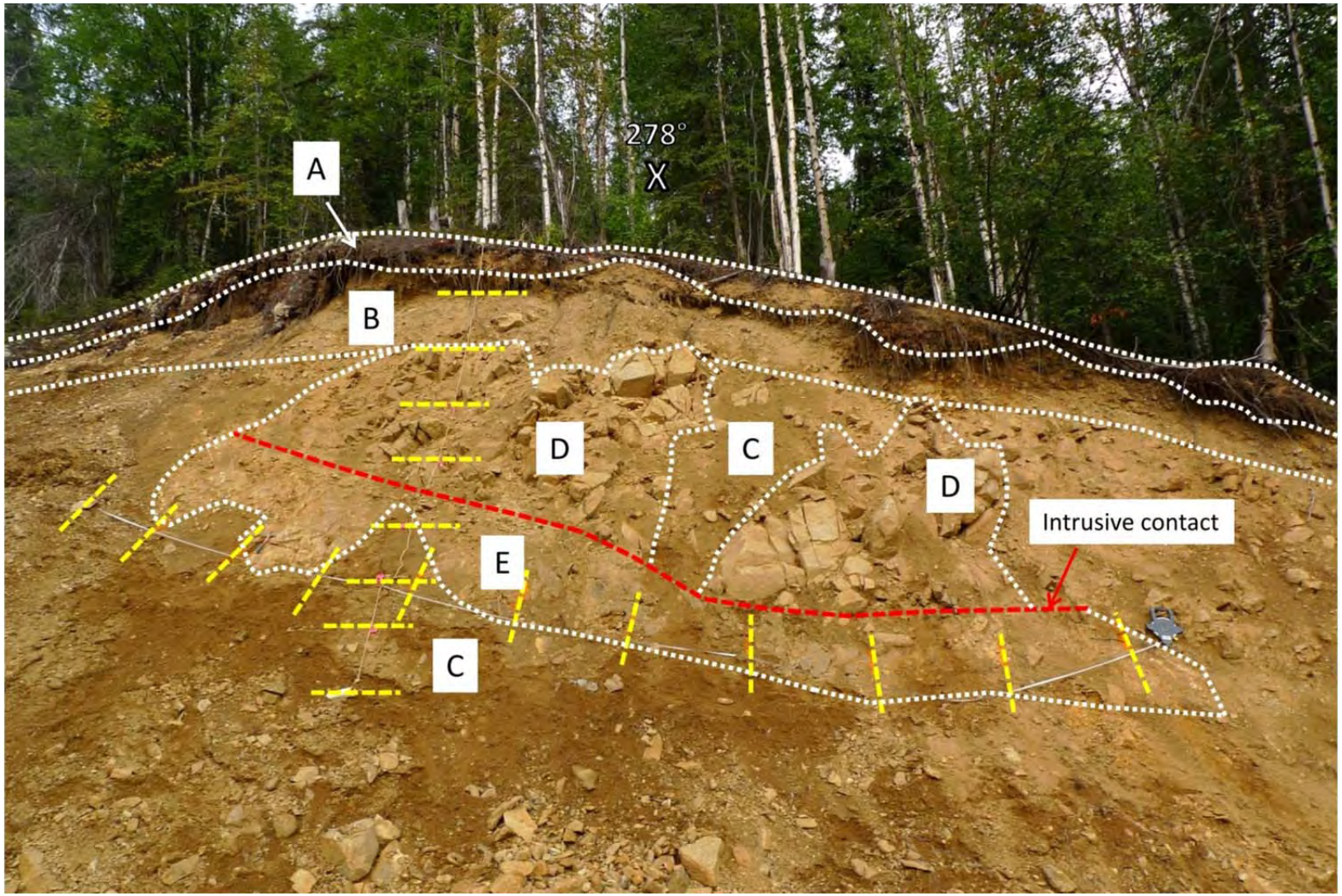
Outcrop OC-BGC11-30

Location: Pit area
Facility: Platinum Gulch WRSA
Outcrop type: Man-made (exploration road cut)

Northing: 7099467
Easting: 459387
Elevation: 947 m
Survey type: Handheld GPS

Slope Angle: 50°
Slope Direction: 259°
Date logged: 8/14/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-30

Photo of structure - Granodiorite

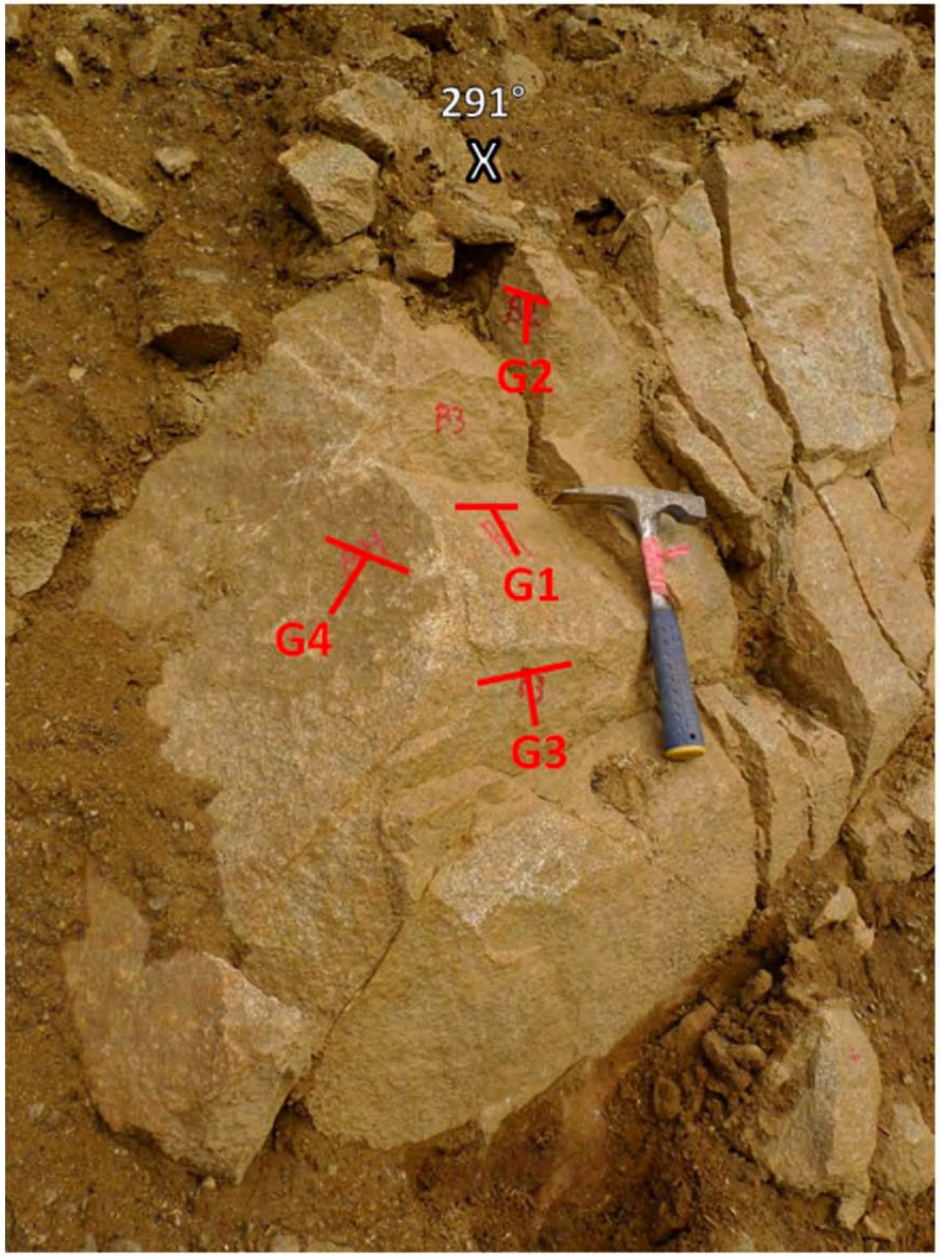
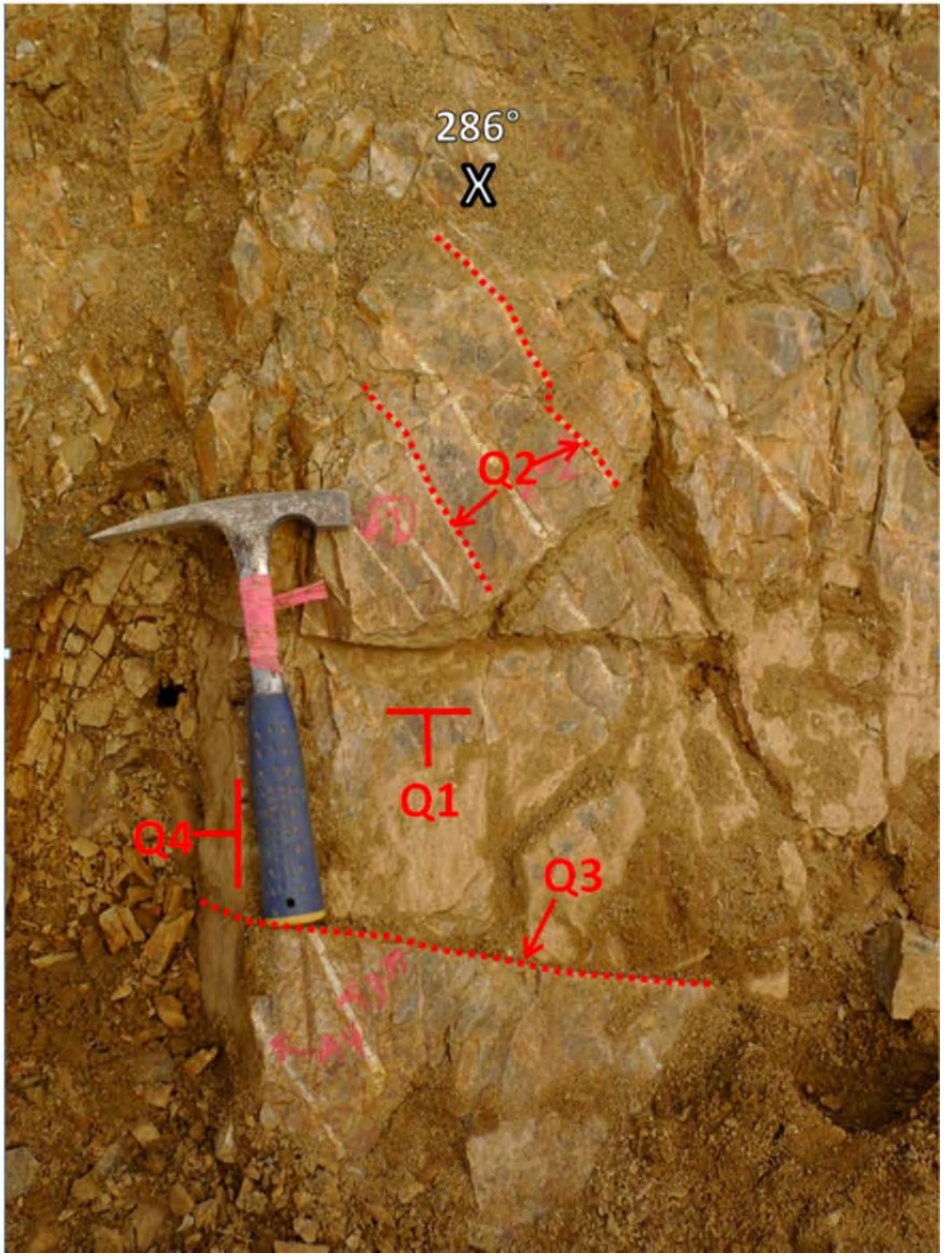


Photo of structure - Quartzite



Outcrop OC-BGC11-30

DESCRIPTION OF MATERIALS

A: Root mat and organic silt. [COLLUVIUM]

B: SAND with gravel and cobbles, well-graded (SW). Light brown, moist. Clasts granodiorite and meta-sedimentary, angular to sub-angular, equidimensional to tabular, strong (R3-R4); max particle size ~ 100 mm. [COLLUVIUM]

C: Ravelled material from outcrop.

D: Yellowish-grey medium-grained GRANODIORITE. Slightly weathered (W2); strong (R4). Blocks ~ 20cm, equidimensional to tabular. GSI structure = Very Blocky, GSI surface = Good, GSI range = 50-60.

E: Dark grey, fine-grained QUARTZITE. Lightly weathered (W1.5-W2); strong (R3-R4). Blocks ~ 5 cm; tabular. GSI structure = Blocky/Disturbed, GSI surface = Good to Fair, GSI range = 40-50.

Lithological contact: 0.3-m-thick zone of reddish-grey medium sandy decomposed rock (DX) derived from the granodiorite unit. Minor clay present from alteration of feldspars.

DISCONTINUITY TABLE – UNITS D/E

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
G1	45-61	216-249	0	None	16 (1m)	R4	0.5	0.7m	J
G2	81-85	138-162	0-30	SA	10-12(1m)	R4	0.4	1.5m+	J
G3	71-82	072-073	0-1	None	6-8(1m)	R4	0.4	3m+	J
G4	55-65	306-320	0-1	FE	6-8(1m)	R3	1	1m+	J
Q1	54-62	257-269	0	None	8 (1m)	R3	0.05	1m+	JO
Q2	No broken surfaces		1-10	QZ	10(1m)	R3.5	0.1	2m+	J, V
Q3	33-71	075-136	2	None	4-6(1m)	R3.5	0.15	1m	J
Q4	64-68	325-348	0.2	None	6-8(1m)	R3.5	0.08	1.5m+	J

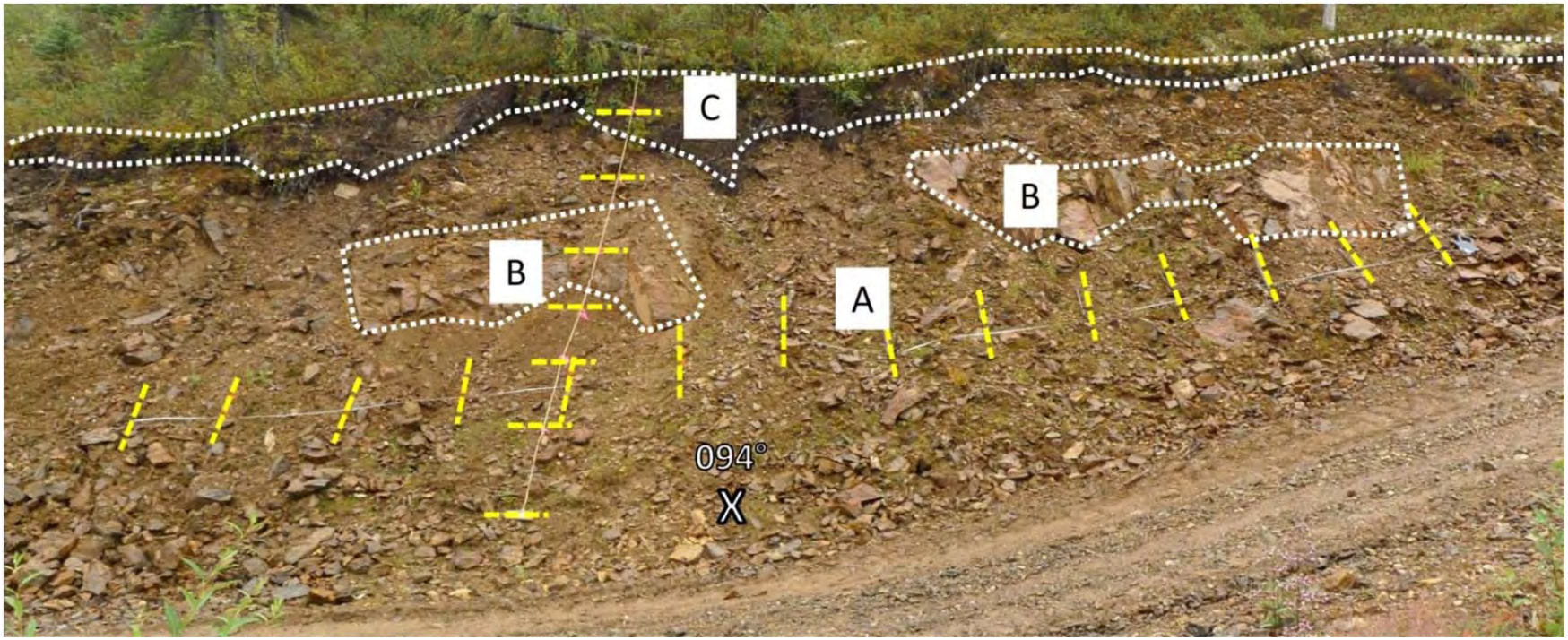
Outcrop OC-BGC11-31

Location: Pit area
Facility: Open pit
Outcrop type: Man-made (road cut)

Northing: 7099768
Easting: 459788
Elevation: 1087 m
Survey type: Handheld GPS

Slope Angle: 51°
Slope Direction: 287°
Date logged: 8/15/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: SILT: Gravelly, some sand (ML). Brown, soft, moist, and homogenous. Clasts: Meta-sedimentary, angular, flat/elongated, strong (R4). Fines have low plasticity, rapid dilatancy, low toughness. [COLLUVIUM]

B: Dark grey, fine-grained QUARTZITE. Faintly to lightly weathered (W1.5-W2); strong (R3-R4). Blocks ~ 10 cm; tabular. GSI structure = Blocky/Disturbed to Very Blocky, GSI surface = Good, GSI range = 45-55.

C: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-31

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	47-51	254-262	0	None	12-16	R3.5	0.1	1m+	JO
2	82-84	149-153	0-40	QZ	16	R4	0.3	1m+	J, V
3	33-50	087-118	0-2	None	12-20	R4	0.25	0.5m+	J
4	36-66	241-259	0-2	None	16	R4	0.4	1m+	J

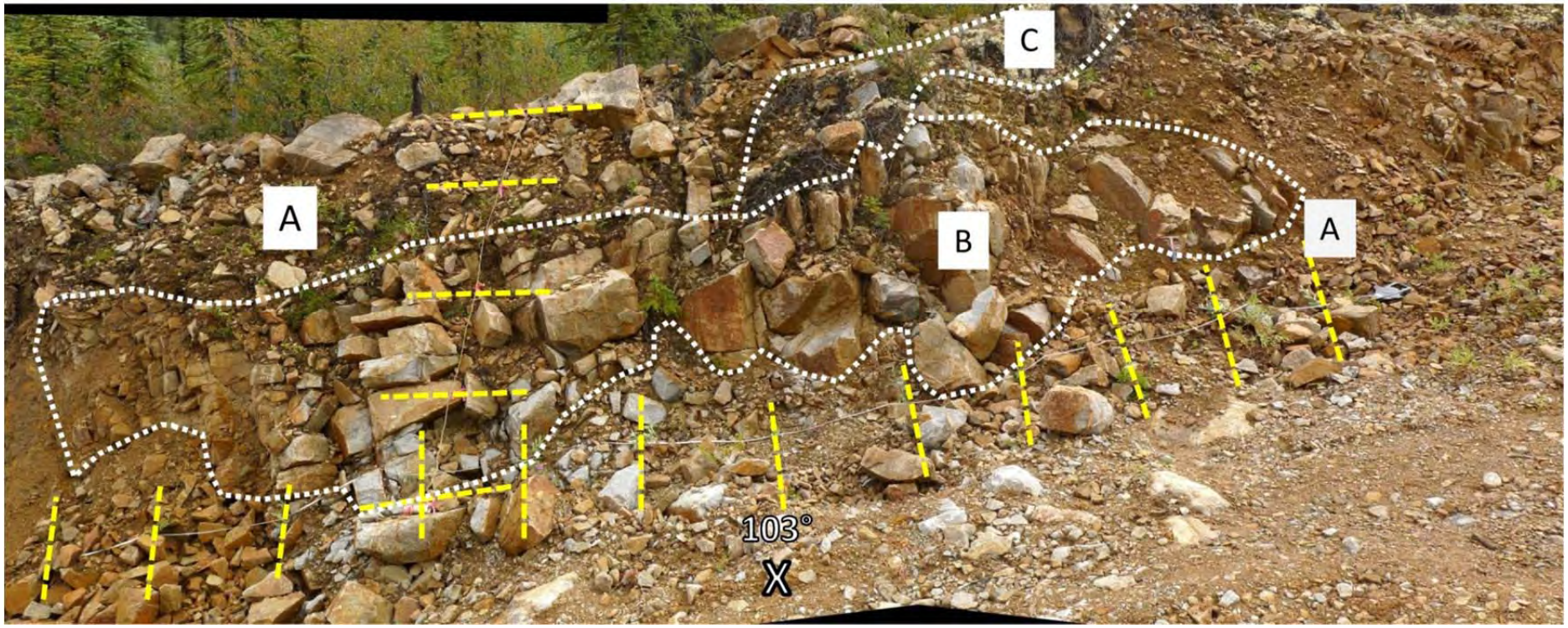
Outcrop OC-BGC11-32

Location: Pit area
Facility: Open pit
Outcrop type: Man-made (exploration trench)

Northing: 7099753
Easting: 460179
Elevation: 1176 m
Survey type: Handheld GPS

Slope Angle: 60°
Slope Direction: 272°
Date logged: 8/15/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

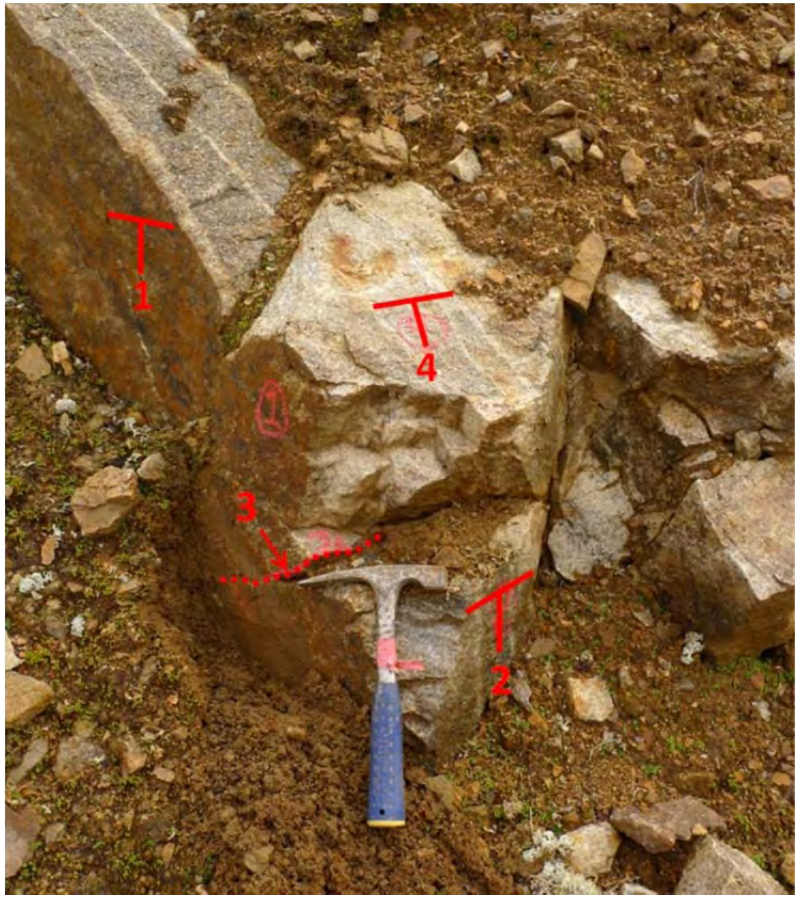
A: SAND: Some gravel, cobbles, and boulders, trace silt, well-graded (SW). Brown, moist, nonplastic. Clasts: Fine gravel to boulder-sized granodiorite; angular, equidimensional, strong (R4). [COLLUVIUM]

B: Grey, medium-grained GRANODIORITE. Faintly weathered (W1.5-W2); strength varies from R4-R5 with degree of weathering/alteration. Blocks ~ 30 cm; prismatic. Open fracture surfaces due to rock mass movement/dilation. GSI structure =Blocky to Very Blocky, GSI surface = Fair to Poor, GSI range = 45-55.

C: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-32

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	74-86	138-142	1-50	QZ	8(1m)	R4	0.3	2.5m+	J, V, S
2	78-89	231-238	2-20	None	10(1m)	R4.5	0.5	2.5m+	J
3	33-56	042-082	1-10	None	16(1m)	R4.5	0.4	1m+	J
4	38-51	260-270	NV	None	8(1m)	R4.5	0.4	1.5m+	J

Outcrop OC-BGC11-33

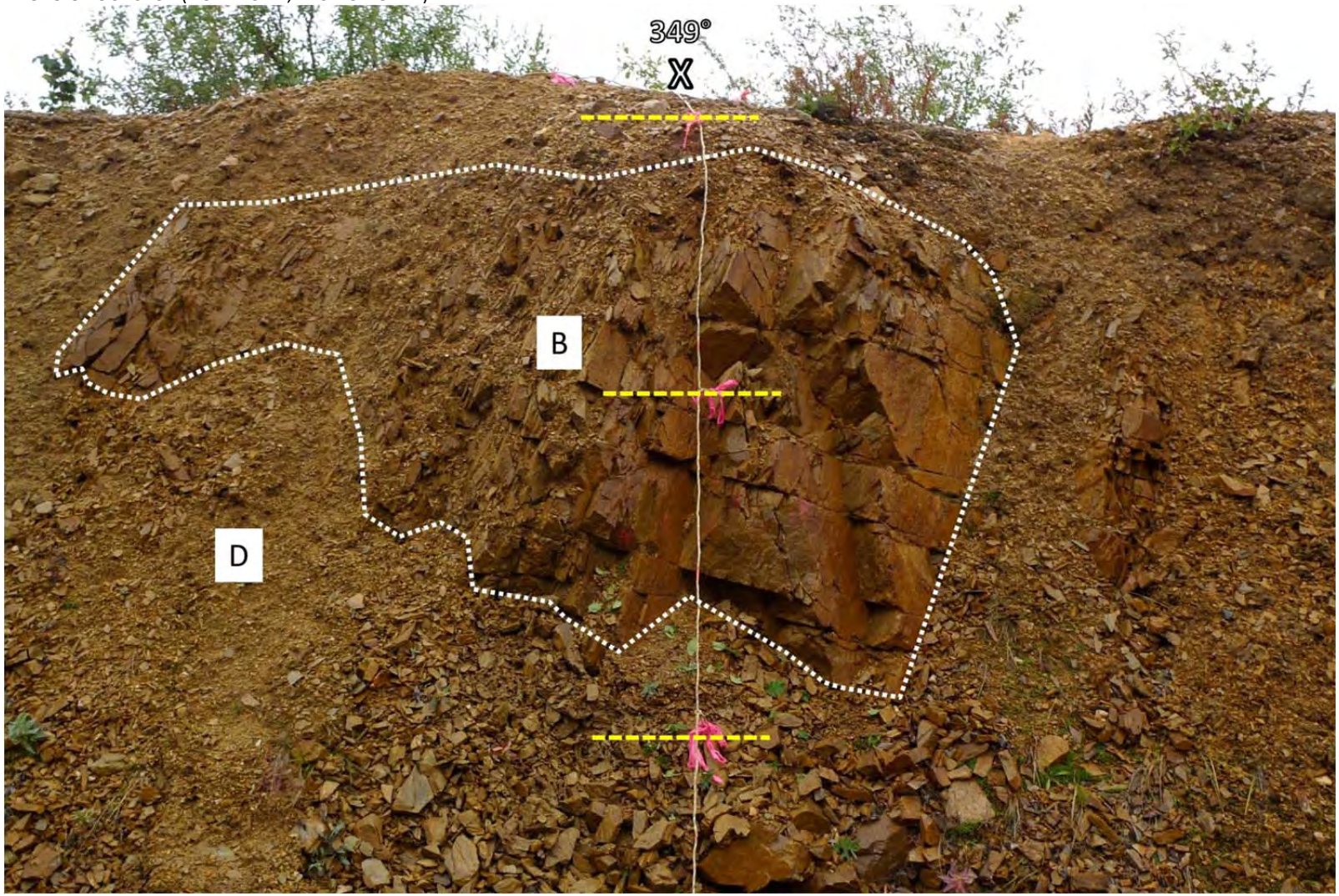
Location: Eagle Pup
Facility: Pit/Eagle Pup WRSA
Outcrop type: Man-made (exploration trench)

Northing: 7099961
Easting: 460143
Elevation: 1160 m
Survey type: Handheld GPS

Slope Angle: 70°
Slope Direction: 012°
Date logged: 8/15/2011
Logged by: GH

* Station comprises two outcrops (north and south) on either side of a deep ditch.

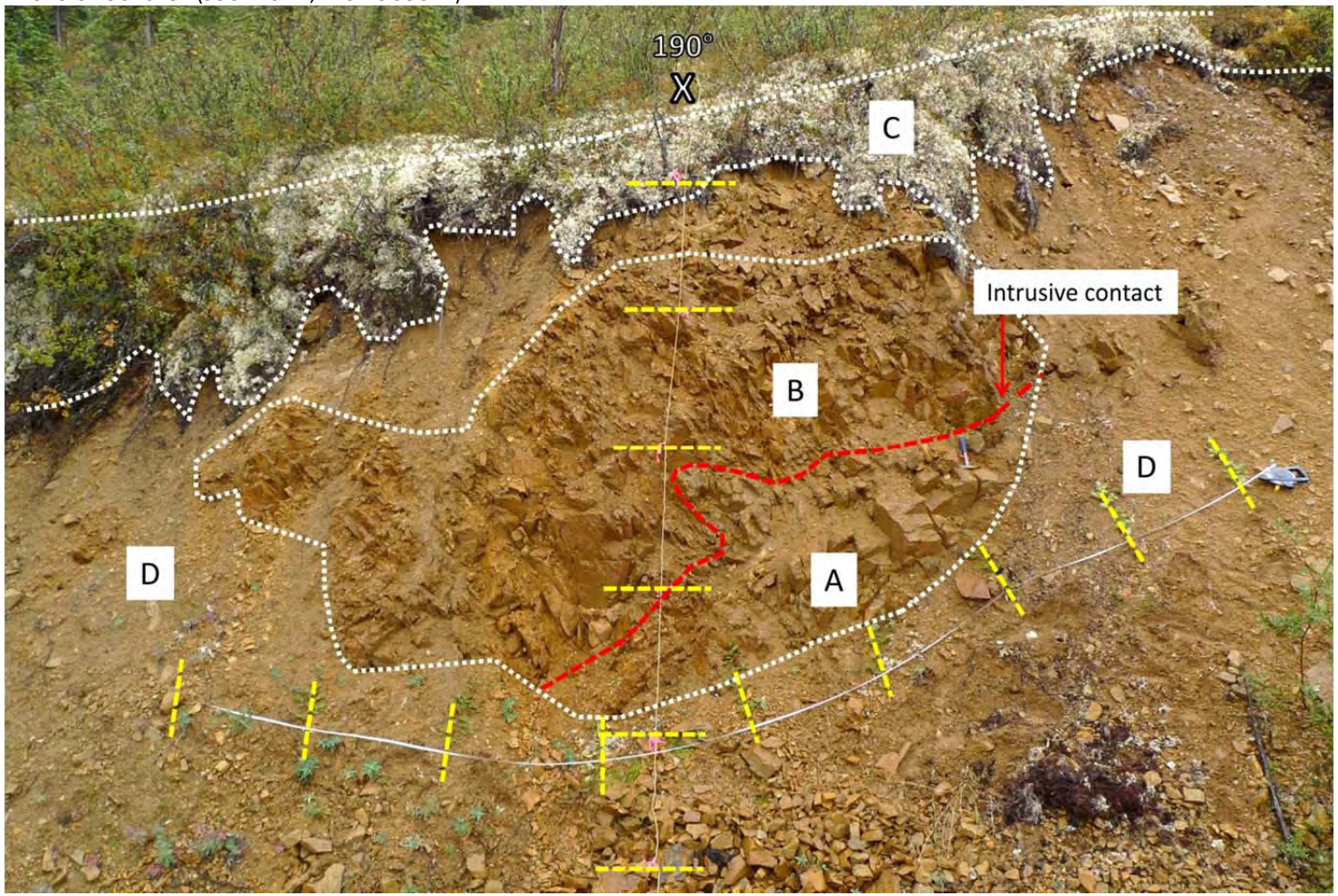
PHOTO OF OUTCROP (NORTH SIDE, FACING NORTH)



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-33

PHOTO OF OUTCROP (SOUTH SIDE, FACING SOUTH)



DESCRIPTION OF MATERIALS

A: Yellowish grey, medium-grained GRANODIORITE. Lightly weathered (W1.5-W2); strong (R3-R4). Blocks ~15 cm; equidimensional. GSI structure = Very Blocky, GSI surface = Good to Fair, GSI range = 45-55.

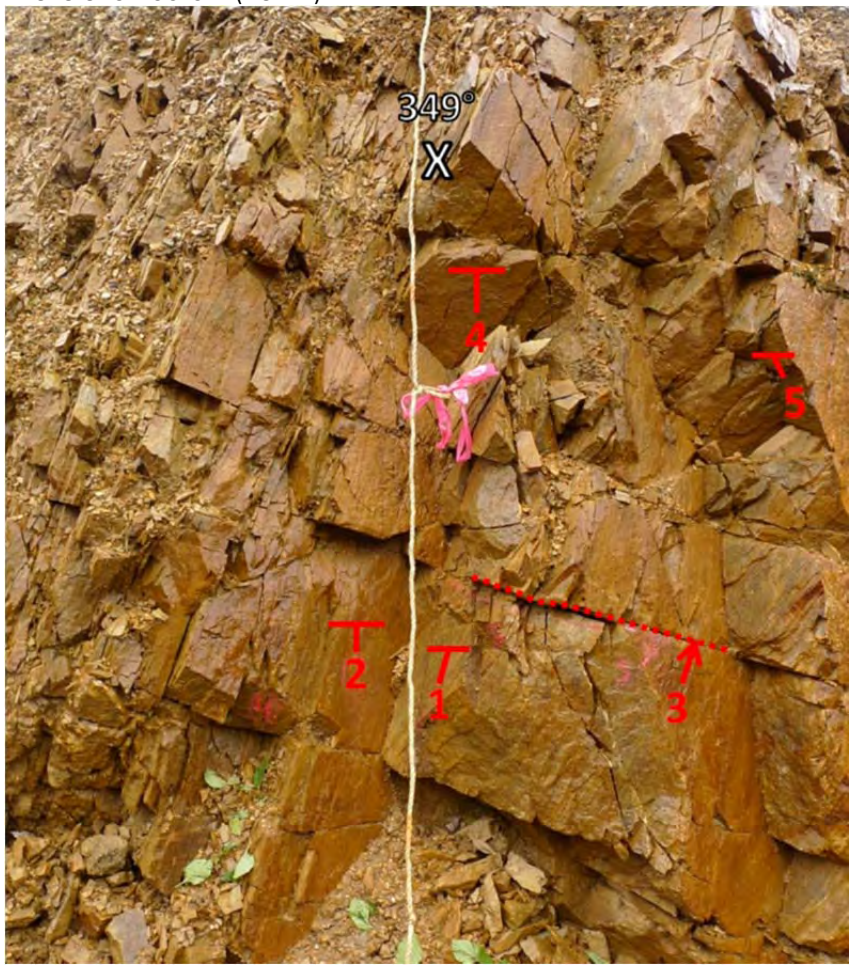
B: Light brown, fine-grained QUARTZITE. Lightly weathered (W1.5-W2); strong (R3-R4). Blocks ~ 8 cm; rhombohedral. GSI structure = Blocky/disturbed, GSI surface = Fair, GSI range = 35-45.

C: Root mat and organic silt. [TOPSOIL]

D: SAND: Fine to medium, some silt, some, gravel, well-graded (SW). Light brown, nonplastic, moist. Clasts composed of both granodiorite & metasedimentary rock, strong (R3-R4), angular. [COLLUVIUM]

Outcrop OC-BGC11-33

PHOTO OF STRUCTURE (NORTH)



DISCONTINUITY TABLE (NORTH OUTCROP, UNIT B)

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
N1	61-65	231-248	0-5	None	8 (10cm)	R3	0.05	1m+	JO
N2	82-84	132-134	1-3	None	4 (1m)	R3	0.1	2m+	J
N3	20-29	026-052	1-5	None	4 (1m)	R3	0.25	1.5m+	J
N4	58-71	347-006	1-2	None	8 (10cm)	R3	0.4	0.5m	J
N5	61-79	033-047	0	None	12 (10cm)	R3	0.5	0.3m	J

Outcrop OC-BGC11-33

PHOTO OF GRANODIORITE STRUCTURE (SOUTH OUTCROP)

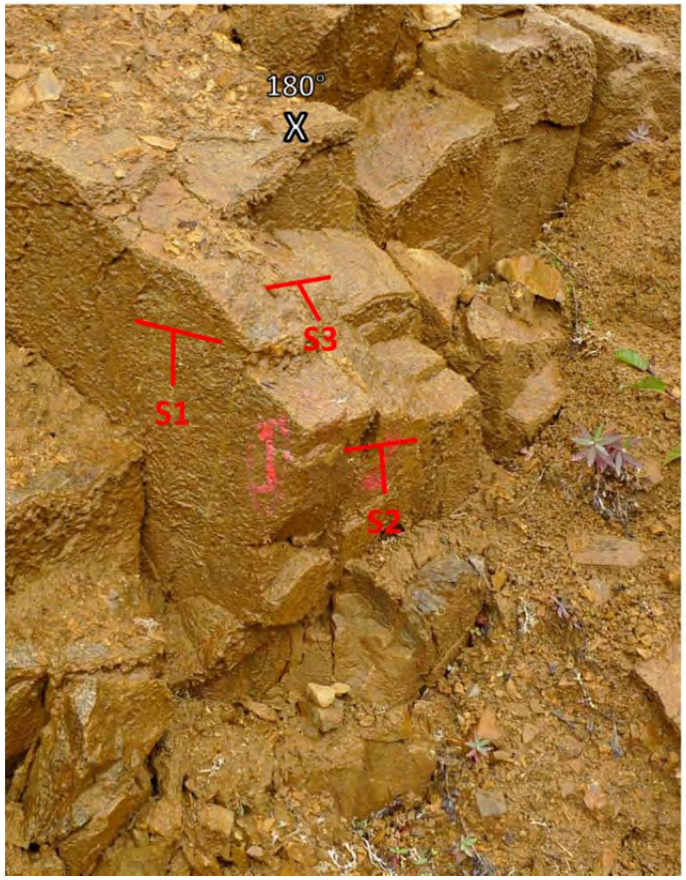
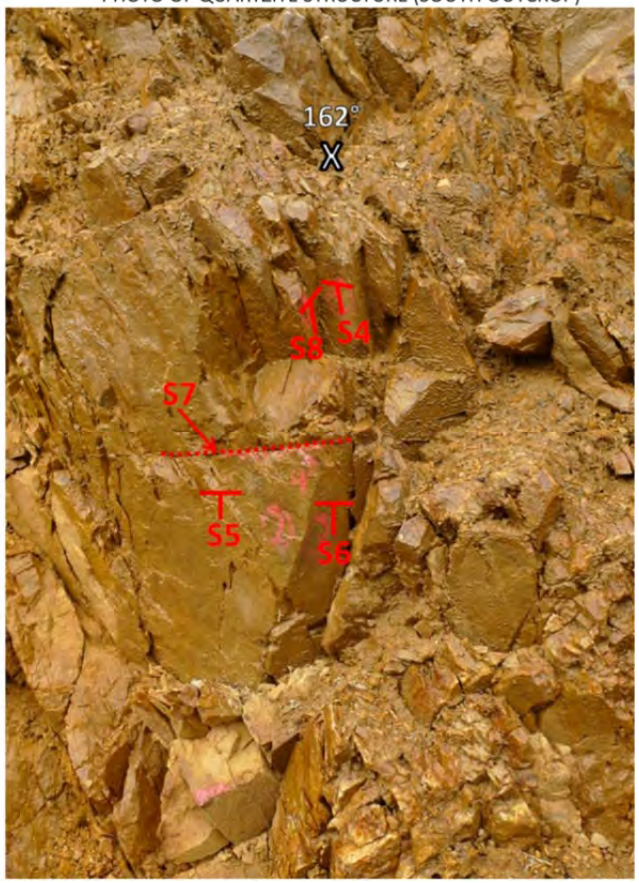


PHOTO OF QUARTZITE STRUCTURE (SOUTH OUTCROP)



DISCONTINUITY TABLE (SOUTH OUTCROP, UNITS B/A)

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
S1	69-76	225-228	2-30	BX, None	6-8(1m)	R4	0.2	1m+	J
S2	63-67	143-144	1-3	QZ	8-10(1m)	R3	0.15	1.5m+	J
S3	48	333-340	0	None	16(1m)	R4	0.2	0.5m	J
S4	46-65	194-238	0-2	None	4 (10cm)	R3	0.08	2m+	JO
S5	69-75	132-182	1	BX	12 (1m)	R3.5	NV	0.7m+	J
S6	64-66	133-138	2-5	None, BX	4 (1m)	R3.5	0.2	1m+	J
S7	16-30	240-269	0-2	None	4 (1m)	R3.5	0.3	1m+	J
S8	68-88	268-273	0.3	None	8 (10cm)	R3.5	NV	0.5m	J

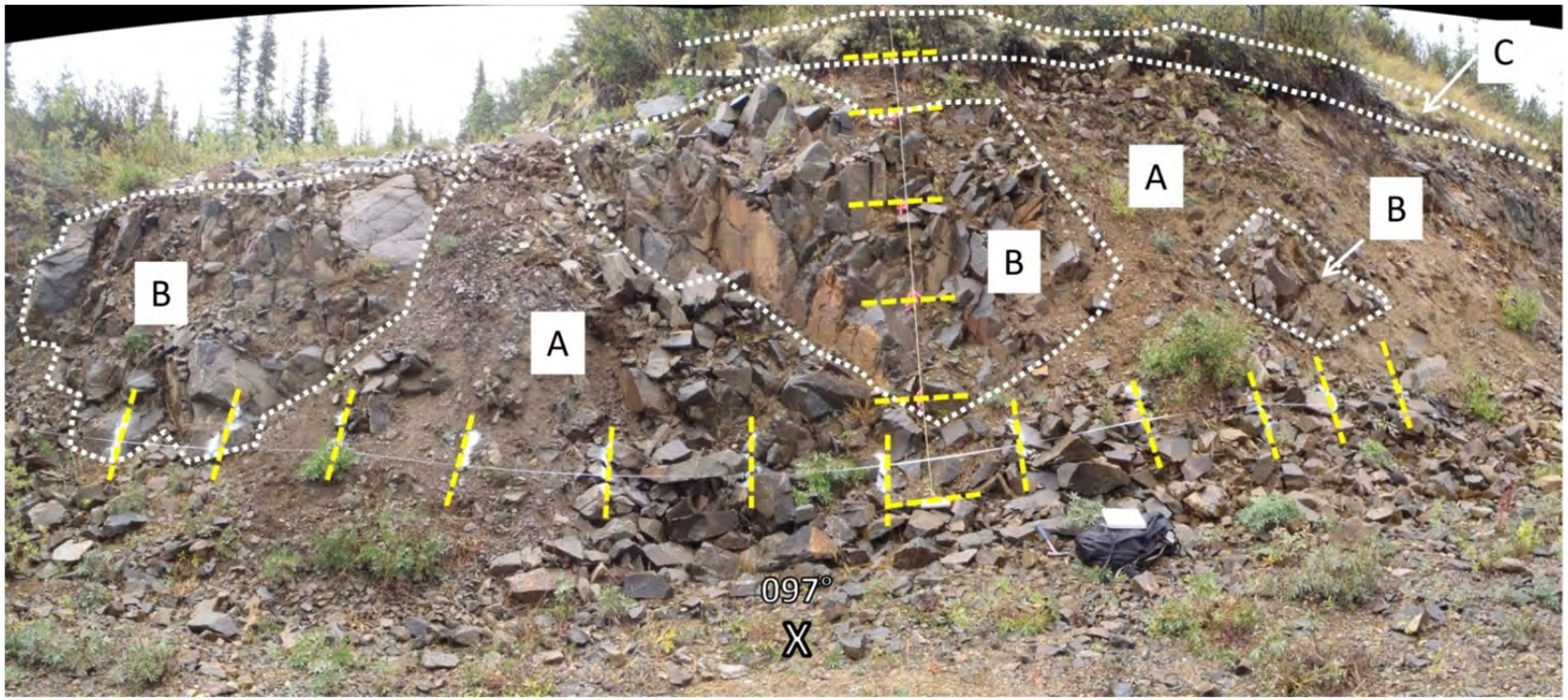
Outcrop OC-BGC11-34A

Location: Pit area
Facility: Open pit
Outcrop type: Man-made (exploration road cut)

Northing: 7099344
Easting: 460193
Elevation: 1266 m
Survey type: Handheld GPS

Slope Angle: 61°
Slope Direction: 275°
Date logged: 8/16/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: SAND: Gravelly, cobbly, some silt, well-graded (SW). Brown, nonplastic, moist, soft, homogenous. Clasts angular to sub-angular, equidimensional to flat, mostly intrusive lithology, weak to very strong (R2-R5, depending on degree of weathering). Max particle size ~ 200 mm. [COLLUVIUM]

B: Dark grey, fine-grained porphyritic igneous rock (possibly a DIKE). Groundmass of quartz & dark mafic minerals w/1-5mm plagioclase phenocrysts. Fresh with minor FE staining (W1-W1.5); very strong to extremely strong (R5-R6). Blocks ~ 30 cm; rhombohedral. GSI structure = Blocky to Very Blocky, GSI surface = Good, GSI range = 55-65.

C: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-34A

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	86-87	130-145	1	None	2-4 (1m)	R3	0.7m	3m+	J, S
2	80-85	058-079	0	None	6-8 (1m)	R4.5	0.3m	2m+	J
3	45-70	309-326	0	None	8-10 (1m)	R5	0.3m	1m	J
4	43-58	212-236	0	None	12-16 (1m)	R5	0.4m	2m	J

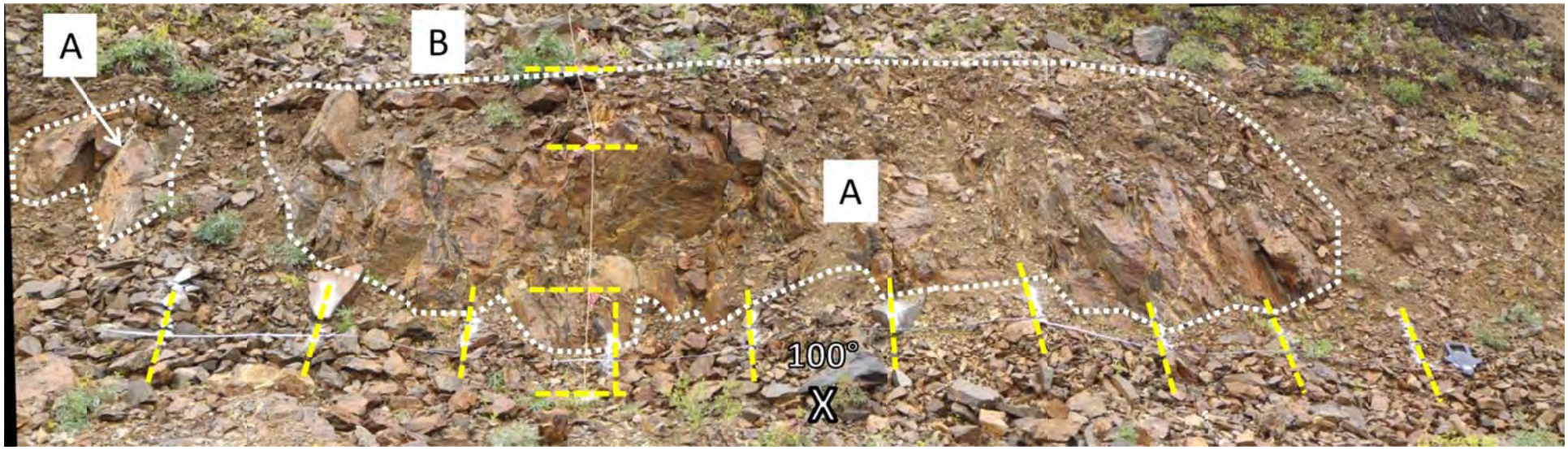
Outcrop OC-BGC11-34B

Location: Pit area
Facility: Open pit
Outcrop type: Man-made (exploration road cut)

Northing: 7099344
Easting: 460193
Elevation: 1266 m
Survey type: Handheld GPS

Slope Angle: 55°
Slope Direction: 283°
Date logged: 8/16/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

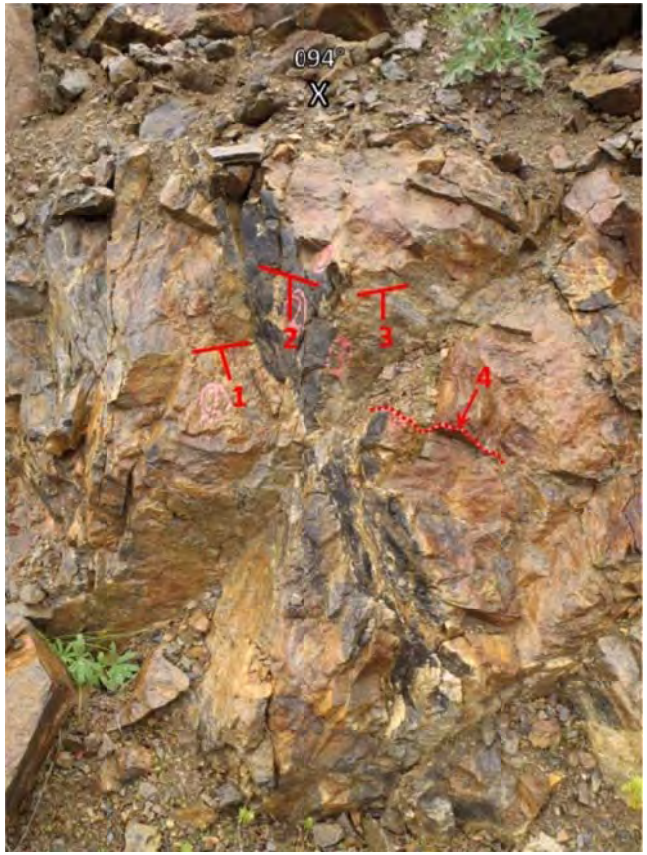
A: Dark grey, fine-grained QUARTZITE. Faintly weathered (W1.5); strong to very strong (R4-R5). Blocks rhomboidal; ~ 20 cm. GSI structure = Very Blocky, GSI surface = Good, GSI range = 50-60.

B: GRAVEL: Cobbly, well-graded (GW). Greyish-brown, nonplastic, moist, homogenous. ~60% clasts (Fine gravel to boulders, mostly intrusive lithology, angular, equidimensional to flat, very strong, max particle size ~ 300 mm); 40% matrix (30% sand, 10% silt). [COLLUVIUM]

C: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-34B

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	54-71	226-242	0-2	None	12-16 (1m)	R4	0.2	1m+	JO
2	85-88	310-320	0	None	12-16 (1m)	R4	0.3	1m+	J, V
3	70-82	076-098	1-3	SA	10-12 (1m)	R4	0.4	3m+	J
4	39-49	100-107	0-2	None	10-12 (1m)	R4	0.5	1m	J
5	59-79	334-010	0	None	15 (10cm)	R4	0.3	0.5m	J

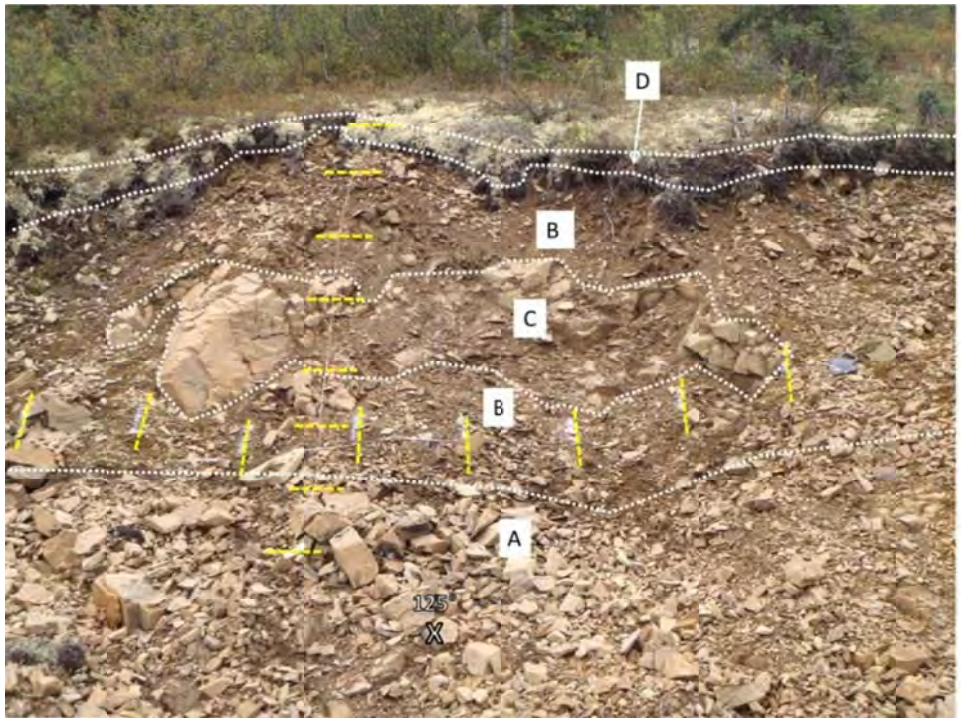
Outcrop OC-BGC11-35

Location: Stuttle Gulch
Facility: Secondary crusher
Outcrop type: Man-made (drill pad cut for BH-BGC11-37)

Northing: 7100175
Easting: 459768
Elevation: 1023 m
Survey type: Handheld GPS

Slope Angle: 50°
Slope Direction: 298°
Date logged: 8/16/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Blocky rubble derived from outcrop.

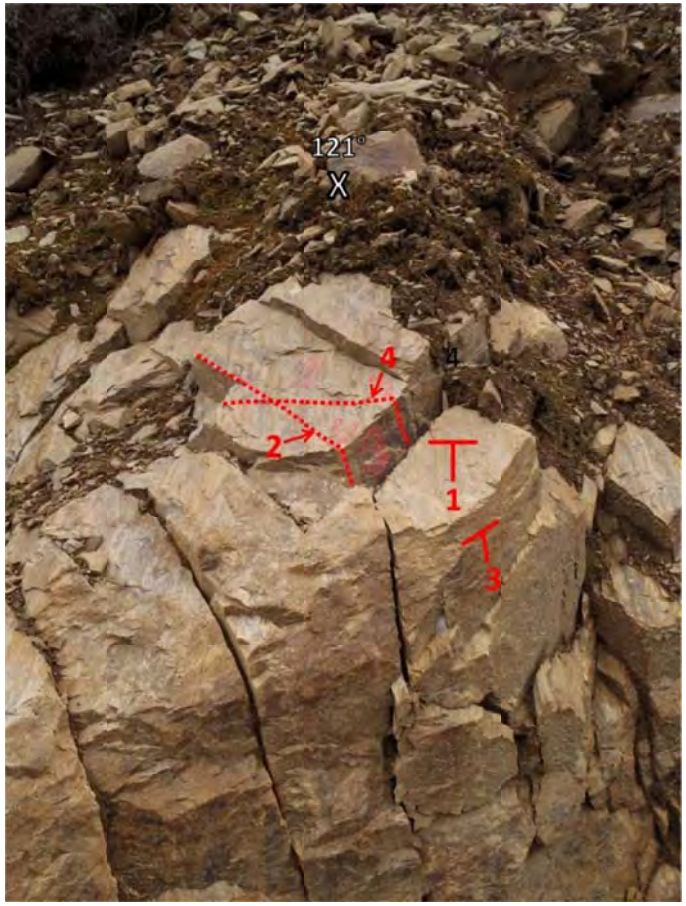
B: SAND: Fine to medium, gravelly, some silt, trace organic material, well-graded (SW-SM). Brown, nonplastic, moist, soft, and homogenous, with rapid dilatancy. Clasts are angular to sub-angular, meta-sedimentary, fine gravel to cobbles, flat and elongated, medium strong to strong (R3-R4). Max particle size ~ 200 mm. [COLLUVIUM]

C: Light brown, fine-grained QUARTZITE. Lightly weathered (W2); strong (R3-R4). Blocks ~ 15 cm; rhombohedral. GSI structure = Very Blocky, GSI surface = Good to Fair, GSI range = 45-55.

D: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-35

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT C

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	40-52	298-325	0	None	12-20 (1m)	R3	0.2	1m+	JO
2	62-80	142-160	0-5	None	4 (1m)	R3	0.3	1m+	J
3	76-89	264-298	0-50	None, SA	20 (1m)	R3	0.3	2m+	J
4	66-77	095-102	0-1	None	12 (10cm)	R3	0.5	0.3m	J

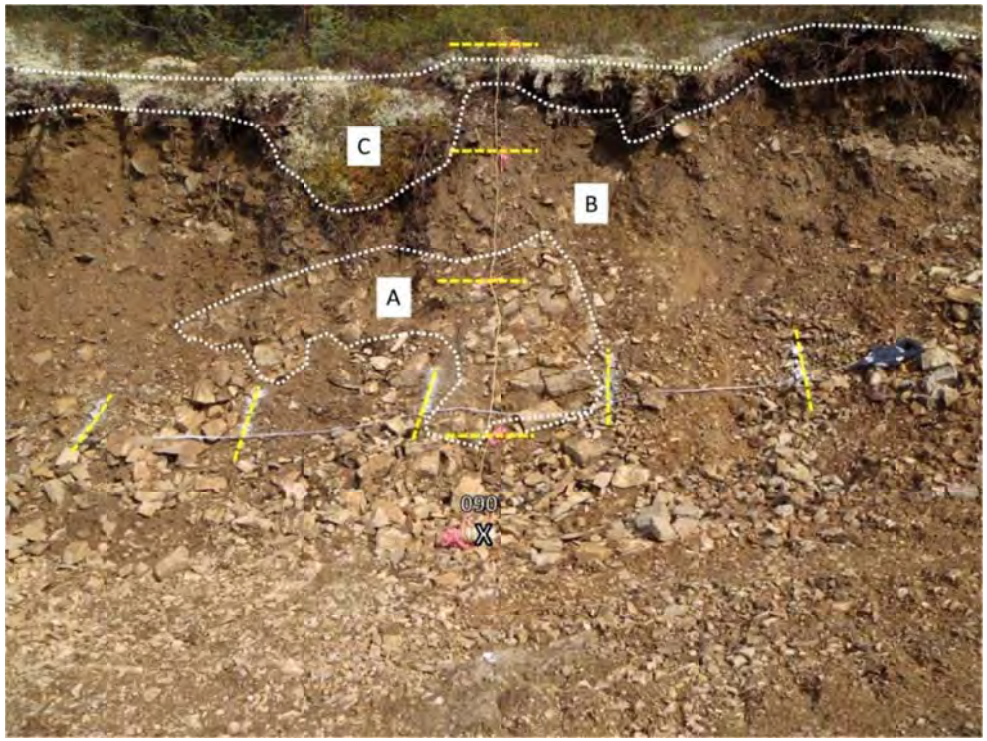
Outcrop OC-BGC11-36

Location: Stuttle Gulch
Facility: Secondary crusher
Outcrop type: Man-made (drill pad cut at BH-BGC11-36)

Northing: 7100272
Easting: 459698
Elevation: 1009 m
Survey type: Handheld GPS

Slope Angle: 60°
Slope Direction: 272°
Date logged: 8/16/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Yellowish-brown, fine-grained QUARTZITE. Lightly weathered (W2); medium strong (R3). Blocks ~ 10 cm; equidimensional. GSI structure = Very Blocky to Blocky/Disturbed, GSI surface = Good to Fair, GSI range = 40-50.

B: SAND: Silty, gravelly, trace cobbles, gap-graded (SM). Brown, nonplastic, no dry strength, rapid dilatancy, moist, firm. Silt content increases upwards; gravel increases downwards. Clasts: Metasedimentary lithology, angular to sub-angular, flat, medium strong (R3); max particle size ~ 100 mm. [COLLUVIUM]

C: Organic silt and root mat. [TOPSOIL]

Outcrop OC-BGC11-36

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC (scale)	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	32-51	290-322	0-10	SA-SM	12 (10cm)	R3	0.1	0.5m+	JO
2	73-75	186-192	1-5	SA-SM	4 (10cm)	R3	0.1	1m+	J
3	62-65	091-098	1-10	SA-SM	16 (10cm)	R3	0.15	1.5m+	J

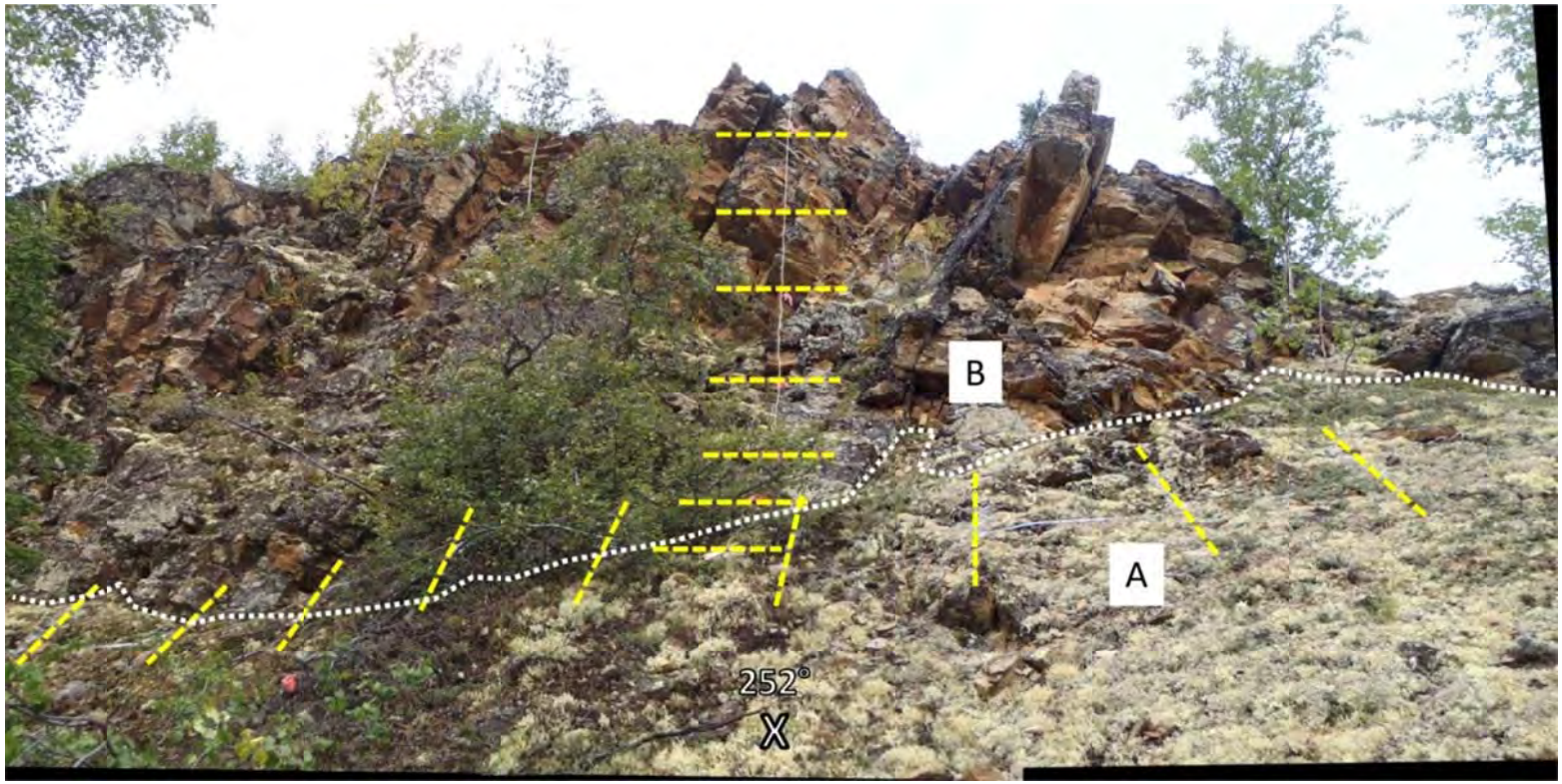
Outcrop OC-BGC11-37

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Natural

Northing: 7100383
Easting: 460067
Elevation: 1052 m
Survey type: Handheld GPS

Slope Angle: 65°
Slope Direction: 088°
Date logged: 8/17/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: GRAVEL: Some organic silt, some sand, trace cobbles, well-graded (GW-GM). Light brown, nonplastic, moist, firm to hard, and homogenous. Clasts are metasedimentary lithology derived from outcrop, flat, angular, medium strong (R3); max particle size ~ 200 mm. [COLLUVIUM]

B: Light brownish grey, fine-grained well-foliated QUARTZITE. Lightly weathered (W1.5-W2); strong (R3-R4; strength varies depending on pervasiveness of foliation planes & weathering). Blocks prismatic to rhombohedral; ~ 25 cm. GSI structure = Very Blocky, GSI surface = Good to Fair, GSI range = 45-55.

Outcrop OC-BGC11-37

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	27-32	279-315	0-20	None	12-16 (1m)	R3.5	0.2	3m	JO
2	63-67	164-172	1-40	BX, None	10-12 (1m)	R4	0.2	6m+	J
3	66-84	074-105	0-10	BX, None	12-20 (1m)	R4	0.3	1m	J
4	60-74	183-204	0-2	None	10-12 (1m)	R4	1+	1m	J

Outcrop OC-BGC11-38

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Man-made (road cut)

Northing: 7100968
Easting: 460124
Elevation: 997 m
Survey type: Handheld GPS

Slope Angle: 62°
Slope Direction: 218°
Date logged: 8/17/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: GRAVEL: Sandy, cobbly, trace silt, well-graded (GW). Brown, moist, soft, noplastic and homogenous. Clasts are metasedimentary, sub-angular to angular, flat to elongate, strong (R4), and fine jupwards from the base of the outcrop. Max particle size ~ 400 mm.

B: Grey, fine-grained QUARTZITE. Faintly weathered (W1.5); strong (R4). Blocks are prismatic; ~ 20 cm. GSI structure = Very Blocky, GSI surface = Good to Fair, GSI range = 50-60. Abundant small-scale (cm-scale) folds are present. A few blocks on outcrop surface are toppling outwards on discontinuity set 4.

C: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-38

PHOTO OF STRUCTURE



DISCONTINUITY TABLE - UNIT B

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	29-35	252-330	0-5	None, SA-SM	10-20 (1m)	R3.5	0.2	4m+	JO
2	71-79	167	2-30	None, SA-SM	4 (1m)	R4	0.2	3m+	J
3	75-76	247-277	2-5	None, SA-SM	20 (1m)	R4	0.3	1m	J
4	71-73	059-076	0-100 (toppling)	None, SA-SM	20 (1m)	R4		1.5m	J

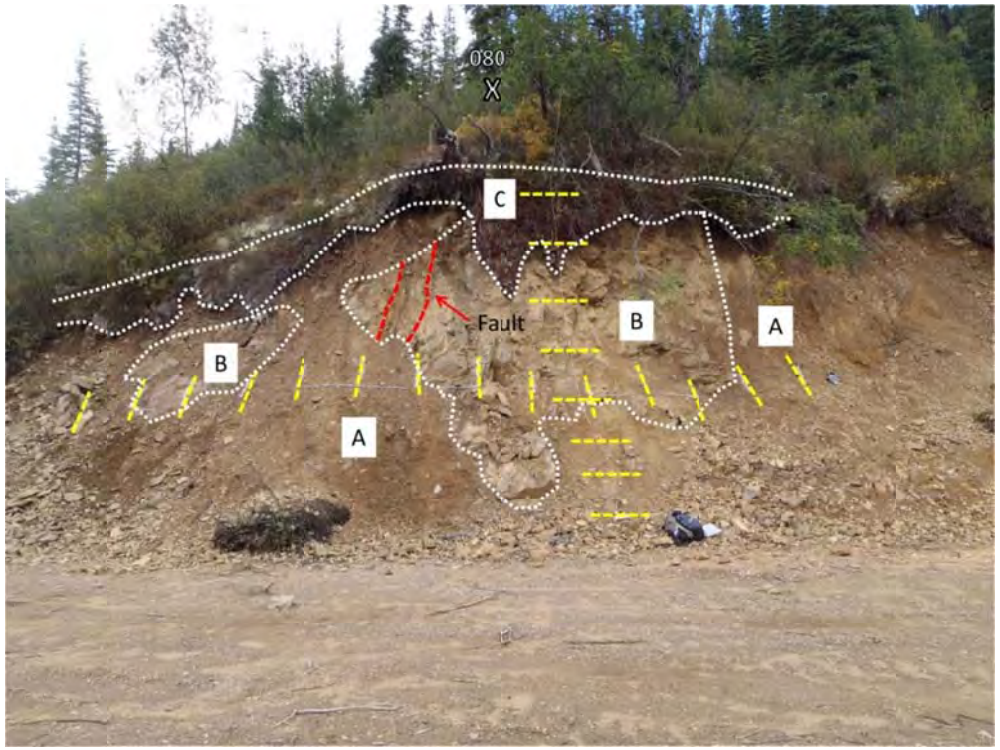
Outcrop OC-BGC11-39

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Man-made (drill pad cut)

Northing: 7100395
Easting: 460382
Elevation: 1057 m
Survey type: Handheld GPS

Slope Angle: 55°
Slope Direction: Curves 245-268° (convex)
Date logged: 8/17/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: SAND, gravelly, trace to some silt, trace cobbles, well-graded (SW-SM). Brown, nonplastic, moist, firm, and homogenous with rapid dilatancy and low dry strength. Clasts are meta-sedimentary, equidimensional to flat, angular to subangular, and medium strong to strong (R3-R4). Max particle size ~ 100 mm. [COLLUVIUM]

B: Dark grey, fine-grained QUARTZITE with veins of calcite. Lightly weathered (W1.5-W2); strong to very strong (R4-R5). Blocks ~ 20 cm; rhombohedral. GSI structure = Very Blocky, GSI surface = Good, GSI range = 50-60.

C: Root mat and organic silt. [TOPSOIL]

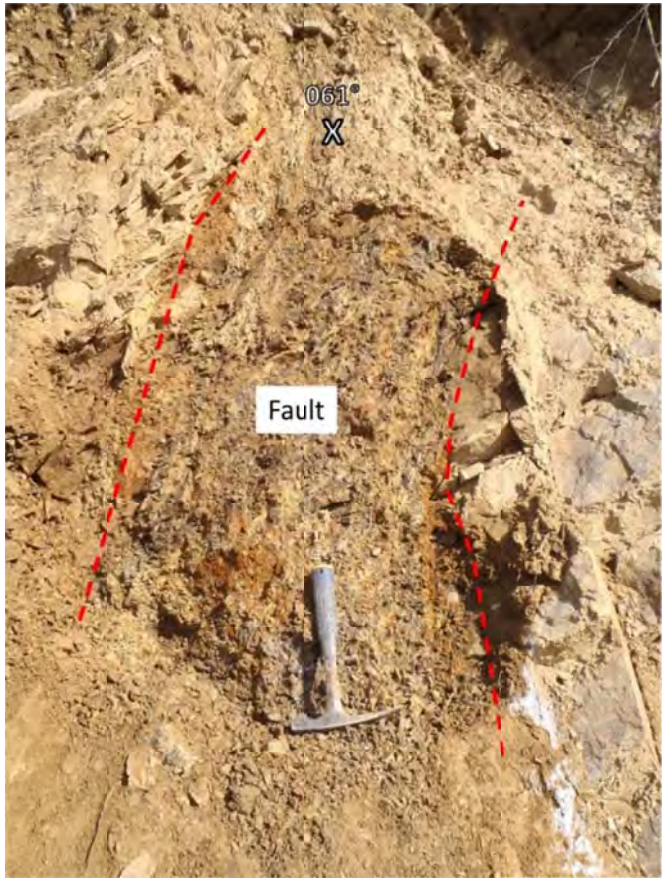
Outcrop OC-BGC11-39

PHOTO OF STRUCTURE



Outcrop OC-BGC11-39

PHOTO OF FAULT



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	52-59	293-311	0-4	None	4-20 (1m)	R4	0.2	2m+	JO
2	45-70	044-091	0-15	None	8 (1m)	R4	0.3	2m+	J
3	72-87	335-360	0	None	12 (1m)	R4	0.5	2.5m+	J
4	63-71	189-215	0-2	None	4 (1m)	R4	0.5	1m+	J
5	78-88	030-056	0	None	12 (1m)	R4	0.7	1m+	J

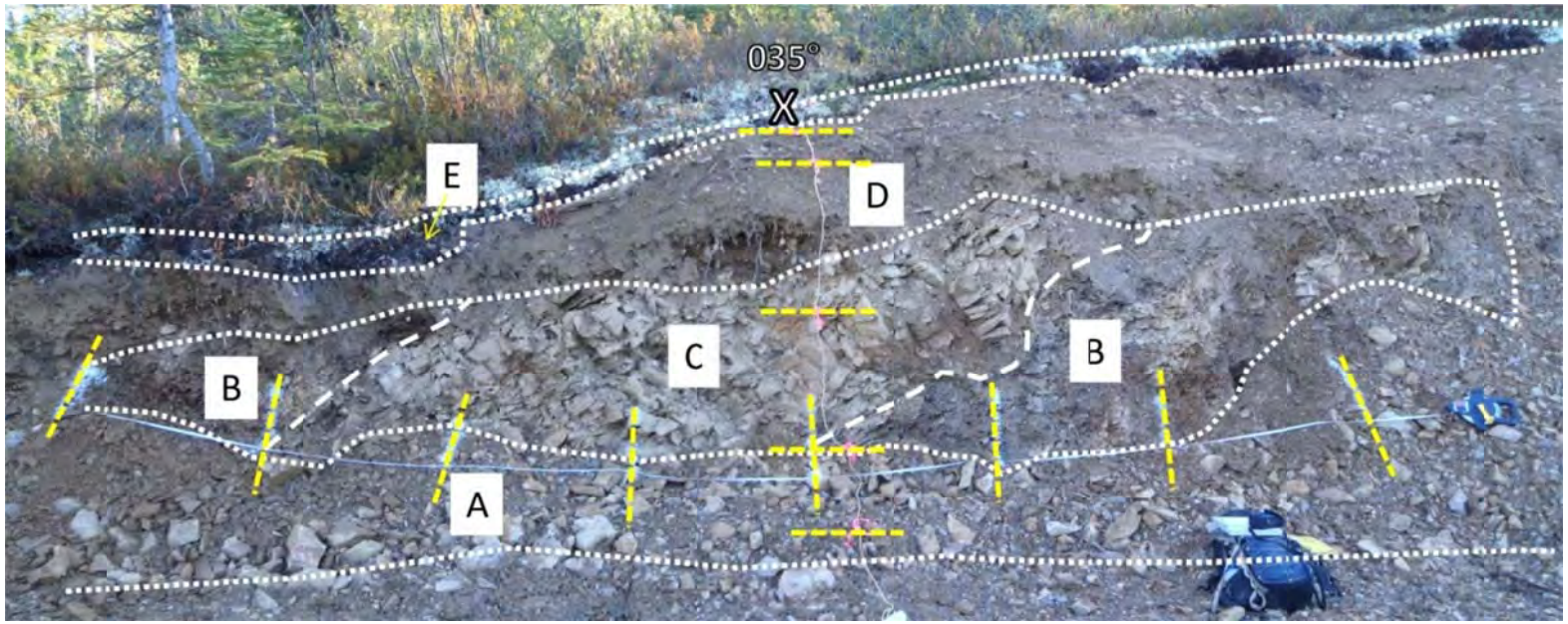
Outcrop OC-BGC11-40

Location: Ann Gulch
Facility: Heap leach pads
Outcrop type: Man-made (drill pad cut at BH-BGC11-29)

Northing: 7101809
Easting: 459981
Elevation: 1051 m
Survey type: Handheld GPS

Slope Angle: 60°
Slope Direction: 215°
Date logged: 8/18/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Fallen colluvium and rubble from outcrop.

B: Grey, fine-grained PHYLLITE interspersed with minor seams (~20%) of quartzite. Has brittly folded and crushed texture. Slightly to moderately weathered (W2-W3); very weak (R1). Blocks <1cm; tabular. GSI structure = Foliated/Laminated/Sheared, GSI surface = Fair to Very Poor, GSI range <20. NOTE: Rock mass quality possibly below the limit of GSI applicability.

C: Light brown, fine-grained QUARTZITE interspersed with micaceous phyllitic seams (~30%). Slightly weathered (W2); very weak to medium strong (R1-R3). Blocks ~ 5 cm; equidimensional to tabular. GSI structure = Blocky/Disturbed, GSI surface = Fair, GSI range = 30-40.

D: SILT: Some sand, trace fine to medium gravel, trace organics (ML). Brown, very soft, moist; low plasticity, rapid dilatancy, low toughness, no dry strength. Clasts angular to subangular, metasedimentary, flat, medium strong (R3). Max particle size ~ 5 cm. Grades into highly weathered bedrock at its base. [COLLUVIUM]

E: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-40

PHOTO OF STRUCTURE - UNIT C



DISCONTINUITY TABLE – UNITS B/C

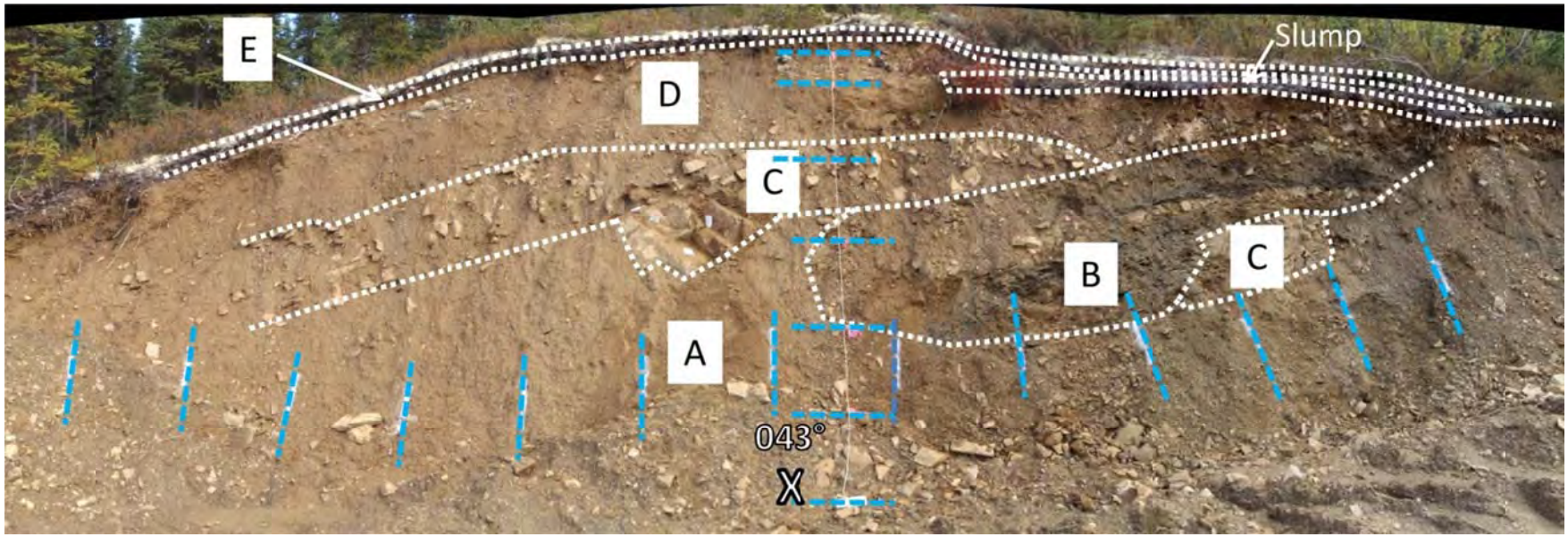
Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	29-33	278-316	1-3	None	8 (10cm)	R2	0.03	0.3m+	JO
2	55-72	158-167	1-3	None	8 (10cm)	R3	0.1	0.5m+	J
3	64-73	055-072	1-40	None, SM-SA	12 (10cm)	R3	0.08	0.3m+	J

Outcrop OC-BGC11-41

Location: Ann Gulch
Facility: Heap leach pad
Northing: 7102064
Easting: 459915
Elevation: 1048 m

Slope Angle: 50°
Slope Direction: Curves 200-241° (concave)
Date logged: 8/18/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing between blue dashed lines.

DESCRIPTION OF MATERIALS

A: Ravelled rock and colluvium draping outcrop.

B: Grey, fine-grained PHYLLITE with seams/blocks of interspersed quartzite (30%). Is sheared/weathered to a silty material in places. Lightly to highly weathered (W2-W4); extremely weak to very weak (R0-R1). Blocks tabular, <1 cm in size. GSI structure = Foliated/Laminated/Sheared, GSI surface = Poor, GSI range = <20. NOTE: rock mass quality below the limit of GSI applicability.

C: Brown, fine-grained QUARTZITE with micaceous foliation planes. Lightly weathered (W2); medium strong (R3). Blocks ~ 10 cm; rhombohedral. GSI structure = Blocky/Disturbed, GSI surface = Fair, GSI range = 35-45.

D: SILT: Sandy, trace gravel, trace organics (ML). Brown, moist, soft; low plasticity, rapid dilatancy, low toughness, no dry strength. Clasts meta-sedimentary, angular to subangular, medium strong (R3), flat. Max particle size ~ 7 cm. Coarsens downwards and grades into weathered bedrock.[COLLUVIUM]

E: Organic silt and root mat. [TOPSOIL]

Outcrop OC-BGC11-41

PHOTO OF STRUCTURE



DISCONTINUITY TABLE

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	37-44	358-012	0-5	None, CX, DX	13 (10cm)	R3		1m+	JO
2	31-54	162-188	0	None, SM-SA	12 (1m)	R3		1m	J
3	85-89	071-095	0-100	None, SM-SA	20 (1m)	R3		1m	J
4	NOT A SET (IS FOLIATION WHERE FOLDED)								
5	65-70	260-267	0-100	None, SM-SA	8 (10cm)	R3		0.3m+	J

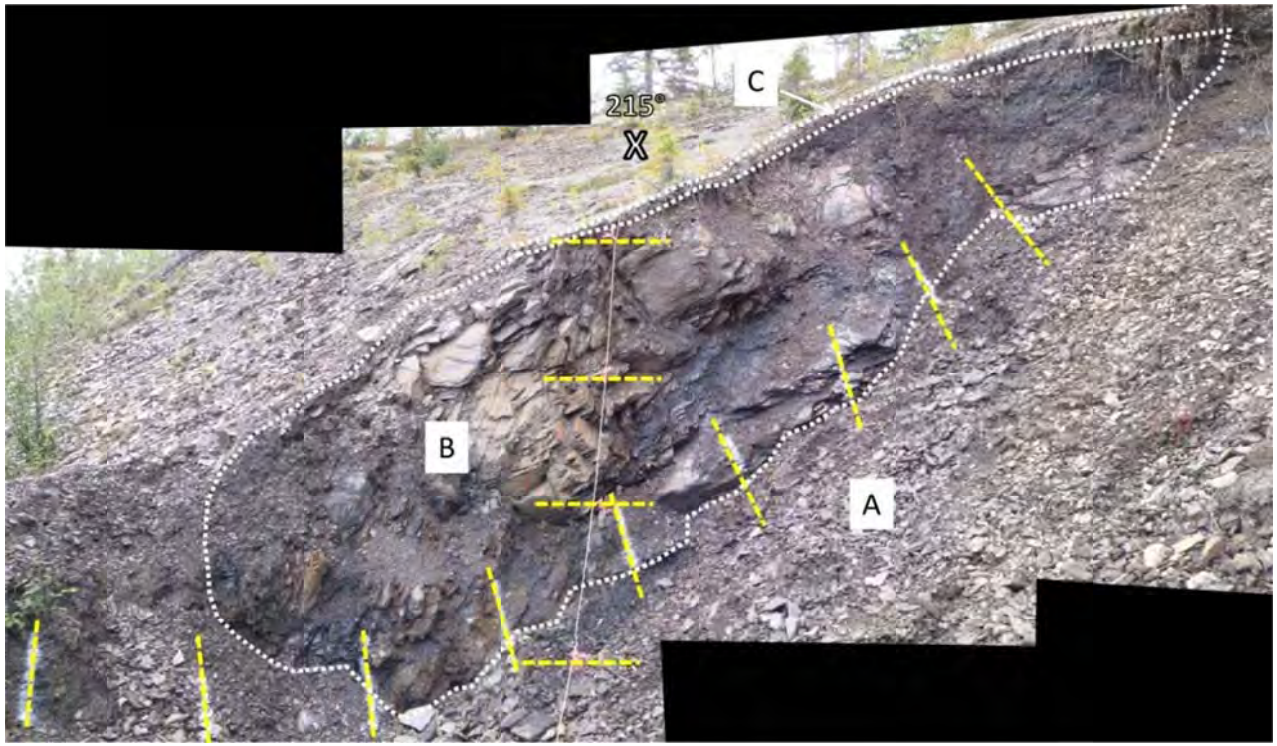
Outcrop OC-BGC11-42

Location: Ann Gulch
Facility: Heap leach pads
Outcrop type: Man-made (test pit wall)

Northing: 7101893
Easting: 459188
Elevation: 1072 m
Survey type: Handheld GPS

Slope Angle: 75°
Slope Direction: 041°
Date logged: 8/18/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing between blue dashed lines.

DESCRIPTION OF MATERIALS

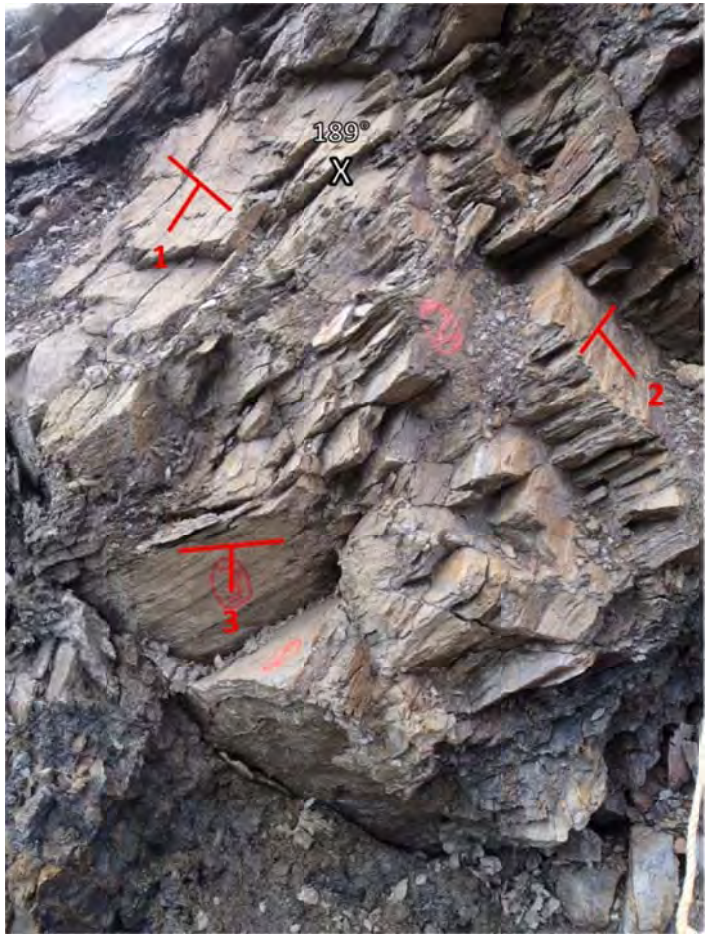
A: Rubble from excavation.

B: Dark grey, fine-grained PHYLLITE. Contains a few foliation-parallel 5-10 cm seams of graphitic material that are sheared and weathered to soil consistency. Lightly weathered (W2); extremely weak to weak (R0-R2). Blocks <1cm to ~ 10 cm where not sheared. GSI structure = Foliated/Laminated/Sheared, GSI surface = Poor, GSI range <20. NOTE: Rock mass quality below the limit of GSI applicability.

C: Colluvium, root mat and topsoil (~ 10 cm thick). [TOPSOIL]

Outcrop OC-BGC11-42

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	42-52	078-112	0-100	CX, SM, GP	20 (1m) - wavy	R1.5	0.01	3m+	JO
2	57-68	342-351	0.5-5	None	10 (1m) - wavy	R2	0.3	1m	J
3	50-62	193-222	0-3	None	20 (1m) - wavy	R2	0.3	1m	J

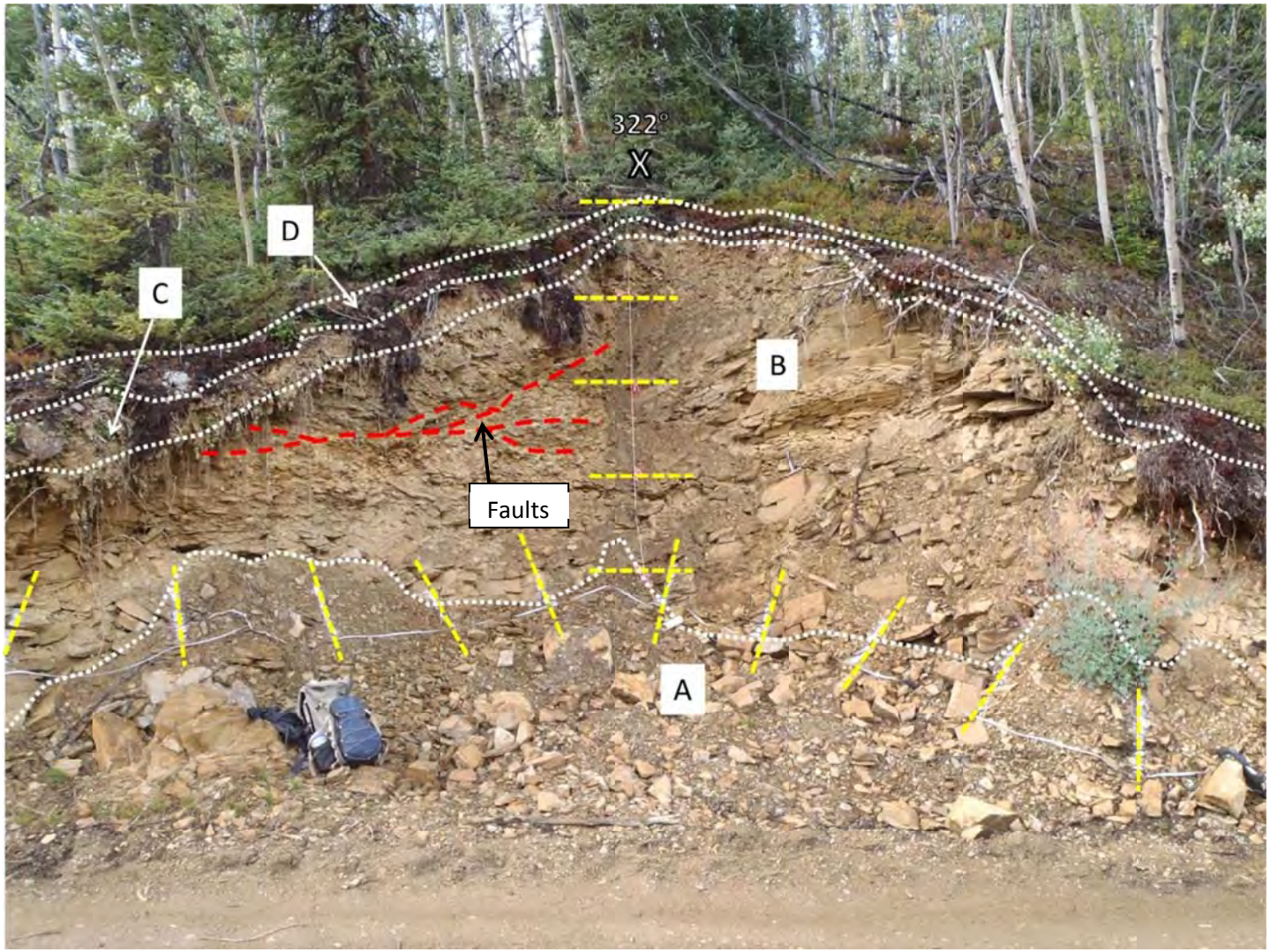
Outcrop OC-BGC11-43

Location: Middle reach Dublin Gulch
Facility: Heap leach pads
Outcrop type: Man-made (borrow cut next to road)

Northing: 7101403
Easting: 459686
Elevation: 913 m
Survey type: Handheld GPS

Slope Angle: 70-90°
Slope Direction: 095/181° (concave square corner cut into slope).
Date logged: 8/18/2011
Logged by: GH

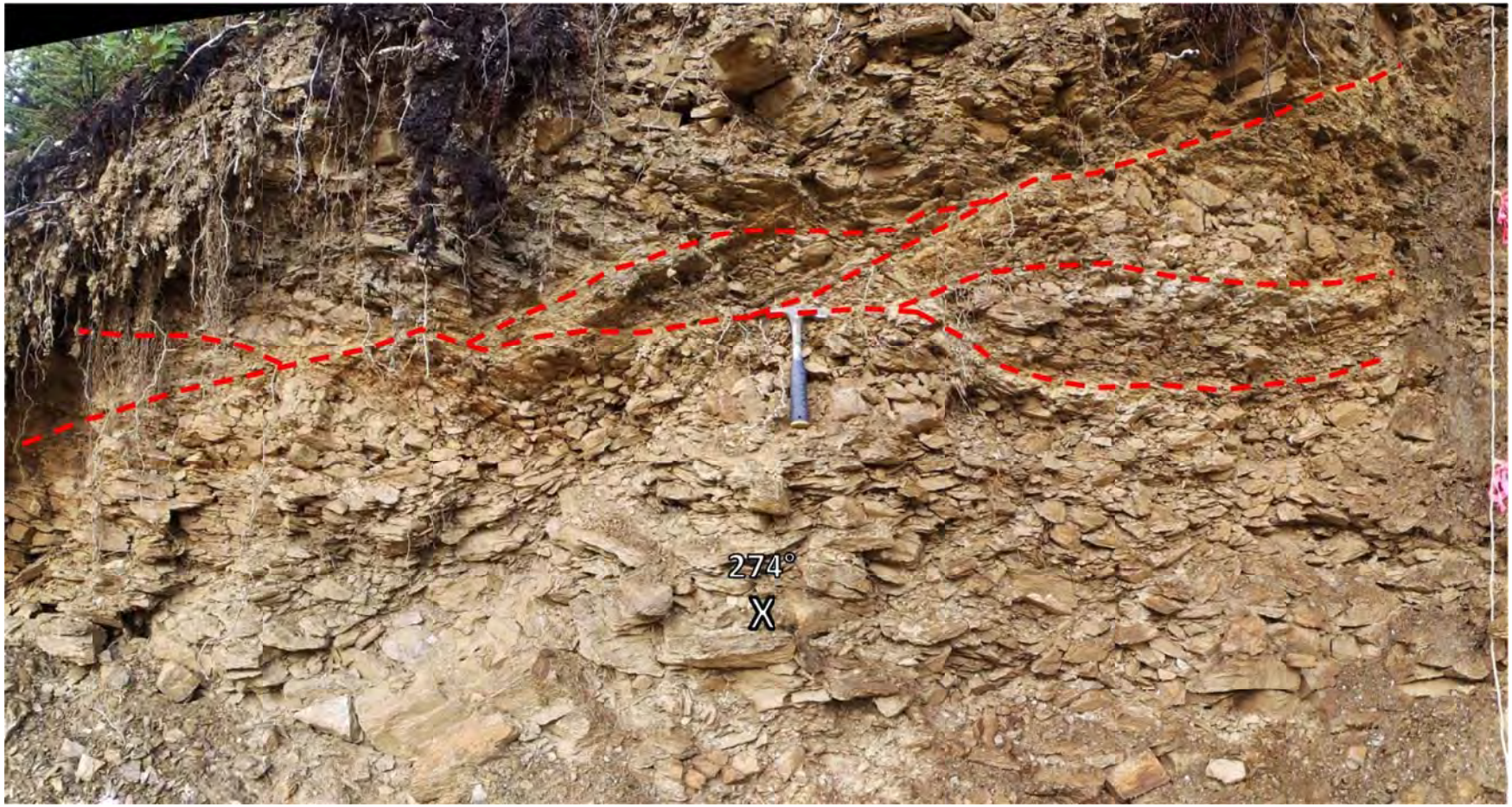
PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-43

PHOTO OF FAULTS



DESCRIPTION OF MATERIALS

A: Ravelled soil and blocks derived from the outcrop.

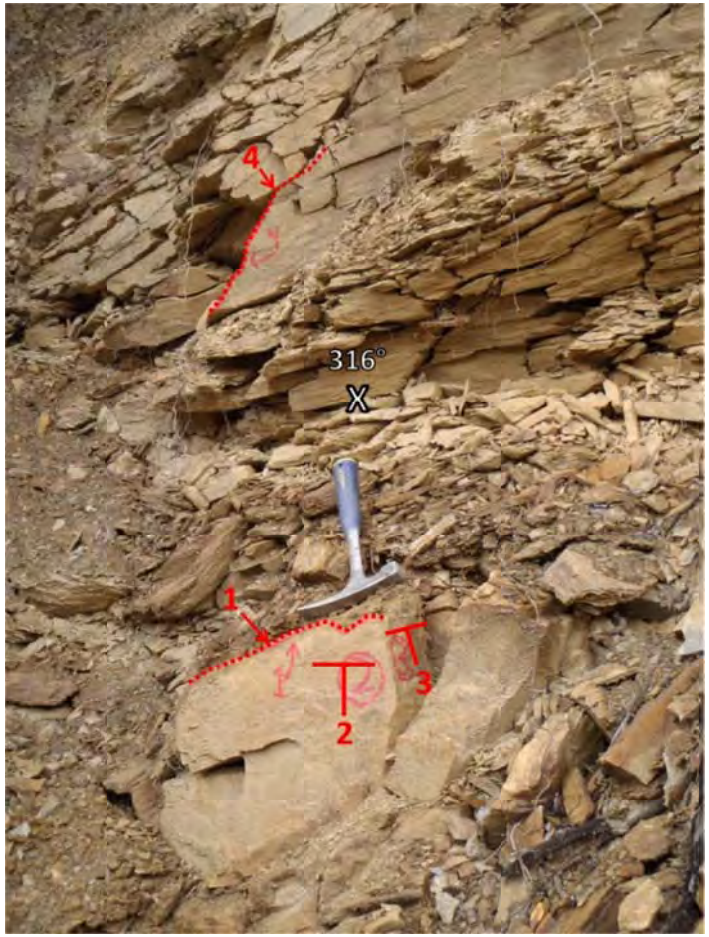
B: Brown to grey, fine-grained PHYLLITE (blockier material at base of outcrop = quartzite). Lightly to moderately weathered (W2-W3); very weak to medium strong (R1-R3), very dilated. Blocks ~ 5 cm (except 15 cm at base of outcrop); prismatic to tabular. GSI structure = Blocky/Disturbed to disintegrated, GSI surface = Poor, GSI range <25.

C: SAND: Silty, some gravel, some organics, well-graded (SM). Brown, dry, very soft, homogenous; low plasticity, rapid dilatancy, low toughness, and no dry strength. Clasts are metasedimentary, angular to sub-angular, flat, weak to medium strong (R2-R3). Max particle size ~ 100 mm. The lower contact grades downwards into weathered bedrock. [COLLUVIUM]

D: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-43

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	17-25	265-311	0-10	None, CX	6-10 (1m)	R2		2m+	JO
2	83-88	167-175	1-30	None, SA-SM	12-16 (1m)	R2.5		1m+	J
3	74-87	081-105	1-50	None, SA-SM	12 (10cm)	R2.5		1.5m+	J
4	49-72	218-244	2-15	None, SA-SM	20 (1m)	R2.5		1.5m	J
5	30-40	265-280	10-70	FB, CX	20 (1m)	R1		6m+	F

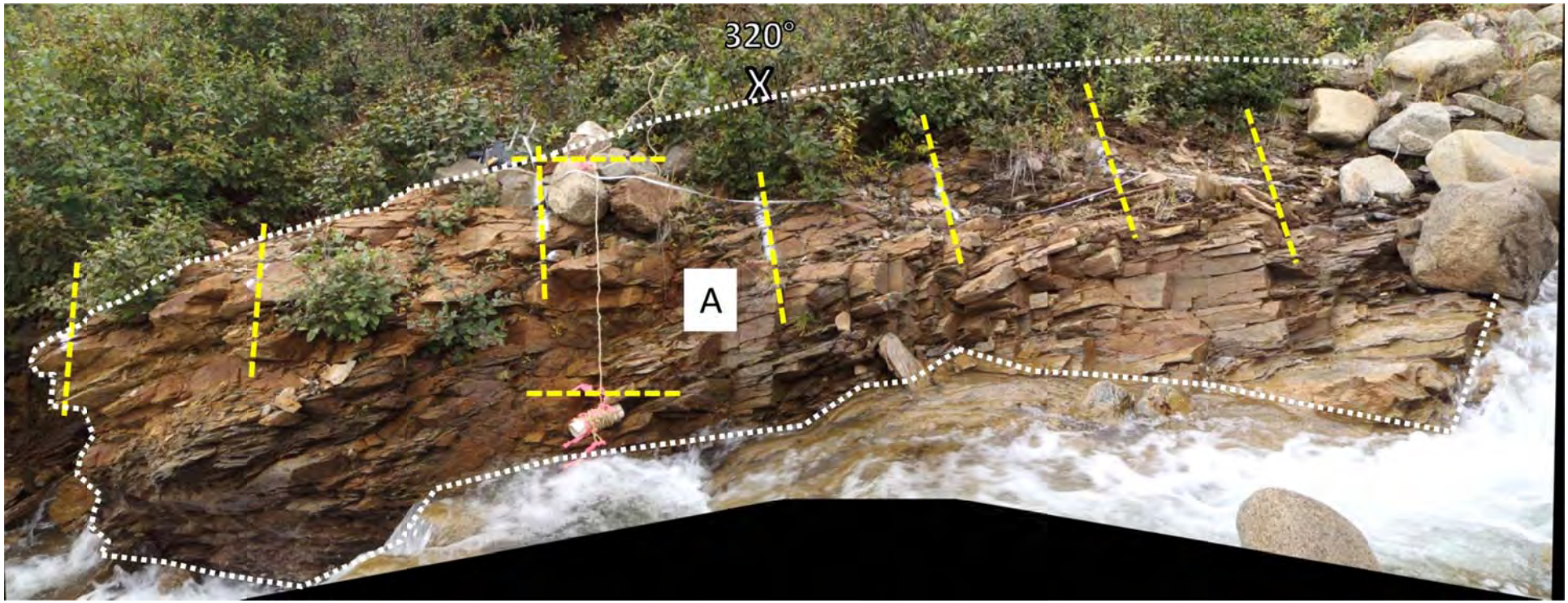
Outcrop OC-BGC11-44

Location: Middle reach Dublin Gulch
Facility: Heap leach pads
Outcrop type: Natural (stream channel)

Northing: 7101327
Easting: 459852
Elevation: 895 m
Survey type: Handheld GPS

Slope Angle: 60°
Slope Direction: 121°
Date logged: 8/19/2011
Logged by: GH

PHOTO OF OUTCROP



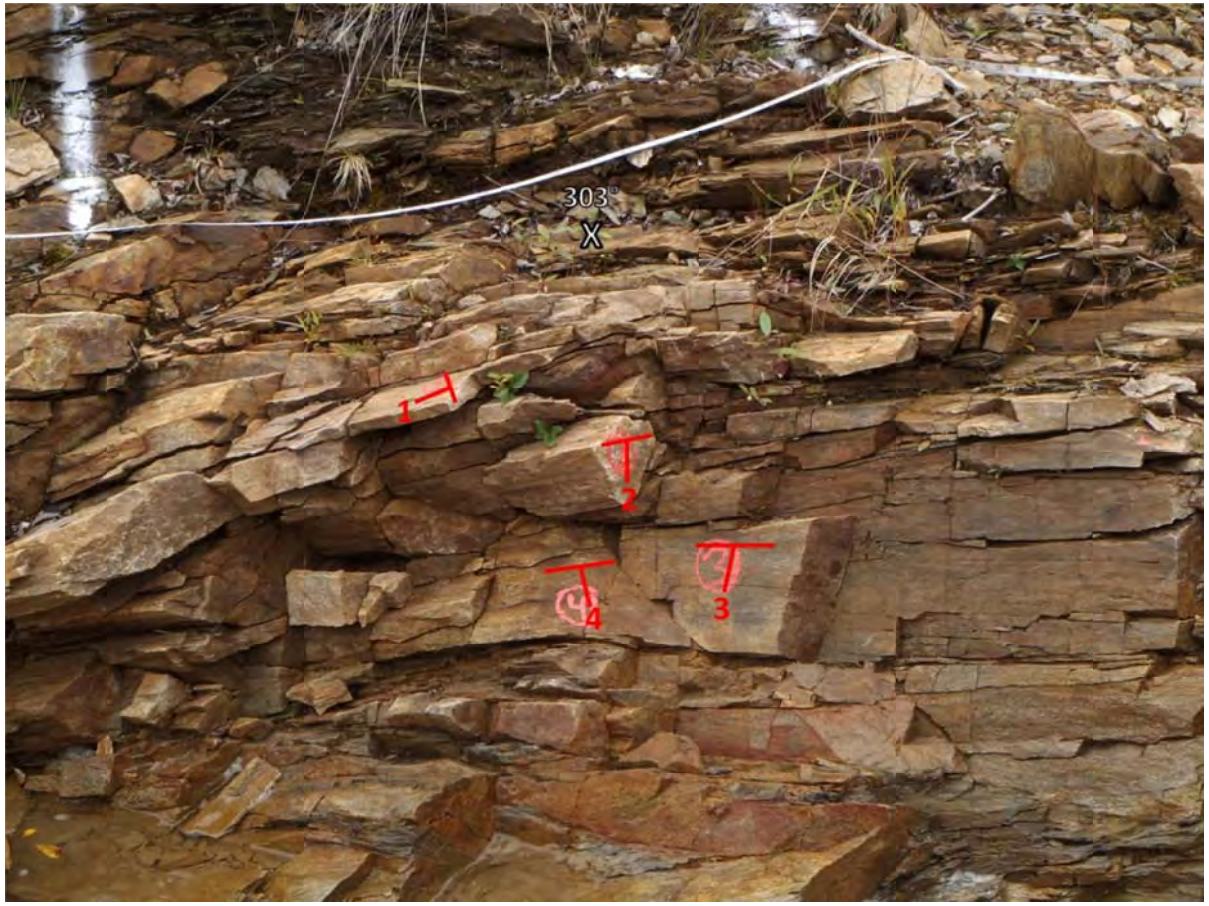
1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Brown, fine-grained QUARTZITE (60%) interbedded with seams of soft grey PHYLLITE (40%). Abundant small-scale tight folding apparent (cm to dm-scale) with axial planes oriented parallel to foliation. Lightly weathered (W2); weak (R2 - phyllite) to medium strong (R3 - quartzite). Blocks 5-10 cm; tabular (phyllite) to equidimensional (quartzite). GSI structure = Blocky/Disturbed, GSI surface = Fair, GSI range = 30-40.

Outcrop OC-BGC11-44

PHOTO OF STRUCTURE



DISCONTINUITY TABLE

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	18-33	283-306	0-5	None	20 (1m)	R2.5	0.05	4m+	JO
2	72-79	080-097	0-2	None	8 (10cm)	R2.5	0.1	1m	J
3	62-69	165-169	0-3	None	4 (1m)	R2.5	0.2	1m	J
4	23-38	112-130	NV	NV	12 (10cm)	R2.5	0.8	0.6m	J

Outcrop OC-BGC11-45

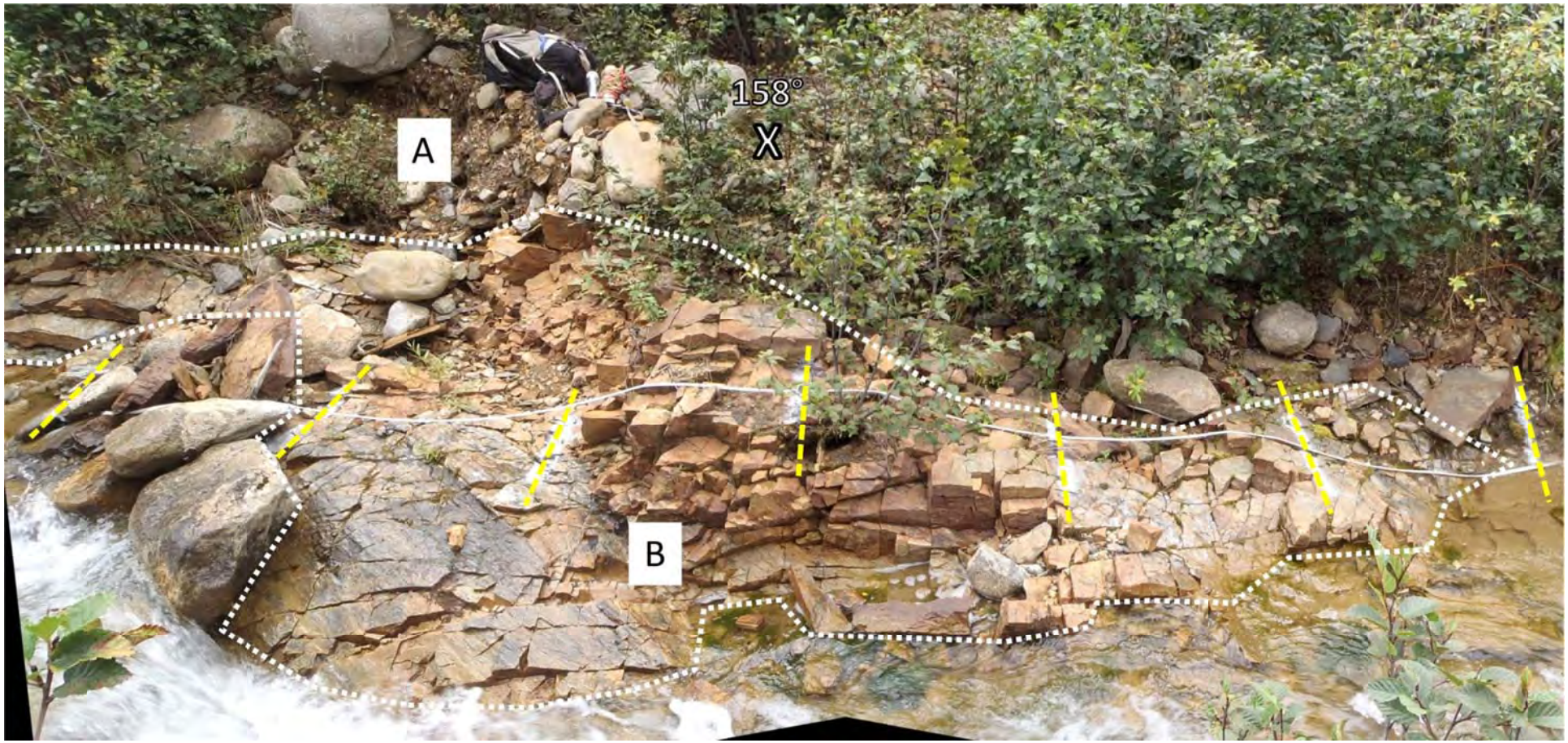
Location: Dublin Gulch valley bottom
Facility: Heap leach pads
Outcrop type: Natural (stream channel)

Northing: 7101136
Easting: 459318
Elevation: 848 m
Survey type: Handheld GPS

Slope Angle: 70°
Slope Direction: 245°
Date logged: 8/19/2011
Logged by: GH

* Station comprises two small outcrops (45 South and 45 North) on opposite sides of Dublin Creek.

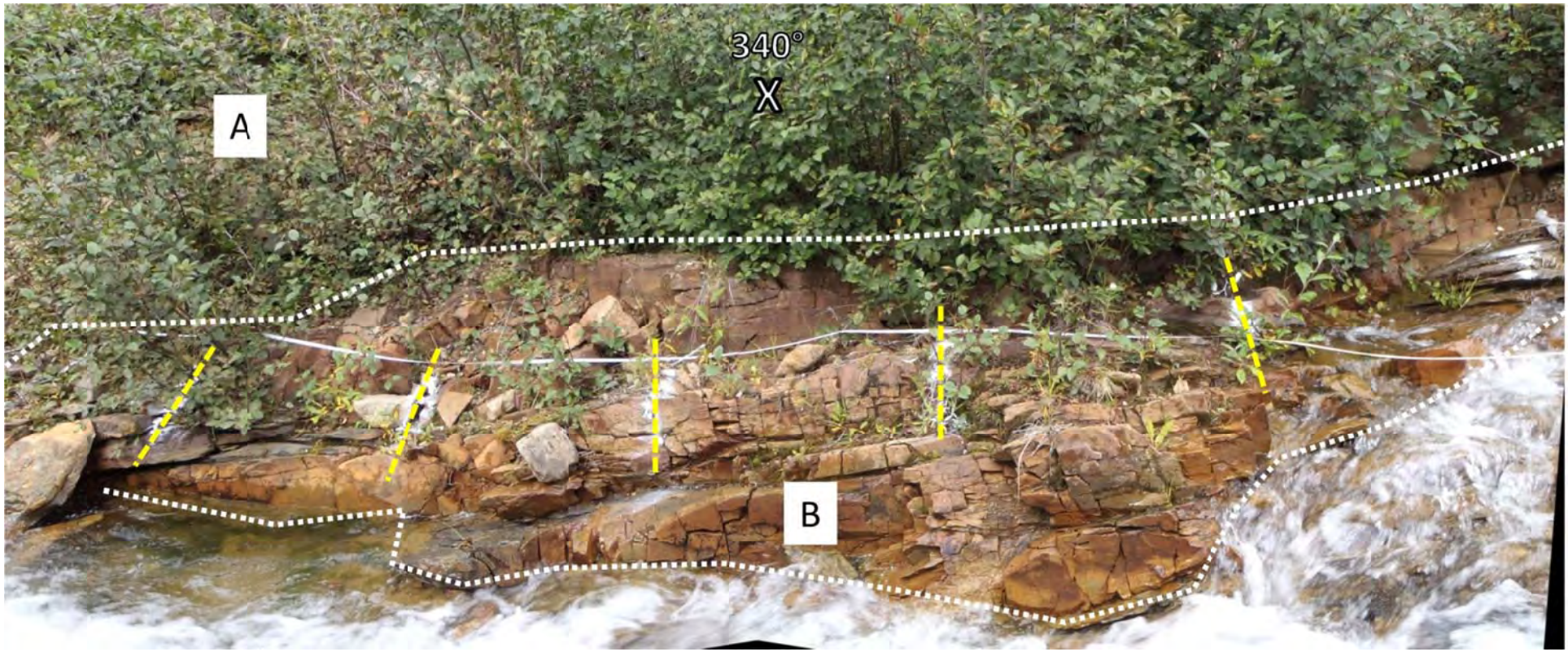
PHOTO OF OUTCROP 45 SOUTH



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-45

PHOTO OF OUTCROP 45 NORTH



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: SAND: Gravelly, some cobbles and boulders, well-graded (SW). Brown, nonplastic, moist, soft, and homogenous; No dilatancy, toughness or dry strength. Clasts are various lithologies, angular to rounded, all shapes, and max particle size ~500 mm. [PLACER TAILINGS]

B: Grey, fine-grained QUARTZITE with minor micaceous seams of PHYLLITE (~20%). Lightly weathered (W2); medium strong to strong (R3-R4). Blocks 5-10 cm; equidimensional to prismatic. GSI stucture = Blocky/Disturbed, GSI surface = Good to Fair, GSI range = 40-50.

Outcrop OC-BGC11-45

PHOTO OF STRUCTURE – 45 SOUTH



DISCONTINUITY TABLE – 45 SOUTH

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
S1	28	261	0-10	None	20 (1m)	R3	0.05	5m+	JO
S2	72-82	138-150	1-5	None, SU	16 (1m)	R3	0.07	4m+	J, V
S3	81-82	234-248	1-3	None	20 (1m)	R3	0.15	1m	J

Outcrop OC-BGC11-45

PHOTO OF STRUCTURE – 45 NORTH



DISCONTINUITY TABLE – 45 NORTH

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
N1	25-29	297-337	0-10	None	20 (1m)	R3	0.05	5m+	JO
N2	84-89	154-162	1-5	None, SU	16 (1m)	R3	0.07	4m+	J, V
N3	80-86	064-089	1-3	None	20 (1m)	R3	0.15	1m	J

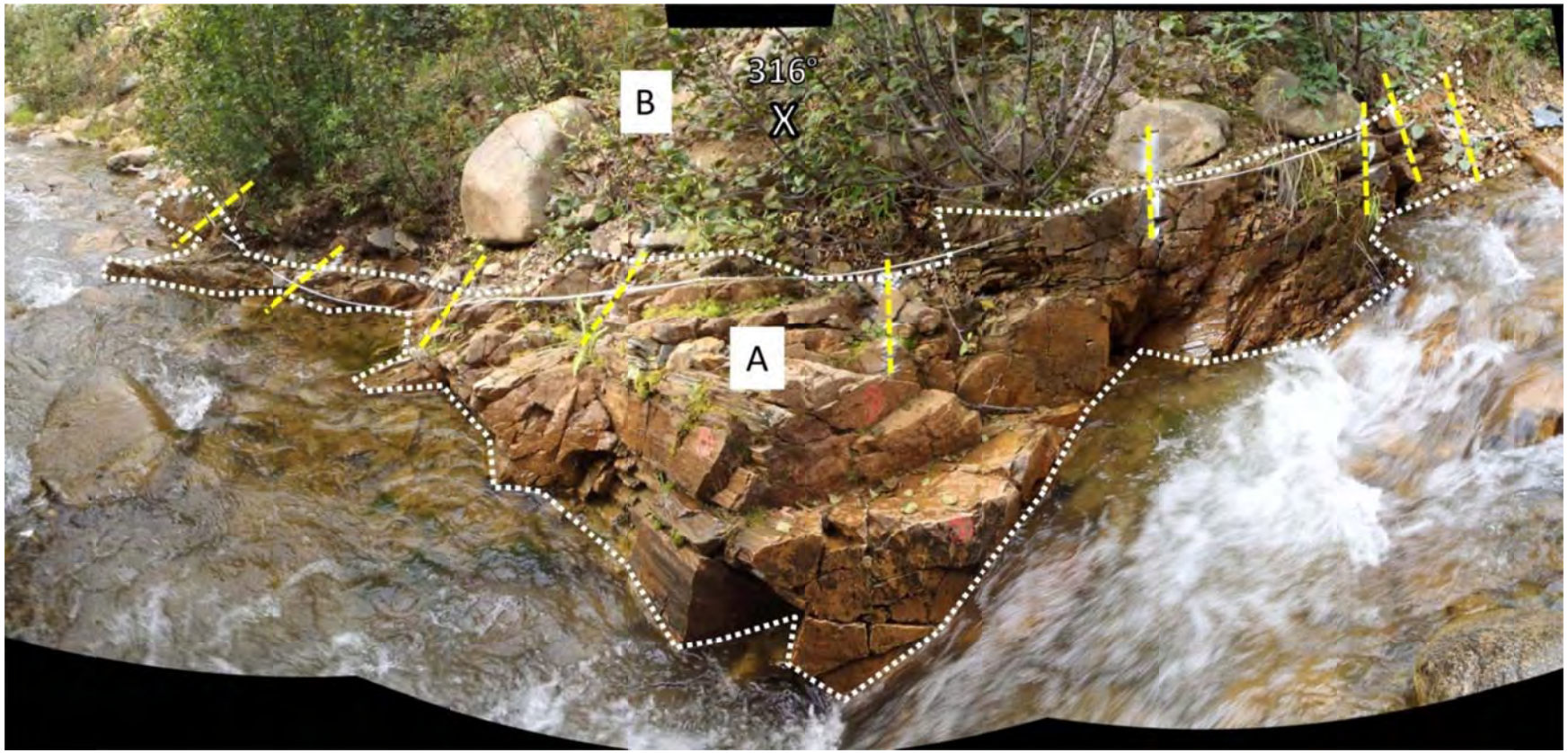
Outcrop OC-BGC11-46

Location: Dublin Gulch valley bottom
Facility: Heap leach pads
Outcrop type: Natural (stream channel)

Northing: 7101078
Easting: 459173
Elevation: 839 m
Survey type: Handheld GPS

Slope Angle: 45°
Slope Direction: Curves 158-177° (convex)
Date logged: 8/19/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Brown, fine-grained QUARTZITE. Faintly to lightly weathered (W1.5-W2); strong (R4). Blocks ~ 10 cm; prismatic. GSI structure = Very Blocky to Blocky/Disturbed, GSI surface = Good, GSI range = 45-55.

B:SAND: Gravelly, some cobbles and boulders, well-graded (SW). Brown, nonplastic firm, moist, and homogenous; no dilatancy or dry strength. Clasts are various lithologies, medium strong to very strong (R3-R5), angular to rounded, all shapes. Max particle size ~700 mm. [PLACER TAILINGS]

Outcrop OC-BGC11-46

PHOTO OF STRUCTURE



DISCONTINUITY TABLE (UNIT A)

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	27-45	309-348	0-5	None	20 (1m) - wavy	R4	0.1	1m+	JO
2	79-85	143-157	0-3	None	12 (1m)	R4	0.3	1.5m+	J
3	78-90	067-089	0-5	None	20 (1m)	R4	0.15	1.5m	J
4	64-79	198-212	NV	NV	10 (1m)	R4	NV	1m	J

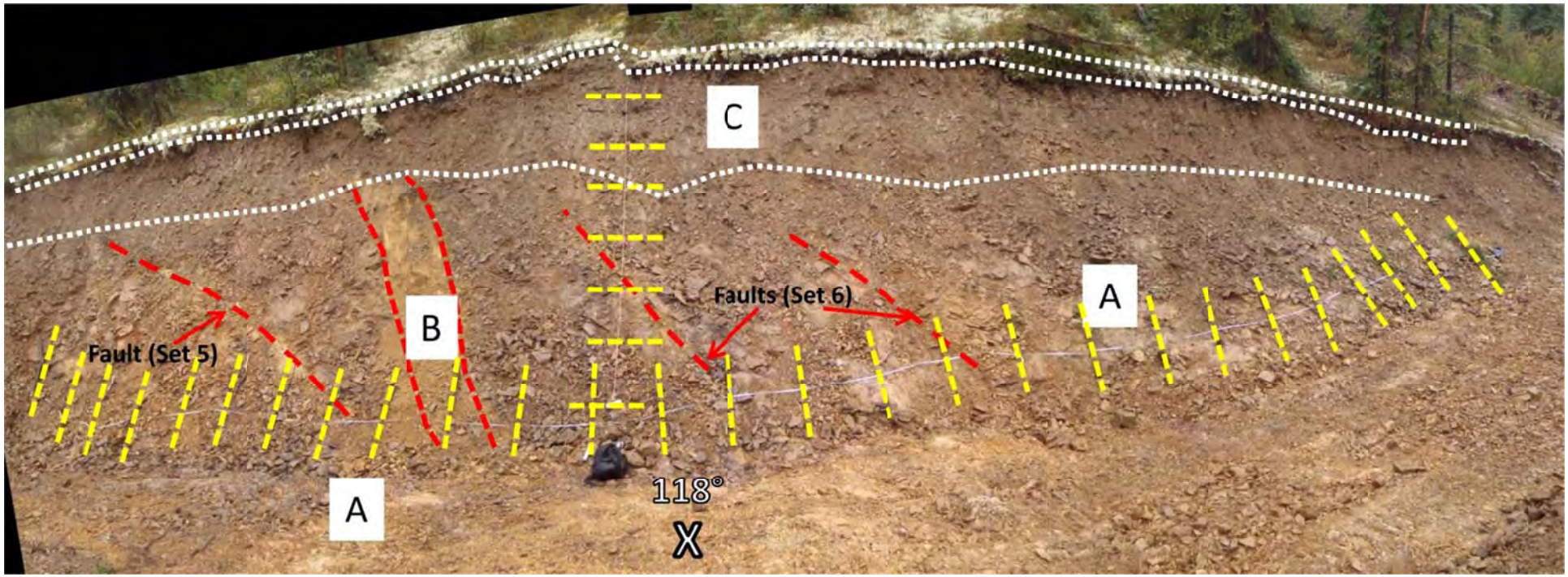
Outcrop OC-BGC11-47

Location: Stuttle Gulch
Facility: Secondary crusher
Outcrop type: Man-made (plate load test excavation cut)

Northing: 7100272
Easting: 459725
Elevation: 993 m
Survey type: Handheld GPS

Slope Angle: 50°
Slope Direction: 302°
Date logged: 8/20/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Fine-grained meta-sedimentary rock, mostly yellowish-brown, but altered to a purple-red color near the middle of the outcrop (QUARTZITE?). Moderately weathered (W3); weak to medium strong (R2-R3), except extremely to very weak (R0-R1) near faults and at sandy dike. Blocks ~ 0.05 m; tabular. GSI suraface = Poor, GSI structure = Disturbed, GSI range = 25-35.

B: Medium-grained yellow SAPROLITE (intrusive dike). Completely weathered (W5); extremely to very weak (R0-R1). Effectively medium sand with silt and clay (SM). Nonplastic. ~ 1 m wide.

C: [COLLUVIUM]. See test pit log for TP-BGC11-50.

D: Root mat and organic silt. [TOPSOIL] See test pit log for TP-BGC11-50.

Outcrop OC-BGC11-47

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	40-45	294-308	0-5	SA-SM	16 (1m)	R2	0.05	1.5m	JO
2	52-66	163-187	0-5	CX	12 (1m)	R2.5	0.15	2m+	J
3	54-71	072-094	0-5	SA-SM	8 (10cm)	R2.5	0.1	2m+	J
4	59-72	261-285	NV	SA-SM	12 (10cm)	R2.5	NV	0.5m+	J
5	41	247	100	FG	16 (1m)	R1		6m+	F
6	43-62	178-205	30	CX/DX	12 (1m)	R1		5m+	F

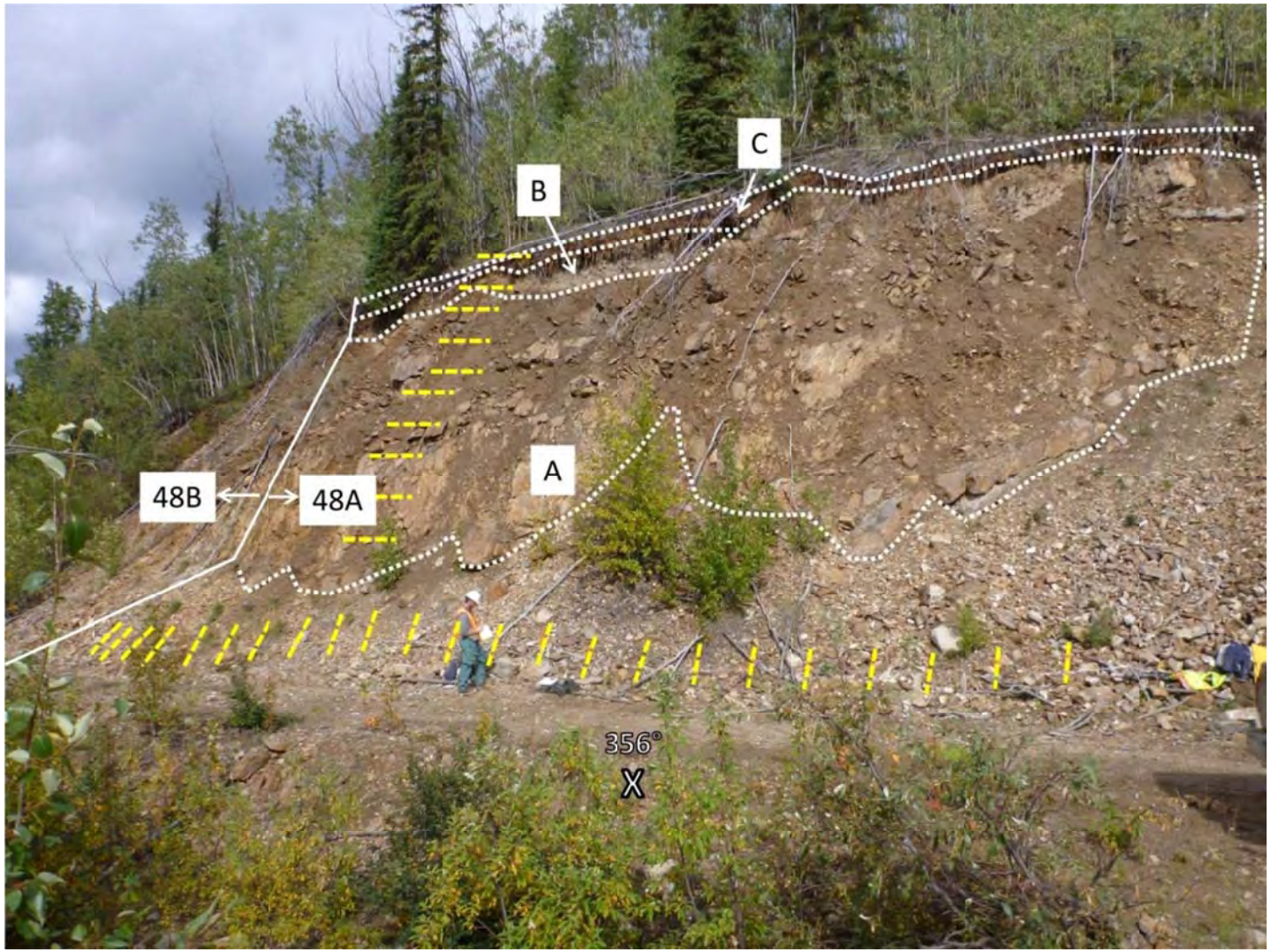
Outcrop OC-BGC11-48A

Location: Dublin Gulch valley bottom
Facility: Plant site
Outcrop type: Man-made (road cut)

Northing: 7101009
Easting: 458635
Elevation: 807 m
Survey type: Handheld GPS

Slope Angle: 68°
Slope Direction: Curves 192-219° (convex)
Date logged: 8/21/2011
Logged by: GH/LGT

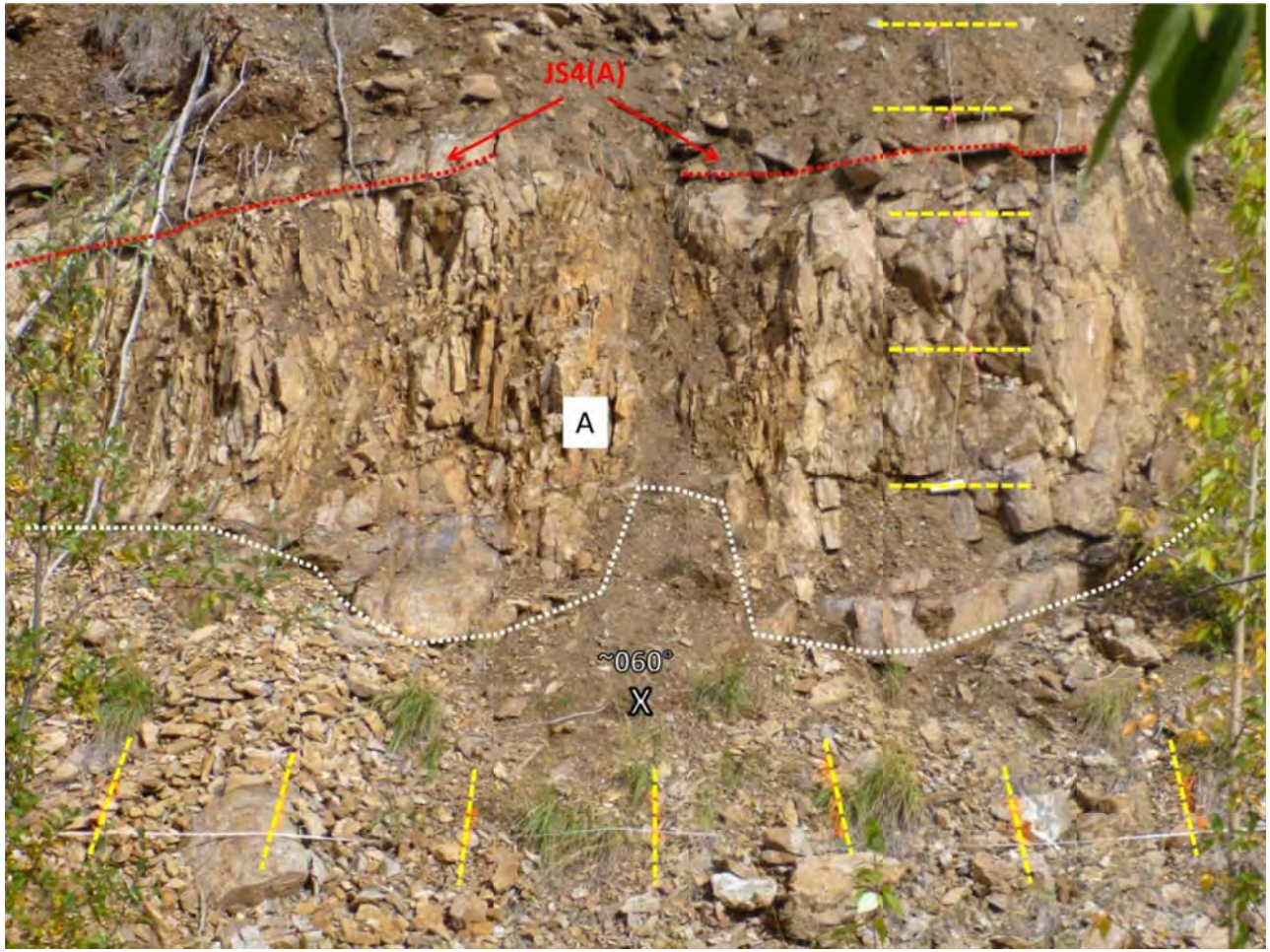
PHOTO #1 OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-48A

PHOTO #2 OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

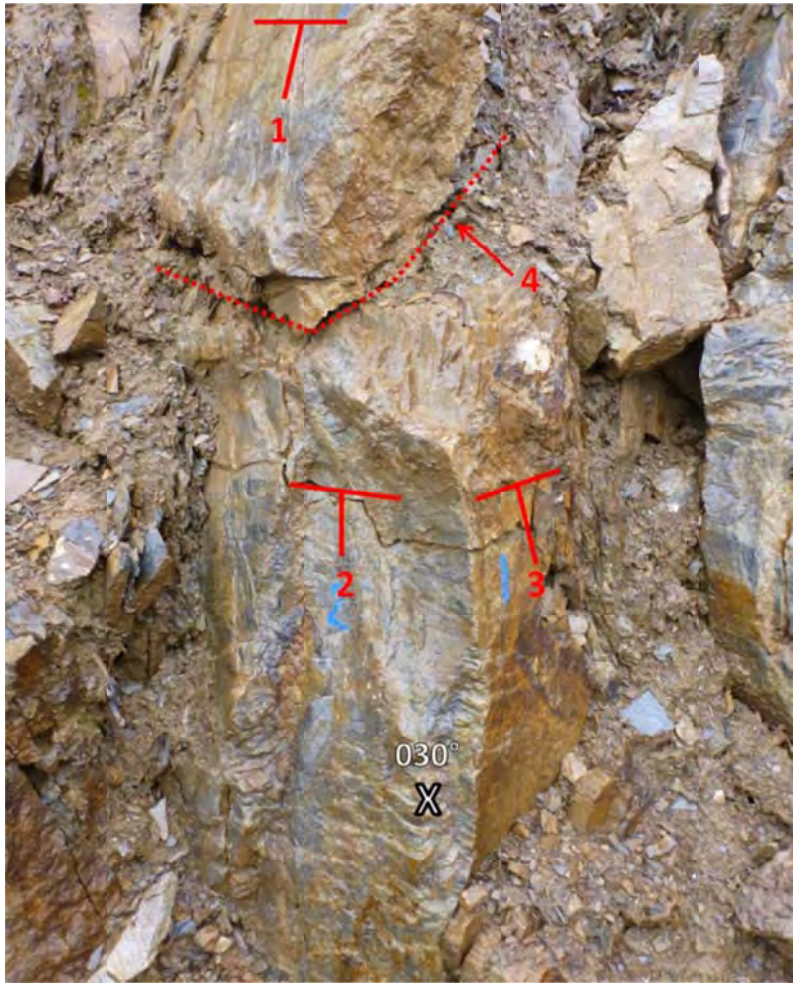
A: Reddish-brown, fine-grained QUARTZITE. Highly fractured at cm-scale - usually shatters when struck with a geological hammer. Lightly weathered (W2); medium strong (R3). Blocks rhombohedral; ~ 5 cm. GSI structure = Disturbed/Seamy, GSI surface = Fair, GSI range = 30-40.

B: GRAVEL: Some sand, trace silt, trace boulders, trace rootlets, well-graded (GW). Brown, dry to moist, homogenous, non-cemented. Clasts are flat to elongate, angular, metasedimentary, meduim strong to strong (R3-R4). Max particle size 400 mm. [HIGHLY WEATHERED ROCK]

C: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-48A

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	72-86	140-170	0-10	None	4 (0.3m)	R3	0.05	3m+	J
2	46-70	243-251	NV	None	12 (0.3m)	R3	1	1m	J
3	57-76	235-252	0-10	None	12 (0.3m)	R3	0.2	1m	JO
4	28-35	236-241	100	BX	16 (1m)	R3	NV	8m+	J, F

Outcrop OC-BGC11-48B

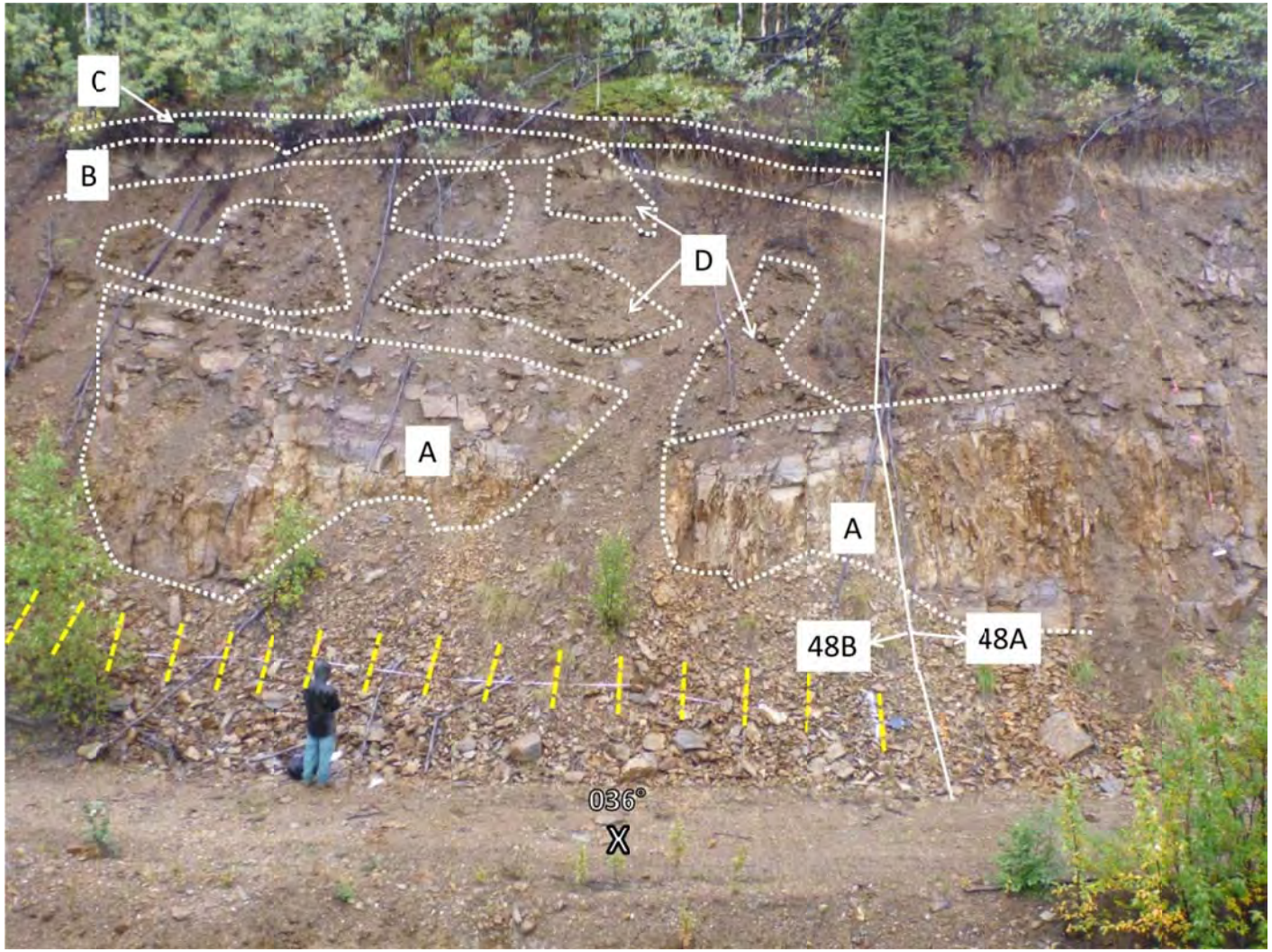
Location: Dublin Gulch valley bottom
Facility: Plant site
Outcrop type: Man-made (road cut)

Northing: 7101022
Easting: 458616
Elevation: 805 m
Survey type: Handheld GPS

Slope Angle: 55°
Slope Direction: 239°
Date logged: 8/21/2011
Logged by: GH/LGT

* Outcrop is immediately adjacent (west) of OC-BGC11-48A.

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-48B

DESCRIPTION OF MATERIALS

A: Yellowish-brown, fine-grained QAUARTZITE. Foliated, faintly to lightly weathered (W1.5-W2); medium strong (R3). Blocks are prismatic. Discontinuities are extremely close to closely spaced and are medium persistent. GSI structure = Blocky/Disturbed, GSI surface condition = Good, GSI range = 40-50.

B: GRAVEL: Some sand, trace cobbles and boulders, trace silt, well-graded (GW). Brown, dry to moist, homogenous, non-cemented. Clasts are flat to elongate, angular, metasedimentary, highly weathered (W4); medium strong to strong (R3-R4). Maximum particle size 400 mm. [HIGHLY WEATHERED ROCK]

C: Root mat and organic silt. [TOPSOIL]

D: Greyish-brown, fine-grained QUARTZITE. Moderately weathered (W3); medium strong (R3). 3 main discontinuity sets with loose apertures (rock mass is well-dialated) and infilled with CX or iron stained. GSI structure = disintegrated, GSI surface = Poor, GSI range <25.

DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	82-87	231-247	0-5	None	20 (1m)	R3	0.05	2m+	JO
2	71-90	320-327	0-30	QZ, FE	12 (1m)	R3	0.1	4m+	J, S
3	47-54	215-233	3-100	BX, CX	20 (1m)	R3	0.5	10m	J, F
4	67-70	321-336	0-3	None	8 (10 cm)	R3	0.2	1m	J

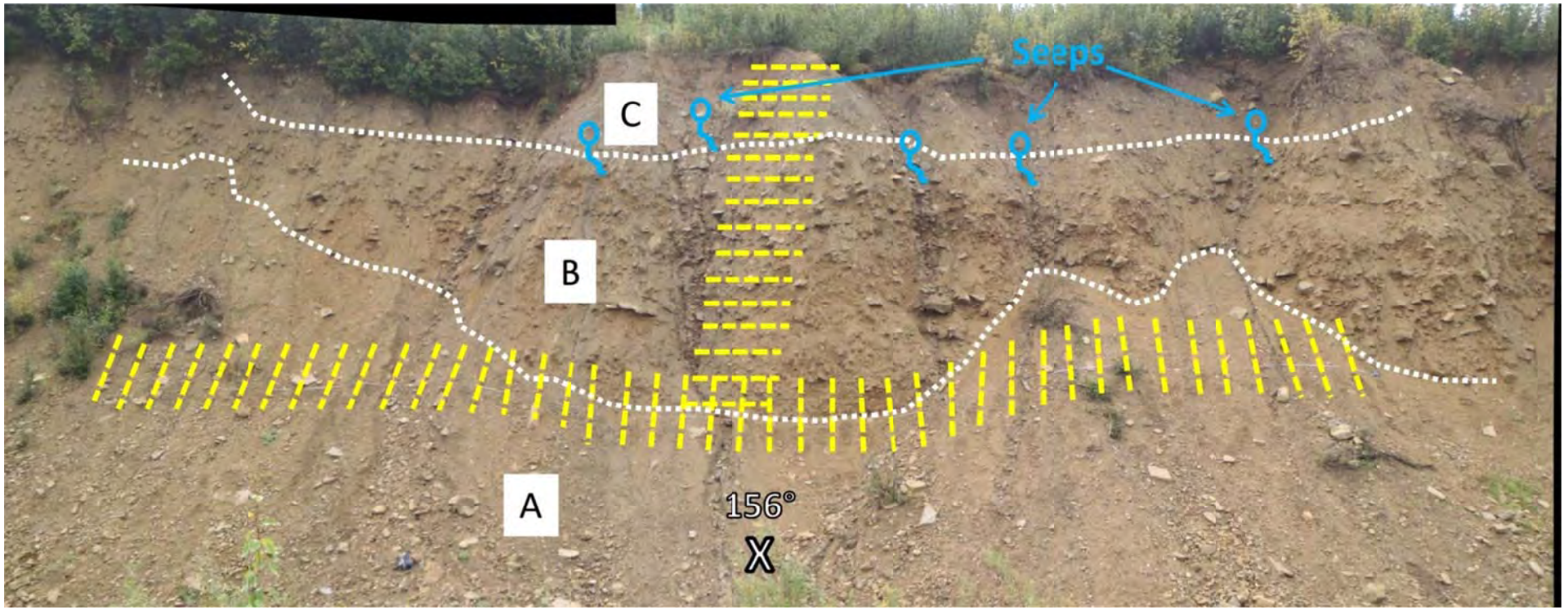
Outcrop OC-BGC11-49

Location: Dublin Gulch valley bottom
Facility: Heap leach pads
Outcrop type: Man-made (excavated by placer miners)

Northing: 7101020
Easting: 459452
Elevation: 859 m
Survey type: Handheld GPS

Slope Angle: 66° (unit B); 41° (unit A)
Slope Direction: 336°
Date logged: 8/22/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Ravelled material from scarp.

B: GRAVEL: Sandy (medium to coarse), cobbly, trace boulders, well-graded (GW). Brown, , nonplastic, firm, moist, homogenous (massive), and poorly consolidated. Fines notably absent. Clasts angular to subrounded, many lithologies (various types of metasedimentary or intrusive rock), weak to very strong (R2-R5), all shapes. Max particle size ~ 500 mm. Deposit contains layers of aligned cobbles dipping gradually to the west. This is suggestive of being the distal part of a debris fan originating further east along Dublin Gulch, where larger debris is found. This interpretation remains speculative for the time being. Other plausible interpretations include placer tailings (least likely) and till (lateral moraine, believed to be less likely than debris flow hypothesis).

C: SAND: Silty, some gravel, trace cobbles, well-graded (SM). Lensed with pockets of sandy silt 1-5 cm thick. Brown, moist, soft, nonplastic, with low dry strength, rapid dilatancy, low toughness. Clasts are angular to subrounded, all shapes, various lithologies, weak to strong (R2-R4). [FILL]

Outcrop OC-BGC11-49

PHOTO OF UNIT B



DISCONTINUITIES N/A (NO ROCK UNITS)

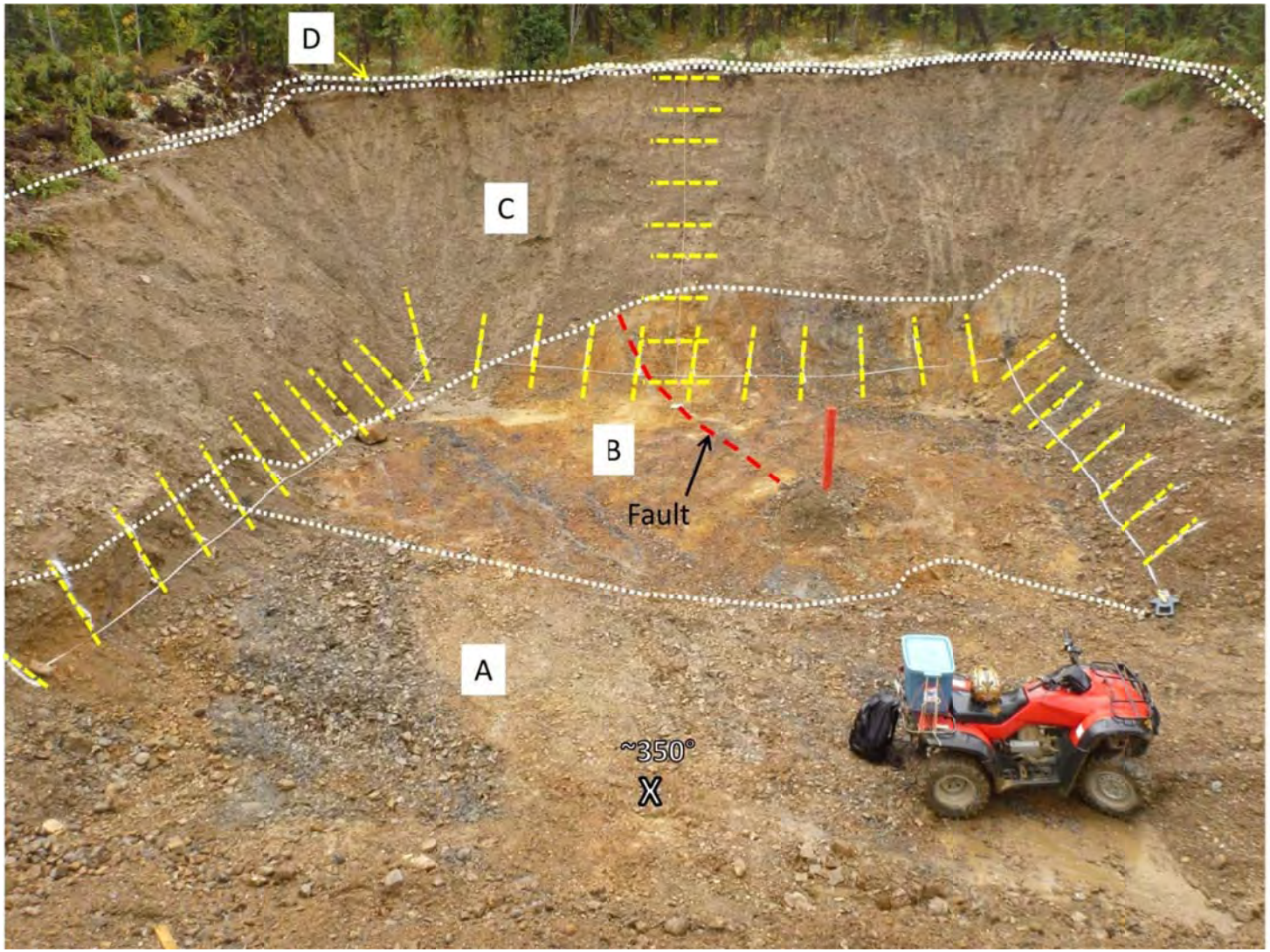
Outcrop OC-BGC11-50

Location: West flank Tin Dome
Facility: Plant site
Outcrop type: Man-made (plate load test excavation cut)

Northing: 7101140
Easting: 458828
Elevation: 859 m
Survey type: Handheld GPS

Slope Angle: 46°
Slope Direction: 172°
Date logged: 8/22/2011
Logged by: GH

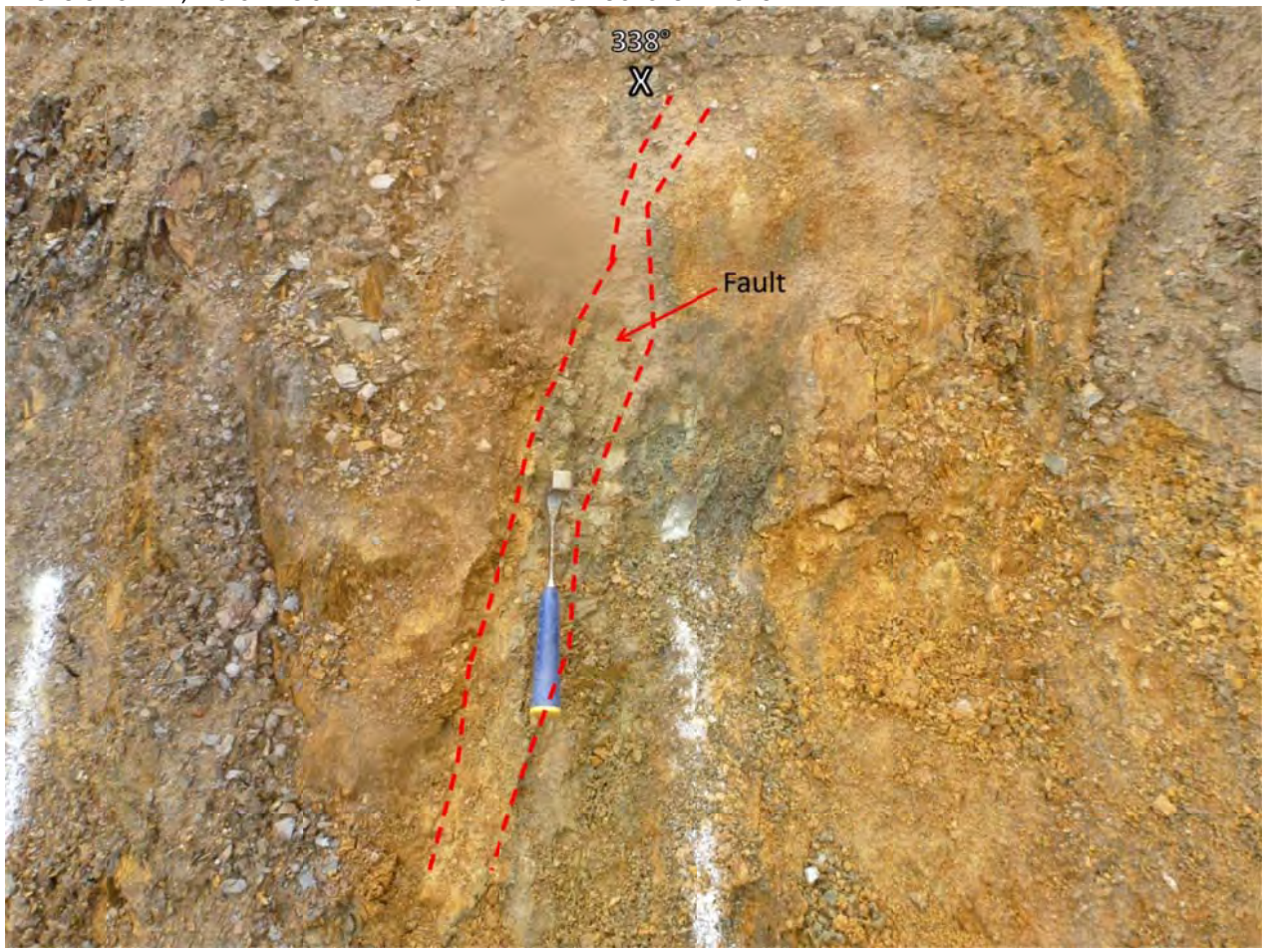
PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

Outcrop OC-BGC11-50

PHOTO OF UNIT B, INCLUDING CLAYEY FAULT INDICATED ON OUTCROP PHOTO



DESCRIPTION OF MATERIALS

A: Fine-grained brown/black SLATE/PHYLLITE and QUARTZITE. Lightly to moderately weathered (W2-W3); weak to medium strong (R2-R3). Blocks average 1-3 cm; are equidimensional to tabular. GSI structure = disintegrated, GSI surface = Fair to Poor, GSI range = 20-30. [LIGHTLY TO MODERATELY WEATHERED BEDROCK]

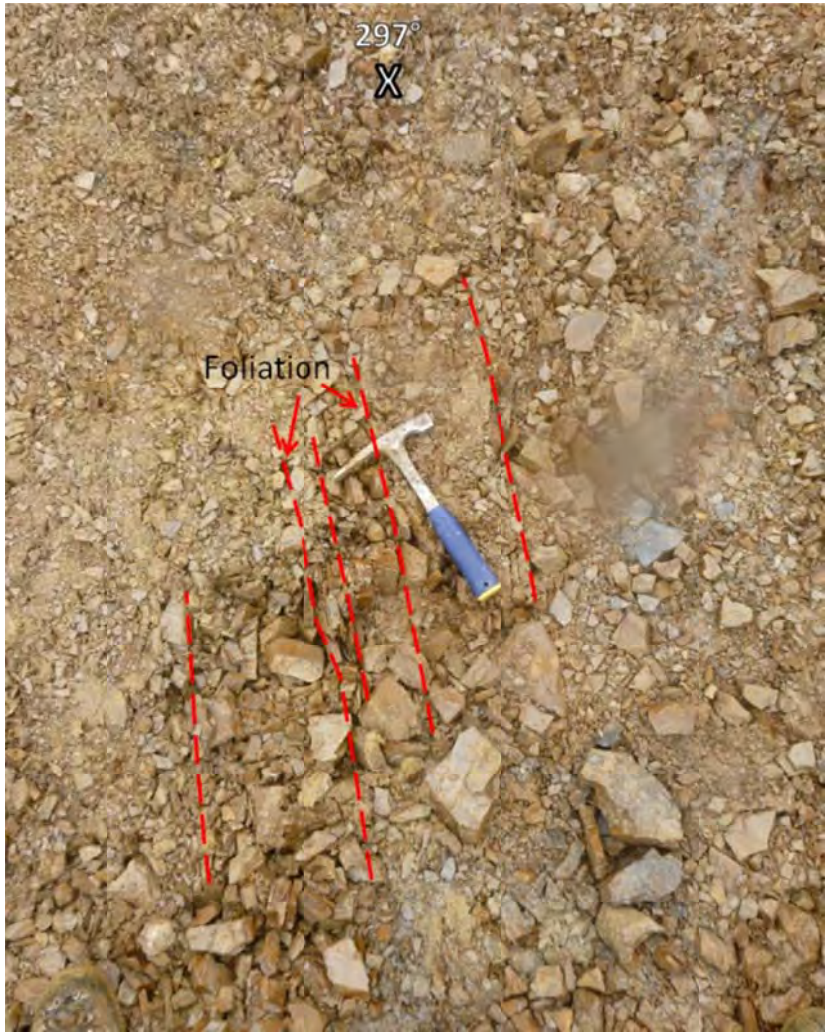
B: Highly weathered fine-grained yellow/black SLATE/PHYLLITE and QUARTZITE. Moderately to completely weathered (W3-W5); extremely to very weak (R0-R1). No significant blockiness; GSI not applicable. Quartzite weathered towards a sandy soil; slate /phyllite towards a slippery silty/clayey micaceous material. [MODERATELY TO COMPLETELY WEATHERED BEDROCK]

C: Gravelly sand - see test pit log for TP-BGC11-103. [TILL]

D: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-50

PHOTO OF STRUCTURE – UNIT A



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
Foliation	72-83	206-223	0-100	None, CX, FG	8 (10cm)	R2.5	0.02	1m+	JO, F

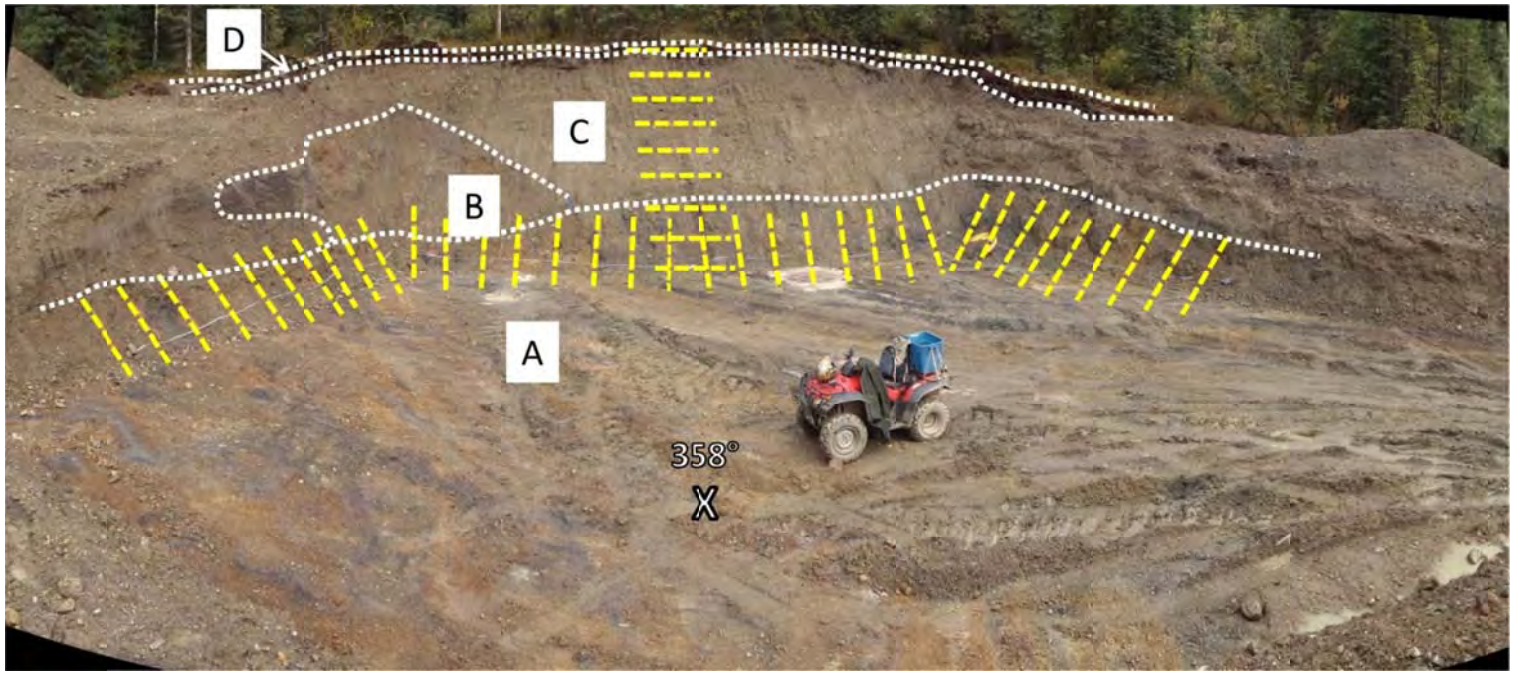
Outcrop OC-BGC11-51

Location: West flank Tin Dome
Facility: Plant site
Outcrop type: Man-made (plate load test excavation cut)

Northing: 7101187
Easting: 458932
Elevation: 885 m
Survey type: Handheld GPS

Slope Angle: 58°
Slope Direction: 165°
Date logged: 8/23/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Fine-grained, brown to black meta-sedimentary rock. Mostly QUARTZITE (60%) with seams of PHYLLITE (35%) and quartz veins (5%). Moderately to completely weathered (W3-W5); extremely to very weak (R0-R1) except some small "floating" blocky zones. Weathering generally decreases with depth, but varies laterally as well. Phyllite is silty/clayey and slippery; quartzite mostly sandy/silty. Avg block size <1cm; GSI not applicable. [HIGHLY WEATHERED BEDROCK]

B: Highly dilated, rotated and displaced weathered bedrock with intermixed silty sand (SM) from soil above. Clasts moderately weathered (W2.5) and weak (R2.5); 1-5 cm in size. GSI not applicable. [DILATED, COMPLETELY WEATHERED BEDROCK AND SOIL]

C: [COLLUVIUM/TILL]. See testpit log for TP-BGC11-105.

D: Root mat and organic silt. [TOPSOIL]

Outcrop OC-BGC11-51

PHOTO OF UNIT B



Outcrop OC-BGC11-51

PHOTO OF UNIT A



DISCONTINUITY TABLE – UNIT A

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
Foliation	37-87	158-215	0-100	None, CX, FG	12 (10cm)	R0-R3	0.005-0.05	1m+	JO, F

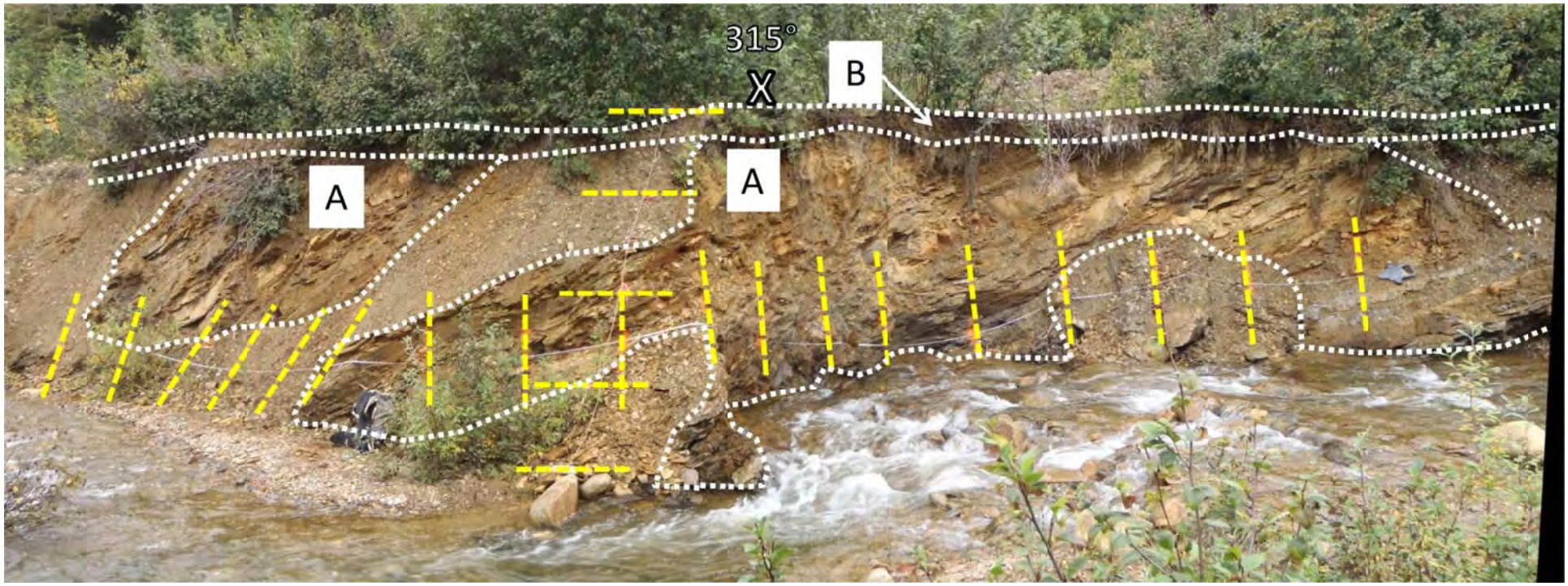
Outcrop OC-BGC11-52

Location: Dublin Gulch valley bottom
Facility: Heap leach pads / processing ponds
Outcrop type: Natural (stream channel)

Northing: 7101039
Easting: 459097
Elevation: 849 m
Survey type: Handheld GPS

Slope Angle: 65°
Slope Direction: Curves 116-172° (convex)
Date logged: 8/23/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

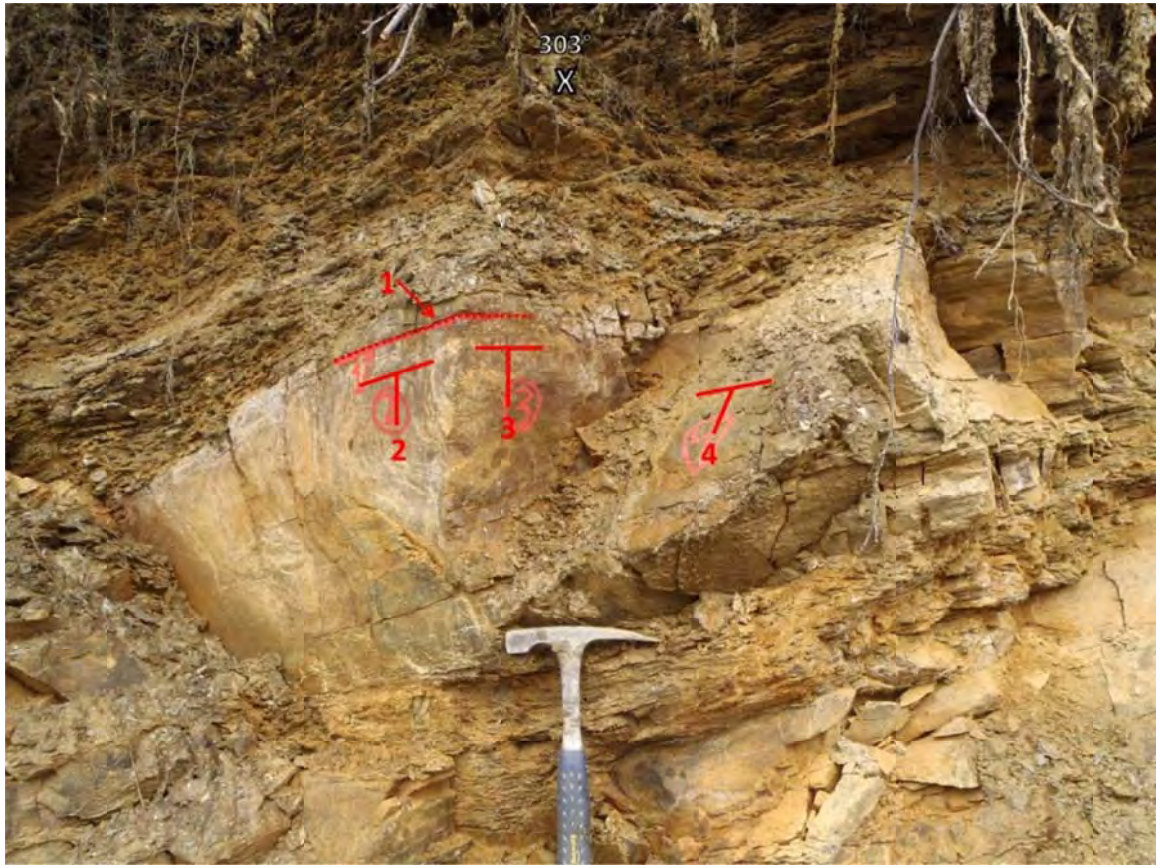
DESCRIPTION OF MATERIALS

A: Dark grey, fine-grained QUARTZITE (60%) interbedded with schistose seams of PHYLLITE (40%). Phyllite weathered to clayey residual soil in upper ~1m of outcrop. Slightly weathered to highly weathered (W2-W4); very weak (R1 - phyllite) to medium strong (R3 - quartzite). Blocks ~ 5 cm, equidimensional. GSI structure = Disturbed, GSI surface = Poor, GSI range = 20-30. Some beds in this outcrop may be calcareous, as indicated by (1) the presence of minor calcite precipitate on the outcrop surface, and (2) some of the blocky "quartzite" seams being softer than typical quartz according to a field hardness test.

B: SAND: Silty, some fine to medium gravel, well-graded (SM). Contains abundant rootlets. Brown, moist, loose, homogenous; nonplastic, no dry strength, rapid dilatancy. Clasts angular to subangular, weak to medium strong (R2-R3), flat, mostly metasedimentary. [COLLUVIUM with TOPSOIL].

Outcrop OC-BGC11-52

PHOTO OF STRUCTURE



DISCONTINUITY TABLE

Set	Orientation range		Aperture (mm)	Infill	JRC (scale)	JWCS	Spacing (m)	Persistence (m)	Type
	Dip°	DD°							
1	24-30	211-250	0-10	DX	20 (1m)	R2	0.05 (marble), <0.01 (phyllite)	5m+	JO
2	74-81	335-344	1-10	DX, CA	6 (1m)	R2.5	0.1	4m+	J
3	72-88	076-099	1-5	DX, CA	8 (10cm)	R2.5	0.1	0.5m	J
4	56-65	180-197	NV	CA	12 (1m)	R2.5	0.5	1m+	J

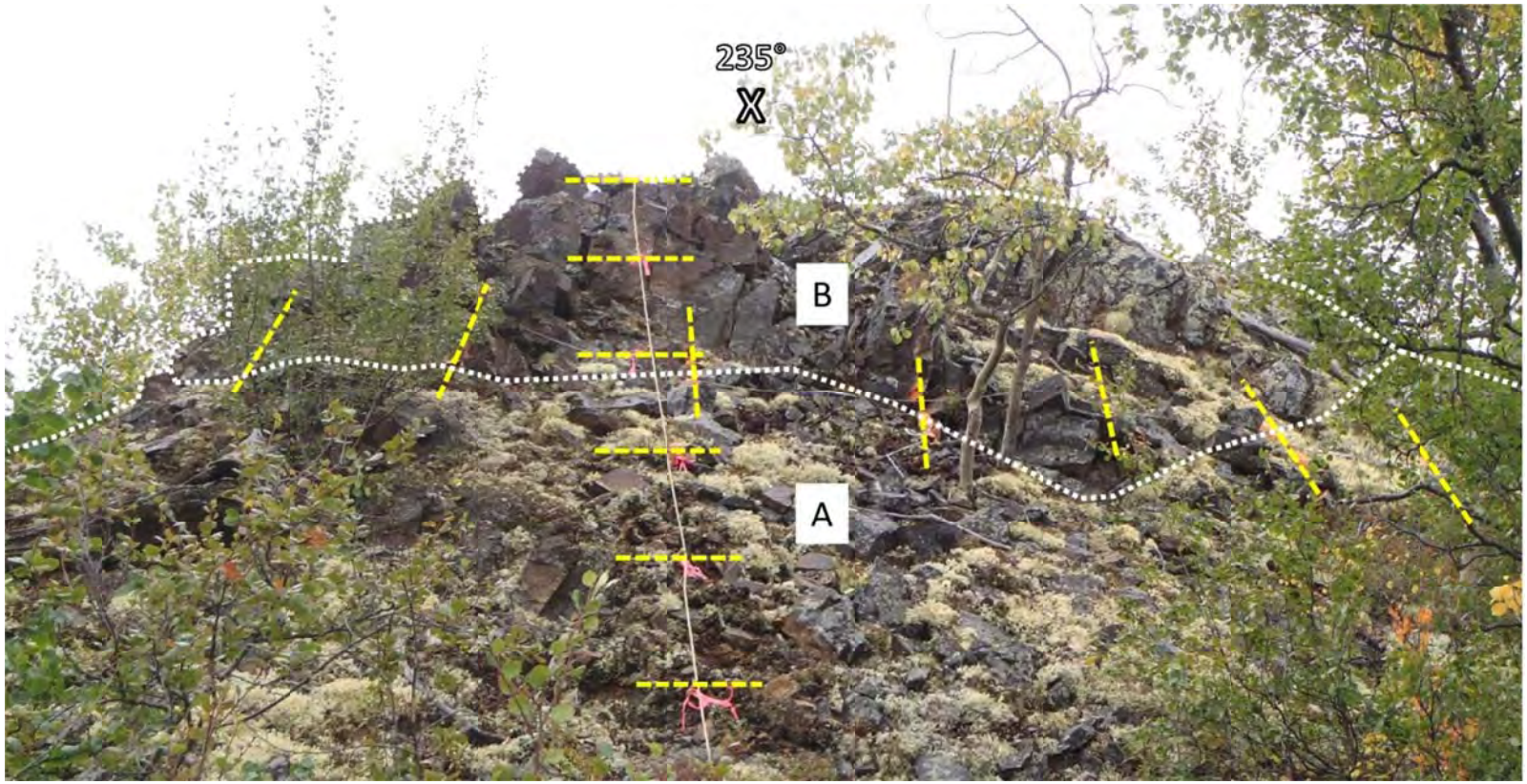
Outcrop OC-BGC11-53

Location: Stuttle Gulch
Facility: 100-day storage
Outcrop type: Natural

Northing: 7099996
Easting: 459359
Elevation: 1009 m
Survey type: Handheld GPS

Slope Angle: 45°
Slope Direction: 044°
Date logged: 8/23/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: GRAVEL: Cobbly, some sand, some organic silt, well-graded (GW). Fines moist, very soft; have low plasticity, rapid dilatancy, and no dry strength. Clasts are metasedimentary, angular, flat, and medium strong to strong (R3-R4). [COLLUVIUM] with thin cap of [TOPSOIL].

B: Dark grey, fine-grained QUARTZITE. Faintly weathered (W1.5); strong (R4). Blocks ~ 15 cm,; equidimensional. GSI structure = Very Blocky, GSI surface = Good, GSI range = 50-60.

Outcrop OC-BGC11-53

PHOTO OF STRUCTURE



DISCONTINUITY TABLE

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	29-32	271-294	0-5	None	8 (1m)	R4	0.15	1m+	JO
2	78-86	139-161	1-20	None, OG	8 (1m)	R4	0.15	2m+	J
3	69-86	060-089	1-10	None, OG	16 (1m)	R4	0.15	2m+	J

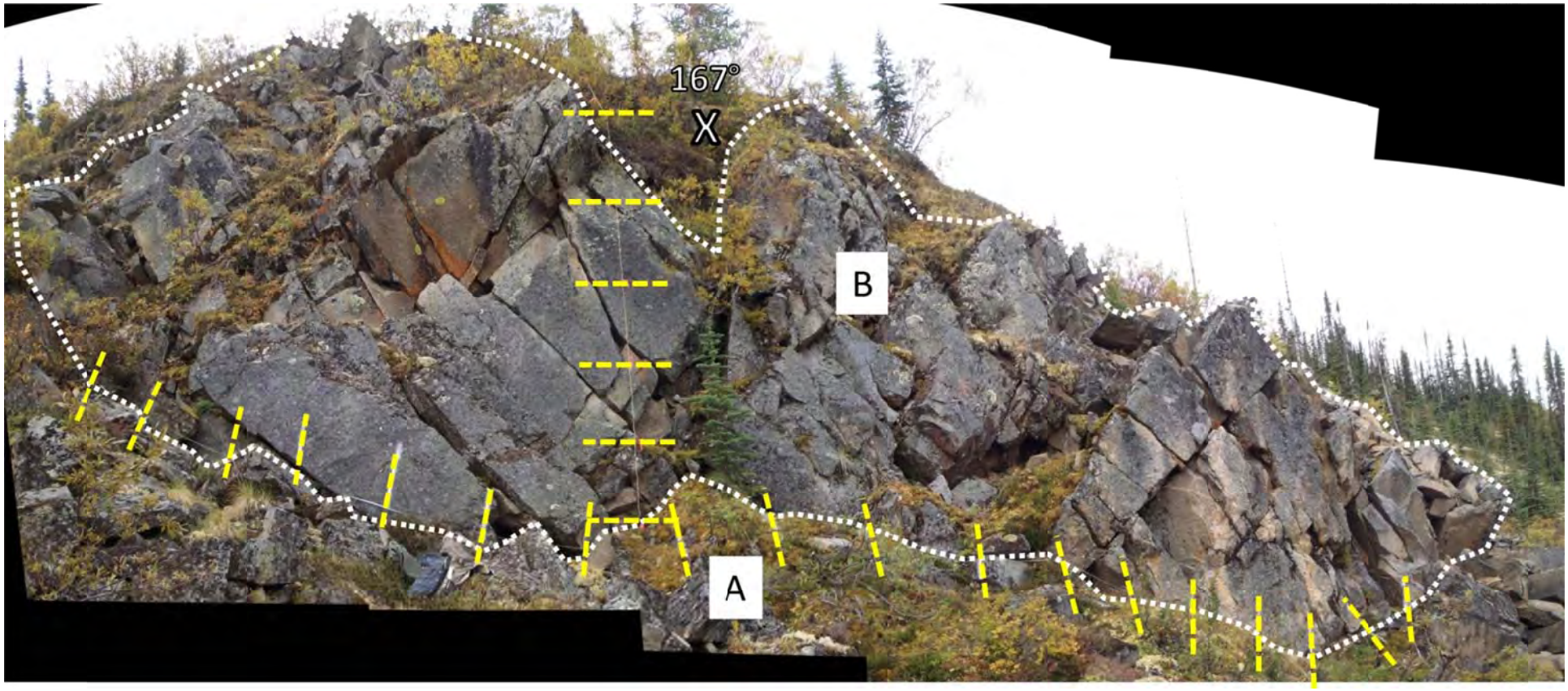
Outcrop OC-BGC11-54

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Natural

Northing: 7099871
Easting: 460694
Elevation: 1288 m
Survey type: Handheld GPS

Slope Angle: 75°
Slope Direction: 142°
Date logged: 8/24/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

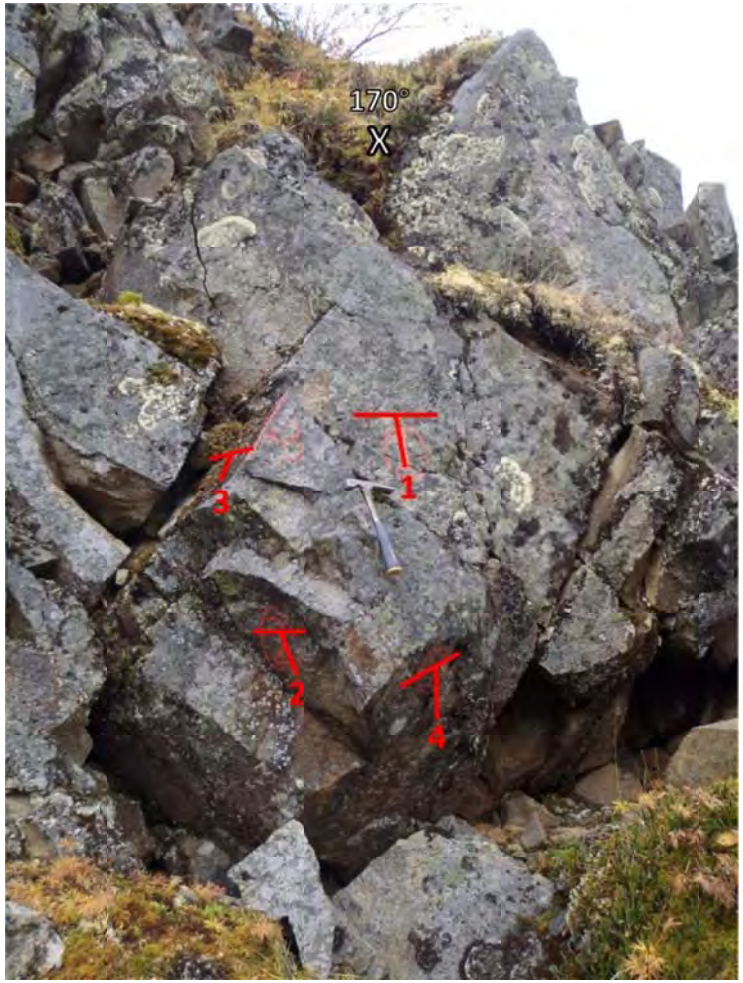
DESCRIPTION OF MATERIALS

A: BOULDERS: Some cobbles, some gravel, minor organics. Clasts angular, equidimensional to elongate, granodiorite, very strong to extremely strong (R5-R6). [FROST-SHATTERED BEDROCK]

B: Medium-grained grey GRANODIORITE. Faintly weathered (W1.5); very strong to extremely strong (R5-R6). Blocks ~ 0.7 m; rhombohedral. GSI structure = Blocky, GSI surface = Good, GSI range = 60-70.

Outcrop OC-BGC11-54

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	82-87	143-172	1-100	None	12 (1m)	R5	0.6	5m+	J
2	53-70	211-247	1-100	None	16 (1m)	R5	0.7	6m+	J
3	59-83	035-054	1-50	None	16 (1m)	R5	2	4m+	J
4	41-57	105-128	1-100	None	12 (1m)	R5	2	5m+	J

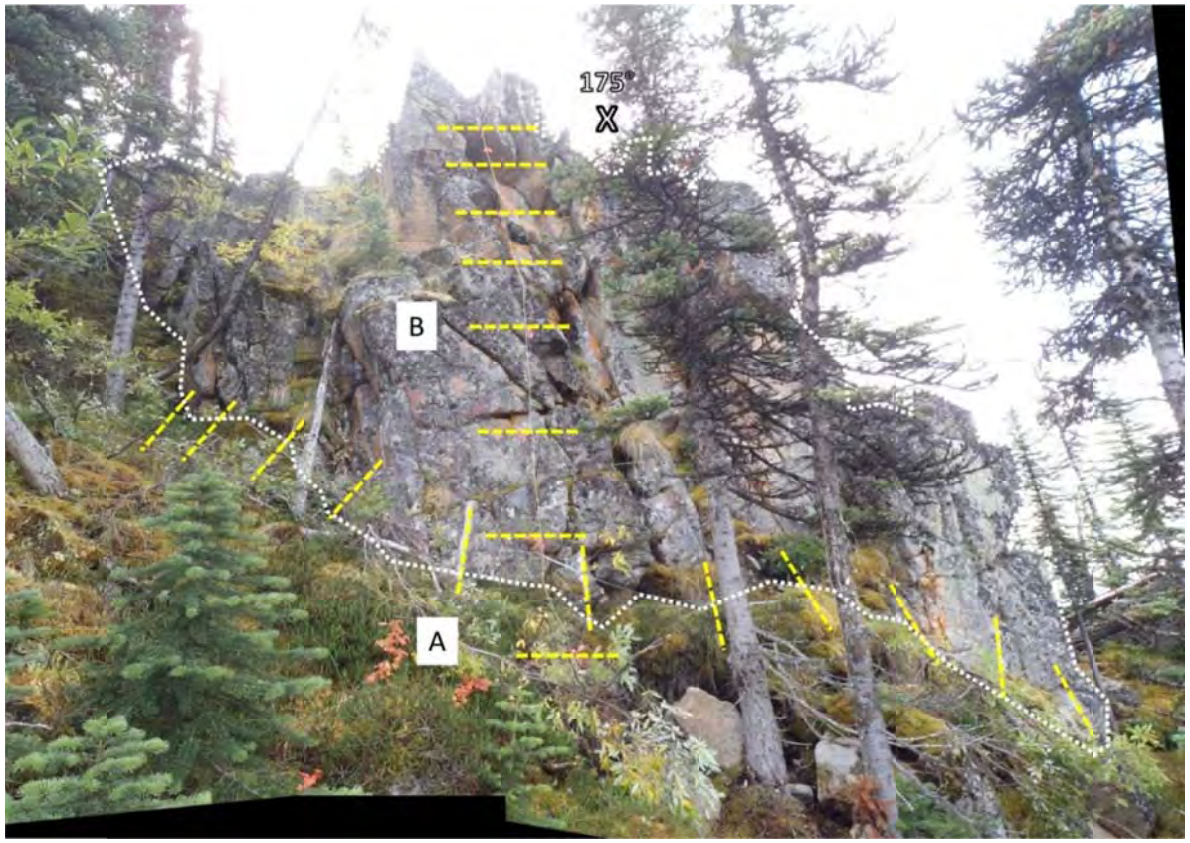
Outcrop OC-BGC11-55A

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Natural

Northing: 7100389
Easting: 460728
Elevation: 1248 m
Survey type: Handheld GPS

Slope Angle: 78°
Slope Direction: 349°
Date logged: 8/24/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: BOULDERS and COBBLES covered by ~ 10 cm of TOPSOIL (moss/heather root mat and some organic silt). Clasts angular, equidimensional to elongate, granodiorite. [FROST-SHATTERED BEDROCK]

B: Grey, coarse-grained GRANODIORITE. Faintly weathered (W1.5); strong to very strong (R4-R5). Blocks ~ 0.5m; rhombohedral. GSI structure = Blocky, GSI surface = Good to Fair, GSI range = 55-65.

Outcrop OC-BGC11-55A

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC (scale)	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)				(m)	(m)	
1	78-89	354-000	0-50	None	8 (1m)	R4	0.6	3.5m	J
2	80-82	252-280	0-50	None	12-16 (1m)	R4	0.7	3m	J
3	24-42	070-285	0-5	None	12 (1m)	R4	0.7	2m	J
4	52-62	252-275	0-40	None	12 (1m)	R4	1	2m	J

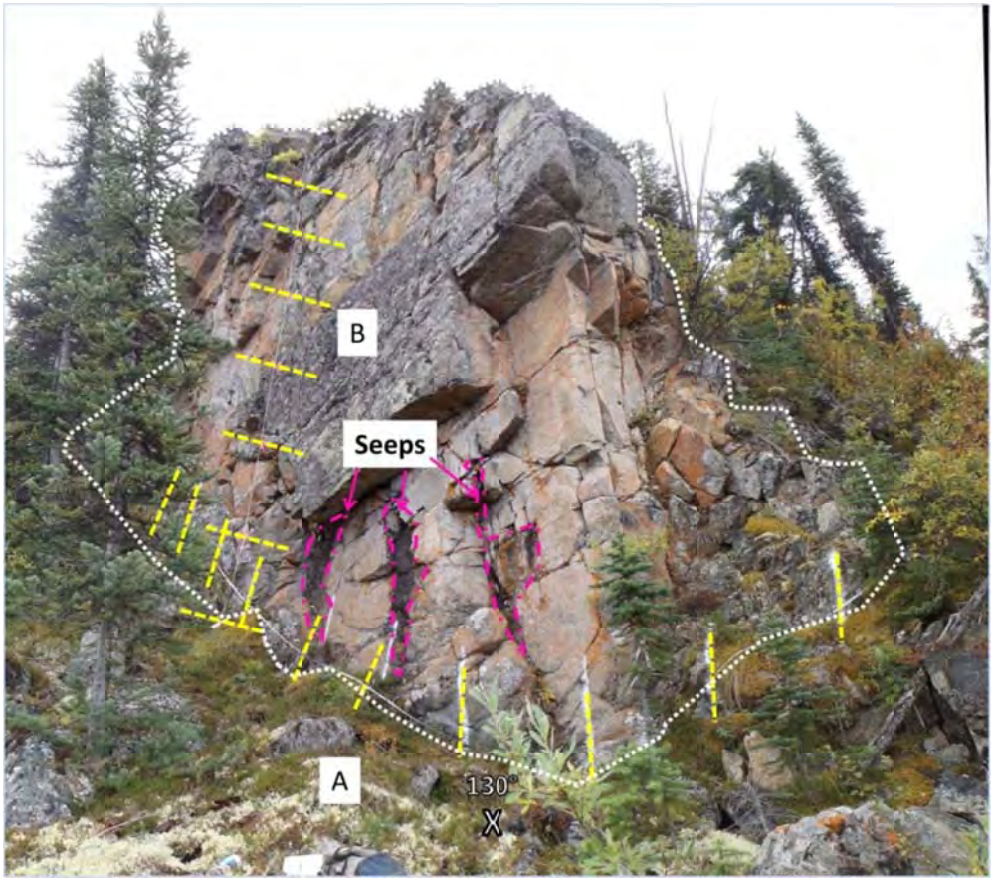
Outcrop OC-BGC11-55B

Location: Eagle Pup
Facility: Eagle Pup WRSA
Outcrop type: Natural

Northing: 7100373
Easting: 460719
Elevation: 1239 m
Survey type: Handheld GPS

Slope Angle: 85°
Slope Direction: 353°
Date logged: 8/24/2011
Logged by: GH

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: BOULDERS and COBBLES covered by ~ 10 cm of TOPSOIL (moss/heather/root mat and some organic silt). Angular, equidimensional to elongate, granodiorite. [FROST-SHATTERED BEDROCK]

B: Grey, coarse-grained GRANODIORITE. Faintly to lightly weathered (W1.5-W2); strong to very strong (R4-R5). Some zones of moderately weathered R3 rock near water seeps. Blocks ~ 0.4 m; rhombohedral. GSI structure = Blocky, GSI surface = Good to Fair, GSI range = 55-65.

Outcrop OC-BGC11-55B

PHOTO OF STRUCTURE



DISCONTINUITY TABLE – UNIT B

Set	Orientation range		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type
	Dip°	DD°	(mm)		(scale)		(m)	(m)	
1	83-89	352-357	0-3	None	10 (1m)	R4	0.4	8m+	J
2	78-90	252-286	0-40	None	16 (1m)	R4	0.5	4m	J
3	18-32	036-065	0-3	CA	20 (1m)	R4	0.4	2.5m	J
4	50-70	260-294	0-10	None	20 (1m)	R4	0.8	2m	J
5	57-70	160-165	1-3	CA	4-8 (1m)	R4	1	7m+	J

APPENDIX C
TEST PIT LOGS

TEST PIT LOGS

Table C- 1: Summary of Test Pits

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Final Length (m)
TP-BGC11-50	7100283	459702	1011	5.8
TP-BGC11-51	7100436	459665	972	4.7
TP-BGC11-52	7101809	459978	1051	5.0
TP-BGC11-53	7102242	460049	1103	4.0
TP-BGC11-54	7102175	460416	1178	2.0
TP-BGC11-55	7102242	460619	1209	2.0
TP-BGC11-56	7102183	460247	1158	2.0
TP-BGC11-57	7102087	460209	1144	5.0
TP-BGC11-58	7102129	460079	1118	5.0
TP-BGC11-59	7099985	459791	1065	2.6
TP-BGC11-60	7099940	459795	1067	2.7
TP-BGC11-61	7099870	459439	1008	5.0
TP-BGC11-62	7099924	459251	975	6.2
TP-BGC11-63	7099914	459139	940	4.6
TP-BGC11-64	7100206	459151	945	4.7
TP-BGC11-65	7099236	459542	986	8.0
TP-BGC11-66	7099178	459943	1134	7.5
TP-BGC11-67	7099861	458808	857	6.5
TP-BGC11-68	7099590	458859	849	6.5
TP-BGC11-69	7099457	458915	875	6.5
TP-BGC11-70	7099123	459409	983	3.0
TP-BGC11-71	7101244	459115	885	2.2
TP-BGC11-72	7101194	459202	874	4.3
TP-BGC11-73	7101498	460472	984	3.0
TP-BGC11-74	7101487	460629	1014	5.5
TP-BGC11-75	7101499	460786	1040	4.2
TP-BGC11-76	7101302	461068	1125	5.4
TP-BGC11-77	7101655	461364	1099	5.5
TP-BGC11-78	7101628	461728	1186	5.5
TP-BGC11-79	7101806	461903	1166	3.8
TP-BGC11-80	7101551	461753	1210	6.7
TP-BGC11-81	7101480	461711	1207	3.9
TP-BGC11-82	7100691	458604	815	7.5
TP-BGC11-83	7100077	458786	863	1.3
TP-BGC11-84	7100006	458763	863	2.6
TP-BGC11-85	7100055	458783	865	2.5
TP-BGC11-86	7101751	460124	894	7.5

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Final Length (m)
TP-BGC11-87	7100247	460690	1194	3.5
TP-BGC11-88	7101008	459813	922	6.0
TP-BGC11-89	7100737	459876	985	6.5
TP-BGC11-90	7100502	459686	981	6.5
TP-BGC11-91	7100633	459649	969	2.1
TP-BGC11-92	7100733	459587	933	1.7
TP-BGC11-93	7100794	459536	917	1.9
TP-BGC11-94	7101522	459983	930	5.0
TP-BGC11-95	7100135	460283	1109	3.2
TP-BGC11-96	7100170	460287	1103	2.0
TP-BGC11-97	7099463	460546	1353	4.0
TP-BGC11-98	7099465	460521	1342	2.2
TP-BGC11-99	7099496	460576	1352	2.5
TP-BGC11-100	7099505	460565	1345	3.5
TP-BGC11-101	7098940	460089	1180	2.4
TP-BGC11-102	7099111	460565	1361	4.6
TP-BGC11-103	7101150	458820	865	6.0
TP-BGC11-104	7100924	459738	832	5.6
TP-BGC11-105	7101190	458939	878	3.0
TP-BGC11-106	7100012	460375	1155	3.0
TP-BGC11-107	7100261	460182	1044	3.2
TP-BGC11-108	7099975	460285	1145	1.5
TP-BGC11-109	7100520	460137	977	5.3
TP-BGC11-110	7101062	459851	942	5.0
TP-BGC11-111	7100373	460653	1185	2.0
TP-BGC11-112	7100504	460350	1033	2.5
TP-BGC11-113	7099490	459071	878	2.5
TP-BGC11-114	7099369	459190	914	3.2
TP-BGC11-115	7099453	459187	899	5.7
TP-BGC11-116	7099423	459251	905	2.3
TP-BGC11-117	7099578	459184	896	8.0
TP-BGC11-118	7100268	459335	951	5.3
TP-BGC11-119	7100548	458587	824	2.1
TP-BGC11-120	7100484	458511	816	4.4
TP-BGC11-121	7100588	458502	815	3.3
TP-BGC11-122	7100707	458684	825	5.8
TP-BGC11-123	7101322	458498	808	2.4
TP-BGC11-124	7101502	458559	825	6.5
TP-BGC11-125	7100047	459492	995	2.5

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Final Length (m)
TP-BGC11-126	7100300	459464	946	3.1
TP-BGC11-127	7100117	459889	1096	2.5
TP-BGC11-128	7101526	458423	803	3.0
TP-BGC11-129	7101340	458563	822	6.8
TP-BGC11-130	7101183	458709	865	6.0
TP-BGC11-131	7101430	459934	921	3.5
TP-BGC11-132	7101515	459840	922	5.3
TP-BGC11-133	7101608	460048	984	4.4
TP-BGC11-134	7101419	460101	945	4.2
TP-BGC11-135	7101383	459998	931	3.5
TP-BGC11-136	7101306	459896	910	4.8
TP-BGC11-137	7101171	459920	943	5.0
TP-BGC11-138	7100041	459771	1050	6.3
TP-BGC11-139	7099033	459001	935	3.0
TP-BGC11-140	7097912	459228	954	4.5
TP-BGC11-141	7098871	460019	1154	5.0
TP-BGC11-142	7098318	459037	913	4.5
TP-BGC11-143	7100441	458644	838	4.0
TP-BGC11-144	7100144	460540	1158	1.0
TP-BGC11-145	7101471	459853	959	5.1

NOTES:
1. Location for BGC holes from handheld GPS measurements.
2. Coordinates in UTM NAD 83, Zone 8N.

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-50

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459702E, 7100283N
GROUND ELEVATION (m): 1011
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 29 Jun 11
FINISH DATE: 29 Jun 11
FINAL DEPTH OF PIT (m): 5.8
LOGGED BY: EB/LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Lichen, moss, rootmat. [TOPSOIL]
1					SILT (ML) Gravelly, some clay, trace sand, low to medium plasticity, firm, yellowish brown, moist to damp, metasedimentary clasts are angular to subrounded, elongated, maximum particle size = 70 mm, weak to strong (R2 to R4). [COLLUVIUM]
2					GRAVEL (GW) Trace sand, well graded, angular, elongated, maximum particle size = 250 mm, weak to strong (R2 to R4), yellowy brown, moist, metasedimentary clasts. [COLLUVIUM]
3	G	1			GRAVEL (GM) Silty, trace sand, trace cobbles, trace boulders, well graded, angular, elongated, maximum particle size = 350 mm, weak to strong (R2 to R4), low plastic matrix, yellowish brown, moist, metasedimentary clasts. [COLLUVIUM] Below 0.65 m - Increasing silt and cobble content to the top of bedrock. 2.8 - 3.0 m - Sample 1, grain size analysis, 84% gravel, 11% sand, 5% fines. Specific gravity analysis, average specific gravity 2.8.
	G	2			3.3 - 3.6 m - Sample 2, grain size analysis, 67% gravel, 23% sand, 10% fines.
4			4.5		SAND (SM) Silty, some gravel, trace cobbles, trace boulders, well graded, subangular to angular, elongated, maximum particle size = 300 mm, metasedimentary clasts, weak (R2), yellow brown, moist. Silt content varies throughout the unit, forms lenses. Iron staining observed. [HIGHLY TO COMPLETELY WEATHERED BEDROCK]
5					
6					End of test pit at 5.8 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Logged from cut walls for drill pad for BH-BGC11-36 and excavated below pad surface.
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-51

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459665E, 7100436N
GROUND ELEVATION (m): 972
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 29 Jun 11
FINISH DATE: 29 Jun 11
FINAL DEPTH OF PIT (m): 4.7
LOGGED BY: EB/LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Lichen, moss, rootmat, wet. [TOPSOIL]
1	G	1			GRAVEL (GM) Silty, trace to some sand, metasedimentary clasts are angular to subrounded, elongated, maximum particle size = 140 mm, weak (R2). Fines: low plasticity, hard, rapid dilatancy, yellow brown, white mottling and iron staining, wet when thawed. Frozen: Nbn. [COLLUVIUM] 0.2 - 1.44 m - Sample 1, grain size analysis, 32% gravel, 24% sand, 34% silt, 10% clay.
2	G	2			SAND (SM) Some gravel, some silt, trace cobbles well graded, angular to subangular elongated, maximum particle size = 140 mm, yellow brown, moist, metasedimentary clasts, weak to medium strong (R2 to R3). [COLLUVIUM] 2.4 - 2.8 m - Sample 2, grain size analysis, 50% gravel, 23% sand, 27% fines. Sulphate analysis, 0.13 % total sulphate ion content.
3					SAND AND GRAVEL (GM) Silty, trace cobbles, trace boulders, well graded, angular to subrounded, elongated, maximum particle size = 400 mm, yellowish brown, dry to moist, low plastic matrix, metasedimentary clasts, weak to strong (R2 to R4). [COLLUVIUM]
4	G	3			4.2 - 4.5 m - Sample 3, grain size analysis, 60% gravel, 34% sand, 6% fines.
5					End of test pit at 4.7 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered from 0.2-1.44 m. 5) Encountered resistance on boulders (weathered bedrock?) at bottom of excavation. 6) Logged from cut walls for drill pad for BH-BGC11-35 and excavated below pad surface.
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

EGP (TESTPIT) EGP_TESTPIT GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-52

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459978E, 7101809N
GROUND ELEVATION (m): 1051
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 02 Jul 11
FINISH DATE: 02 Jul 11
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION	Su - kPa (40, 80, 120, 160) / VANE FIELD LAB / PEAK ◆ ■ / REMOLD ◇ □ / ▲ UC/2 / △ Pocket Pen /2 / ★ % Fines / Moisture Content W_P% W% W_L% (20, 40, 60, 80)
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]	
					GRAVEL (GM) Some silt, trace sand, trace cobbles, well graded, loose, maximum particle size = 200 mm, flat and elongated, angular, brown, moist, clasts: medium strong (R3), slightly weathered (W2). [COLLUVIUM]	
1						
2					METASEDIMENTARY ROCK Brown, iron staining, extremely to highly fractured, medium strong (R3), slightly weathered (W2). [SLIGHTLY WEATHERED BEDROCK]	
3	G	1	2		3.3 - 3.5 m - Sample 1, grain size analysis, 30% cobbles, 63% gravel, 6% sand, 1% fines.	★○
4						
5					End of test pit at 5.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Test pit excavated at drill pad for BH-BGC11-29.	
6						
7						
8						

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-53

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460049E, 7102242N
GROUND ELEVATION (m): 1103
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 02 Jul 11
FINISH DATE: 02 Jul 11
FINAL DEPTH OF PIT (m): 4.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
					SILT (ML) Trace sand, trace gravel, trace cobbles, low plasticity, firm to stiff, brown, moist. [COLLUVIUM] PP/2 = 100 kPa
1					GRAVEL (GM) Some silt, trace sand, trace cobbles, well graded, maximum particle size = 200 mm, flat and elongated, angular, iron staining. [MODERATELY WEATHERED METASEDIMENTARY BEDROCK]
2	G	1	3		2.0 - 2.2 m - Sample 1, grain size analysis, 79% gravel, 18% sand, 3% fines.
3					
4					End of test pit at 4.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Test pit excavated at drill pad for BH-BGC11-27.
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-54

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460416E, 7102175N
GROUND ELEVATION (m): 1178
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 02 Jul 11
FINISH DATE: 02 Jul 11
FINAL DEPTH OF PIT (m): 2.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
	G	1			GRAVEL (GM) Silty, some sand, trace cobbles, trace boulders, well graded, loose, maximum particle size = 250 mm, angular, iron staining. Fines: low plastic, firm to stiff, brown, moist, heterogeneous. [COLLUVIUM] 0.4 - 0.6 m - Sample 1, grain size analysis, 57% gravel, 18% sand, 19% silt, 6% clay.
1			2		METASEDIMENTARY ROCK Iron staining, highly fractured, blocky, angular, strong (R4), slightly weathered (W2). [SLIGHTLY WEATHERED BEDROCK]
2					End of test pit at 2.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Test pit excavated at drill pad for BH-BGC11-25.
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-55

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460619E, 7102242N
GROUND ELEVATION (m): 1209
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 02 Jul 11
FINISH DATE: 02 Jul 11
FINAL DEPTH OF PIT (m): 2.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	1			ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1			3		GRAVEL (GM) Silty, trace sand, trace cobbles. Fines: low plastic, firm, brown, moist, heterogeneous. [COLLUVIUM] 0.4 - 0.6 m - Sample 1, grain size analysis, 57% gravel, 19% sand, 20% silt, 4% clay.
2	G	2			METASEDIMENTARY ROCK Excavated as silty gravel, trace sand, trace cobbles, well graded, maximum particle size = 250 mm, angular, iron staining, moist. [MODERATELY WEATHERED METASEDIMENTARY BEDROCK] 1.9 - 2.0 m - Sample 2, grain size analysis, 80% gravel, 13% sand, 7% fines.
3					End of test pit at 2.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Test pit excavated at drill pad for BH-BGC11-24.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-56

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460247E, 7102183N
GROUND ELEVATION (m): 1158
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 04 Jul 11
FINISH DATE: 04 Jul 11
FINAL DEPTH OF PIT (m): 2.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1			3.5		METASEDIMENTARY ROCK Blocky to very blocky, poor joint wall condition, medium strong (R3), moderately to highly weathered (W3 to W4). [MODERATELY TO HIGHLY WEATHERED BEDROCK]
2			2		METASEDIMENTARY ROCK As above but slightly weathered. [SLIGHTLY WEATHERED BEDROCK]
					End of test pit at 2.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) No sample taken.

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-57

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460209E, 7102087N
GROUND ELEVATION (m): 1144
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 04 Jul 11
FINISH DATE: 04 Jul 11
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			GRAVEL (GM) Silty, some sand, trace cobbles, angular, iron staining, size increasing with depth. Fines: low plasticity, firm to very stiff, brown, moist. [COLLUVIUM] 0.5 - 1.1 m - Sample 1, grain size analysis, 50% gravel, 18% sand, 27% silt, 5% clay.
2					
3			3		METASEDIMENTARY ROCK Gravel and silt present when excavated, blocky, iron stained, maximum particle size = 300 mm, subangular to angular, medium strong (R3), moderately weathered (W3). [MODERATELY WEATHERED METASEDIMENTARY BEDROCK]
4					
5					End of test pit at 5.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Cut for drill pad for BH-BGC11-26 logged as part of test pit.
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-58

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460079E, 7102129N
GROUND ELEVATION (m): 1118
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 04 Jul 11
FINISH DATE: 04 Jul 11
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
	G	1			GRAVEL AND SAND (GM/SM) Silty, trace cobbles, trace clay. Fines: low plastic, firm, brown, moist, slow dilatancy. [COLLUVIUM] At 0.7 m - Sample 1, grain size analysis, 36% gravel, 37% sand, 23% silt, 4% clay.
1					
2	G	2			GRAVEL (GW) Fine to coarse, trace sand, trace silt, well graded, compact, maximum particle size = 50 mm, flat and elongated, angular, iron staining, moist, laminated, very weak (R1). [COLLUVIUM]
3			4		METASEDIMENTARY ROCK Blocky, iron stained, 300 mm blocks, angular to sub-angular, highly weathered (W4), medium strong (R3). Excavated as cobbles, gravel, and silt. [HIGHLY WEATHERED BEDROCK] At 2.0 m - Sample 2, grain size analysis, 69% gravel, 25% sand, 6% fines. Specific gravity analysis, 2.84 (average).
4					
5					End of test pit at 5.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-59

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459791E, 7099985N
GROUND ELEVATION (m): 1065
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 07 Jul 11
FINISH DATE: 07 Jul 11
FINAL DEPTH OF PIT (m): 2.6
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
0.5	G	1			GRAVEL (GM) Fine to medium gravel, silty, some sand, some cobbles, trace boulders, elongated, angular, maximum particle size = 350 mm. Fines: non-plastic, soft, brown, homogeneous, moist. [COLLUVIUM] 0.4 - 0.6 m - Sample 1, grain size analysis, 67% gravel, 20% sand, 12% silt, 1% clay.
1					
2			3.5		METASEDIMENTARY ROCK Orange grey, very weak to weak (R1.5 to R2), moderately to highly weathered (W3 to W4), fine grained, disturbed, polyhedral structure, when excavated: gravel, with silt and sand. JS 1 - Dip/DipDir: 38/124 Ap: 30-150mm JRC: 14/0.3m JS 2 - Dip/DipDir: 85/194 Ap: 30-150mm JRC: 2-16/0.3m JS 3 - Dip/DipDir: 89/266 Ap: 30-150mm JRC: 16/0.1m [MODERATELY TO HIGHLY WEATHERED METASEDIMENTARY BEDROCK]
3					At 1.85m - Block size increases, slightly to moderately weathered (W2.5), medium strong to strong (R3 to R4).
2.6					End of test pit at 2.6 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Test pit excavated at drill pad for BH-BGC11-50.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

○ ★ ✕

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-60

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459795E, 7099940N
GROUND ELEVATION (m): 1067
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 07 Jul 11
FINISH DATE: 07 Jul 11
FINAL DEPTH OF PIT (m): 2.7
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			SILT (ML) Some sand, some gravel, trace cobbles, non-plastic, moist, brown-grey, soft, homogeneous, gravel and cobbles are angular and elongated. [COLLUVIUM] 0.65 - 1.0 m - Frozen: Vx, Vr (30%). 0.7 - 0.9 m - Sample 1, grain size analysis, 20% gravel, 25% sand, 53% silt, 2% clay. Sulphate analysis, 0.07% total sulphate ion content. 1.0 - 1.5 m - Frozen: Vx (5-10%).
2					SILT AND GRAVEL (ML/GM) Some sand. Frozen: Vx (10%). [COLLUVIUM]
					ORGANICS Dark black. Frozen: Nbn. [ORGANICS]
3					End of test pit at 2.7 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.65 m to bottom of excavation. 5) Test pit consists of road cut and 1 m of excavation.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-61

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459439E, 7099870N
GROUND ELEVATION (m): 1008
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 07 Jul 11
FINISH DATE: 07 Jul 11
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			SILT (ML) Gravelly, sandy, trace cobbles, low plastic, brown, moist, homogeneous, medium dry strength, no dilatancy. Clasts: angular to subangular, iron staining, moderately weathered (W3) medium strong (R3). [COLLUVIUM] 0.7 - 0.8 m - Sample 1, grain size analysis, 30% gravel, 32% sand, 36% silt, 2% clay.
2	G	2	2.5		METASEDIMENTARY ROCK iron stained, medium strong (R3), slightly to moderately weathered, fine grained, blocky and disturbed, angular to subangular, dip 44°, dip dir. 266°, excavated as gravel, cobbley, some silt, trace sand. [SLIGHTLY TO MODERATELY WEATHERED METASEDIMENTARY BEDROCK] 1.7 - 1.9 m - Sample 2, grain size analysis, 55% gravel, 29% silt, 16% fines.
3					
4					
5					End of test pit at 5.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-62

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459251E, 7099924N
GROUND ELEVATION (m): 975
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 07 Jul 11
FINISH DATE: 07 Jul 11
FINAL DEPTH OF PIT (m): 6.2
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			SILT (ML) Cobbley, gravelly, sandy, low plastic, soft, brown, moist, homogeneous, moderate dry strength, no dilatancy. [COLLUVIUM] 0.9 - 1.0 m - Sample 1, grain size analysis, 33% gravel, 23% sand, 40% silt, 4% clay.
2					SAND (SM) Silty, trace gravel, trace cobbles, compact to dense, brown, moist, homogeneous. [COLLUVIUM]
3					
4	G	2			3.5 - 3.7 m - Sample 2, grain size analysis, 33% gravel, 39% sand, 22% silt, 6% clay.
5					
6					
7					End of test pit at 6.2 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — ○ — — — × W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-63

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459139E, 7099914N
GROUND ELEVATION (m): 940
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 07 Jul 11
FINISH DATE: 07 Jul 11
FINAL DEPTH OF PIT (m): 4.6
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
	G	1	4		GRAVEL (GM) Silty, trace cobbles (angular, maximum particle size = 250 mm), trace sand, brown, moist, homogeneous. Fines are low plastic, firm, medium dry strength, rapid dilatency. [COLLUVIUM] 0.5 - 0.7 m - Sample 1, grain size analysis, 53% gravel, 23% sand, 20% silt, 4% clay.
1					
2					METASEDIMENTARY ROCK Disintegrated, iron stained, highly weathered (W4), weak (R2). [HIGHLY WEATHERED BEDROCK]
			3		METASEDIMENTARY ROCK Iron stained, slightly to moderately weathered (W2.5 to W3), medium strong (R3), very blocky, polyhedral, excavated as cobbles, some gravel, some silt. [MODERATELY WEATHERED BEDROCK] 1.1 - 1.5 m - Frozen: Vx (1-2%).
3					
4					
5					End of test pit at 4.6 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered from 1.1-1.5 m. 5) Substantial sloughing.
6					
7					
8					

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — ○ — × W_L%; 20, 40, 60, 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-64

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459151E, 7100206N
GROUND ELEVATION (m): 945
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 07 Jul 11
FINISH DATE: 07 Jul 11
FINAL DEPTH OF PIT (m): 4.7
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION	Su - kPa (40, 80, 120, 160) / VANE FIELD LAB / PEAK ◆ ■ / REMOLD ◇ □ / ▲ UC/2 / △ Pocket Pen /2 / ★ % Fines / Moisture Content W_P% W% W_L% (20, 40, 60, 80)
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]	
					SILT (SM) Some gravel, some sand, trace cobbles, non plastic, greyish brown. Frozen: Nf. [COLLUVIUM]	
1	G	1			SAND (SP) Trace silt, some gravel, trace cobbles, fine to medium, poorly graded, angular, greyish brown. Frozen: Nf. [COLLUVIUM] 1.5 - 1.6 m - Sample 1, grain size analysis, 26% gravel, 60% sand, 14% fines.	○ ★
2			5		METASEDIMENTARY ROCK Disintegrated, orange brown, fine grained, completely weathered (W5), very weak (R1), excavated as gravel and sand. [COMPLETELY WEATHERED BEDROCK]	
3			3		METASEDIMENTARY ROCK Very blocky, dark orange brown, angular to sub-angular, fine to coarse, moderately weathered (W3), medium strong to strong (R3 to R4), excavated as cobbles, sandy, gravelly. Visible set dipping downslope. [MODERATELY WEATHERED BEDROCK]	
4						
5					End of test pit at 4.7 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered from 0.3-2.0 m.	
6						
7						
8						

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-65

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459542E, 7099236N
GROUND ELEVATION (m): 986
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 09 Jul 11
FINISH DATE: 09 Jul 11
FINAL DEPTH OF PIT (m): 8.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	1			ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1			4.5		SAND (SW) Gravelly, trace cobbles, trace silt, well graded, compact, maximum particle size = 150 mm, sub-angular to angular, light brown, moist, homogeneous. [COLLUVIUM] 0.4 - 0.5 m - Sample 1, grain size analysis, 49% gravel, 36% sand, 15% fines. GRAVEL (GM) Silty, some sand, some cobbles, dark grey to brown. Clasts: metasedimentary, medium strong to strong (R3 to R4). [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY BEDROCK]
2			3		METASEDIMENTARY ROCK Iron stained, medium strong to strong (R3 to R4), moderately weathered (W3), very blocky, poor to fair joint condition, rhombohedral, iron stained, excavated as cobbles, some gravel, trace silt, trace sand. [MODERATELY WEATHERED BEDROCK]
3					
4					
5					
6			4		METASEDIMENTARY ROCK Light brown, medium strong (R3), highly weathered (W4), Blocky/disturbed, poor to fair joint condition, oxidized, excavated as cobbles (100 mm), sandy, some gravel. [HIGHLY WEATHERED BEDROCK]
7			3		METASEDIMENTARY ROCK Very blocky, poor to fair joint condition, rhombohedral, fine to coarse, angular, moderately weathered (W3), medium strong to strong (R3 to R4), excavated as cobbley, some gravel, trace sand. [MODERATELY WEATHERED BEDROCK]
8					

Su - kPa
40 80 120 160

VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-65

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459542E, 7099236N
GROUND ELEVATION (m): 986
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 09 Jul 11
FINISH DATE: 09 Jul 11
FINAL DEPTH OF PIT (m): 8.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
8					End of test pit at 8.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Excavation on side of steep slope along existing road cut. Approximately 5 m exposure above road surface.
9					
10					
11					
12					
13					
14					
15					
16					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-66

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459943E, 7099178N
GROUND ELEVATION (m): 1134
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 09 Jul 11
FINISH DATE: 09 Jul 11
FINAL DEPTH OF PIT (m): 7.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat [TOPSOIL]
1					GRAVEL (GM) Silty, trace cobbles, compact, maximum particle size = 150 mm, subangular to angular, light brown, moist, homogeneous. [COLLUVIUM]
	G	1			SAND (SM) Silty, some gravel, fine to medium, well graded, dense, maximum particle size = 35 mm, angular to sub-angular, light to orangish brown, stratified. [COLLUVIUM]
2	G	2			At 1.3 m - Sample 1, grain size analysis, 12% gravel, 63% sand, 25% fines.
			4.5		SILT (ML) Sandy, some clay, trace gravel, low plastic, soft, light brown to grey, moist, homogeneous. [COLLUVIUM] PP/2 = 25 kPa
3					At 1.8 m - Sample 2, grain size analysis, 2% gravel, 32% sand, 51% silt, 15% clay.
			3		SAND AND GRAVEL (SW-GW) Iron staining. Clasts: metasedimentary, very weak to weak (R1 to R2). [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY BEDROCK]
4					METASEDIMENTARY ROCK Iron staining, medium strong (R3), moderately weathered (W3), very blocky, fair to poor joint condition, excavated as cobbles and gravel. [MODERATELY WEATHERED BEDROCK]
			2		METASEDIMENTARY ROCK Iron staining, medium strong to strong (R3 to R4), slightly weathered (W2), blocky, fair joint condition, excavated as cobbles and gravel. [SLIGHTLY WEATHERED BEDROCK]
5					
6					
7					
8					End of test pit at 7.5 m Notes: 1) Refusal on bedrock.

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — ○ — × W_L%; 20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-66

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459943E, 7099178N
GROUND ELEVATION (m): 1134
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 09 Jul 11
FINISH DATE: 09 Jul 11
FINAL DEPTH OF PIT (m): 7.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
8					2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Test pit excavated at old drill pad cut slope.
9					
10					
11					
12					
13					
14					
15					
16					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-67

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458808E, 7099861N
GROUND ELEVATION (m): 857
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 10 Jul 11
FINISH DATE: 10 Jul 11
FINAL DEPTH OF PIT (m): 6.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			GRAVEL and SAND (GM/SM) Silty, trace cobbles, compact, maximum particle size = 200 mm, medium brown, moist, homogeneous. Clasts: angular to subangular. [COLLUVIUM] 0.7 - 0.9 m - Sample 1, grain size analysis, 45% gravel, 19% sand, 28% silt, 8% clay. Specific gravity analysis, 2.72 (average).
2					GRAVEL and SAND (GM/SM) As above, some cobbles, trace boulders, maximum particle size = 500 mm, dense. Cobbles and boulders very strong to extremely strong (R5 to R6). [COLLUVIUM/TILL?]
3					
4					
5					
6					
7					End of test pit at 6.5 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
8					

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — — — ○ — — — × W_L%; 20, 40, 60, 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-68

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458859E, 7099590N
GROUND ELEVATION (m): 849
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 10 Jul 11
FINISH DATE: 10 Jul 11
FINAL DEPTH OF PIT (m): 6.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION	Su - kPa (40, 80, 120, 160) / VANE FIELD LAB / PEAK ◆ ■ / REMOLD ◇ □ / ▲ UC/2 / △ Pocket Pen /2 / ★ % Fines / Moisture Content W_P% W% W_L% (20, 40, 60, 80)
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]	
					GRAVEL (GM) Silty, some fine sand, trace cobbles, trace boulders, non plastic, compact, medium brown, moist, homogeneous. Clasts: angular to sub-angular, maximum particle size = 270 mm. [COLLUVIUM]	
1						
	G	1			1.6 - 1.8 m - Sample 1, grain size analysis, 44% gravel, 38% sand, 18% fines.	○ ★
2					SAND (SM) Silty, cobbley, gravelly, trace boulders, dense, moist, medium brown, homogeneous, sub-angular to sub-rounded, maximum particle size = 400 mm, average cobble size = 100-150 mm, non plastic matrix. [COLLUVIUM]	
3						
4						
5						
6						
7					End of test pit at 6.5 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.	
8						

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-69

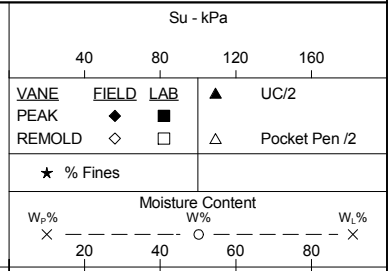
LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458915E, 7099457N
GROUND ELEVATION (m): 875
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 10 Jul 11
FINISH DATE: 10 Jul 11
FINAL DEPTH OF PIT (m): 6.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, root mat. [TOPSOIL]
1					SILT (ML) Trace to some sand, trace clay, firm to stiff, grey, moist, stratified, high dry strength, no dilatancy. [COLLUVIUM] PP/2 = 75 kPa
2	G	1			1.7 - 1.9 m - Sample 1, grain size analysis, 7% sand, 90% silt, 3% clay.
3	G	2			GRAVEL (GM) Silty, trace sand. Fines: stiff, light brown, moist, homogeneous. [COLLUVIUM] 2.8 - 2.9 - Sample 2, grain size analysis, 47% gravel, 31% sand, 19% silt, 3% clay.
4			5		GRAVEL (GM) Cobbley, some silt, some sand, elongated to equidimensional, subangular to subrounded, blue grey brown, heavy iron staining, very weak (R1), metasedimentary clasts. [COMPLETELY WEATHERED METASEDIMENTARY BEDROCK]
5			3		GRANODIORITE Iron staining, very strong to extremely strong (R5 to R6), moderately weathered (W3), very blocky, rhombohedral, fair joint condition. [MODERATELY WEATHERED BEDROCK]
6					
7					End of test pit at 6.5 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Cut on upslope of exisiting road.
8					



EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

TEST PIT # TP-BGC11-70

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006
LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459409E, 7099123N
GROUND ELEVATION (m): 983
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 10 Jul 11
FINISH DATE: 10 Jul 11
FINAL DEPTH OF PIT (m): 3.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1			2		GRANODIORITE Iron staining, very strong to extremely strong, slightly weathered, blocky, rhombohedral, sand and silt infilling. [SLIGHTLY WEATHERED BEDROCK]
2					
3					End of test pit at 3.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Test pit excavated adjacent to existing road cut.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-71

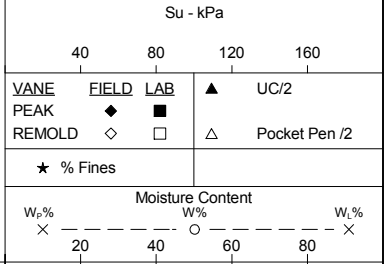
LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459115E, 7101244N
GROUND ELEVATION (m): 885
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 11 Jul 11
FINISH DATE: 11 Jul 11
FINAL DEPTH OF PIT (m): 2.2
LOGGED BY: EC/LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			SILT (ML) Gravelly, some sand, trace clay, medium to high plasticity, brownish grey, slight organic odour, wet when thawed, maximum particle size = 40 mm, Frozen: Vx(10-20%). Clasts: metasedimentary, elongated and flat, angular to sub-angular, medium strong (R3). [COLLUVIUM]
2					SILT (ML) Gravelly, sandy, trace clay, medium to high plasticity, brownish grey, slight organic odour, wet when thawed, maximum particle size = 40 mm. Clasts: metasedimentary, elongated and flat, angular to sub-angular, medium strong (R3). Frozen: Vx (30%). [COLLUVIUM]
					1.3 - 1.6 m - Sample 1, grain size analysis, 28% gravel, 41% sand, 26% silt, 5% clay.
3					End of test pit at 2.2 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.25 m to bottom of excavation. 4) Test pit executed as a road cut was being undertaken.
4					
5					
6					
7					
8					



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-72

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459202E, 7101194N
GROUND ELEVATION (m): 874
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 11 Jul 11
FINISH DATE: 11 Jul 11
FINAL DEPTH OF PIT (m): 4.3
LOGGED BY: EC/LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	2			SILT (ML) Some gravel, some sand, low plastic, soft, dark grey brown, moist, homogeneous, slow dilatancy. Clasts: fine to medium grained, equidimensional to elongated, angular, metasedimentary. [COLLUVIUM]
2					GRAVEL (GM) Fine to medium gravel, silty, trace sand, trace clay, equidimensional to elongated, angular, metasedimentary clasts. Fines: low plastic, soft, light brown, moist, homogeneous, slow dilatency. [COLLUVIUM] 0.8 - 1.0 m - Sample 2, grain size analysis, 35% gravel, 46% sand, 12% silt, 7% clay.
3	G	1	3		METASEDIMENTARY ROCK Yellowish brown, fine grained, foliated, phyllitic, slightly to moderately weathered (W2.5), intact rock strength varies from very weak (R1) for small phyllitic clasts to strong (R4) for boulder size siltstone clasts. One main set observed (foliation): Dip 15°, dip direction 300°. [MODERATELY WEATHERED BEDROCK] 2.4 - 2.6 m - Sample 1, grain size analysis, 68% gravel, 25% sand, 7% fines.
4					
5					End of test pit at 4.3 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Excavated as road cut was being undertaken.
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-73

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460472E, 7101498N
GROUND ELEVATION (m): 984
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 11 Jul 11
FINISH DATE: 11 Jul 11
FINAL DEPTH OF PIT (m): 3.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			SILT (ML) Sandy, some boulders, some cobbles, some gravel, non-plastic, medium brown, homogeneous, maximum particle size = 800 mm. Frozen 0.3-1.0m: Vx (<1%). Clasts: subangular to subrounded, strong to very strong (R4 to R5). [COLLUVIUM] 0.8 - 1.0 m - Sample 1, grain size analysis, 17% gravel, 50% sand, 31% silt, 2% clay.
2					BOULDERS AND COBBLES Silty, some gravel, trace sand, rounded to subrounded, moist, strong to very strong (R4 to R5) clasts, maximum particle size = 1200 mm. [COLLUVIUM]
3					End of test pit at 3.0 m. Notes: 1) Refusal on boulders. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered from 0.3-2.1 m.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — ○ — — — — × W_L%

20 40 60 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-74

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460629E, 7101487N
GROUND ELEVATION (m): 1014
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 11 Jul 11
FINISH DATE: 11 Jul 11
FINAL DEPTH OF PIT (m): 5.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			GRAVEL (GM) Silty, trace sand, trace cobbles, dense, grey to medium brown, moist, homogeneous, maximum particle size = 150 mm, angular to subangular, matrix non plastic. [COLLUVIUM] 1.2 - 1.4 m - Sample 1, grain size analysis, 39% gravel, 26% sand, 28% silt, 7% clay.
2					
3	G	2			SILT (ML) Trace gravel, trace sand, trace clay, low plastic, soft to firm, grey, moist to wet, homogeneous, low dry strength, rapid dilatancy. [COLLUVIUM] At 3.0 m - Sample 2, grain size analysis, 3% sand, 83% silt, 14% clay.
4					SAND (SM) Silty, some gravel, trace cobbles, trace clay, light brown, moist, angular, moderately weathered, iron staining, maximum particle size = 200 mm, low plastic matrix. [COLLUVIUM]
5	G	3			At 4.5 m - Sample 3, grain size analysis, 20% gravel, 30% sand, 44% silt, 6% clay.
6					End of test pit at 5.5 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage (wet layer at 2.5-3.0 m). 4) Not frozen. 5) Minor sloughing of pit walls.
7					
8					

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-75

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 460786E, 7101499N

GROUND ELEVATION (m): 1040

DATUM: UTM NAD 83

EXCAVATOR: 325D Cat

OPERATOR: EWING

START DATE: 12 Jul 11

FINISH DATE: 12 Jul 11

FINAL DEPTH OF PIT (m): 4.2

LOGGED BY: EC

REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
					GRAVEL (GM) Silty, some cobbles, trace sand, well graded, loose, maximum particle size = 200 mm, elongated and flat, angular, light brown, moist, stratified. [COLLUVIUM]
1					METASEDIMENTARY ROCK Iron staining, medium strong (R3), moderately weathered (W3), blocky, disturbed, disintegrated, tabular blocks, flat, poor joint condition, excavated as cobbles and gravel, some silt. Dominant joint set has dip/dir of 050°/118°, average spacing 80-150 mm, maximum block size = 300 mm, average joint roughness coefficient (JRC) of 5 mm/25 cm. [MODERATELY WEATHERED BEDROCK]
2			3		
3					
4					
					End of test pit at 4.2 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) No samples taken.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-76

LOCATION: STEWART GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 461068E, 7101302N
GROUND ELEVATION (m): 1125
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 12 Jul 11
FINISH DATE: 12 Jul 11
FINAL DEPTH OF PIT (m): 5.4
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	1			ORGANICS Moss, vegetation, rootlets. [TOPSOIL] 0.4 - 0.6 m - Sample 1, grain size analysis, 18% gravel, 20% sand, 54% silt, 8% clay.
1					SILT (ML) Some fine to coarse gravel, trace sand, trace clay, non plastic, soft, medium brown, moist, homogeneous, no dilatancy. [COLLUVIUM]
2					METASEDIMENTARY ROCK Medium strong (R3), moderately weathered (W3), disintegrated, polyhedral blocks, fair joint condition, non stained. Excavated as cobbles and gravels, silty, trace boulders, maximum particle size = 450 mm, average particle size: 50-200 mm. [MODERATELY WEATHERED BEDROCK]
3			3		
4					
5					
6					End of test pit at 5.4 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Sloughing at 5.4 m. 6) Easy excavating.
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-77

LOCATION: OLIVE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 461364E, 7101655N
GROUND ELEVATION (m): 1099
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 12 Jul 11
FINISH DATE: 12 Jul 11
FINAL DEPTH OF PIT (m): 5.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
	G	1			GRAVEL (GM) Silty, trace cobbles, trace sand, well graded, compact, maximum particle size = 150 mm, angular to subangular, medium to dark brown, moist, homogeneous. [COLLUVIUM] 0.4 - 0.5 m - Sample 1, grain size analysis, 22% gravel, 34% sand, 31% silt, 13% clay.
1			4		METASEDIMENTARY ROCK Dark brown to grey (with iron staining), highly weathered (W4), weak to medium strong (R2 to R3). Disintegrated - excavated as silty gravel, some cobbles, trace boulders. [HIGHLY WEATHERED BEDROCK]
2					
3			3.5		METASEDIMENTARY ROCK Iron stained, weak to medium strong (R2 to R3), moderately to highly weathered (some pockets of completely weathered orangish yellow material), blocky/disturbed, tabular blocks, excavated as gravel and cobbles, silty, trace boulders, maximum particle size = 350 mm, average size 50-100 mm. [MODERATELY TO HIGHLY WEATHERED BEDROCK]
4					
5					
6					End of test pit at 5.5 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
7					
8					

Su - kPa

40 80 120 160

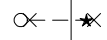
VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-78

LOCATION: BAWN BOY GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 461728E, 7101628N
GROUND ELEVATION (m): 1186
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 12 Jul 11
FINISH DATE: 12 Jul 11
FINAL DEPTH OF PIT (m): 5.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1					GRAVEL (GM) Silty, trace cobbles, trace sand, well graded, compact, maximum particle size = 150 mm, moist, homogeneous, angular to subangular clasts, medium brown. [COLLUVIUM]
2					METASEDIMENTARY ROCK Brown to orange, iron staining, weak to medium strong (R2 to R3), moderately to highly weathered (W3 to W4), disintegrated to blocky and disturbed, polyhedral blocks, highly fractured, excavated as gravel and cobbles, some silt, trace sand, maximum particle size = 300 mm, average particle size = 80-150 mm. [MODERATELY TO HIGHLY WEATHERED BEDROCK]
3			3.5		3.5 - 4.0 m - Light to moderate seepage from all sides of pit.
4					
5					
6					End of test pit at 5.5 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) Light to moderate seepage from 3.5-4.0 m. 4) Not frozen. 5) No samples taken.
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-79

LOCATION: BAWN BOY GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 461903E, 7101806N
GROUND ELEVATION (m): 1166
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 12 Jul 11
FINISH DATE: 12 Jul 11
FINAL DEPTH OF PIT (m): 3.8
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
	G	1			SAND (SW-SM) Some silt, some cobbles, some gravel, trace boulders (granodiorite), subangular to subrounded, maximum particle size = 300 mm. Fines: low plastic, brownish grey, wet, homogeneous. Frozen: Vs (30-40%), lenses approximately 4 cm thick. [COLLUVIUM?] 0.4 - 0.6 m - Sample 1, grain size analysis, 41% gravel, 48% sand, 8% silt, 3% clay.
1	G	2			
2			5.5		METASEDIMENTARY ROCK Orange to yellow, extremely weak (R0), residual soil to completely weathered (W6 to W5), fine grained, saturated, excavated as clay/silt/sand. Frozen: Nbn. [COMPLETELY WEATHERED BEDROCK] 1.2 - 1.3 m - Sample 2, grain size analysis, 1% gravel, 72% sand, 27% fines. 1.3 - 1.5 m - Seepage from southern corner of pit.
3					
4					End of test pit at 3.8 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) Seepage from 1.3-1.5 m. 4) Frozen ground encountered below 0.2 m to bottom of excavation. 3) Slouging due to seepage.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-80

LOCATION: OLIVE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 461753E, 7101551N
GROUND ELEVATION (m): 1210
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 13 Jul 11
FINISH DATE: 13 Jul 11
FINAL DEPTH OF PIT (m): 6.7
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Topsoil, rootmat. [TOPSOIL]
1					SILT (ML) Sandy, some gravel, trace clay, trace cobbles, trace boulders, low plastic, rapid dilatancy, brown, no odour, moist, soft, homogeneous. Clasts: elongated, angular (metasedimentary gravel), maximum particle size = 500 mm, granodiorite boulders, fresh to slightly weathered (W1.5) and very strong (R5). [COLLUVIUM]
2					GRAVEL (GW) Sandy, trace cobbles, well graded, maximum particle size = 55 mm, pinkish brown, moist. Clasts: metasedimentary, elongated, angular, weak (R2). [COLLUVIUM]
3					METASEDIMENTARY ROCK Dark reddish grey, medium strong (R3), slightly weathered (W2), fine grained, foliated, dominant joint set parallel to foliation (40°/278°) with secondary sets: (86°/197°) and (85°/61°), joint roughness (JRC) along foliation 30mm/0.45 m = 20, 0.25-1 mm aperture, infill is iron staining and crushed rock. Other sets JRC=10, similar infill and apertures. Foliation very closely spaced (20-100 mm apart). [SLIGHTLY WEATHERED BEDROCK]
4			2		
5					
6					
7					End of test pit at 6.7 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) Light seepage at base of test pit. 4) Not frozen. 5) Test pit is at an existing road cut.
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-81

LOCATION: OLIVE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 461711E, 7101480N
GROUND ELEVATION (m): 1207
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 13 Jul 11
FINISH DATE: 13 Jul 11
FINAL DEPTH OF PIT (m): 3.9
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Topsoil, rootmat [TOPSOIL]
1	G	1			SAND AND GRAVEL (SW/GW) Some cobbles, trace silt, some cobbles, well graded, loose, maximum particle size = 250 mm, light pinkish brown, no odour, moist, homogeneous, non-cemented. Clasts: mainly metasedimentary, weak (R2), slightly to moderately weathered (W2.5), equidimensional to elongated, angular to subangular. [COLLUVIUM]
2			2.5		GRAVEL (GW-GM) Sandy, some silt, trace clay, trace cobbles, trace boulders, equidimensional to elongated, angular to subangular, maximum particle size = 300 mm, Fines: low plastic, brown, moist, homogeneous, no odour, no cementation, rapid dilatency. [COLLUVIUM] 0.7 - 1.0 m - Sample 1, grain size analysis, 65% gravel, 24% sand, 10% silt, 1% clay. At 1.3 m - There is a 10 cm thick organic layer: roots, organic silt.
3					METASEDIMENTARY ROCK Light yellowish brown, fine grained, extremely closely fractured, foliated, very weak (R1), slightly to moderately weathered (W2.5), 1 recognizable set parallel to foliation (with a dip/dip direction of 85/159), typical aperture 1-4mm, infill is crushed rock, sand and iron staining, JRC= 4-15, spacing between foliation 20-120 mm. Clasts: medium strong to strong (R3 to R4), slightly weathered (W2). Quartz veins present. [SLIGHTLY TO MODERATELY WEATHERED BEDROCK]
4					End of test pit at 3.9 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Excavation was made as a refreshing of existing road cut.
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

★ ○

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-82

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458604E, 7100691N
GROUND ELEVATION (m): 815
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 11 Jun 11
FINISH DATE: 11 Jun 11
FINAL DEPTH OF PIT (m): 7.5
LOGGED BY: DW
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					**ORGANICS** Organics, rootmat. [TOPSOIL]
1	G	4			**SILT (ML)** Some medium to fine sand, trace gravel, compact, yellowish/beige, moist. Clasts: maximum particle size = 80 mm, subrounded elongated. [ALLUVIUM?] 0.7 - 1.1 m - Sample 4, grain size analysis, 20% sand, 80% fines.
2	G	5			**SILT (ML)** Sandy, low plasticity, firm to stiff, yellowish to brown, moist to wet. [ALLUVIUM] PP/2 = 75 kPa 1.9 - 2.1 m - Sample 5, grain size analysis, 25% sand, 75% fines.
3	G	2			**SAND (SM)** Medium to fine, silty, gravelly, compact to dense, maximum particle size = 100 mm, subrounded, brownish, reddish, moist, highly weathered gravel sized metasedimentary rock fragments. [ALLUVIUM] 3.0 - 3.3 m - Sample 2, grain size analysis, 7% gravel, 21% sand, 72% fines.
4					**SILT (ML)** Sandy, low plasticity, very stiff, brown, moist, some organics. [ALLUVIUM] PP/2 = 140-190 kPa
5	G	1			4.7 - 4.9 m - Sample 1, grain size analysis, 5% sand, 90% silt, 5% clay.
6					**GRAVEL (GP)** Some sand, gravel sized particles of highly weathered metasediments, maximum particle size = 170 mm. [ALLUVIUM]
7	G	3			**SILT (ML)** Sandy, clayey, low plasticity, still to very stiff, brown to black, moist to wet when thawed, some organics, soft, organic smell. Frozen: Vs-Vx (5-10%). [ALLUVIUM] PP/2: 90-140 kPa At 6.5 m - Exposed massive ice (approximately 0.6 x 0.3 m). 6.7 - 7.0 m - Sample 3, grain size analysis, 2% gravel, 20% sand, 74% silt, 4% clay.
8					End of test pit at 7.5 m.

Su - kPa: 40, 80, 120, 160

VANE PEAK ◆ FIELD ■ LAB ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% ×; 20, 40, 60, 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-82

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458604E, 7100691N
GROUND ELEVATION (m): 815
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 11 Jun 11
FINISH DATE: 11 Jun 11
FINAL DEPTH OF PIT (m): 7.5
LOGGED BY: DW
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
8					Notes: 1) Completed at maximum reach of excavator. 2) Test pit corresponded with septic system excavation of 52 m x 53 m. 3) No seepage. 4) When excavation for septic system began June 8th, 2011, ground was frozen below 0.3 m. When test pit was excavated frozen ground encountered from 6.2 m to base of test pit.
9					
10					
11					
12					
13					
14					
15					
16					

Su - kPa
40 80 120 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-83

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458786E, 7100077N
GROUND ELEVATION (m): 863
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 13 Jul 11
FINISH DATE: 13 Jul 11
FINAL DEPTH OF PIT (m): 1.3
LOGGED BY: EC/JS
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, brown peat, vegetation, moss. [TOPSOIL]
	G	1			ORGANIC SILT Dark brown to black. Frozen: trace Vx. [ORGANICS]
1					SAND (SM) Fine sand, gravelly, silty, trace cobbles, trace boulders. Fines: inorganic silt, high plastic, brown to grey, wet. Frozen: trace Vx, Nbe, wet when thawed. [COLLUVIUM] 0.6 - 0.8 m - Sample 1, grain size analysis, 33% gravel, 29% sand, 31% silt, 7% clay.
2					End of test pit at 1.3 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.3 m to bottom of excavation. 4) Difficult to excavate, excavator resting on saturated soils.
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-84

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458763E, 7100006N
GROUND ELEVATION (m): 863
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 13 Jul 11
FINISH DATE: 13 Jul 11
FINAL DEPTH OF PIT (m): 2.6
LOGGED BY: EC/JS
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
	G	1			SILT (ML) Some sand, some gravel, trace cobbles, medium brown, moist, homogeneous. Clasts: angular to subangular clasts, loose. [COLLUVIUM] 0.4 - 0.6 m - Sample 1, grain size analysis, 20% sand, 34% silt, 46% clay. Sulphate analysis, 0.07% total sulphate ion content.
1					
					SILT (ML) Sandy, fine, trace clay, mottled medium grey and orange brown. Frozen: Nbn, moist when thawed. Sand/gravel/cobble lenses until end of pit. [COLLUVIUM]
2	G	2			2.3 - 2.5 m - Sample 2, grain size analysis, 2% gravel, 4% sand, 84% silt, 10% clay.
					End of test pit at 2.6 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) Slow seepage in north wall at 0.5 m. 4) Frozen ground encountered below 0.75 m to bottom of excavation. 5) Frozen material very difficult to excavate.
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-85

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458783E, 7100055N
GROUND ELEVATION (m): 865
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 13 Jul 11
FINISH DATE: 13 Jul 11
FINAL DEPTH OF PIT (m): 2.5
LOGGED BY: EC/JS
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss, vegetation. [TOPSOIL]
					ORGANIC SILT Dark brown to black. Frozen: trace Vx. [ORGANICS]
1	G	1			SILT (ML) Sandy (fine), some gravel, trace cobbles, trace boulders, low to non-plastic, brown to grey, wet, occasional stratification of tan brown layer, angular clasts. Frozen: Vs (50%). [COLLUVIUM] 0.7 - 1.1 m - Sample 1, grain size analysis, 7% gravel, 42% sand, 40% silt, 11% clay.
2					SILT (ML) Sandy, fine, trace clay, non to low plastic. Frozen: Vs/Vr (20-25%), thin ice lenses, decreasing ice content with depth. [COLLUVIUM]
3					End of test pit at 2.5 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.3 m to bottom of excavation. 5) Very difficult to excavate.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-86

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460124E, 7101751N
GROUND ELEVATION (m): 894
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 13 Jul 11
FINISH DATE: 13 Jul 11
FINAL DEPTH OF PIT (m): 7.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1					SAND (SM) Fine to medium, gravelly, silty, well graded, compact, maximum particle size = 60 mm, angular to subangular, yellowish brown, moist, homogeneous, rootlets and trace organics. [COLLUVIUM]
2					METASEDIMENTARY ROCK Foliated, yellowish brown, highly to completely weathered (W4 to W5), weak to medium strong (R2 to R3), maximum block size = 400 mm, excavated as gravel, some cobbles, some sand, trace silt, trace boulders, layered with different degrees of weathering and colour 0.5-1.5 m thick (yellow orange, grey, brown). [HIGHLY TO COMPLETELY WEATHERED BEDROCK]
3					
4			4.5		
5					
6					
7					
8					End of test pit at 7.5 m. Notes: 1) Completed at maximum reach of excavator.

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-86

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 460124E, 7101751N

GROUND ELEVATION (m): 894

DATUM: UTM NAD 83

EXCAVATOR: 325D Cat

OPERATOR: EWING

START DATE: 13 Jul 11

FINISH DATE: 13 Jul 11

FINAL DEPTH OF PIT (m): 7.5

LOGGED BY: EC

REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
8					2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Easy excavating (weak rock).
9					
10					
11					
12					
13					
14					
15					
16					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-87

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460690E, 7100247N
GROUND ELEVATION (m): 1194
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 14 Jul 11
FINISH DATE: 14 Jul 11
FINAL DEPTH OF PIT (m): 3.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION	Su - kPa (40, 80, 120, 160) / VANE FIELD LAB / PEAK ◆ ■ / REMOLD ◇ □ / ▲ UC/2 / △ Pocket Pen /2 / ★ % Fines / Moisture Content W_P% W% W_L% (20, 40, 60, 80)
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]	
	G	1			ORGANIC SILT Gravelly, some sand, trace cobbles, non-plastic, very soft, dark brown to black, moist. [ORGANICS]	★○
1					SAND (SP) Coarse, gravelly (fine), trace cobbles, poorly graded, very loose, largest particle size = 100 mm, stratified, angular to subangular, medium brown to brownish orange, moist to wet. [COLLUVIUM] 0.6 - 0.8 m - Sample 1, grain size analysis, 26% gravel, 68% sand, 6% fines. At 1.1 m - Light seepage.	
2			5		SAND (SW) Coarse sand, gravelly, some cobbles, angular, very dense, orangish brown, very weak to weak (R1 to R2), clasts are metasedimentary. Becomes cobbley and less weathered with depth. Cobbles: strong (R4). [COMPLETELY WEATHERED METASEDIMENTARY BEDROCK]	
3			3		METASEDIMENTARY ROCK Same as above but stronger (R4) and moderately weathered (W3). [MODERATELY WEATHERED BEDROCK]	
4					End of test pit at 3.5 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) Seepage observed, along back of road, at 1.1 m. 4) Not frozen. 5) Excavated on upslope of road cut. 6) Excavation became extremely difficult at 3.3 m. 7) Heavy rain overnight may be contributing to seepage.	
5						
6						
7						
8						

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-88

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459813E, 7101008N
GROUND ELEVATION (m): 922
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 14 Jul 11
FINISH DATE: 14 Jul 11
FINAL DEPTH OF PIT (m): 6.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			SAND (SM) Fine to coarse sand, silty, gravelly, trace cobbles, trace boulders, angular to subangular, maximum particle size = 500 mm. Fines: non-plastic, firm, light brown, moist, homogeneous. [COLLUVIUM] 1.5 - 1.8 m - Sample 1, grain size analysis, 27% gravel, 39% sand, 23% silt, 11% clay.
2					SAND (SW) Some cobbles, some gravel, fine to coarse, trace boulders, trace silt, well graded, dense, maximum particle size = 800 mm, light brown, dry to moist, homogeneous, cobbles and boulders are slightly weathered (W2), strong to very strong (R4 to R5), metasedimentary and granodiorite. Clasts: subangular to subrounded. [COLLUVIUM]
3					
4					COBBLES AND BOULDERS Sandy, trace gravel, trace silt, maximum particle size = 1100 mm, subrounded to subangular, light brown, dry. Clasts: slightly weathered (W2), medium strong to strong (R4 to R5), metasedimentary and granodiorite. [COLLUVIUM]
5					
6					End of test pit at 6.0 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Required moderate effort to excavate.
7					
8					

Su - kPa

40 80 120 160

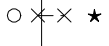
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-89

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459876E, 7100737N
GROUND ELEVATION (m): 985
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 14 Jul 11
FINISH DATE: 14 Jul 11
FINAL DEPTH OF PIT (m): 6.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
	G	1			GRAVEL (GW) Fine to medium, trace sand, trace cobbles, subangular to subrounded, well graded, very loose, maximum particle size = 150 mm, grey to brown, moist, homogeneous. [COLLUVIUM]
1	G	2			0.4 - 0.6 m - Sample 1, grain size analysis, 78% gravel, 21% sand, 1% fines.
					SAND (SM) Silty, some gravel, trace cobbles, trace boulders, firm, brown, moist, homogeneous. Clasts: subangular. 1.15 - 1.5 m - Frozen: Vx (<1%). [COLLUVIUM]
2					1.3 - 1.5 m - Sample 2, grain size analysis, 24% gravel, 32% sand, 36% silt, 8% clay.
3					
4					
5			5		METASEDIMENTARY ROCK Disintegrated to blocky/disturbed, grey to brown, completely weathered (W5), excavated as cobbles and gravel, sandy, trace silt, 30% of blocks weathered to clay. Extremely weak to weak (R0 to R2), some medium strong to strong clasts (R3 to R4). [COMPLETELY WEATHERED BEDROCK]
6					
7					End of test pit at 6.5 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered from 1.15 - 4.5 m.
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-90

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459686E, 7100502N
GROUND ELEVATION (m): 981
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 14 Jul 11
FINISH DATE: 14 Jul 11
FINAL DEPTH OF PIT (m): 6.5
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss, vegetation. [TOPSOIL]
1	G	1			SAND (SM) Fine, silty, some gravel, trace cobbles, well-graded, dense, maximum particle size = 180 mm, medium brown, stratified, trace rootlets. Clasts: angular to subangular. [COLLUVIUM] 0.8 - 1. 0 m - Sample 1, grain size analysis, 11% gravel, 23% sand, 66% fines.
2					SILT (ML) Trace sand, some clay, low plastic, grey, moist, stiff, stratified, low dry strength, no dilatancy, layered with occasional fine brown sand, layers <10 cm thick. [COLLUVIUM]
3					
4	G	2			3.5 - 3.6 m - Sample 2, grain size analysis, 4% sand, 90% silt, 6% clay.
5					SAND (SP) Some gravel, fine to coarse, brown, subrounded to rounded, maximum particle size = 300 mm, dense, well graded, brown, moist to dry. Clasts: medium strong to strong (R3 to R4). [COLLUVIUM]
6					
7					End of test pit at 6.5 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
8					

Su - kPa
40 80 120 160
VANE PEAK ◆ ■ ▲ UC/2
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-91

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459649E, 7100633N
GROUND ELEVATION (m): 969
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 15 Jul 11
FINISH DATE: 15 Jul 11
FINAL DEPTH OF PIT (m): 2.1
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			SAND (SM) Silty, some fine to medium gravel, trace cobbles, well graded, loose, medium to brown, wet, stratified, trace rootlets. Clasts angular, maximum particle size = 250 mm. [COLLUVIUM]
2	G	2			SILT (ML) Some sand, trace cobbles (quartz), trace gravel, trace clay, grey, angular particles, wet when thawed, stratified. Frozen: Vx (20%). [COLLUVIUM] 0.8 - 1.0 m - Sample 1, grain size analysis, 7% gravel, 23% sand, 60% silt, 10% clay.
3					GRAVEL (GM) Silty, some sand, some cobbles, trace clay, subangular to subrounded, grey to brown, quartz clasts. Frozen: Vx (10%). [COLLUVIUM] 1.6 - 1.8 m - Sample 2, grain size analysis, 52% gravel, 33% sand, 12% silt, 3% clay.
4					End of test pit at 2.05 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.55 m to bottom of excavation. 5) Extreme difficulty excavating (scraping).
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-92

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459587E, 7100733N
GROUND ELEVATION (m): 933
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 15 Jul 11
FINISH DATE: 15 Jul 11
FINAL DEPTH OF PIT (m): 1.7
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Vegetation, moss, rootmat. [TOPSOIL]
1	G	1			SILT (ML) Some gravel, trace cobbles, trace sand, turns to slurry when thawed, grey. Clasts of quartz: angular to subangular. Frozen: Vx (20-50%). [COLLUVIUM] 0.25 - 0.5 m - Trace organic inclusions. 0.6 - 0.8 m - Sample 1, grain size analysis, 7% sand, 81% silt, 12% clay.
2					End of test pit at 1.7 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) Seepage from west corner at 0.25 m. 4) Encountered frozen ground below 0.25 m to bottom of excavation. 5) Extreme difficulty excavating.
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-93

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459536E, 7100794N
GROUND ELEVATION (m): 917
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 15 Jul 11
FINISH DATE: 15 Jul 11
FINAL DEPTH OF PIT (m): 1.9
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
					ORGANIC SILT (OL) Rootlets, brown/dark brown to black. [ORGANICS]
1					ICE Thin layer of silt, trace sand, fine, clear, transparent, <1% bubbles.
					SILT AND ICE (ML) Some gravel, trace sand, trace cobbles, brown to grey, homogeneous, quartz clasts. Frozen: Vx/Vs (40-60%), <1% bubbles, trace nodules <100 mm, turns to slurry when thawed. [COLLUVIUM]
2					End of test pit at 1.9 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) Light seepage in NE corner at 0.4 m. 4) Encountered frozen ground below 0.4 m to bottom of excavation. 5) Extremely difficult to excavate (scraping).
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-94

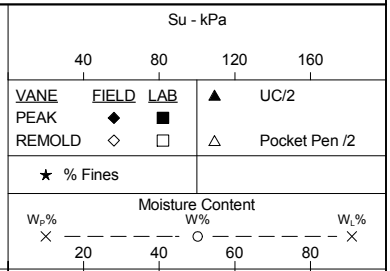
LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459983E, 7101522N
GROUND ELEVATION (m): 930
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 15 Jul 11
FINISH DATE: 15 Jul 11
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			SILT (ML) Some gravel, sandy, trace boulders (angular), low plastic, medium brown. Frozen: Vx, (5-10%), occasional ice lenses, soft and wet when thawed. [COLLUVIUM] 1.2 - 1.3 m - Sample 1, grain size analysis, 22% gravel, 34% sand, 34% silt, 10% clay.
2	G	2			SAND (SP) Fine, some gravel, trace silt, trace cobbles, trace boulders, poorly graded, moist, homogeneous, medium to light brown. Clasts angular, maximum particle size = 200 mm. [COLLUVIUM] 2.3 - 2.5 m - Sample 2, grain size analysis, 21% gravel, 38% sand, 41% fines.
3					
4					At 4.2 m - Boulder content increases, subrounded to rounded.
5					End of test pit at 5.0 m. Notes: 1) Refusal on boulders. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered from 0.2-2 m.
6					
7					
8					



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-95

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460283E, 7100135N
GROUND ELEVATION (m): 1109
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 26 Jul 11
FINISH DATE: 26 Jul 11
FINAL DEPTH OF PIT (m): 3.2
LOGGED BY: EC/SP
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, root mat. [TOPSOIL]
1	G	1	5		SAND (SW) Fine to medium, trace gravel, trace silt, trace clay, compact, maximum particle size = 250 mm, angular, moist. Disintegrated granodiorite. [COMPLETELY WEATHERED GRANODIORITE ROCK] 0.1 - 0.3 m - Orangish brown. 0.3 - 3.2 m - Light grayish brown - white stratified (0.5-10 cm). 0.9 - 1.1 m - Sample 1, grain size analysis, 10% gravel, 65% sand, 25% fines.
2	G	2	5		SAND (SW) Some clay, trace silt, trace gravel, maximum particle size = 250 mm, angular, light gray brown; disintegrated granodiorite. [COMPLETELY WEATHERED GRANODIORITE ROCK] 1.8 - 2.2 m - Frozen: Vx (<1%). 2.0 - 3.0 m - Sample 2, grain size analysis, 1% gravel, 75% sand, 24% fines. 2.2 - 3.2 m - Frozen: Vx (20-30%), white, granular.
3					End of test pit at 3.2 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 5) Frozen ground encountered below 1.8 m to bottom of excavation.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-96

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460287E, 7100170N
GROUND ELEVATION (m): 1103
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 26 Jul 11
FINISH DATE: 26 Jul 11
FINAL DEPTH OF PIT (m): 2.0
LOGGED BY: EC/SP
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, vegetation, rootmat. [TOPSOIL]
1	G	1			SAND (SW) Some gravel, some cobbles, loose, maximum particle size = 100 mm, angular, moist, stratified, trace rootlets, medium brown - gray. Clasts: granodiorite. [COMPLETELY WEATHERED BEDROCK]
	G	2			SAND (SW) Fine to medium, trace gravel, trace silt, maximum particle size = 45 mm, angular, compact, moist, stratified; layers: 1-10 cm. Clasts: granodiorite. [COMPLETELY WEATHERED BEDROCK]
2	G	3			0.7 - 0.9 m - Sample 1, grain size analysis, 26% gravel, 60% sand, 14% fines. SILT (ML) Clayey, trace gravel, trace sand, low plastic, grey and brown, moist to wet, stratified brown - grey layers, slow dilatancy. Frozen: Vx (< 1%). [COMPLETELY WEATHERED BEDROCK] 1.3 - 1.5 m - Sample 2, grain size analysis, 3% gravel, 32% sand, 54% silt, 11% clay.
3					SAND (SW) Some gravel, trace cobbles, trace silt, maximum particle size = 280 mm, angular, medium brown. Frozen: Vx (30-40%), cloudy, wet when thawed. [COMPLETELY WEATHERED BEDROCK] 1.8 - 2.0 m - Sample 3, grain size analysis, 36% gravel, 49% sand, 15% fines.
4					End of test pit at 2.0 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 1.25 m to bottom of excavation. 5) Extreme difficulty excavating 1.6-2.0 m.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-97

LOCATION: PIT AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460546E, 7099463N
GROUND ELEVATION (m): 1353
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 25 Jul 11
FINISH DATE: 25 Jul 11
FINAL DEPTH OF PIT (m): 4.0
LOGGED BY: EC
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	1			GRAVEL (GW) Cobbly, silty, sandy, trace boulders, maximum particle size = 500 mm, loose, damp, homogeneous. Clasts metasedimentary; angular. [COLLUVIUM]
3	G	2	4		METASEDIMENTARY ROCK Highly weathered, blocky/disturbed, fair joint condition, light to dark brown, heavily iron stained, very weak to weak (R1 to R2), excavated as cobbles and gravel - some sand. Some clasts: quartz, medium strong to strong (R2 to R3). [HIGHLY WEATHERED BEDROCK]
4					End of test pit at 4.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

20 40 60 80

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-98

LOCATION: PIT AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460521E, 7099465N
GROUND ELEVATION (m): 1342
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 25 Jul 11
FINISH DATE: 25 Jul 11
FINAL DEPTH OF PIT (m): 2.2
LOGGED BY: EC/PQ
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					GRAVEL AND COBBLES (GW) Silty, sandy, trace boulders, well-graded, loose, damp, homogeneous. Clasts metasedimentary, angular, medium to very strong (R3 to R5), maximum particle size = 500 mm. [COLLLUVIUM]
1	G	1			
2	G	2	2.5		METASEDIMENTARY ROCK Slightly to moderately weathered (W2 to W3), very blocky, angular, fair joint condition, brown to red to black, iron stained, medium to very strong (R3 to R5). [SLIGHTLY TO MODERATELY WEATHERED BEDROCK]
3					End of test pit at 2.2 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

W%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-99

LOCATION: PIT AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460576E, 7099496N
GROUND ELEVATION (m): 1352
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 25 Jul 11
FINISH DATE: 25 Jul 11
FINAL DEPTH OF PIT (m): 2.5
LOGGED BY: EC/PQ
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					GRAVEL AND COBBLES (GW) Silty, sandy, trace boulders, well-graded, angular, medium to very strong (R3 to R5) metasedimentary clasts, maximum particle size = 500 mm, loose, damp. [COLLUVIUM]
1					
2	G	1	4		METASEDIMENTARY ROCK Highly weathered, some quartz alteration, very blocky, angular, fair joint condition, light to dark orangish brown, heavily iron stained, medium strong to strong (R3 to R4). [HIGHLY WEATHERED BEDROCK]
3					End of test pit at 2.5 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-100

LOCATION: PIT AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460565E, 7099505N
GROUND ELEVATION (m): 1345
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 25 Jul 11
FINISH DATE: 25 Jul 11
FINAL DEPTH OF PIT (m): 3.5
LOGGED BY: EC/PQ
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					GRAVEL AND COBBLES (GW) Silty, sandy, trace boulders, well-graded, angular, medium strong to very strong (R3 to R5), metasedimentary clasts, maximum particle size = 500 mm, loose, damp. [COLLUVIUM]
3	G	1	4		METASEDIMENTARY ROCK Highly weathered, blocky/disturbed, angular, fair joint condition, light to dark brown, iron stained, very weak to weak (R1 to R2), trace strong to very strong material (R4 to R5). [HIGHLY WEATHERED BEDROCK]
3.5					End of test pit at 3.5 m. Notes: 1) Refusal on Bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-101

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460089E, 7098940N
GROUND ELEVATION (m): 1180
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 30 Jul 11
FINISH DATE: 30 Jul 11
FINAL DEPTH OF PIT (m): 2.4
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	1			ORGANICS Rootmat. [TOPSOIL]
1					SILT (ML) Trace sand, non plastic, brown to dark brown, slight organic odour, wet, stratified. Frozen: Vr (5%), ice lenses 2-30 mm thick. [COLLUVIUM]
1	G	2			GRAVEL and SAND (GW/SW) Trace to some silt, trace cobbles and boulders, well graded, maximum particle size = 550 mm, brown. Clasts: metasedimentary, elongated, angular, medium strong to very strong (R3 to R5). Frozen: Vx (30-40%), wet when thawed. [COLLUVIUM]
2					
3					End of test pit at 2.4 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.2 m to bottom of excavation. 5) Excavated on side of pad for planned exploration drill hole.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-102

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460565E, 7099111N
GROUND ELEVATION (m): 1361
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 01 Aug 11
FINISH DATE: 01 Aug 11
FINAL DEPTH OF PIT (m): 4.6
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	1			ORGANICS Rootmat, organic silt. [TOPSOIL]
1			4		GRAVEL (GW) Silty, cobbly some fine sand, trace boulders, well graded, compact, particles are flat; angular, metasedimentary, strong (R4), brown, moist, homogeneous, non-cemented, no odour. [COLLUVIUM]
2					COBBLES AND BOULDERS Some silt, some sand, some gravel, brown, moist. Clasts: metasedimentary, flat, platy, angular, strong (R4). [HIGHLY WEATHERED METASEDIMENTARY ROCK]
3			2		METASEDIMENTARY ROCK Dark grey discoloured reddish brown, fine grained, foliated, weak to strong (R2 to R4), slightly weathered (W2). 3 Joint Sets: 25°/248° (foliation), 48°/350°, 89°/077° Fault along foliation (22°/250° fault with 35 mm gouge, chlorite, crushed/decomposed rock). [SLIGHTLY WEATHERED BEDROCK]
4					
5					End of test pit at 4.6 m. Notes: 1) Refusal on Bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Test pit excavated on drill pad for BH-BGC11-45.
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-103

LOCATION: WEST FLANK TIN DOME

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458820E, 7101150N
GROUND ELEVATION (m): 865
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 05 Aug 11
FINISH DATE: 05 Aug 11
FINAL DEPTH OF PIT (m): 6.0
LOGGED BY: AKU
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					**ORGANICS** Organic silt and rootmat. [TOPSOIL]
1					**SILT (ML)** Sandy, some gravel, trace cobbles, moist, low plastic, loose to compact, sub-angular to sub-rounded, flat, metasedimentary clasts, light brown. [COLLUVIUM]
2					
3					
4	G	1			**SAND AND GRAVEL (SW/GW)** Trace silt, trace cobbles, well graded, maximum particle size = 250 mm, subrounded, metasedimentary and granodiorite clasts (generally metasedimentary), compact, light brown. [TILL] 4.4 - 4.8 m - Sample 1, grain size analysis, 47% gravel, 48% sand, 5% fines.
5					
6			4.5		**METASEDIMENTARY ROCK** Orange and grey, fine grained, foliated, highly fractured, highly weathered (W4.5), very weak (R1). [HIGHLY WEATHERED BEDROCK]
7					End of test pit at 6.0 m. Notes: 1) Completed at target depth. 2) Test pit used for plate load testing. 3) No seepage. 4) Not frozen.
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-104

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459738E, 7100924N
GROUND ELEVATION (m): 832
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 23 Aug 11
FINISH DATE: 23 Aug 11
FINAL DEPTH OF PIT (m): 5.6
LOGGED BY: LGT /DW
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat and organic silt. 0.1 - 0.3 m - Light seepage directly below rootmat. [TOPSOIL]
1	G	1			SILT (ML) Gravelly, some sand, trace cobbles, non plastic, firm, brownish grey, no odour, moist, homogeneous, rapid dilatancy. Clasts: metasedimentary, equidimensional to flat, angular to sub-angular, medium strong to strong (R3 to R4), maximum particle size = 200 mm. [COLLUVIUM].
2					GRAVEL (GW) Sandy, some cobbles, trace boulders, well graded, loose to compact, maximum particle size = 500 mm, particles are equidimensional to elongated, rounded to angular, mix of medium to very strong (R3 to R5), granodiorite and medium strong to strong (R3 to R4), metasedimentary rock (90% metased clasts), pinkish brown, moist, homogeneous, non cemented. [TILL] 1.2 - 1.6 m - Sample 1, grain size analysis, 60% gravel, 33% sand, 7% fines.
3					
4			4		SILT (ML) Sandy, gravelly, trace clay, low plastic, firm to stiff, yellowish orange, no odour, moist, laminated/foliated: phyllitic rock that crumbles down to silt when disturbed, micaceous. [COMPLETELY WEATHERED METASEDIMENTARY BEDROCK]
5			4		GRAVEL (GW) Sandy, silty, trace clay, well graded, maximum particle size = 250 mm. Clasts: phyllite, platy, extremely to very weak (R0 to R1), yellowish brown/grey/orange, moist, foliated. [HIGHLY WEATHERED METASEDIMENTARY BEDROCK] At 4.4 m - 250 mm thick quartz vein.
6					End of test pit at 5.6 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) Light seepage from 0.1-0.3 m (directly beneath rootmat). 4) Not frozen. 5) Sloughing near bottom of test pit.
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-105

LOCATION: WEST FLANK TIN DOME

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458939E, 7101190N
GROUND ELEVATION (m): 878
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 09 Aug 11
FINISH DATE: 09 Aug 11
FINAL DEPTH OF PIT (m): 3.0
LOGGED BY: AKU
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat and organic silt. [TOPSOIL]
1					SAND (SM) Silty, some gravel, trace to some cobbles, moist, well graded, loose to compact, sub-angular, quartz pieces, light brown becoming grey with depth, metasedimentary clasts. [COLLUVIUM]
2					
			4		METASEDIMENTARY ROCK Grey, very weak to weak (R1.5), highly fractured, iron stained in places. [HIGHLY WEATHERED BEDROCK]
3					End of test pit at 3.0 m. Notes: 1) Completed at target depth. 2) Test pit used for plate load testing. 3) No seepage. 4) Not frozen.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-106

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460375E, 7100012N
GROUND ELEVATION (m): 1155
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 06 Aug 11
FINISH DATE: 06 Aug 11
FINAL DEPTH OF PIT (m): 3.0
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat. [TOPSOIL]
					ORGANIC SILT (OL) Trace sand,non-plastic, wet, dark brown. [PEAT]
1	G	1			SAND (SW) Trace to some fine gravel, trace cobbles, maximum particle size = 80 mm, brown, wet. Clasts: elongate to equidimensional, angular to subangular, granodiorite, strong to very strong (R4 to R5). Frozen: Nbn. [COLLUVIUM]
2					GRAVEL (GW) Cobbley, sandy, some boulders, maximum particle size = 2.5 m, wet, yellowish brown, homogeneous. Clasts: elongated to equidimensional, angular to subangular, granodiorite, strong to very strong (R4 to R5), fresh to faintly weathered (W1 to W1.5). Frozen: Vx (20%), ice is colourless, cloudy to clear, up to 10% organic sediment inclusion. [COLLUVIUM]
3					1.4 - 1.9 m - Frozen: Vx (5-10%).
					End of test pit at 3.0 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.45 m to bottom of excavation. 5) Logged from cut made for drill pad for BH-BGC11-61 and BH-BGC11-66.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-107

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460182E, 7100261N
GROUND ELEVATION (m): 1044
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 16 Aug 11
FINISH DATE: 16 Aug 11
FINAL DEPTH OF PIT (m): 3.2
LOGGED BY: JD/KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION	Su - kPa (40, 80, 120, 160) / VANE FIELD LAB / PEAK ◆ ■ / REMOLD ◇ □ / ▲ UC/2 / △ Pocket Pen /2 / ★ % Fines / Moisture Content W_P% × W% ○ W_L% × (20, 40, 60, 80)
0					ORGANICS Rootmat, organic silt. [TOPSOIL]	
					SILT (ML) Gravelly, sandy, trace cobbles, low plastic, brown, no odour, wet when thawed, no cementation, homogeneous, rapid dilatancy, maximum particle size = 200 mm. Clasts: some flat clasts, angular, metasedimentary, slightly weathered (W2), weak to medium strong (R2 to R3). Frozen: Vx/Vr (5-15%), in lenses 0.5-5 mm thick and gravel-size crystals. [COLLUVIUM]	
1						
2						
	G	1			Below 2.6 m - Grades to sand (SM), some silt, some sand. 2.8 - 3.0 m - Sample 1, grain size analysis, 25% gravel, 41% sand, 30% silt, 4% clay. Below 2.9 m - Excavation with ripper shank required.	○ ★
3						
					End of test pit at 3.2 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.25 m to bottom of excavation. 4) Test pit excavated at drill pad for BH-BGC11-64.	
4						
5						
6						
7						
8						

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-108

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460285E, 7099975N
GROUND ELEVATION (m): 1145
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 09 Aug 11
FINISH DATE: 09 Aug 11
FINAL DEPTH OF PIT (m): 1.5
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, organic soil. [TOPSOIL]
1	G	1			SILT (ML) Trace sand, trace boulder, (>10% of silt is organic), non plastic, homogeneous, rapid dilatancy, dark brown, organic odour, wet to moist, seams of yellowish brown sand (SW), maximum particle size = 600 mm, trace rootlets. Frozen: Nbn. [COLLUVIUM]
2					GRAVEL (GM) Silty, cobbley, sandy, well graded, maximum particle size = 350 mm, particles are elongated to equidimensional, angular, light brown, no odour, wet when thawed. Frozen: Vx (20-30%), ice is clear, colourless, granular. Clasts: granodiorite, strong to very strong (R4 to R5), fresh to slightly weathered (W1 to W2). [COLLUVIUM] 0.9 - 1.15 m - Sample 1, grain size analysis, 37% gravel, 37% sand, 26% fines.
3					End of test pit at 1.5 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.15 m to bottom of excavation. 5) Wet from thawing of excess ice.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-109

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460137E, 7100520N
GROUND ELEVATION (m): 977
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 16 Aug 11
FINISH DATE: 16 Aug 11
FINAL DEPTH OF PIT (m): 5.3
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS
					GRAVEL (FILL) Sandy, trace silt, trace cobbles, well graded, loose, mazimum particle size = 200 mm, flat, some elongated particles, angular, reddish brown, no odour, moist to wet, homogeneous, no cementation, gravel cobbles are metasedimentary rock. [FILL - DEBRIS FROM ADJACENT EXPLORATION TRENCH SPOIL PILE]
1	G	1			
2	G	2			SAND (SP) Primarily fine sand, some coarse sand, gravelly, trace silt, trace cobbles, poorly (gap) graded, loose to compact, maximum particle size = 200 mm, flat, subangular to subrounded, brown, some grey mottling in sand, no odour, moist, no cementation, gravel and cobbles are typically metasedimentary, trace granodiorite clasts. [COLLUVIUM]
3					
4					
5					GRAVEL (GW) Sandy, trace silt, trace cobbles, well graded, compact, maximum particle size = 200 mm, some flat clasts, angular, brown, no odour, moist, no cementation. Clasts: primarily metasedimentary, trace granodiorite clasts. [COLLUVIUM]
6					End of test pit at 5.3 m. Notes: 1) Refusal of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-110

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459851E, 7101062N
GROUND ELEVATION (m): 942
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 16 Aug 11
FINISH DATE: 16 Aug 11
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Lichen, rootmat, organic soil. [TOPSOIL]
1	G	1			SAND (SM) Gravelly, some silt, trace cobbles, well graded, loose to compact, maximum particle size = 100 mm, some flat gravel/cobbles, subangular to subrounded, light brown, no odour, moist, no cementation, gravel/cobbles are metasedimentary rock. [COLLUVIUM]
2					2.0 - 2.3 m - Reddish brown.
3					
4					
5					End of test pit at 5.0 m. Notes: 1) Refusal on moderately weathered metasedimentary bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
6					
7					
8					

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% × (20, 40, 60, 80)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-111

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460653E, 7100373N
GROUND ELEVATION (m): 1185
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 17 Aug 11
FINISH DATE: 17 Aug 11
FINAL DEPTH OF PIT (m): 2.0
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat. [TOPSOIL]
1	G	1			BOULDERS Angular to subangular, typically flat, maximum particle size = 800 mm, oriented approximately parallel to slope, granodiorite boulders. [COLLUVIUM]
2					BOULDERS Some cobbles, some coarse sand, some silt, trace gravel, poorly (gap graded), compact, maximum particle size = 800 mm, oversize typically flat, sand and gravel equidimensional, subangular to angular, brown sand/silt, grey/white oversize, no odour, moist, no cementation, sand/gravel and oversize are granodiorite. [COLLUVIUM]
3					End of test pit at 2.0 m. Notes: 1) Refusal on boulders/cobbles. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-112

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460350E, 7100504N
GROUND ELEVATION (m): 1033
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 17 Aug 11
FINISH DATE: 17 Aug 11
FINAL DEPTH OF PIT (m): 2.5
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat. [TOPSOIL]
1					GRAVEL (GP) Cobbly, poorly (uniformly) graded, loose, flat, angular, brown, moist, metasedimentary clasts. [COLLUVIUM]
	G	1			GRAVEL (GM) Silty, trace cobbles, trace sand, well graded, maximum particle size = 100 mm, angular to subangular, some flat gravels, brown, no cementation, clasts are metasedimentary, low plastic fines. Frozen: Vx (10-20%). [COLLUVIUM] 1.3 - 1.4 m - Sample 1, grain size analysis, 48% gravel, 33% sand, 19% fines. Below 1.5 m - Colour changes to light brown.
2					
					End of test pit at 2.5 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.6 m to bottom of excavation. 5) Frozen material also noted on lower half of access track cut by excavator from existing road down to test pit.
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-113

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459071E, 7099490N
GROUND ELEVATION (m): 878
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 17 Aug 11
FINISH DATE: 17 Aug 11
FINAL DEPTH OF PIT (m): 2.5
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					SILT/FINE SAND [WASHOUT FROM DRILLPAD ABOVE]
1					SILT (ML) Some gravel, trace sand, trace cobbles, low plastic, soft to firm, light brown, grey mottling, no odour, moist, homogeneous, no cementation, maximum particle size = 200 mm, gravel and cobbles are primarily metasedimentary, trace granodiorite, angular to subangular. [COLLUVIUM] At 1.5 m - Seepage entering pit from downhill side.
2					
3					End of test pit at 2.5 m. Notes: 1) Terminated due to slouging of walls and seepage. 2) Backfilled to surface. 3) Seepage at 1.5 m. 4) Not frozen. 5) Pit located approximately 30 cm below natural ground (organics removed) and approximately 3 m downslope of existing drill pad.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-114

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459190E, 7099369N
GROUND ELEVATION (m): 914
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 17 Aug 11
FINISH DATE: 17 Aug 11
FINAL DEPTH OF PIT (m): 3.2
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS
					SAND (SW) Sand, some silt, some gravel, trace clay, trace cobbles, loose to compact, maximum particle size = 200 mm, subangular, dark brown, no odour, moist, no cementation, gravel & cobbles are metasedimentary and granodiorite. [COLLUVIUM] Below 0.7 m - Colour change to light brown.
2					GRAVEL (GW) Sandy (coarse), some clay, trace silt, trace cobbles, compact to dense, maximum particle size = 100 mm, moist, equidimensional, angular to subangular, light brown, no odour, moist, no cementation, granodiorite clasts. [COLLUVIUM?] Below 2.3 m - Frozen: Vx/Vc (<5%). Cobble content increases to some.
3					End of test pit at 3.2 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 2.3 m to bottom of excavation. 4) No samples taken.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

W%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-115

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459187E, 7099453N
GROUND ELEVATION (m): 899
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 17 Aug 11
FINISH DATE: 17 Aug 11
FINAL DEPTH OF PIT (m): 5.7
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	1			SILT (ML) Some coarse sand, some gravel, trace cobbles, low plastic, firm, light brown, no odour, moist, no cementation. Clasts: mostly metasedimentary, trace granodiorite, angular to subangular, some flat, maximum particle size = 150 mm. [COLLUVIUM]
2					Below 2.5 m - Cobble content increases to some.
3					Below 3.7 m - Maximum particle size = 300 mm, some gravel to gravelley, trace boulders.
6					End of test pit at 5.7 m. Notes: 1) Completed at the maximum reach of excavator. 2) Backfilled to surface. 3) No seepage 4) Not frozen. 5) Test pit located on abandoned access road and located approximately 20 cm below natural ground surface.
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-116

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459251E, 7099423N
GROUND ELEVATION (m): 905
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 18 Aug 11
FINISH DATE: 18 Aug 11
FINAL DEPTH OF PIT (m): 2.3
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS At 0.2 m - Light seepage.
	G	1			SILT (ML) Gravelly, some sand, trace cobbles, low plasticity, soft to firm, light brown, no odour, moist, no cementation, maximum particle size = 200 mm. Clasts: metasedimentary, angular to subangular, some flat. [COLLUVIUM]
1					
					Below 1.5 m - Frozen: Vx/Vs/Vc (approximately 5-10%), coatings and lenses 1-3 mm thick and sand-sized crystals.
2	G	2			2.2 - 2.3 m - Sample 2, grain size analysis, 49% gravel, 36% sand, 15% fines.
					End of test pit at 2.3 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) Light seepage at 0.2 m. 4) Frozen ground encountered below 1.5 m to bottom of excavation. 3) Unfrozen walls sloughing throughout excavation.
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-117

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459184E, 7099578N
GROUND ELEVATION (m): 896
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 18 Aug 11
FINISH DATE: 18 Aug 11
FINAL DEPTH OF PIT (m): 8.0
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	1			ORGANICS Rootmat. [TOPSOIL]
					SAND (SP) Coarse sand, some gravel, trace cobbles, trace silt, poorly (gap) graded, loose to compact, maximum particle size = 150 mm, angular to subangular, some flat, colour varies throughout unit: brown, reddish, orange (colour variation occurs in horizontal lines), no odour, moist, metasedimentary clasts. [COLLUVIUM]
7					At 7.0 m - Cobble content increases to some.

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% × (20, 40, 60, 80)

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-117

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459184E, 7099578N
GROUND ELEVATION (m): 896
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 18 Aug 11
FINISH DATE: 18 Aug 11
FINAL DEPTH OF PIT (m): 8.0
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
8					End of test pit at 8.0 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Pit excavated at base of existing 2 m high cut slope, adjacent to historic hole: MW96-25.
9					
10					
11					
12					
13					
14					
15					
16					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-118

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459335E, 7100268N
GROUND ELEVATION (m): 951
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 18 Aug 11
FINISH DATE: 18 Aug 11
FINAL DEPTH OF PIT (m): 5.3
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat. [TOPSOIL]
1					SAND (SP) Fine sand, trace coarse sand, gravelly, trace silt, trace cobbles, poorly (gap) graded, loose to compact, maximum particle size = 100 mm, some gravel/cobbles are flat, subangular, no odour, moist, no cementation. [COLLUVIUM]
			5		SAND (SP) Trace gravel, trace silt, poorly graded, compact, maximum particle size = 50 mm, some equidimensional, some flat, angular, light reddish brown, no odour, moist to wet, homogeneous, no cementation, metasedimentary clasts. [COMPLETELY WEATHERED METASEDIMENTARY ROCK]
2					SAND AND GRAVEL (SW/SW) Trace cobbles, dense, maximum particle size = 100 mm, flat, some elongated, angular, grey/brown/light orange, no odour, moist, foliated/bedded structure. Clasts: metasediments and very weak (R1). Cobble content increases to some with depth. [HIGHLY WEATHERED METASEDIMENTS]
3					
4			4		
5					
6					End of test pit at 5.3 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — ○ — — — × W_L%

W%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-119

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458587E, 7100548N
GROUND ELEVATION (m): 824
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 18 Aug 11
FINISH DATE: 18 Aug 11
FINAL DEPTH OF PIT (m): 2.1
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss, organics. [TOPSOIL]
1	G	1			SILT (OL) Low plastic, dark brown to black, moist, trace rootlets. [ORGANICS]
					SILT (ML) Some fine sand, trace gravel, flat, angular, non-plastic, soft, rapid dilatancy, orange, wet when thawed, no cementation. [ALLUVIUM?] Below 0.45 m - Frozen: Vs (<2%), ice lenses 0.5-3 mm thick.
2					SILT (ML) Trace fine sand, low plasticity, orangey brown. Frozen: Vs (<2%), ice lenses 0.5 - 2 mm thick. [ALLUVIUM?] At 0.9 m - Ice lens: 30 mm thick. 0.9 - 1.1 m - Sample 1, modified proctor test, optimized dry density 1780 kg/m^3 at 13.5% moisture content. Permeability analysis, 4.2x10^-10 m/s. Below 1.1 m - Trace clay. At 2.0 m - Ice lens: 25 mm thick.
3					End of test pit at 2.05 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.45 m to bottom of excavation.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-120

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458511E, 7100484N
GROUND ELEVATION (m): 816
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 18 Aug 11
FINISH DATE: 18 Aug 11
FINAL DEPTH OF PIT (m): 4.4
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss, organics. [TOPSOIL]
					SILT (ML) Some fine sand, some gravel, trace clay, trace cobbles, low plastic, soft, brown, moist to wet, stratified, no cementation. Clasts: metasedimentary and granodiorite, slightly weathered (W1.5 to W2), medium strong (R3), subrounded to subangular, maximum particle size = 200 mm. [ALLUVIUM?] 0.35 - 1.0 m - Frozen: Nbn. At 0.9 m - Sand and gravel layer, 30 mm thick. 1.0 - 3.0 m - Frozen: Vs (5%), ice lenses 2-25 mm thick.
3					SILT (ML) Some clay, trace gravel, trace cobbles, subrounded, low plastic, grey, firm. Frozen: Vs (10-20%), ice lenses 1-40 mm thick. [ALLUVIUM?]
4	G	1			3.8 - 4.0 m - Sample 1, modified proctor test, optimized dry density 1840 kg/m^3 at 13% moisture content. Permeability analysis, 6.5x10^-10 m/s.
					ICE 10-20% sediment inclusions.
					End of test pit at 4.4 m. Notes: 1) Refusal on massive ice. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.35 m to bottom of excavation.

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% × (20, 40, 60, 80)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-121

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458502E, 7100588N
GROUND ELEVATION (m): 815
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 19 Aug 11
FINISH DATE: 19 Aug 11
FINAL DEPTH OF PIT (m): 3.3
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss, silt. [TOPSOIL]
1					SILT (ML) Trace fine sand, trace gravel, trace cobbles, trace boulders, low plastic, soft to firm, orangey brown, moist. Clasts: metasedimentary and granodiorite, medium strong to strong (R3 to R4), slightly weathered (W2), maximum particle size > 300 mm, elongated and flat, subangular. [ALLUVIUM?] Vs0.7 - 0.8 m - Frozen: 10 cm thick ice lens, granular ice. 0.8 - 1.2 m - Frozen: Vs (50%) in lenses 2-20 mm thick. 1.2 - 2.2 m - Vs (20%).
2					At 2.2 m - A 10 cm thick, darker brown, organic layer.
3	G	1			SILT (ML) Trace medium to coarse gravel, trace cobbles, trace boulders, low plastic, grey-brown, homogeneous. Clasts: metasedimentary and granodiorite, rounded to subangular, slightly weathered (W2), medium strong (R3). Frozen: Vs (1-5%). [ALLUVIUM?] 2.9 - 3.1 m - Sample 1, modified proctor test, optimized dry density 1940 kg/m^3 at 13.5% moisture content. Permeability analysis, 4x10^-10 m/s.
4					End of test pit at 3.3m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.7 m to bottom of excavation.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-122

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458684E, 7100707N
GROUND ELEVATION (m): 825
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 19 Aug 11
FINISH DATE: 19 Aug 11
FINAL DEPTH OF PIT (m): 5.8
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Moss. [TOPSOIL]
1					SILT (ML) Trace sand, trace to some gravel, some cobbles, trace boulders, non-plastic, soft to firm, orangey brown, moist, rapid dilatancy. Clasts: sub rounded to subangular, flat to equidimensional, slightly weathered (W1.5 to W2), metasedimentary, medium strong to strong (R3 to R 4.5). [PLACER TAILINGS]
2					0.7 - 1.55 m - Zones of trace to some clay, medium plastic, grey-brown, no sand, some seams contain orangey brown, less plastic silt. 1.55 - 5.8 m - Made up of 50% grey-brown silt and approximately 50% orangey-brown less plastic silt. Not segregated into obvious layers. [PLACER TAILINGS]
3					
4					
5	G	1			At 5.4 m - An 800 mm boulder. 5.4 - 5.8 m - Sample 1, modified proctor test, optimized dry density 2110 kg/m^3 at 9% moisture content. Permeability analysis, 3.15x10^-10 m/s.
6					End of test pit at 5.8 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Some sloughing.
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-123

LOCATION: WEST FLANK TIN DOME

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458498E, 7101322N
GROUND ELEVATION (m): 808
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 19 Aug 11
FINISH DATE: 19 Aug 11
FINAL DEPTH OF PIT (m): 2.4
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss, organics. [TOPSOIL]
1					SILT (ML) Some medium to coarse sand, gravelly, trace cobbles, non to low plastic, rapid dilatancy, firm, wet, orangey brown. Clasts: metasedimentary, angular, equidimensional, strong (R4), to slightly weathered (W1.5 to W2). [COLLUVIUM] 0.4 - 0.5 m - Frozen: massive ice, granular, 10% sediment inclusions. 0.5 - 1.3 m - Frozen: Vs, ice in lenses 1-15 mm thick, grades from 60% at 0.5 m to 15% at 1.3 m.
2	G	1			SILT (ML) Gravelly, sandy, some cobbles. Frozen: Vs (10-40%), ice lenses, 2-20 mm thick with trace organics. [COLLUVIUM]
3					End of test pit at 2.4 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.4 m to bottom of excavation.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-124

LOCATION: WEST FLANK TIN DOME

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458559E, 7101502N
GROUND ELEVATION (m): 825
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 19 Aug 11
FINISH DATE: 19 Aug 11
FINAL DEPTH OF PIT (m): 6.5
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss. [TOPSOIL]
1					SILT (ML) Gravelly,some sand, trace cobbles, trace boulders, low plastic, firm, orange brown, moist to wet, no cementation, rapid dilatancy, layered. Contains several organic layers and layers with iron staining 1-5 cm thick. Clasts: metasedimentary, subangular to angular, platey, faintly to slightly weathered (W1.5 to W2), medium strong to strong (R3 to R4), maximum particle size = 300 mm. [COLLUVIUM]
2					SILT (ML) Some gravel, some sand, trace cobbles non-plastic, soft, brown to dark brown, dry to moist, no cementation. Clasts: subangular to angular, platey to equidimensional, metasedimentary, slightly weathered (W1.5 to W2), medium strong (R3), trace organics. [COLLUVIUM]
3					
4					
5					At 5.5 m - Seepage.
6	G	1			6.2 - 6.4 m - Sample 1, grain size analysis, 21% gravel, 29% sand, 50% fines.
7					End of test pit at 6.5 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) Seepage at approximately 5.5 m. 4) Not frozen. 5) Significant sloughing.
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

W% 20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-125

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459492E, 7100047N
GROUND ELEVATION (m): 995
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 19 Aug 11
FINISH DATE: 19 Aug 11
FINAL DEPTH OF PIT (m): 2.5
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, organic silt. [TOPSOIL]
	G	1			ORGANIC SILT (OL) Trace sand, trace fine gravel, trace cobbles, low plastic, firm, light to dark brown, organic odour, moist to wet, no cementation, rapid dilatancy.
1					SILT (ML) Some sand, some gravel, trace cobbles, low plastic, dark brownish grey, slight organic odour, wet when thawed, rapid dilatancy. Frozen: Vx/Vs (15-25%). [COLLUVIUM] At 1. 5m - Sandy, trace boulders, yellowish brown. Frozen: Vx(5-10%). Clasts: metasedimentary, medium strong to strong (R3 to R4), faintly to slight weathered (W1.5 to W2), flat to elongated, angular.
2					
3					End of test pit at 2.5 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.55 m to bottom of excavation. 5) Used ripper shank to penetrate frozen ground.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-126

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459464E, 7100300N
GROUND ELEVATION (m): 946
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 19 Aug 11
FINISH DATE: 19 Aug 11
FINAL DEPTH OF PIT (m): 3.1
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					**ORGANICS** Rootmat and organic silt. [TOPSOIL]
1					**SILT (ML)** Sandy, fine, gravelly, trace clay, low plastic, firm, brown, no odour, moist, homogeneous, no cementation, rapid dilatancy. [COLLUVIUM] At 0.5 m - A 120 mm thick dark brown organic silt layer. At 1.2 m - Thin bed (100 mm) of grey silt (ML-MH) some gravel, trace cobbles, non-plastic. Clasts: metasedimentary, flat to elongated, angular, medium strong to strong (R3 to R4), fresh to slightly weathered (W1.5), compact, maximum particle size = 130 mm, orangey brown, moist, homogeneous, non cemented.
2	G	1			**GRAVEL AND SAND (GW-SW)** Fine to coarse, silty, trace cobbles, well graded, compact, brown, wet, homogeneous, non cemented. Clasts: metasedimentary, elongate to equidimensional, angular to subangular. Sloughing due to moderate seepage. [COLLUVIUM] 1.7 - 2.2 m - Sample 1, grain size analysis, 52% gravel, 30% sand, 18% fines.
3					**GRAVEL (GM)** Silty, trace to some sand, poorly graded, dense, grey matrix, grey/brown clasts, wet. Frozen: Vx (10-20%). [COLLUVIUM]
4					End of test pit at 3.1 m. Notes: 1) Terminated due to sloughing, seepage and refusal on frozen ground. 2) Backfilled to surface. 3) Seepage below 1.5 m. 3) Frozen ground encountered below 2.5 m to bottom of excavation.
5					
6					
7					
8					

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — — — ○ — — — × W_L%; 20, 40, 60, 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-127

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459889E, 7100117N
GROUND ELEVATION (m): 1096
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 19 Aug 11
FINISH DATE: 19 Aug 11
FINAL DEPTH OF PIT (m): 2.5
LOGGED BY: LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat. [TOPSOIL]
1					SILT (ML) Gravelly, some cobbles, some sand, non plastic, firm, orange brown, no odour, moist, non cemented, no dry strength, rapid dilatancy. Clasts: metasedimentary, equidimensional to flat, angular, slightly weathered (W2), weak to medium strong (R2 to R3). [COLLUVIUM]
2			2		METASEDIMENTARY ROCK Orange brown, fine grained, foliated, very closely fractured, slightly weathered (W2), weak to medium strong (R2.5 to R3), 3 joint sets, iron stained, crushed rock infill, 0.1-0.5 mm aperture, 20-60 mm spacing, joint roughness (JRC) = 2-6. Foliation: 033°/326° (dip varies from 15°-35°) Set: 034°/175° Set: 062°/282° [SLIGHTLY WEATHERED BEDROCK]
3					End of test pit at 2.5 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) No samples taken. 6) Structural measurements: Dip/Dip direction.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-128

LOCATION: HAGGART CREEK

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458423E, 7101526N
GROUND ELEVATION (m): 803
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 19 Aug 11
FINISH DATE: 19 Aug 11
FINAL DEPTH OF PIT (m): 3.0
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss. [TOPSOIL]
1					SILT (ML) Gravelly, some sand, trace cobbles, non-plastic, rapid dilatancy, soft, wet, brown. Clasts: metasedimentary, subangular to angular, flat, medium strong to strong (R3 to R4), slightly weathered (W1.5 to W2). [COLLUVIUM] Below 0.6 m - Frozen: Vs/Vx (10-20%), ice lenses 2-20 mm thick.
2					At 1.8 m - Recovered one piece of ice and soil that is clear, 20 cm thick, has trace organics, and consists of approximately 60% ice. Below 1.8 m - Vs (1-10%).
3	G	1			2.5 - 3.0 m - Sample 1, grain size analysis, 7% gravel, 32% sand, 61% silt.
4					End of test pit at 3.0 m Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 0.6 m to bottom of excavation. 5) Sloughing of non-frozen upper layer.
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-129

LOCATION: WEST FLANK TIN DOME

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458563E, 7101340N
GROUND ELEVATION (m): 822
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 20 Aug 11
FINISH DATE: 20 Aug 11
FINAL DEPTH OF PIT (m): 6.8
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss, organics. [TOPSOIL]
					SILT (SM) Some medium to coarse sand, gravelly, trace cobbles, non plastic, firm, wet, orangey brown, maximum particle size = 140 mm, trace organics. Clasts: metasedimentary, subangular to angular, flat to equidimensional, slightly weathered (W2), medium strong to strong (R3 to R4). [COLLUVIUM] At 1.2 m - An orange layer, 10 cm thick, with greater iron staining. At 1.3 m - A brown layer, 5 cm thick, of mostly decomposed organics. At 2.0 m - A brown layer, 5 cm thick, of mostly decomposed organics.
3	G	2			
4					SILT (ML) Trace medium to coarse sand, some gravel, trace cobbles, trace organics, low plastic, firm to stiff, moist, greyish brown. Clasts: metasedimentary, medium strong to strong (R3 to R4), subangular to angular, flat to equidimensional, fresh to slightly weathered (W1.5), metasedimentary, maximum particle size = 140 mm. [COLLUVIUM]
6.6	G	1			6.6 - 6.8 m - Sample 1, grain size analysis, 16% gravel, 31% sand, 53% fines. 6.7 - 6.8 m - Frozen: Vs (1-5%), ice lenses 2-5 mm thick, clear.
7					End of test pit at 6.8 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Frozen ground encountered below 6.7 m to bottom of excavation.

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% × (20, 40, 60, 80)

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-129

LOCATION: WEST FLANK TIN DOME

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458563E, 7101340N
GROUND ELEVATION (m): 822
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 20 Aug 11
FINISH DATE: 20 Aug 11
FINAL DEPTH OF PIT (m): 6.8
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
8					5) Some sloughing at 1.2 m depth, extensive sloughing at 6.8 m depth.
9					
10					
11					
12					
13					
14					
15					
16					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-130

LOCATION: WEST FLANK TIN DOME

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458709E, 7101183N
GROUND ELEVATION (m): 865
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 20 Aug 11
FINISH DATE: 20 Aug 11
FINAL DEPTH OF PIT (m): 6.0
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION	Su - kPa (40, 80, 120, 160) / VANE FIELD LAB / PEAK ◆ ■ / REMOLD ◇ □ / ▲ UC/2 / △ Pocket Pen /2 / ★ % Fines / Moisture Content W_P% W% W_L% (20, 40, 60, 80)
0					ORGANICS Rootmat, organics, moss. [TOPSOIL]	
					SILT (ML) Sandy, some gravel, trace cobbles, non plastic, brown, dry, firm, no to weak cementation. Clasts: subangular to angular, flat to equidimensional, metasedimentary, medium strong to very strong (R3 to R5), slightly weathered (W2), maximum particle size = 200 mm. [COLLUVIUM] Below 1.2 m - Trace boulders, maximum particle size = 600 mm.	
1						
2						
3						
4					4.0 - 4.5 m - Increased cobble content.	
5						
6	G	1			5.8 - 6.0 m - Sample 1, grain size analysis, 35% gravel, 43% sand, 22% fines.	○ ★
					End of test pit at 6.0 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.	
7						
8						

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-131

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459934E, 7101430N
GROUND ELEVATION (m): 921
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 20 Aug 11
FINISH DATE: 20 Aug 11
FINAL DEPTH OF PIT (m): 3.5
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION	Su - kPa (40, 80, 120, 160) / VANE FIELD LAB / PEAK ◆ ■ / REMOLD ◇ □ / ▲ UC/2 / △ Pocket Pen /2 / ★ % Fines / Moisture Content W_P% W% W_L% (20, 40, 60, 80)
0					ORGANICS Rootmat, moss. [TOPSOIL]	
					BOULDERS AND COBBLES Silty, some sand, some gravel, wet, brown. Clasts: mostly granodiorite with some metasedimentary and some quartz clasts, subangular, slightly weathered (W1.5 to W2), strong (R4), maximum particle size = 300 mm. [DEBRIS FLOW?]	
1					SAND (SM) Silty, some gravel, trace cobbles, trace boulders, brown, wet, loose. Stratified: contains layers of upward-fining sequences. Clasts: subangular, flat, medium strong to strong (R3 to R4), slightly weathered (W1.5 to W2), maximum particle size = 700 mm. [DEBRIS FLOW?] 0.8 - 1.2 m - Frozen: Nbn. At 1.15 m - There is a 10 cm upwards-fining sequence of coarse sand and gravel.	
2						
3	G	1			3.2 - 3.5 m - Sample 1, grain size analysis, 45% gravel, 38% sand, 17% fines. 3.4 - 3.5 m - Heavy seepage.	○ ★
4					End of test pit at 3.5 m. Notes: 1) Terminated due to sloughing and seepage. 2) Backfilled to surface. 3) Heavy seepage from 3.4-3.5 m. 4) Frozen ground encountered from 0.8-1.2 m.	
5						
6						
7						
8						

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-132

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459840E, 7101515N

GROUND ELEVATION (m): 922

DATUM: UTM NAD 83

EXCAVATOR: 325D Cat

OPERATOR: EWING

START DATE: 20 Aug 11

FINISH DATE: 20 Aug 11

FINAL DEPTH OF PIT (m): 5.3

LOGGED BY: JND

REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss. [TOPSOIL]
1					SILT (ML) Some gravel, some cobbles, trace coarse sand, trace boulders, non plastic, rapid dilatancy, firm, orangish brown, dry. Clasts: metasedimentary, weak to strong (R2 to R4), slightly weathered (W2), angular, maximum particle size = 300 mm. [COLLUVIUM]
			4		SILT(ML) Bouldery, some sand, some gravel, some cobbles, orangish brown, dry. Clasts: very weak to medium strong (R1 to R3), highly weathered (W4), metasedimentary, maximum particle size = 800 mm. [COLLUVIUM]
2					METASEDIMENTARY ROCK Very weak to medium strong (R1 to R3), highly weathered (W4), iron stained, metasedimentary, approximately 60% disintegrated to soil, orangish brown. [HIGHLY WEATHERED BEDROCK]
			2.5		METASEDIMENTARY ROCK Orangish brown, metasedimentary, weak (R2), slightly to moderately weathered (W2 to W3), heavily jointed (spacing of 2-5 cm). [MODERATELY TO SLIGHTLY WEATHERED BEDROCK]
3					
4					
			2		METASEDIMENTARY ROCK Orange-green brown, metasedimentary, weak to medium strong (R2 to R3), slightly weathered (W2), chlorite altered rock, blocky (approximately 50 cm). [SLIGHTLY WEATHERED BEDROCK]
5					
					End of test pit at 5.3 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-133

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 460048E, 7101608N

GROUND ELEVATION (m): 984

DATUM: UTM NAD 83

EXCAVATOR: 325D Cat

OPERATOR: EWING

START DATE: 21 Aug 11

FINISH DATE: 21 Aug 11

FINAL DEPTH OF PIT (m): 4.4

LOGGED BY: JND

REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss. [TOPSOIL]
1					GRAVEL (GM) Silty, some sand, trace cobbles, loose, orangish brown, wet. Clasts: angular, flat, metasedimentary, maximum particle size = 220 mm, weak (R2), slightly weathered (W2). [COLLUVIUM]
2					SILT (ML) Some sand, some gravel, trace cobbles, low plastic, grey. Clasts: angular, flat, metasedimentary, slightly weathered (W2), weak (R2), maximum particle size = 240 mm. Frozen: Vs (10-20%), ice lenses 1-40 mm thick, clear. [COLLUVIUM]
3					GRAVEL (GM) Sandy, silty, trace cobbles, orangish brown. Clasts: metasedimentary, phyllitic, angular, flat, reddish brown, very weak to medium strong (R1 to R3), slightly to moderately weathered (W2 to W3). Frozen: Vx/Vs (10-20%), ice lenses 1-5 mm thick. [MODERATELY TO HIGHLY WEATHERED METASEDIMENTARY BEDROCK]
4	G	1			4.3 - 4.4 m - Sample 1, grain size analysis, 51% gravel, 34% sand, 15% fines.
					End of test pit at 4.4 m. Notes: 1) Refusal on frozen ground. 2) Backfilled to surface. 3) Some seepage and sloughing from top unfrozen layer 0.2-0.6 m. 4) Frozen ground encountered below 0.6 m to bottom of excavation.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80



EGP (TESTPIT) EGP_TESTPIT GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-134

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 460101E, 7101419N

GROUND ELEVATION (m): 945

DATUM: UTM NAD 83

EXCAVATOR: 325D Cat

OPERATOR: EWING

START DATE: 21 Aug 11

FINISH DATE: 21 Aug 11

FINAL DEPTH OF PIT (m): 4.2

LOGGED BY: JND

REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					SILT (ML) Sandy, some gravel, trace cobbles, trace boulders, non plastic, rapid dilatancy, brown, moist. Clasts: metasedimentary and granodiorite, slightly weathered (W2), medium strong to strong (R3 to R4), subrounded to angular, stratified: contains upward fining sequences, maximum particle size = 400 mm. [DEBRIS FLOW?]
1					COBBLES Gravelly, some sand, some silt. Clasts: metasedimentary and granodiorite, flat, subrounded to angular, faintly to slightly weathered (W2), medium strong to strong (R3 to R4). Matrix non-plastic, brown, moist. [DEBRIS FLOW?]
2					BOULDERS Sandy, some gravel, some cobbles, trace silt, moist, brown. Clasts: granodiorite and metasedimentary, subrounded to subangular, medium strong to very strong (R3 to R5), slightly weathered (W2), maximum particle size = 1000 mm. [DEBRIS FLOW?] At 1.3 m - A 1700 by 1000 mm boulder.
3					
4	G	1			4.1 - 4.2 m - Moderate seepage.
					End of test pit at 4.2 m. Notes: 1) Terminated due to sloughing and seepage at base of pit. 2) Backfilled to surface. 3) Moderate seepage from 4.1-4.2 m. 4) Not frozen.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

W% 20 40 60 80

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-135

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459998E, 7101383N
GROUND ELEVATION (m): 931
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 21 Aug 11
FINISH DATE: 21 Aug 11
FINAL DEPTH OF PIT (m): 3.5
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss. [TOPSOIL]
1	G	1			SILT (ML) Trace sand, some gravel, trace organics, trace cobbles, low plastic, rapid dilatancy, greyish brown. Clasts: metasedimentary, reddish brown, medium strong (R3), slightly weathered (W2), subangular, flat, maximum particle size = 120 mm. [COLLUVIUM] At 0.5 m - Some seepage. Below 1.2 m - Some sand, trace boulders, non-plastic, orangish brown. Clasts: granodiorite and metasedimentary, medium strong to strong (R3 to R4), maximum particle size = 500 mm.
2					
3					
4					End of test pit at 3.5 m. Notes: 1) Refusal on boulders. 2) Backfilled to surface. 3) Some seepage at 0.5 m. 4) Not frozen. 5) Some sloughing.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-136

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459896E, 7101306N
GROUND ELEVATION (m): 910
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 21 Aug 11
FINISH DATE: 21 Aug 11
FINAL DEPTH OF PIT (m): 4.8
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss. [TOPSOIL]
1	G	1			SILT (ML) Trace to some sand, trace gravel to gravelly, trace cobbles, low plastic, moist, firm. Comprises alternating layers of 70% orange-brown material (gravelly, trace organics), and 30% grey-brown material 3-10 cm thick (few clasts, no organics). Clasts: metasedimentary, medium strong (R3), slightly weathered (W1.5 to W2), subangular to angular, platey to equidimensional. [PLACER TAILINGS]
2					2.1 - 2.5 m - Becomes trace sand, trace gravel, grey-brown.
3					SAND (SM) Silty, some gravel, trace cobbles, trace boulders, orangish brown, moist. Clasts: metasedimentary and granodiorite, medium strong to strong (R3 to R4), slightly weathered (W2), rounded to angular, maximum particle size = 500 mm. [DEBRIS FLOW?]
4					
5					End of test pit at 4.8 m. Notes: 1) Refusal on boulders. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Sloughing of pit walls due to rainy weather conditions. 6) Test pit excavated at drill pad for BH-BGC11-52
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

20 40 60 80

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-137

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459920E, 7101171N
GROUND ELEVATION (m): 943
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 21 Aug 11
FINISH DATE: 21 Aug 11
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: JND
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					**ORGANICS** Rootmat, moss. [TOPSOIL]
	G	1			**SILT (ML)** Gravelly, some sand, trace cobbles, trace boulders, low plastic, rapid dilatancy, brown. Clasts: metasedimentary, weak to medium strong (R2 to R3), reddish brown and reddish grey, subangular to angular, flat to equidimensional, maximum particle size = 300 mm. [COLLUVIUM]
1			4.5		**METASEDIMENTARY ROCK** Brownish grey, extremely weak to weak (R0 to R2), highly to completely weathered (W4 to W5), phyllitic, crumbles into micaceous flakes under finger pressure. [HIGHLY TO COMPLETELY WEATHERED BEDROCK]
2			2.5		**METASEDIMENTARY ROCK** Reddish brown, 4 visible joint sets, weak to medium strong (R2 to R3), slightly to moderately weathered (W2 to W3). [SLIGHTLY TO MODERATELY WEATHERED BEDROCK]
3			3.5		**METASEDIMENTARY ROCK** Brownish grey, silver along foliation, highly fractured, phyllitic, very weak to weak (R1 to R2), moderately to highly weathered (W3 to W4). [MODERATELY TO HIGHLY WEATHERED BEDROCK]
4					
5					End of test pit at 5.0 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-138

LOCATION: STUTTLE GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459771E, 7100041N
GROUND ELEVATION (m): 1050
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 24 Aug 11
FINISH DATE: 24 Aug 11
FINAL DEPTH OF PIT (m): 6.3
LOGGED BY: DW/LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat. [TOPSOIL]
1	G	1			GRAVEL AND SAND (GM) Silty, well-graded, compact, flat and elongated, metasedimentary clasts, brown, moist, homogeneous, maximum particle size = 120 mm. [COLLUVIUM]
2			4		METASEDIMENTARY ROCK Brown, orangish, fine grained, foliated, weak to medium strong (R2 to R3), 3 main joint sets, hematite staining, crushed rock and silty sand infill, 0.5-5 mm aperture, JRC = 2-5. [HIGHLY WEATHERED BEROCK]
3			2		METASEDIMENTARY ROCK Brown, orangish/reddish, fine grained, foliated, medium strong (R3), slightly weathered (W2), hematite infill, 0.5 - 5 mm aperture, JRC = 2 - 5. Joint set 1: 17/74 Joint set 2: 84/244 Joint set 3: 78/345 [SLIGHTLY WEATHERED BEDROCK]
7					End of test pit at 6.3 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-139

LOCATION: SOUTH OF PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459001E, 7099033N
GROUND ELEVATION (m): 935
DATUM: UTM NAD 83

EXCAVATOR: Hand dug
OPERATOR: N/A

START DATE: 24 Aug 11
FINISH DATE: 24 Aug 11
FINAL DEPTH OF PIT (m): 3.0
LOGGED BY: DW/LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat. [TOPSOIL]
1	G	1	5		GRAVEL AND SAND (GW/SW) Trace to some silt, trace cobbles, well graded, maximum particle size = 85 mm, loose to compact, flat and elongated, angular, yellowish/orangish brown, moist, homogeneous. [COLLUVIUM]
2			3		SAND (SW) Some fine to medium gravel, trace silt, well graded, loose to compact, maximum particle size = 30 mm, flat and elongated, angular, moist, orange to yellow, non cemented, relict bedding structures of the bedrock are visible as alternating orange/brown layers. [COMPLETELY WEATHERED BEDROCK]
3					METASEDIMENTARY ROCK Grey to orangish, fine grained, foliated, medium strong (R3), moderately weathered (W3), 3 joint sets, tabular blocks, hematite infill, aperture 0.5-3 mm, spacing of sets: Foliation: extremely to very closely spaced joints (225°/220°) Joint set 1: no exposure (70°/80°) Joint set 2: very closely to closely spaced joints (50°/344°) [MODERATELY WEATHERED BEDROCK]
4					End of test pit at 3.0 m. Notes: 1) Logged by hand digging the slope of an existing exploration trench. 2) No seepage. 3) Not frozen.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-140

LOCATION: SOUTH OF PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459228E, 7097912N
GROUND ELEVATION (m): 954
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 24 Aug 11
FINISH DATE: 24 Aug 11
FINAL DEPTH OF PIT (m): 4.5
LOGGED BY: DW/LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat and organic silt. [TOPSOIL]
1	G	1			SILT (ML) Gravelly (fine to medium), some sand, trace cobbles, trace clay, trace rootlets, low plasticity, firm, no odour, moist, no cementation, rapid dilatancy. Clasts: metasedimentary, elongated, angular, medium strong (R3), faintly to slightly weathered (W1.5). [COLLUVIUM] PP/2 = 50 kPa. 1.0 - 1.2 m - Sample 1, grain size analysis, 21% gravel, 34% sand, 45% fines. At 1.2 m - Thin layer of sandy silt, brown, vesicular, rapid dilatancy, wet.
2					METASEDIMENTARY ROCK Phyllite, grey, bluish-grey, brownish-grey, fine grained, extremely closely spaced foliation planes, foliation is sub-horizontal, extremely weak (R1), slightly weathered (W2), mica rich, hematite staining on foliation plane, trace clay on foliation joint walls. [SLIGHTLY WEATHERED BEDROCK]
3			2		
4					At 3.7 m - Very difficult to excavate through quartzite beds (1-3 cm thick).
5					End of test pit at 4.5 m. Notes: 1) Refusal on bedrock. 2) Backfilled to surface. 3) No seepage. 4) Not frozen.
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-141

LOCATION: PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460019E, 7098871N
GROUND ELEVATION (m): 1154
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 24 Aug 11
FINISH DATE: 24 Aug 11
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: DW/LGT
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, organic silt. [TOPSOIL]
1					GRAVEL (GM) Silty, trace to some sand, trace rootlets, trace boulders, loose, maximum particle size = 1000 mm, dark brown, no odour, wet, no cementation. Clasts: metasedimentary, elongated, angular to subangular, medium strong (R3), slightly weathered (W2). [COLLUVIUM] At 1.0 m - Seepage.
2					1.9 - 2.5 m - Lenses of sand, 10-15 cm thick, fine, silty, trace gravel, fine to coarse, grey, moist.
3					
4	G	1			3.75 - 4.1 m - Lenses of sand, 10-15 cm thick, fine, silty, trace gravel, grey, moist.
5					End of test pit at 5.0 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) Seepage at 1.0 m. 4) Not frozen. 5) Some sloughing.
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content
W_P% × — — — — ○ — — — — × W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-142

LOCATION: SOUTH OF PLATINUM GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459037E, 7098318N
GROUND ELEVATION (m): 913
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 26 Aug 11
FINISH DATE: 26 Aug 11
FINAL DEPTH OF PIT (m): 4.5
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat, moss. [TOPSOIL]
1					SAND (SM) Some silt, some gravel, trace cobbles, well graded, loose to compact, maximum particle size = 100 mm, some clasts are flat and elongated, angular to subangular, brown, no odour, moist, no cementation, gravel and cobbles are metasedimentary. [COLLUVIUM]
2					
3			4		GRAVEL (GW) Fine to coarse, some sand to sandy, trace cobbles, well graded, compact, maximum particle size = 200 mm, most clasts are flat, some elongated, angular, orange and greyish black, no odour, moist, bedded/foliated structure, talc on some clasts surfaces. Clasts: typically very weak (R1) and break along foliation/bedding. [HIGHLY WEATHERED METASEDIMENTARY ROCK]
4					
5					End of test pit at 4.5 m. Notes: 1) Completed at maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) No samples taken.
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-143

LOCATION: STEINER AREA

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458644E, 7100441N
GROUND ELEVATION (m): 838
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 26 Aug 11
FINISH DATE: 26 Aug 11
FINAL DEPTH OF PIT (m): 4.0
LOGGED BY: KH/DW
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat. [TOPSOIL]
1					SILT (ML) Sandy (fine), poorly (uniformly) graded, low plastic, firm, greyish brown, moist, slight organic odour, no cementation. [ALLUVIUM?] At 0.3 m - Light seepage.
2					SAND (SP) Medium to coarse sand, gravelly, trace cobbles, trace silt, poorly (gap) graded, loose to compact, maximum particle size = 100 mm, sand subrounded, gravel and cobbles rounded, grey, wet, primarily metasedimentary clasts, trace granodiorite clasts. [ALLUVIUM?] At 0.6 m - Light seepage.
					ORGANICS Brownish black.
3					SILT (ML) Some fine to coarse sand, some gravel, trace cobbles, low plastic, soft to firm, brown, no odour, moist, no cementation. Clasts: metasedimentary, subrounded to angular, typically flat. [ALLUVIUM?] At 1.7 m - Moderate seepage.
4					SILT (ML) Some sand, trace clay, low plastic, firm to stiff, light grey, no odour, dry to moist, no cementation. Clasts: metasedimentary, subrounded, maximum particle size = gravel sized. PP/2 = 60-150 kPa. [ALLUVIUM?]
5					End of test pit at 4.0 m. Notes: 1) Terminated due to sloughing. 2) Backfilled to surface. 3) Light seepage found at 0.3 and 0.6 m. Moderate seepage found at 1.7 m. 3) Not frozen. 4) Walls sloughing between 1.0 and 1.7 m.
6					
7					
8					

Su - kPa: 40, 80, 120, 160

	FIELD	LAB	
VANE PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — — — — ○ — — — — × W_L%; W%: 20, 40, 60, 80

△ 3

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-144

LOCATION: EAGLE PUP

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 460540E, 7100144N
GROUND ELEVATION (m): 1158
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 27 Aug 11
FINISH DATE: 27 Aug 11
FINAL DEPTH OF PIT (m): 1.0
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Rootmat. [TOPSOIL]
1					SAND (SW) Sand, some gravel, some silt, trace cobbles, well graded, loose, maximum particle size = 100 mm, sand is subrounded, gravels and cobbles are subangular to angular, grey, no odour, wet, homogeneous, no cementation, granodiorite clasts. Heavy seepage at organics/colluivum contact (0.4 m). [COLLUVIUM]
2					End of test pit at 1.0 m. Notes: 1) Terminated due to sloughing and seepage. 2) Backfilled to surface. 3) Heavy seepage at 0.4 m. 4) Not frozen.
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

W% 20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

TEST PIT # TP-BGC11-145

LOCATION: MIDDLE REACH DUBLIN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459853E, 7101471N
GROUND ELEVATION (m): 959
DATUM: UTM NAD 83

EXCAVATOR: 325D Cat
OPERATOR: EWING

START DATE: 27 Aug 11
FINISH DATE: 27 Aug 11
FINAL DEPTH OF PIT (m): 5.1
LOGGED BY: KH
REVIEWED BY: PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					DRILL PAD FILL
					ORGANICS
1					SAND (SM) Gravelly, some silt, trace cobbles, well graded, compact, maximum particle size = 100 mm, sand is equidimensional, subrounded to subangular, gravel and cobbles are typically flat, some elongated, subangular to angular, light brown, no odour, moist, no cementation, metasedimentary clasts. [COLLUVIUM]
2					
3					Below 2.5 m - Cobble content increases to some.
4					
5					Below 4.5 m - Trace boulders.
					End of test pit at 5.1 m. Notes: 1) Completed to maximum reach of excavator. 2) Backfilled to surface. 3) No seepage. 4) Not frozen. 5) Slight sloughing. 6) Test pit excavated at drill pad for BH-BGC11-31.
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 1/20/12

APPENDIX D
TEST PIT PHOTOS



TP-BGC11-50 – Site photo; drill pad of BH-BGC11-36.



TP-BGC11-50 – Cut slope from construction of drill pad.



TP-BGC11-50 – Pit back wall; pit completed at a depth of 5.8 m.



TP-BGC11-50 – Detail of an excavated bucket.



TP-BGC11-51 – Site photo.



TP-BGC11-51 – Cut slope from access construction; frozen ground.



TP-BGC11-51 – Pit back wall; pit completed at a depth of 4.7 m.



TP-BGC11-51 – Detail of spoil pile.



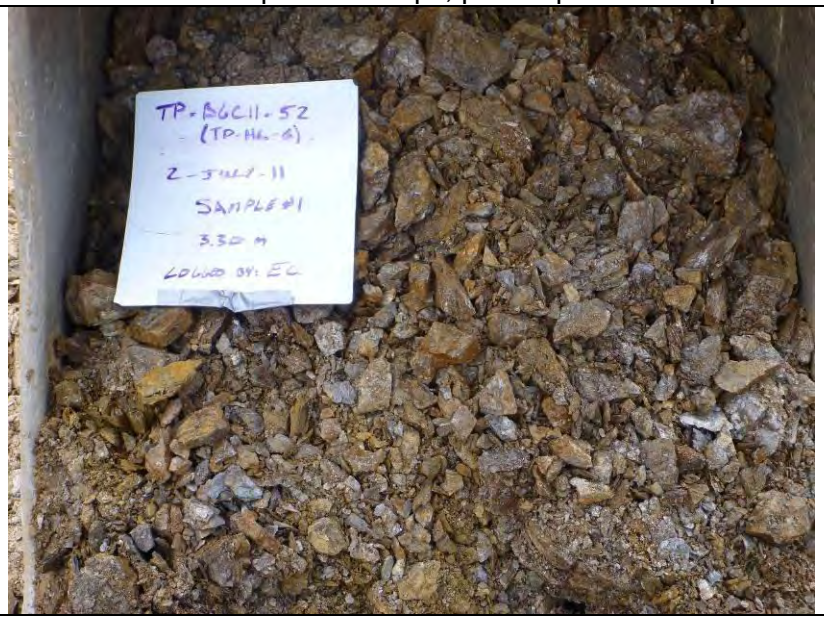
TP-BGC11-52 – Site photo; drill pad of BH-BGC11-29.



TP-BGC11-52 – Cut slope and test pit; pit completed at depth of 5.0 m.



TP-BGC11-52 – Detail of spoil pile.



TP-BGC11-52 – Detail of a bucket excavated from 3.30 m.



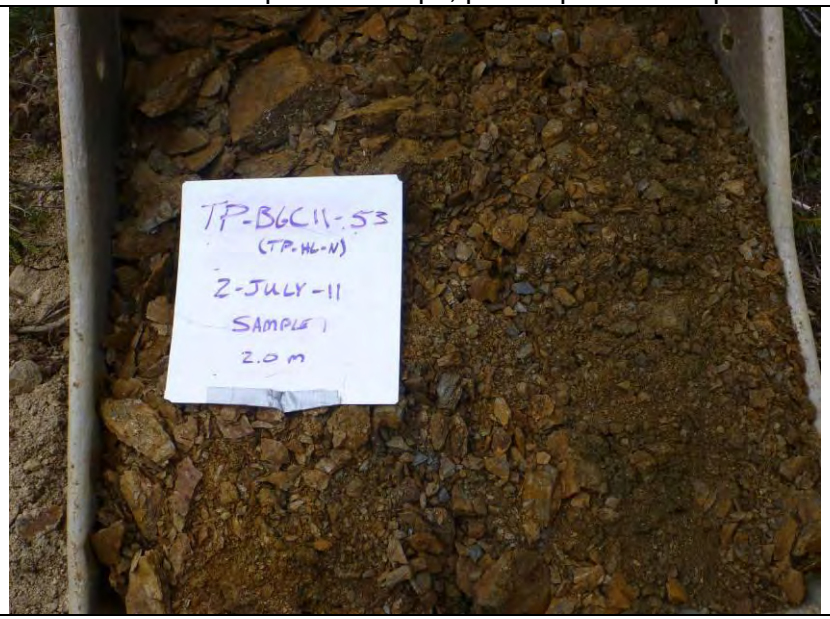
TP-BGC11-53 – Site photo; drill pad of BH-BGC11-27.



TP-BGC11-53 – Cut slope and test pit; pit completed at depth of 4.0 m.



TP-BGC11-53 – Detail of spoil pile.



TP-BGC11-53 – Detail of a bucket excavated from 2.0 m.



TP-BGC11-54 – Site photo; drill pad of BH-BGC11-25.



TP-BGC11-54 – Back wall of test pit; pit completed at depth of 2.0 m.



TP-BGC11-54 – Detail of pit wall at 0.5 m.



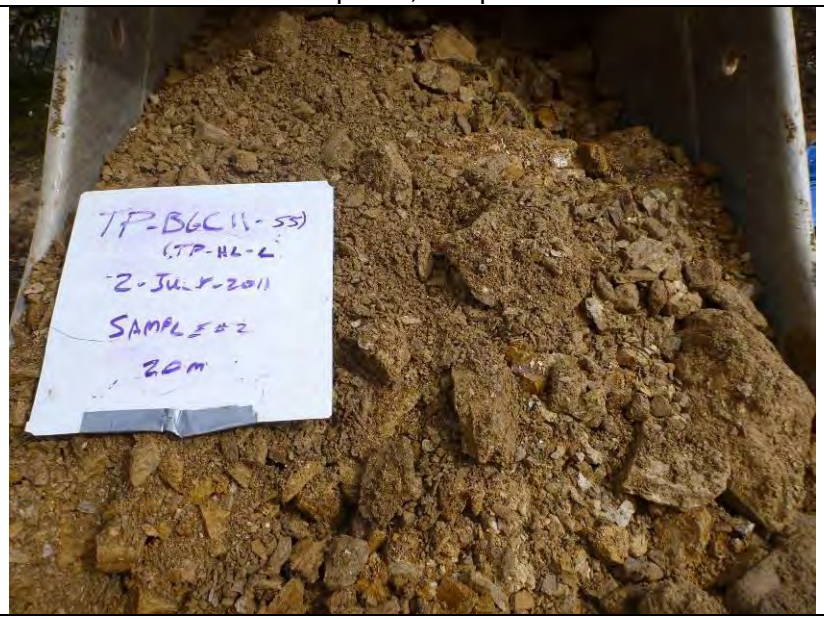
TP-BGC11-54 – Detail of pit wall at 2.0 m; bedrock at base.



TP-BGC11-55 – Site photo; drill pad of BH-BGC11-24.



TP-BGC11-55 – Back wall of test pit; pit completed at depth of 2.0 m.



TP-BGC11-55 – Detail of a bucket excavated from 2.0 m.



TP-BGC11-55 – Detail of pit wall at 0.5 m.



TP-BGC11-56 – Site photo.



TP-BGC11-56 – Back wall of test pit; pit completed at depth of 2.0 m.



TP-BGC11-56 – Detail of spoil pile.



TP-BGC11-56 – Detail of pit wall at 0.5 m.



TP-BGC11-57 – Site photo; drill pad of BH-BGC11-26.



TP-BGC11-57 – Back wall of test pit; pit completed at depth of 5.0 m.



TP-BGC11-57 – Detail of spoil pile; bedrock.



TP-BGC11-57 – Detail of pit wall at 1.0 m.



TP-BGC11-58 – Site photo.



TP-BGC11-58 – Back wall of test pit; pit completed at depth of 5.0 m.



TP-BGC11-58 – Detail of spoil pile; excavated from 2.0 m.



TP-BGC11-58 – Detail of pit wall.



TP-BGC11-59 – Site photo; drill pad of BH-BGC11-50.



TP-BGC11-59 – Cut slope and test pit; pit completed at depth of 2.6 m.



TP-BGC11-59 – Detail of pit wall at 0.5 m.



TP-BGC11-60 – Site photo.



TP-BGC11-60 – Cut slope and test pit; pit completed at depth of 2.7 m.



TP-BGC11-60 – Detail of spoil pile; frozen ground 0.7-0.9 m.



TP-BGC11-60 – Detail of pit wall.



TP-BGC11-61 – Site photo.



TP-BGC11-61 – Cut slope and test pit; pit completed at depth of 2.7 m.



TP-BGC11-61 – Detail of spoil pile.



TP-BGC11-61 – Detail of pit wall 0.7-0.8 m.



TP-BGC11-62 – Back wall of test pit.



TP-BGC11-62 – Bottom of test pit; pit completed at depth of 6.2 m.



TP-BGC11-62 – Detail of a bucket excavated from 3.5-3.7 m.



TP-BGC11-62 – Detail of pit wall from 0.9-1.0 m.



TP-BGC11-63 – Site photo.



TP-BGC11-63 – Back wall of test pit; pit completed at depth of 4.6 m.



TP-BGC11-63 – Detail of spoil pile.



TP-BGC11-63 – Detail of pit wall from 0.5-0.7 m.



TP-BGC11-64 – Site photo.



TP-BGC11-64 – Back wall of test pit; pit completed at depth of 4.7 m.



TP-BGC11-64 – Detail of spoil pile.



TP-BGC11-64 – Detail of pit wall from 1.5-1.6 m.



TP-BGC11-65 – Site photo.



TP-BGC11-65 – Back wall of test pit; pit completed at depth of 8.0 m.



TP-BGC11-65 – Detail of spoil pile.



TP-BGC11-65 – Detail of pit wall from 0.4-0.5 m.



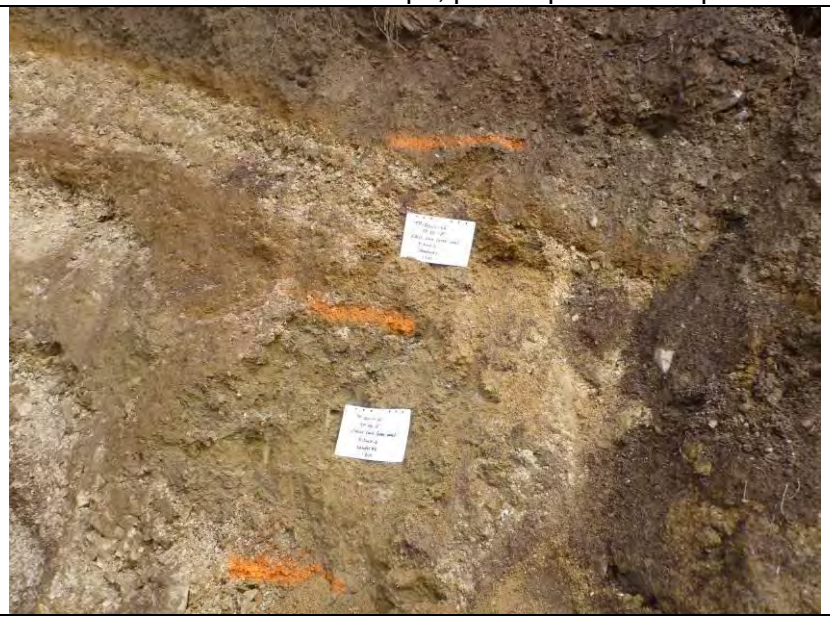
TP-BGC11-66 – Site photo.



TP-BGC11-66 – Back wall of test pit; pit completed at depth of 7.5 m.



TP-BGC11-66 – Detail of spoil pile.



TP-BGC11-66 – Detail of pit wall from 0.0-2.0 m.



TP-BGC11-67 – Back wall of test pit; pit completed at depth of 6.5 m.



TP-BGC11-67 – Detail of spoil pile.



TP-BGC11-67 – Detail of pit wall from 0.7-0.9 m.



TP-BGC11-68 – Back wall of test pit; pit completed at depth of 6.5 m.



TP-BGC11-68 – Detail of spoil pile.



TP-BGC11-68 – Detail of pit wall from 1.6-1.8 m.



TP-BGC11-69 – Site photo.



TP-BGC11-69 – Back wall of test pit; pit completed at depth of 6.5 m.



TP-BGC11-69 – Detail of spoil pile.



TP-BGC11-69 – Detail of pit wall from 2.8-2.9 m.

	
TP-BGC11-70 – Site photo.	TP-BGC11-70 – Cut slope wall; pit completed at depth of 3.0 m.



TP-BGC11-71 – Site photo; drill pad of BH-BGC11-59.



TP-BGC11-71 – Cut slope from access construction.



TP-BGC11-71 – Detail of pit wall 1.3-1.6 m.



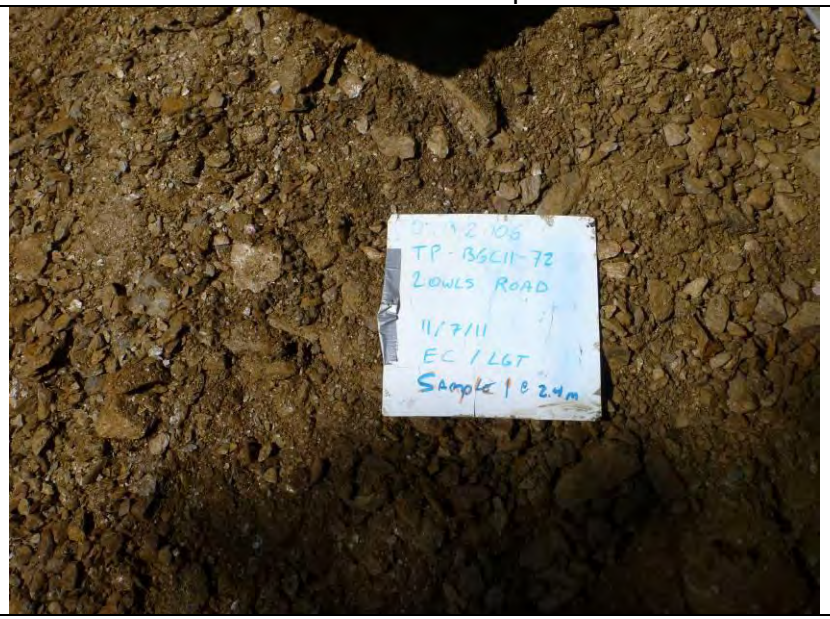
TP-BGC11-71 – Detail of Vx (30%) in pit wall.



TP-BGC11-72 – Site photo.



TP-BGC11-72 – Back wall of test pit; pit completed at depth of 4.3 m.



TP-BGC11-72 – Detail of spoil pile.

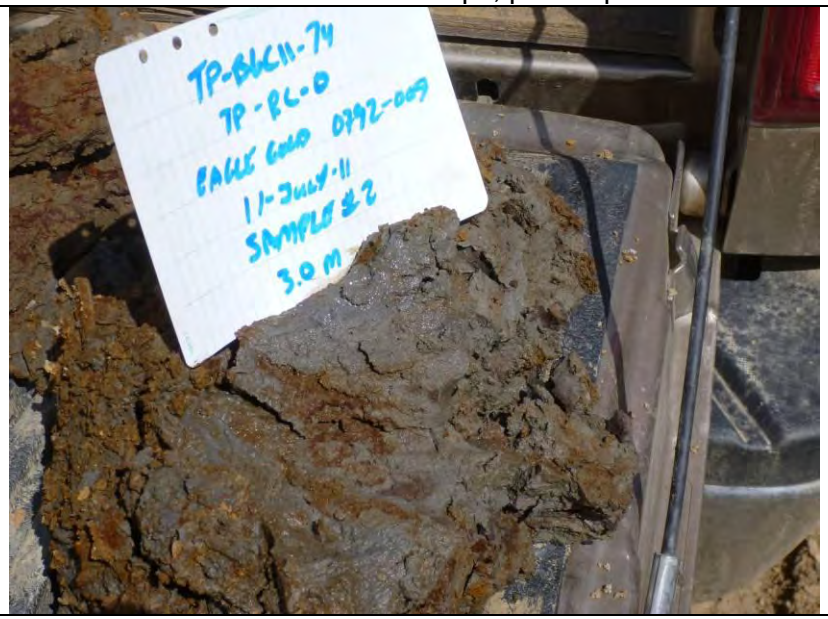
	
TP-BGC11-73 – Back wall of test pit; pit completed at depth of 3.0 m.	TP-BGC11-73 – Detail of pit wall from 0.8-1.0 m.



TP-BGC11-74 – Back wall of test pit; pit completed at 5.5 m.



TP-BGC11-74 – Detail of pit wall 1.2-1.4 m.



TP-BGC11-74 – Detail of sample taken from 3.0 m.



TP-BGC11-75 – Site photo.



TP-BGC11-75 – Back wall of test pit; pit completed at a depth of 4.2 m.



TP-BGC11-75 – Detail of spoil pile.



TP-BGC11-75 – Detail of pit wall 0.4-0.6 m.

	
TP-BGC11-76 – Back wall of test pit; pit completed at a depth of 5.4 m.	TP-BGC11-76 – Detail of spoil pile.



TP-BGC11-77 – Site photo.



TP-BGC11-77 – Back wall of test pit; pit completed at a depth of 5.5 m.



TP-BGC11-77 – Detail of spoil pile.



TP-BGC11-77 – Detail of pit wall 0.4-0.5 m.



TP-BGC11-78 – Site photo.



TP-BGC11-78 – Back wall of test pit; pit completed at a depth of 5.5 m.



TP-BGC11-78 – Detail of spoil pile.



TP-BGC11-78 – Water collected in pit from seepage through the walls.



TP-BGC11-79 – Site photo.



TP-BGC11-79 – Back wall of test pit; pit completed at a depth of 3.8 m.



TP-BGC11-79 – Detail of spoil pile.



TP-BGC11-79 – Detailed view of ice lenses beneath organic mat.



TP-BGC11-80 – Site photo.



TP-BGC11-80 – Back wall of test pit; pit completed at a depth of 6.7 m.



TP-BGC11-80 – Detail of spoil pile.



TP-BGC11-80 – Detail of pit wall.



TP-BGC11-81 – Site photo.



TP-BGC11-81 – Back wall of test pit; pit completed at a depth of 3.9 m.



TP-BGC11-81 – Detail of spoil pile.



TP-BGC11-81 – Detail of pit wall.



TP-BGC11-82 – Site photo; North wall.



TP-BGC11-82 – Site photo; East wall.



TP-BGC11-82 – Back wall of test pit; pit completed at a depth of 7.0 m.



TP-BGC11-82 – Exposed massive ice (ca.0.6m x 0.3m) at 6.5m depth.



TP-BGC11-83 – Site photo.



TP-BGC11-83 – Back wall of test pit; pit completed at a depth of 1.3 m.



TP-BGC11-83 – Detail of spoil pile.



TP-BGC11-83 – Detail of frozen soil sample taken from 0.6-0.8 m.



TP-BGC11-84 – Site photo.



TP-BGC11-84 – Back wall of test pit; pit completed at a depth of 2.6 m.



TP-BGC11-84 – Detail of pit wall 0.4-0.6 m.



TP-BGC11-84 – Detail of frozen soil sample taken from 2.5 m.



TP-BGC11-85 – Back wall of test pit; pit completed at a depth of 2.5 m.



TP-BGC11-85 – Detail of spoil pile.



TP-BGC11-85 – Detail of frozen soil sample taken from 1.0 m.



TP-BGC11-86 – Site photo.



TP-BGC11-86 – Back wall of test pit; pit completed at a depth of 7.5 m.



TP-BGC11-86 – Detail of spoil pile.



TP-BGC11-87 – Site photo.



TP-BGC11-87 – Back wall of test pit; pit completed at a depth of 3.5 m.



TP-BGC11-87 – Detail of spoil pile.



TP-BGC11-87 – Detail of pit wall at 0.6-0.8 m.



TP-BGC11-88 – Back wall of test pit; pit completed at a depth of 6.0 m.



TP-BGC11-88 – Detail of spoil pile.



TP-BGC11-88 – Detail of pit wall at 1.6-1.8 m.



TP-BGC11-89 – Back wall of test pit; pit completed at a depth of 6.5 m.



TP-BGC11-89 – Bottom of test pit; pit completed at a depth of 6.5 m.



TP-BGC11-89 – Detail of spoil pile.



TP-BGC11-89 – Detail of pit wall at 1.3-1.5 m.



TP-BGC11-90 – Back wall of test pit; pit completed at a depth of 6.5 m.



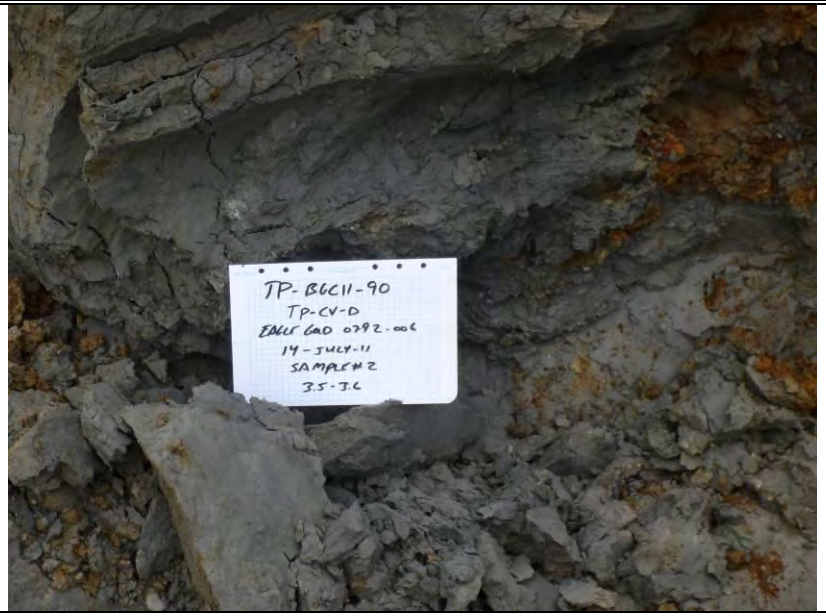
TP-BGC11-90 – Bottom of test pit; pit completed at a depth of 6.5 m.



TP-BGC11-90 – Detail of spoil pile.



TP-BGC11-90 – Detail of pit wall at 0.8-1.0 m.

	
TP-BGC11-90 – Detail of pit wall at 3.5-3.6 m.	



TP-BGC11-91 – Back wall of test pit; pit completed at a depth of 2.05 m.



TP-BGC11-91 – Detail of spoil pile.



TP-BGC11-91 – Detail of sample taken from 0.8-1.0 m.



TP-BGC11-91 – Detail of sample taken from 1.6-1.8 m.



TP-BGC11-92 – Site photo.



TP-BGC11-92 – Back wall of test pit; pit completed at a depth of 1.65 m.



TP-BGC11-92 – Detail of spoil pile.



TP-BGC11-92 – Detail of frozen soil sample taken from 0.6-0.8 m.



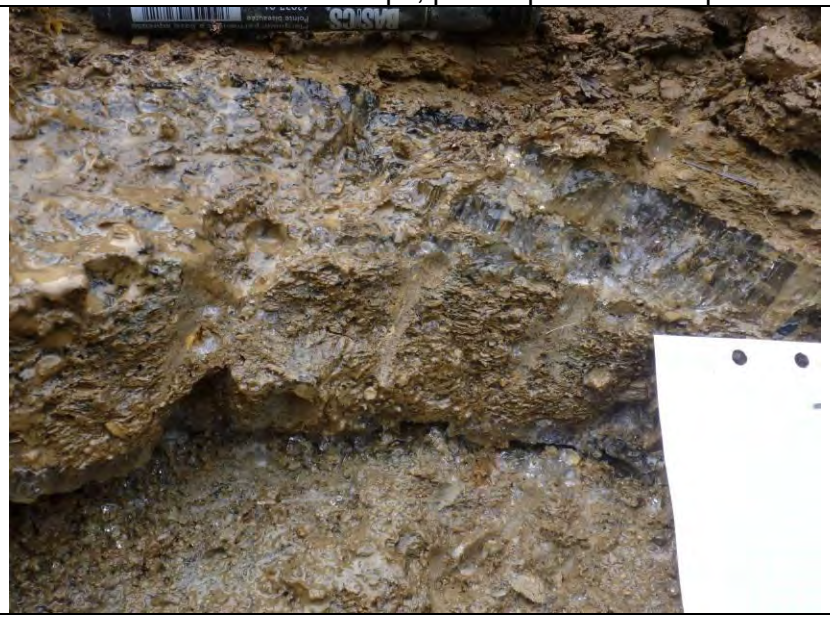
TP-BGC11-93 – Site photo.



TP-BGC11-93 – Back wall of test pit; pit completed at a depth of 1.85 m.



TP-BGC11-93 – Detail of spoil pile.



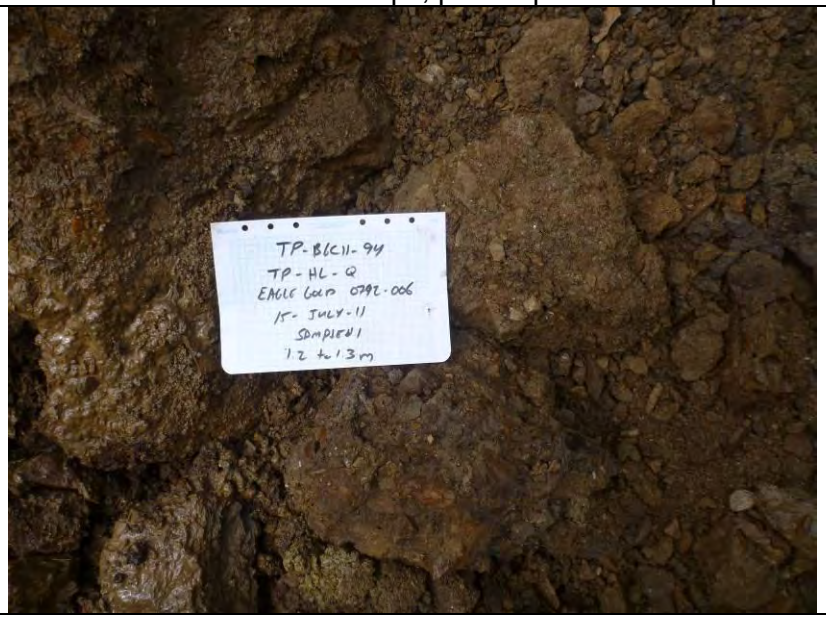
TP-BGC11-93 – Detail of ice in pit wall at 0.4-0.7 m.



TP-BGC11-94 – Back wall of test pit; pit completed at a depth of 5.0 m.



TP-BGC11-94 – Detail of spoil pile.



TP-BGC11-94 – Detail of frozen soil sample taken from 1.2-1.3 m.



TP-BGC11-94 – Detail of soil sample taken from 2.3-2.5 m.



TP-BGC11-95 – Back wall of test pit; pit completed at a depth of 3.2 m.



TP-BGC11-95 – Detail of spoil pile.



TP-BGC11-95 – Detail of pit wall at 0.9-1.1 m.



TP-BGC11-95 – Detail of ice lens.



TP-BGC11-96 – Back wall of test pit; pit completed at a depth of 2.0 m.



TP-BGC11-96 – Detail of spoil pile.



TP-BGC11-96 – Detail of pit wall at 1.3-1.5 m.



TP-BGC11-96 – Detail of frozen soil sample taken from 1.8-2.0 m.



TP-BGC11-97 – Site photo.



TP-BGC11-97 – Trench.



TP-BGC11-97 – Back wall of test pit; pit completed at a depth of 4.0 m.



TP-BGC11-97 – Detail of spoil pile.

	
TP-BGC11-98 – Back wall of test pit; pit completed at a depth of 2.2 m.	TP-BGC11-98 – Detail of spoil pile.

	
TP-BGC11-99 – Back wall of test pit; pit completed at a depth of 2.5 m.	TP-BGC11-99 – Detail of pit wall.

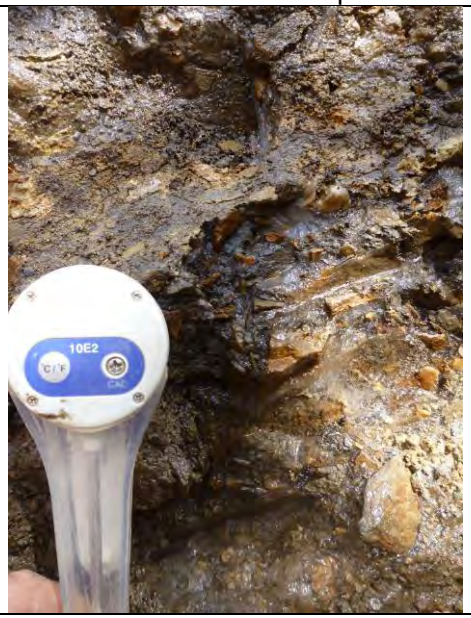
	
TP-BGC11-100 – Back wall of test pit; pit completed at a depth of 3.5 m.	TP-BGC11-100 – Detail of spoil pile.



TP-BGC11-101 – Site photo.



TP-BGC11-101 – Back wall of test pit; pit completed at a depth of 2.4 m.



TP-BGC11-101 – Detail of visible ice in pit wall.



TP-BGC11-101 – Detail of visible ice in pit wall.



TP-BGC11-102 – Site photo; drill pad of BH-BGC11-45.



TP-BGC11-102 – Back wall of test pit; pit completed at a depth of 4.6 m.



TP-BGC11-102 – Detail of spoil pile.



TP-BGC11-102 – Detail of pit wall.



TP-BGC11-103 – Site photo; drill pad of BH-BGC11-67 and 69.



TP-BGC11-103 – Back wall of test pit; pit completed at a depth of 6.0 m.



TP-BGC11-103 – Detail of an excavated bucket.



TP-BGC11-104 – Back wall of test pit; pit completed at a depth of 5.55 m.



TP-BGC11-104 – Detail of spoil pile.



TP-BGC11-104 – Detail of an excavated bucket from below 3.45 m.



TP-BGC11-104 – Detail of pit wall.



TP-BGC11-105 – Site photo.



TP-BGC11-105 – Back wall of test pit; pit completed at a depth of 3.0 m.



TP-BGC11-105 – Detail of pit wall.



TP-BGC11-105 – Detail of bottom of pit.



TP-BGC11-106 – Site photo; drill pad of BH-BGC11-61 and 66.



TP-BGC11-106 – Back wall of test pit; pit completed at a depth of 3.0 m.



TP-BGC11-106 – Detail of visible ice in pit wall.



TP-BGC11-107 – Back wall of test pit; pit completed at a depth of 3.2 m.



TP-BGC11-107 – Detail of spoil pile; excavated from 1.1 m.



TP-BGC11-107 – Detail of melting ice in pit wall.



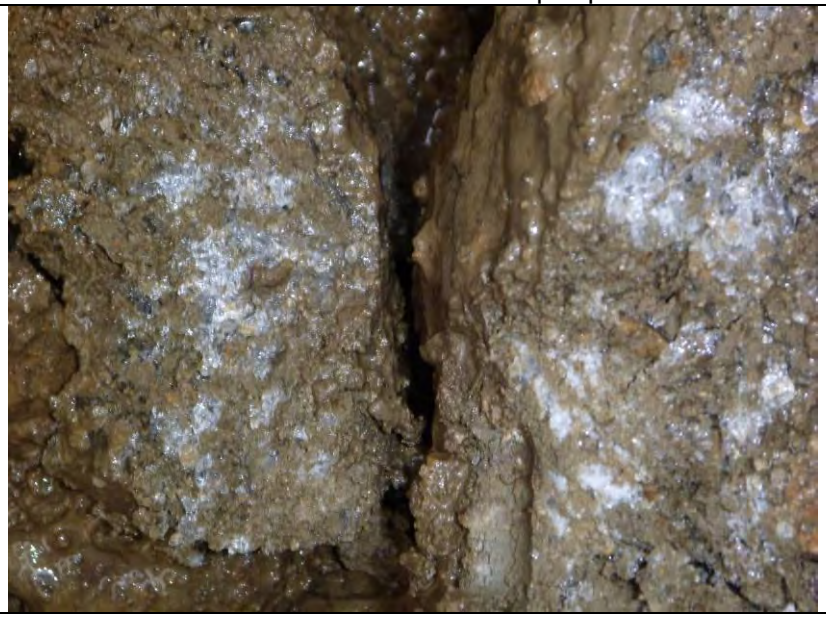
TP-BGC11-108 – Back wall of test pit; pit completed at a depth of 1.5 m.



TP-BGC11-108 – Detail of spoil pile.



TP-BGC11-108 – Detail of scraped frozen ground.



TP-BGC11-108 – Detail of visible ice.



TP-BGC11-109 – Site photo.



TP-BGC11-109 – Back wall of test pit; pit completed at a depth of 5.3 m.



TP-BGC11-109 – Detail of a bucket excavated from 2.3 m.



TP-BGC11-109 – Detail of bottom of pit wall.



TP-BGC11-110 – Site photo.



TP-BGC11-110 – Back wall of test pit; pit completed at a depth of 5.0 m.



TP-BGC11-110 – Detail of a bucket excavated from 5.0 m.



TP-BGC11-110 – Detail of pit wall at 1.2 m.



TP-BGC11-111 – Site photo.



TP-BGC11-111 – Back wall of test pit; pit completed at a depth of 2.0 m.



TP-BGC11-111 – Detail of spoil pile from 2.0 m.



TP-BGC11-111 – Detail of bucket excavated from 2.0 m.



TP-BGC11-112 – Site photo.



TP-BGC11-112 – Back wall of test pit; pit completed at a depth of 2.5 m.



TP-BGC11-112 – Detail of a bucket excavated from 2.5 m.



TP-BGC11-112 – Detail of visible ice in pit wall near surface.



TP-BGC11-113 – Site photo.



TP-BGC11-113 – Back wall of test pit; pit completed at a depth of 2.5 m.



TP-BGC11-113 – Detail of a bucket excavated from 1.5 m.



TP-BGC11-113 – Detail of seepage collecting in pit below 1.5 m.



TP-BGC11-114 – Site photo.



TP-BGC11-114 – Back wall of test pit; pit completed at a depth of 3.2 m.



TP-BGC11-114 – Detail of a bucket excavated from 2.3 m.



TP-BGC11-114 – Detail of frozen material from 2.3 m.



TP-BGC11-115 – Site photo.



TP-BGC11-115 – Back wall of test pit; pit completed at a depth of 5.7 m.



TP-BGC11-115 – Detail of a bucket excavated from 2.5 m.



TP-BGC11-115 – Detail of material from 5.7 m.



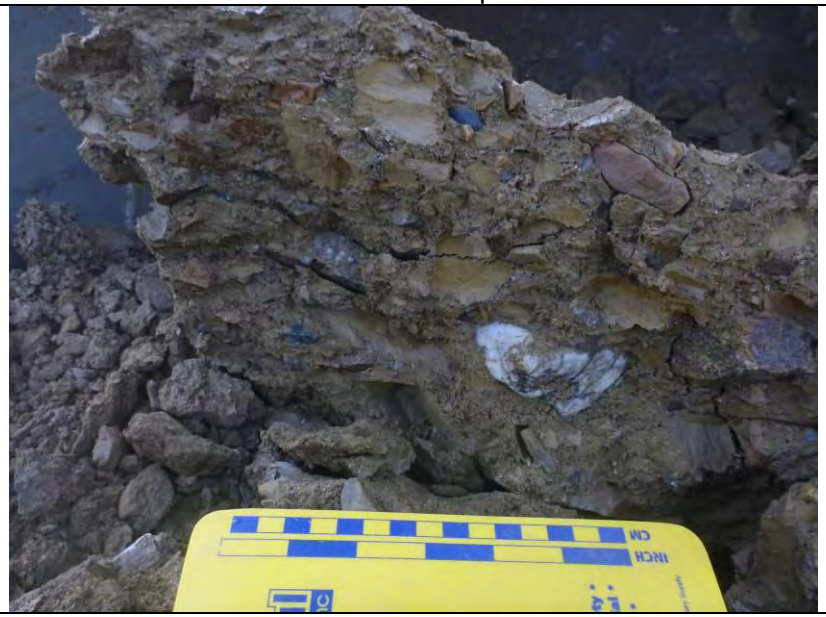
TP-BGC11-116 – Back wall of test pit; pit completed at a depth of 2.3 m.



TP-BGC11-116 – Detail of pit wall at 1.3 m.



TP-BGC11-116 – Detail of seepage in pit wall.



TP-BGC11-116 – Detail of frozen material.



TP-BGC11-117 – Pit completed at depth of 8.0 m.



TP-BGC11-117 – Cut slope wall above pit.



TP-BGC11-117 – Detail of pit wall at 2.3 m.



TP-BGC11-117 – Detail of cut slope wall.



TP-BGC11-118 – Site photo.



TP-BGC11-118 – Back wall of test pit; pit completed at a depth of 5.3 m.



TP-BGC11-118 – Detail of highly weathered bedrock in bucket from 2.3 m.



TP-BGC11-118 – Detail of pit wall at 1.2 m.



TP-BGC11-119 – Site photo.



TP-BGC11-119 – Back wall of test pit; pit completed at a depth of 2.05 m.



TP-BGC11-119 – Detail of spoil pile.



TP-BGC11-119 – Detail of pit wall.



TP-BGC11-120 – Site photo.



TP-BGC11-120 – Spoil pile.



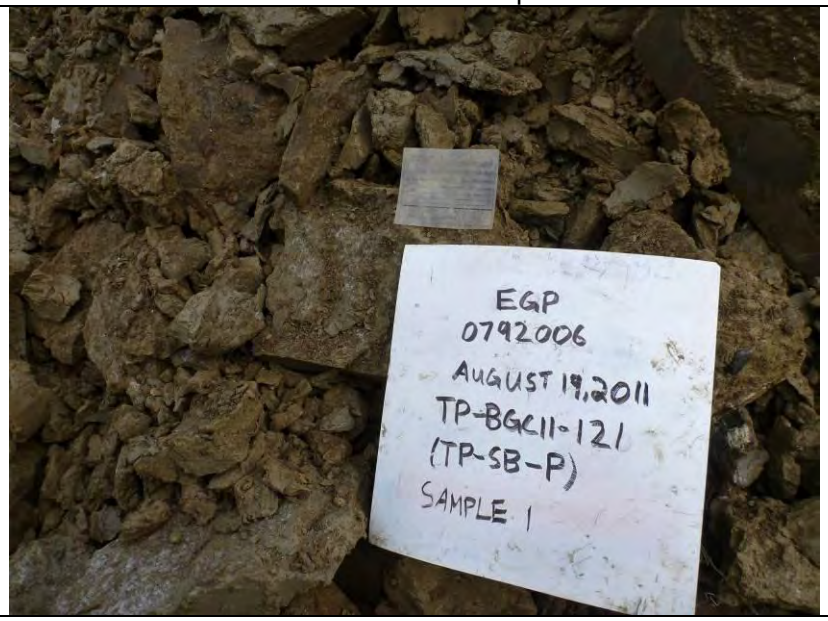
TP-BGC11-120 – Detail of spoil pile.



TP-BGC11-121 – Site photo.



TP-BGC11-121 – Back wall of test pit; pit completed at a depth of 3.3 m.



TP-BGC11-121 – Detail of spoil pile.



TP-BGC11-121 – Detail of lensed ice in pit wall.



TP-BGC11-122 – Site photo.



TP-BGC11-122 – Back wall of test pit; pit completed at a depth of 5.8 m.



TP-BGC11-122 – Detail of a bucket excavated from 5.4-5.8 m.



TP-BGC11-122 – Detail of upper pit wall.



TP-BGC11-123 – Site photo.



TP-BGC11-123 – Back wall of test pit; pit completed at a depth of 2.4 m.



TP-BGC11-123 – Detail of a bucket excavated from 2.4 m.



TP-BGC11-123 – Detail of massive ice in pit wall.



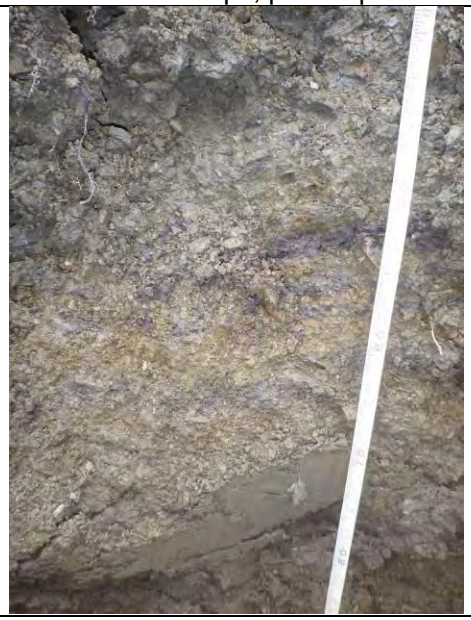
TP-BGC11-124 – Site photo.



TP-BGC11-124 – Back wall of test pit; pit completed at a depth of 6.5 m.



TP-BGC11-124 – Detail of a bucket excavated from 6.2-6.4 m.



TP-BGC11-124 – Detail of pit wall.



TP-BGC11-125 – Site photo.



TP-BGC11-125 – Pit completed at a depth of 2.5 m.



TP-BGC11-125 – Detail of frozen soil chunks in spoil pile.



TP-BGC11-125 – Using ripper shank to penetrate frozen ground.



TP-BGC11-126 – Site photo.



TP-BGC11-126 – Back wall of test pit; pit completed at a depth of 3.1 m.



TP-BGC11-126 – Detail of spoil pile.



TP-BGC11-126 – Detail of topsoil.



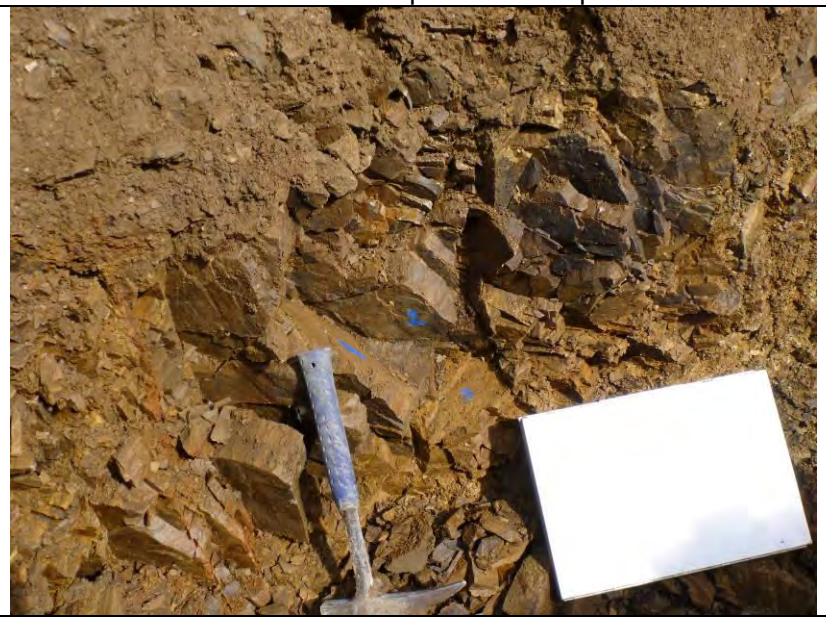
TP-BGC11-127 – Site photo.



TP-BGC11-127 – Pit completed at a depth of 2.5 m.



TP-BGC11-127 – Detail of spoil pile.



TP-BGC11-127 – Detail of structure of bedrock unit at base of pit.



TP-BGC11-128 – Back wall of test pit; pit completed at a depth of 3.0 m.



TP-BGC11-128 – Detail of spoil pile.



TP-BGC11-128 – Detail of pit wall.



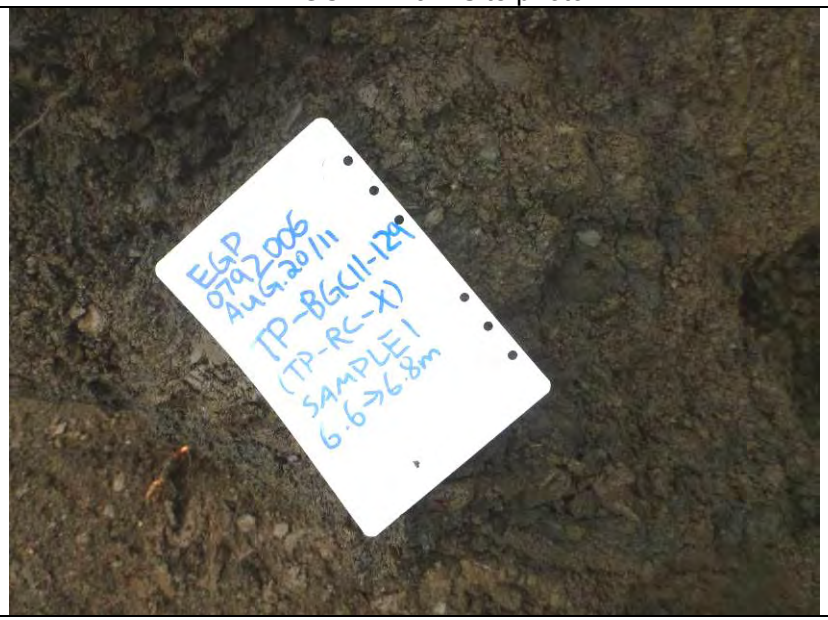
TP-BGC11-128 – Chunk of intact ice recovered at 1.8 m.



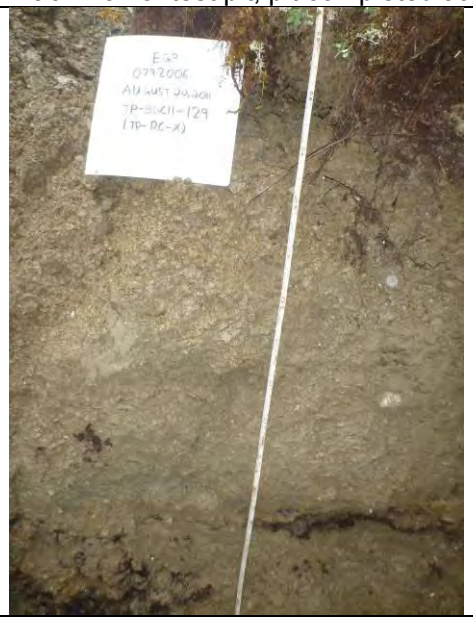
TP-BGC11-129 – Site photo.



TP-BGC11-129 – Back wall of test pit; pit completed at a depth of 6.8 m.



TP-BGC11-129 – Detail of a bucket excavated from 6.6-6.8 m.



TP-BGC11-129 – Detail of upper pit wall.



TP-BGC11-130 – Site photo.



TP-BGC11-130 – Back wall of test pit; pit completed at a depth of 6.0 m.



TP-BGC11-130 – Detail of a bucket excavated from 5.8-6.0 m.



TP-BGC11-130 – Detail of upper pit wall.



TP-BGC11-131 – Site photo.



TP-BGC11-131 – Back wall of test pit; pit completed at a depth of 3.5 m.



TP-BGC11-131 – Detail of spoil pile.



TP-BGC11-131 – Detail of fluvial material in pit wall.



TP-BGC11-132 – Site photo after completion of test pit.



TP-BGC11-132 – Back wall of test pit; pit completed at a depth of 5.3 m.



TP-BGC11-132 – Detail of spoil pile.



TP-BGC11-132 – Detail of pit wall.



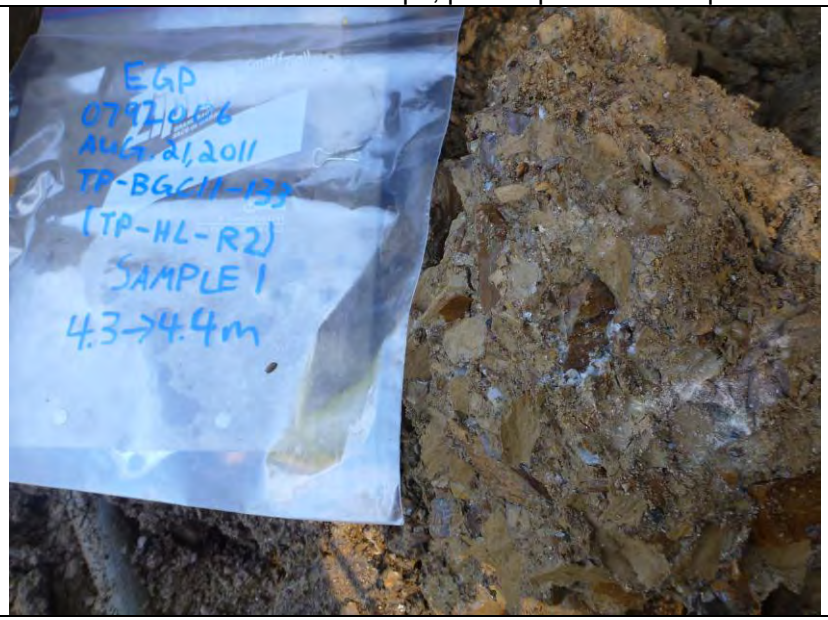
TP-BGC11-133 – Site photo.



TP-BGC11-133 – Back wall of test pit; pit completed at a depth of 4.4 m.



TP-BGC11-133 – Detail of gravelly unit in upper pit wall.



TP-BGC11-133 – Detail of frozen gravel/silt material in bucket.



TP-BGC11-134 – Site photo.



TP-BGC11-134 – Back wall of test pit; pit completed at a depth of 4.2 m.



TP-BGC11-134 – Spoil pile (hammer for scale).



TP-BGC11-134 – Detail of pit wall.



TP-BGC11-135 – Back wall of test pit; pit completed at a depth of 3.5 m.



TP-BGC11-135 – Detail of spoil pile.



TP-BGC11-135 – Detail of upper pit wall to 1.5 m.



TP-BGC11-135 – Detail of base of pit at 3.5 m.



TP-BGC11-136 – Site photo; drill pad of BH-BGC11-52.



TP-BGC11-136 – Back wall of test pit; pit completed at a depth of 4.8 m.



TP-BGC11-136 – Detail of upper pit wall to 1.4 m.



TP-BGC11-136 – Detail of sample taken from 1.0-1.2 m.



TP-BGC11-137 – Site photo.



TP-BGC11-137 – Back wall completed to depth of 5.0 m.



TP-BGC11-137 – Gradational bedrock weathering in pit wall.



TP-BGC11-137 – Detail of weathered bedrock in spoil pile.



TP-BGC11-138 – Back wall of test pit; pit completed at a depth of 6.3 m.



TP-BGC11-138 – Detail of spoil pile at 5.9 m.



TP-BGC11-138 – Detail of pit wall at 5.5 m.



TP-BGC11-138 – Detail of bedrock structure at base of pit (2.0 m).



TP-BGC11-139 – Site photo; along wall of exploration trench.



TP-BGC11-139 – Dug areas along trench wall (3.0 m).



TP-BGC11-139 – Detail of highly weathered bedrock at 1.2 m.



TP-BGC11-139 – Detail of lightly weathered bedrock at base of trench.



TP-BGC11-140 – Site photo.



TP-BGC11-140 – Back wall of test pit; pit completed at a depth of 4.5 m.



TP-BGC11-140 – Detail of spoil pile.



TP-BGC11-140 – Detail of pit wall at 2.8 m.



TP-BGC11-141 – Site photo.



TP-BGC11-141 – Back wall of test pit; pit completed at a depth of 4.95 m.



TP-BGC11-141 – Detail of spoil pile at 4.0 m.



TP-BGC11-142 – Site photo.



TP-BGC11-142 – Back wall of test pit; pit completed at a depth of 4.1 m.



TP-BGC11-142 – Detail of a bucket from 2.6 m.



TP-BGC11-142 – Detail of pit wall at 0.5 m.



TP-BGC11-143 – Site photo at beginning of excavation (0.9 m).



TP-BGC11-143 – Back wall of test pit; pit completed at a depth of 2.2 m.



TP-BGC11-143 – Detail of a bucket excavated from 2.2 m.



TP-BGC11-143 – Detail of pit wall 0.0-0.5 m.



TP-BGC11-144 – Site photo; angular boulders on surface.



TP-BGC11-144 – Back wall of test pit; pit completed at a depth of 1.0 m.



TP-BGC11-144 – Detail of back wall; pit abandoned due to seepage.



TP-BGC11-144 – Seepage upslope from test pit.



TP-BGC11-145 – Site photo; drill pad of BH-BGC11-31.



TP-BGC11-145 – Back wall of test pit; pit completed at a depth of 1.5 m.



TP-BGC11-145 – Detail of wall at 0.5 m.



TP-BGC11-145 – Detail of wall at 1.2 m.

APPENDIX E
BOREHOLE LOGS

BOREHOLE LOGS

Table E- 1: Summary of Boreholes

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Drilling Method	Hole Depth (m)	Installation	Comments
BH-BGC11-24	7102237.7	460624.8	1208.4	Diamond	20.9	--	
BH-BGC11-25	7102179.3	460414.7	1182.8	Diamond	20.4	2" solid PVC	
BH-BGC11-26	7102088.1	460205.8	1150.0	Diamond	30.2	Standpipe piezometer	
BH-BGC11-27	7102232.5	460043.5	1100.2	Diamond	26.5	--	
BH-BGC11-28	7101702.7	459926.5	1010.6	Diamond	40.8	2" solid PVC	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-29	7101802.1	459977.8	1045.3	Diamond	41.2	Standpipe piezometer	
BH-BGC11-30	7101567.8	460122.0	952.0	Diamond	35.1	Standpipe piezometer	
BH-BGC11-31	7101483.0	459850.9	917.8	Diamond	35.1	2" solid PVC	
BH-BGC11-32	7100934.4	458745.2	818.7	Diamond	24.4	Standpipe piezometer	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-33	7100983.6	459115.7	833.0	Diamond	41.4	Standpipe piezometer	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-34	7101053.5	459308.5	848.3	Diamond	38.1	Standpipe piezometer	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-35	7100440.3	459695.7	986.3	Diamond	50.3	Standpipe piezometer	
BH-BGC11-36	7100274.7	459699.9	1002.5	Diamond	50.3	Standpipe piezometer	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-37	7100180.5	459762.8	1034.4	Diamond	43.6	Standpipe piezometer	Standpipe damaged, Jul 2011
BH-BGC11-38	7100416.0	459820.0	1013.0	Diamond	50.5	Standpipe piezometer	
BH-BGC11-39	7101056	458462	804	Auger	28.2	Standpipe piezometer	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-40A	7100038	459763	1050	Diamond	33.2	--	
BH-BGC11-40B	7100038.8	459767.0	1049.8	Diamond	45.7	Standpipe piezometer	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-41	7100999	459777	914	Auger	4.3	--	

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Drilling Method	Hole Depth (m)	Installation	Comments
BH-BGC11-42	7100150.1	460272.3	1098.7	Auger	28.2	25 m thermistor	
BH-BGC11-43	7099106.6	459658.1	1034.0	Diamond	23.8	--	
BH-BGC11-44	7100547.3	458690.4	830.0	Auger	14.7	10 m thermistor	
BH-BGC11-45	7099109.5	460556.2	1354.4	Diamond	20.7	Standpipe piezometer	
BH-BGC11-46	7099004.0	460262.7	1246.1	Diamond	20.1	Standpipe piezometer	
BH-BGC11-47	7100698.9	458811.9	841.8	Auger	16.0	10 m thermistor	
BH-BGC11-48	7099118.1	459936.0	1140.0	Diamond	32.9	Standpipe piezometer	
BH-BGC11-49	7100635.9	458746.5	835.1	Auger	16.0	10 m thermistor	Thermistor removed, Aug 2011
BH-BGC11-50	7099997.6	459791.3	1058.4	Diamond	41.2	--	
BH-BGC11-51	7100743.6	458643.5	818.4	Auger	25.2	25 m thermistor	
BH-BGC11-52	7101316.4	459891.2	909.0	Diamond	22.6	Standpipe piezometer	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-53	7100993.0	459483.6	875.7	Auger	14.5	--	
BH-BGC11-54	7101245.6	458886.2	883.8	Diamond	41.2	Vibrating wire piezometer	
BH-BGC11-55	7100918.4	459440.6	881.0	Auger	14.5	Standpipe piezometer	
BH-BGC11-56	7099822.7	458774.8	845.6	Auger	13.7	2" solid PVC	
BH-BGC11-57	7099978.2	458798.6	859.2	Auger	12.1	Standpipe piezometer and 10 m thermistor	
BH-BGC11-58	7100119.4	458799.8	859.0	Auger	10.8	10 m thermistor	
BH-BGC11-59	7101239.4	459113.1	883.7	Diamond	30.2	Standpipe piezometer	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-60	7100041.6	458795.6	859.2	Auger	9.2	Standpipe piezometer	
BH-BGC11-61	7100013	460367	1157	Auger	2.7	--	
BH-BGC11-62	7100334.1	459785.9	1017.9	Diamond	35.1	Standpipe piezometer	Conducted downhole seismic investigation, Aug 2011
BH-BGC11-63	7100114.1	460302.9	1100.7	Auger	26.7	Vibrating wire piezometer and 25 m thermistor	
BH-BGC11-64	7100262.9	460182.4	1044.1	Diamond	48.8	Standpipe piezometer	
BH-BGC11-65	7100939	458771	825	Auger	6.9	--	

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Drilling Method	Hole Depth (m)	Installation	Comments
BH-BGC11-66	7100011.1	460360.2	1151.9	Diamond	33.5	2" solid PVC	
BH-BGC11-67	7101148	458823	867	Auger	9.9	--	
BH-BGC11-69	7101144.3	458829.3	861.6	Diamond	21.3	2" solid PVC	Conducted downhole seismic investigation, Aug 2011

NOTES:
1. Holes surveyed in August and September 2011 using a differential GPS, with the exception of BH-BGC11-39,40A,41,61,65 and 67, which were surveyed by BGC staff using a handheld GPS.
2. Coordinates in UTM NAD 83, Zone 8N.

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-24

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m): 460,624.8E - 7,102,237.7N
GROUND ELEVATION (m) : 1,208.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 0.00

START DATE : 28 Jun 11
FINISH DATE : 29 Jun 11
FINAL DEPTH (m) : 20.9
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : JND/SP/EB
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GM) Silty, trace sand, maximum particle size = 60 mm, angular. Fines are low to medium plasticity, orange-brown, wet. Clasts are quartz, weak to strong (R2 to R4), iron stained. [COLLUVIUM]		
1				GRAVEL (GW) Trace silt, well graded, maximum particle size = 50 mm, weak (R2), wet. Clasts are slightly weathered iron stained. [COLLUVIUM]		
2				Rock encountered at 1.81 m depth. Refer to rock log.		
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

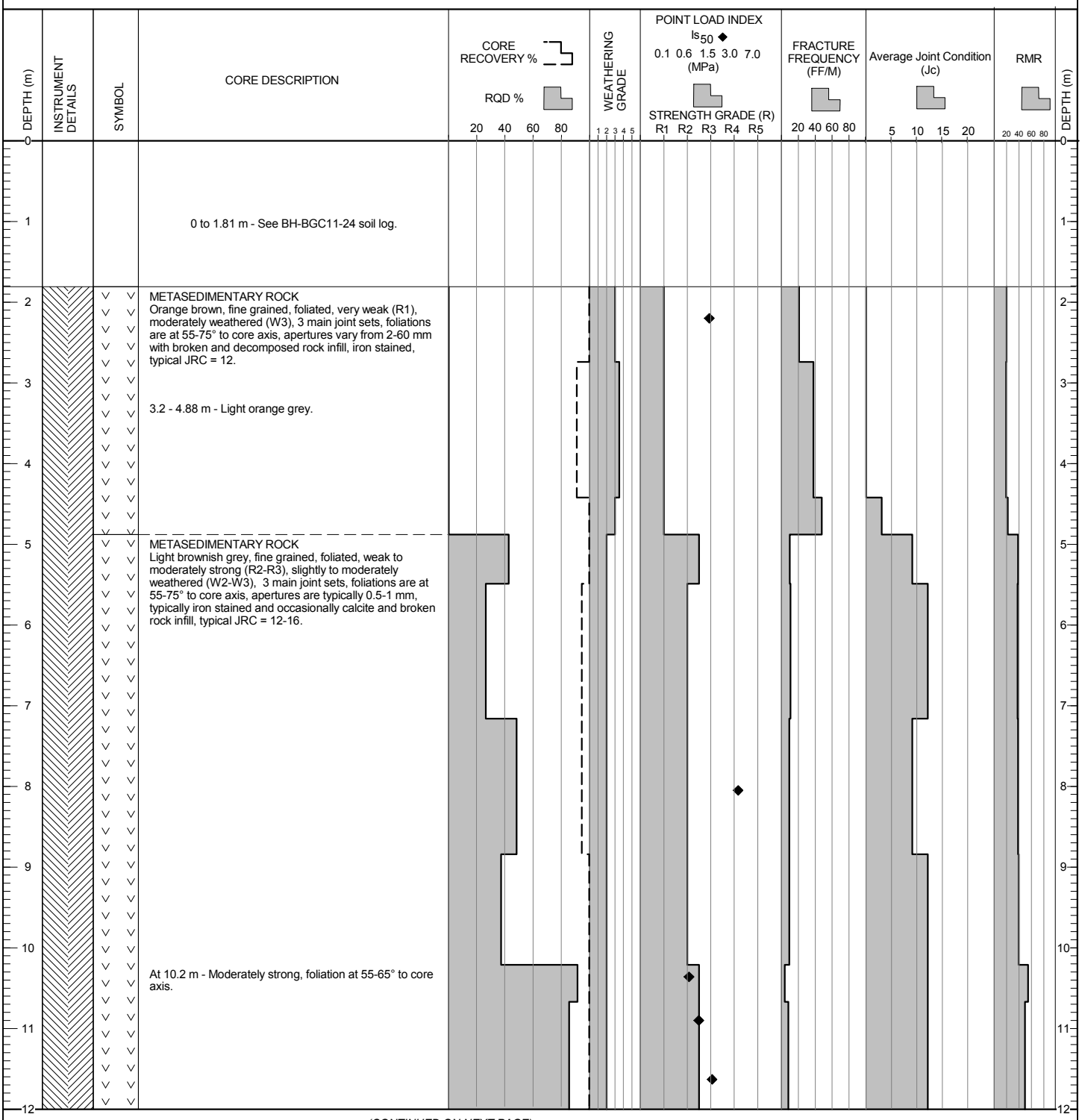
DRILL HOLE # BH-BGC11-24

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 460,624.8E - 7,102,237.7N
GROUND ELEVATION (m) : 1,208.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 0

START DATE : 28 Jun 11
FINISH DATE : 29 Jun 11
FINAL DEPTH (m) : 20.9
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : JND/SP/EB
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

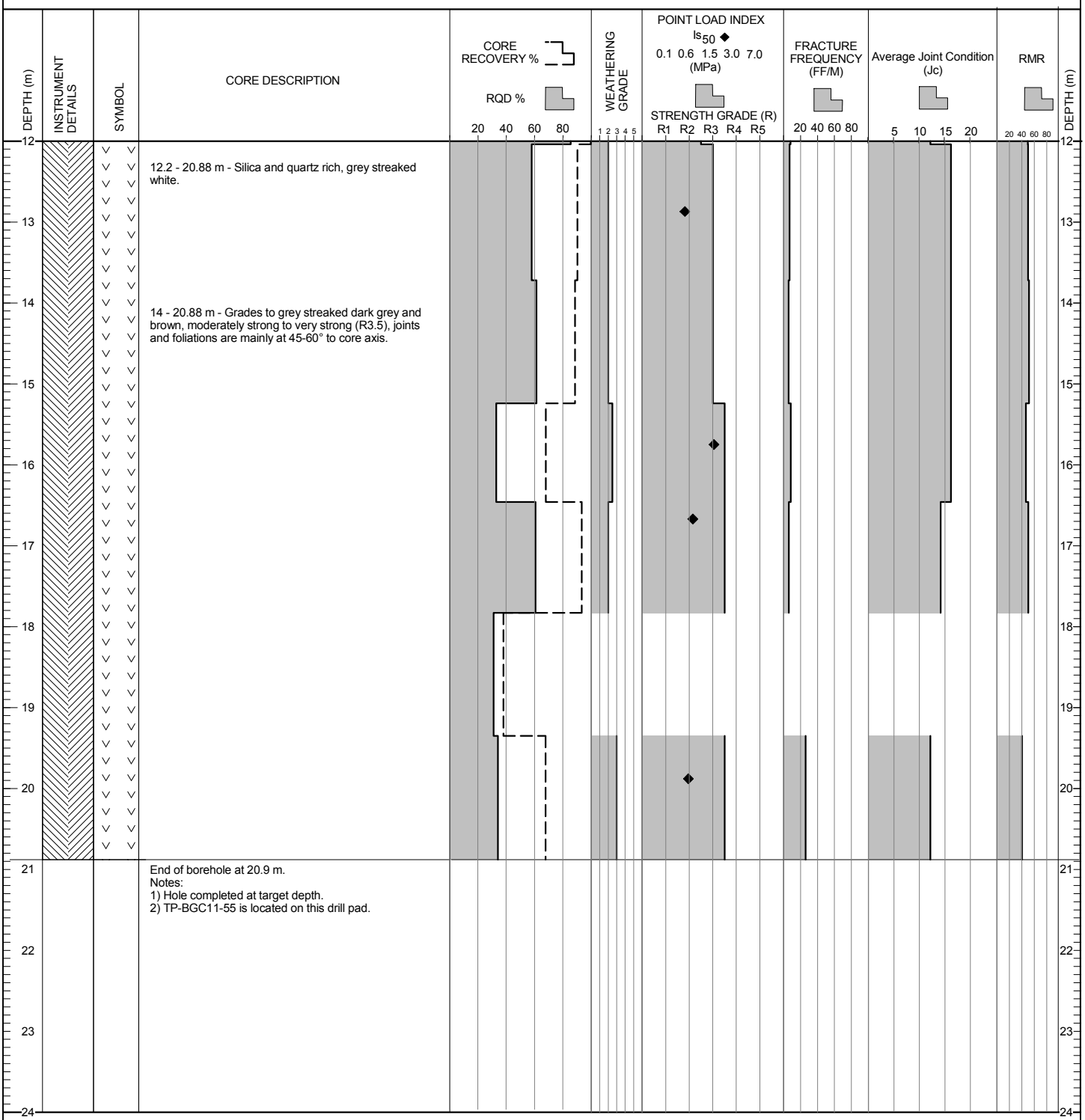
DRILL HOLE # BH-BGC11-24

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 460,624.8E - 7,102,237.7N
GROUND ELEVATION (m) : 1,208.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 0

START DATE : 28 Jun 11
FINISH DATE : 29 Jun 11
FINAL DEPTH (m) : 20.9
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : JND/SP/EB
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-25

LOCATION : ANN GULCH

CO-ORDINATES (m): 460,414.7E - 7,102,179.3N
GROUND ELEVATION (m) : 1,182.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 3.05

START DATE : 29 Jun 11
FINISH DATE : 30 Jun 11
FINAL DEPTH (m) : 20.4
DEPTH TO TOP OF ROCK (m) : 0.9
LOGGED BY : SD/SP/EB
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GM) Silty, some sand, trace cobbles, trace boulders, well graded, loose, maximum particle size = 250 mm, angular, iron staining. Fines: low plastic, firm to stiff, brown, moist, heterogeneous. [COLLUVIUM]		
0.9				Rock encountered at 0.90 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P%, W%, W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

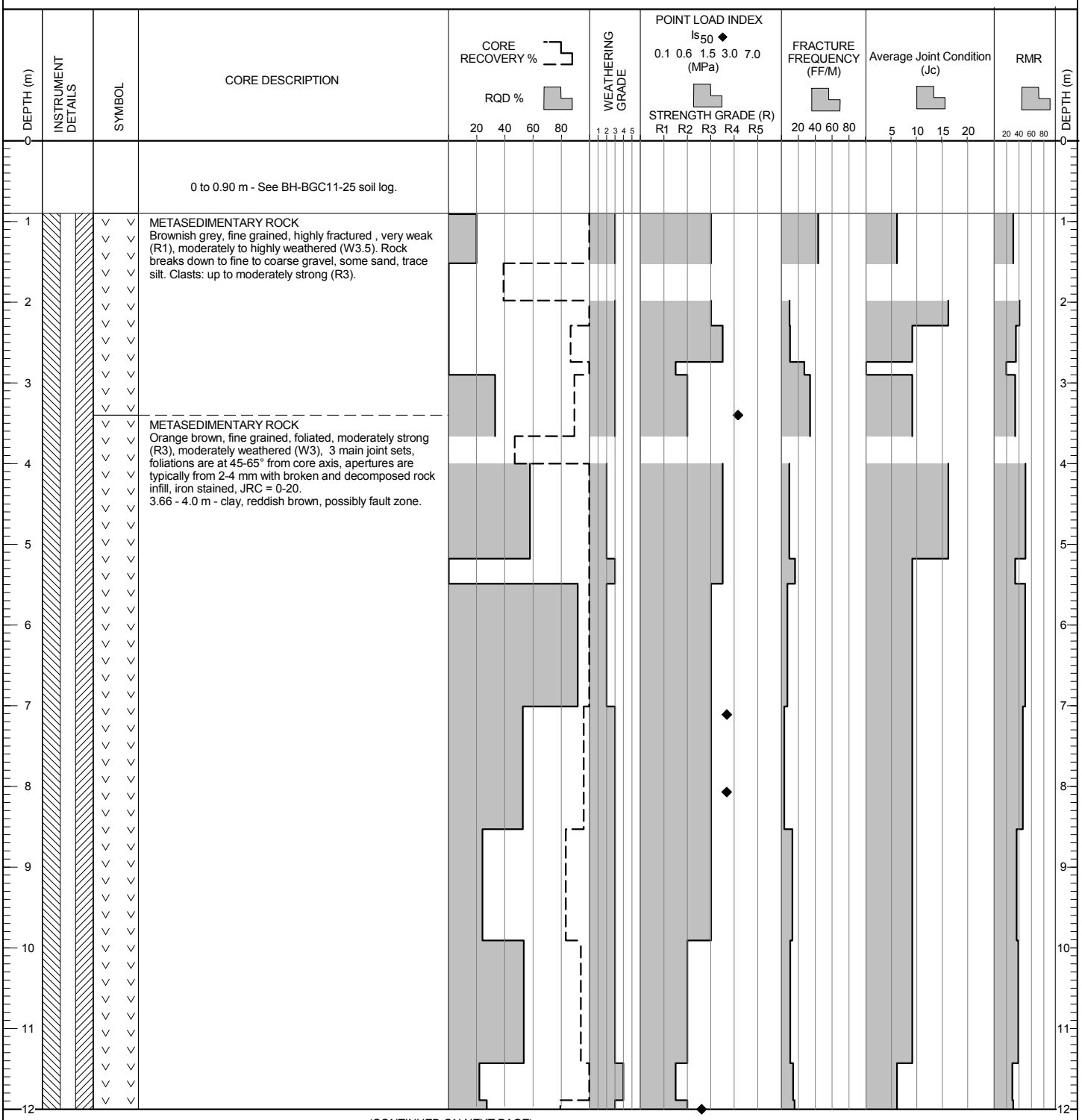
DRILL HOLE # BH-BGC11-25

LOCATION : ANN GULCH

CO-ORDINATES (m) 460,414.7E - 7,102,179.3N
GROUND ELEVATION (m) : 1,182.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 29 Jun 11
FINISH DATE : 30 Jun 11
FINAL DEPTH (m) : 20.4
DEPTH TO TOP OF ROCK (m) : 0.9
LOGGED BY : SD/SP/EB
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

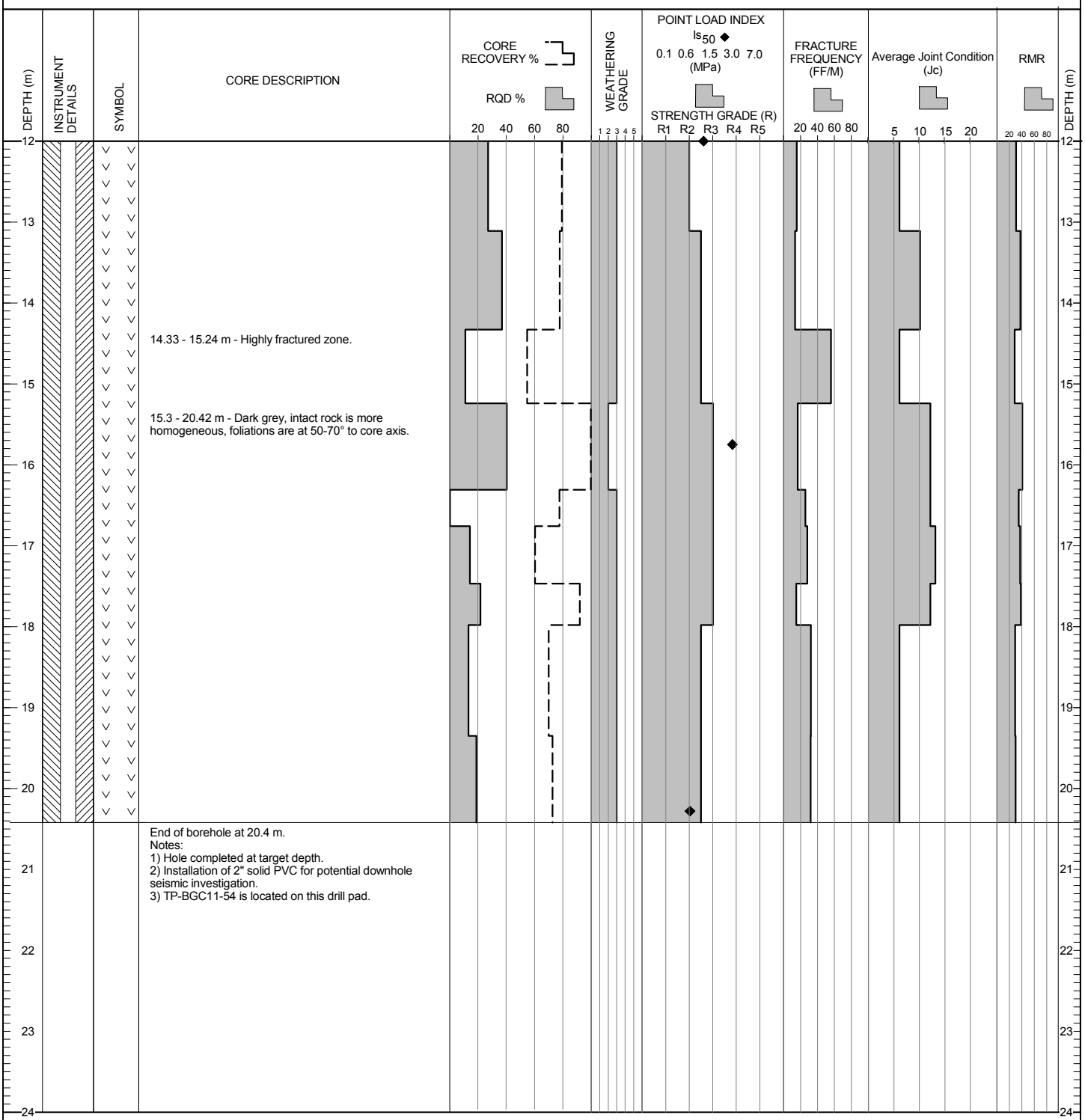
DRILL HOLE # BH-BGC11-25

LOCATION : ANN GULCH

CO-ORDINATES (m) 460,414.7E - 7,102,179.3N
GROUND ELEVATION (m) : 1,182.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 29 Jun 11
FINISH DATE : 30 Jun 11
FINAL DEPTH (m) : 20.4
DEPTH TO TOP OF ROCK (m) : 0.9
LOGGED BY : SD/SP/EB
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

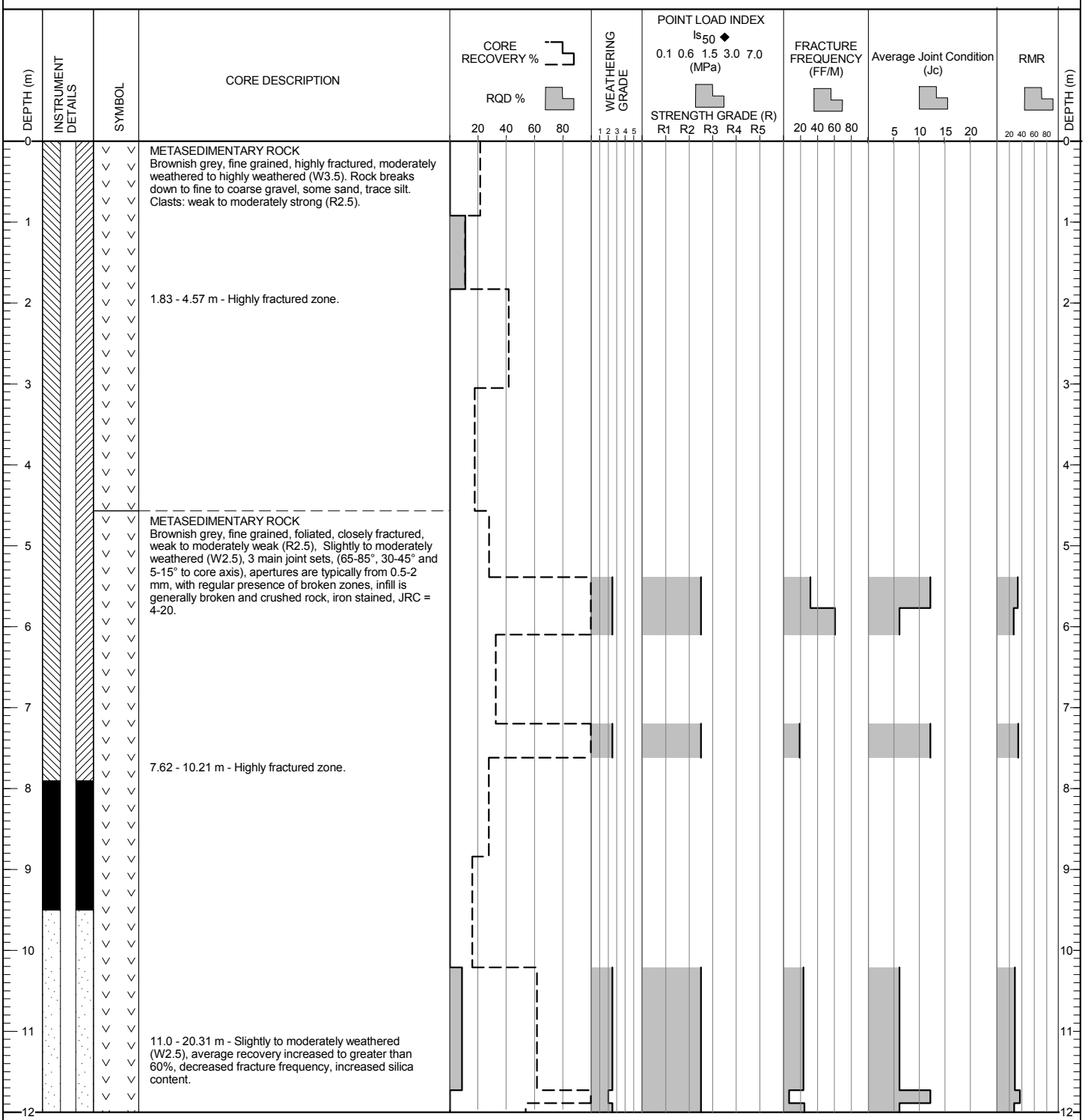
DRILL HOLE # BH-BGC11-26

LOCATION : ANN GULCH

CO-ORDINATES (m) 460,205.8E - 7,102,088.1N
GROUND ELEVATION (m) : 1,139.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 6.1

START DATE : 01 Jul 11
FINISH DATE : 01 Jul 11
FINAL DEPTH (m) : 30.2
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

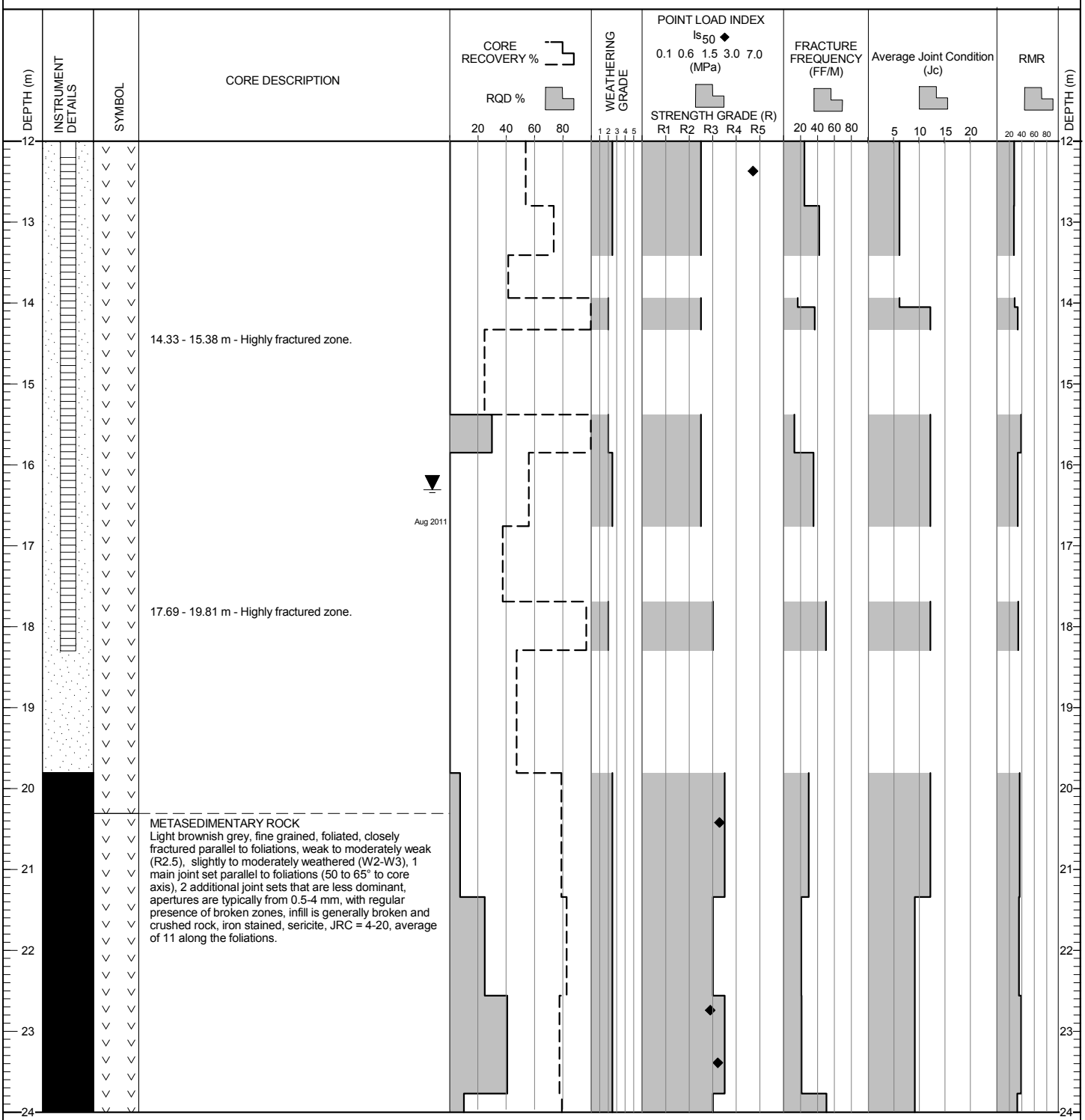
DRILL HOLE # BH-BGC11-26

LOCATION : ANN GULCH

CO-ORDINATES (m) 460,205.8E - 7,102,088.1N
GROUND ELEVATION (m) : 1,139.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 6.1

START DATE : 01 Jul 11
FINISH DATE : 01 Jul 11
FINAL DEPTH (m) : 30.2
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

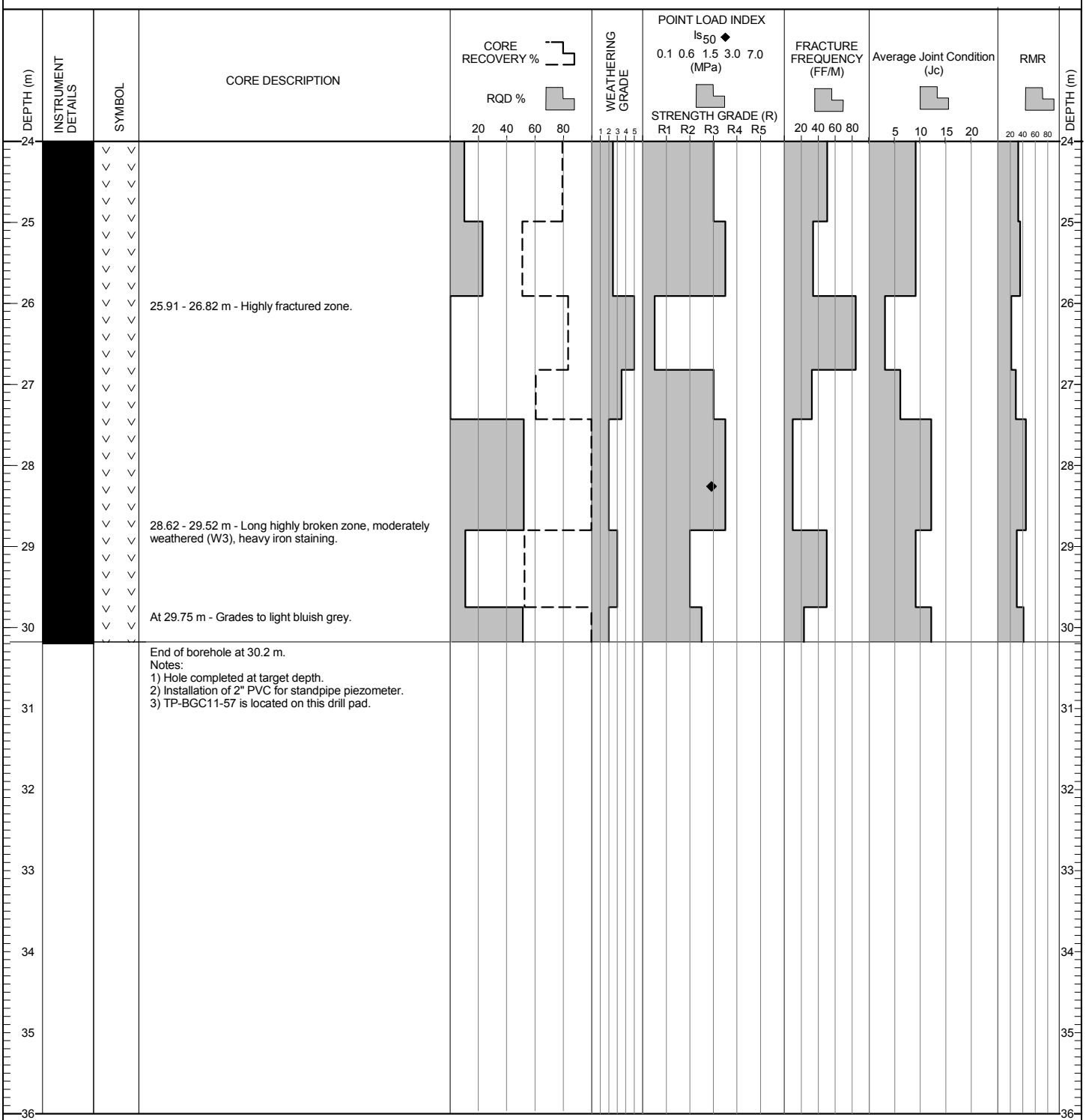
DRILL HOLE # BH-BGC11-26

LOCATION : ANN GULCH

CO-ORDINATES (m) 460,205.8E - 7,102,088.1N
GROUND ELEVATION (m) : 1,139.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 6.1

START DATE : 01 Jul 11
FINISH DATE : 01 Jul 11
FINAL DEPTH (m) : 30.2
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



End of borehole at 30.2 m.
Notes:
1) Hole completed at target depth.
2) Installation of 2" PVC for standpipe piezometer.
3) TP-BGC11-57 is located on this drill pad.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-27

LOCATION : ANN GULCH

CO-ORDINATES (m): 460,043.5E - 7,102,232.5N
GROUND ELEVATION (m) : 1,100.2m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 0.00

START DATE : 04 Jul 11
FINISH DATE : 05 Jul 11
FINAL DEPTH (m) : 26.5
DEPTH TO TOP OF ROCK (m) : 2.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GM) Some silt, trace sand, trace cobbles, well graded, maximum particle size = 200 mm, flat and elongated, angular, iron staining. [HIGHLY WEATHERED METASEDIMENTARY ROCK]		
2				Rock encountered at 2.10 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-27

LOCATION : ANN GULCH

CO-ORDINATES (m) 460,043.5E - 7,102,232.5N
GROUND ELEVATION (m) : 1,100.2m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 0

START DATE : 04 Jul 11
FINISH DATE : 05 Jul 11
FINAL DEPTH (m) : 26.5
DEPTH TO TOP OF ROCK (m) : 2.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0										0
1			0 to 2.10 m - See BH-BGC11-27 soil log.							1
2										2
3			METASEDIMENTARY ROCK Brownish grey, fine grained, highly fractured, very weak to strong (R1 to R3), moderately weathered to highly weathered (W3.5). Rock breaks down to fine to coarse gravel, some sand, trace silt. 2.13 - 7.62 m - Highly fractured zone, very low recovery.							3
4										4
5										5
6										6
7										7
8										8
9			9.14 - 13.11 m - Highly fractured zone.							9
10										10
11										11
12										12

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

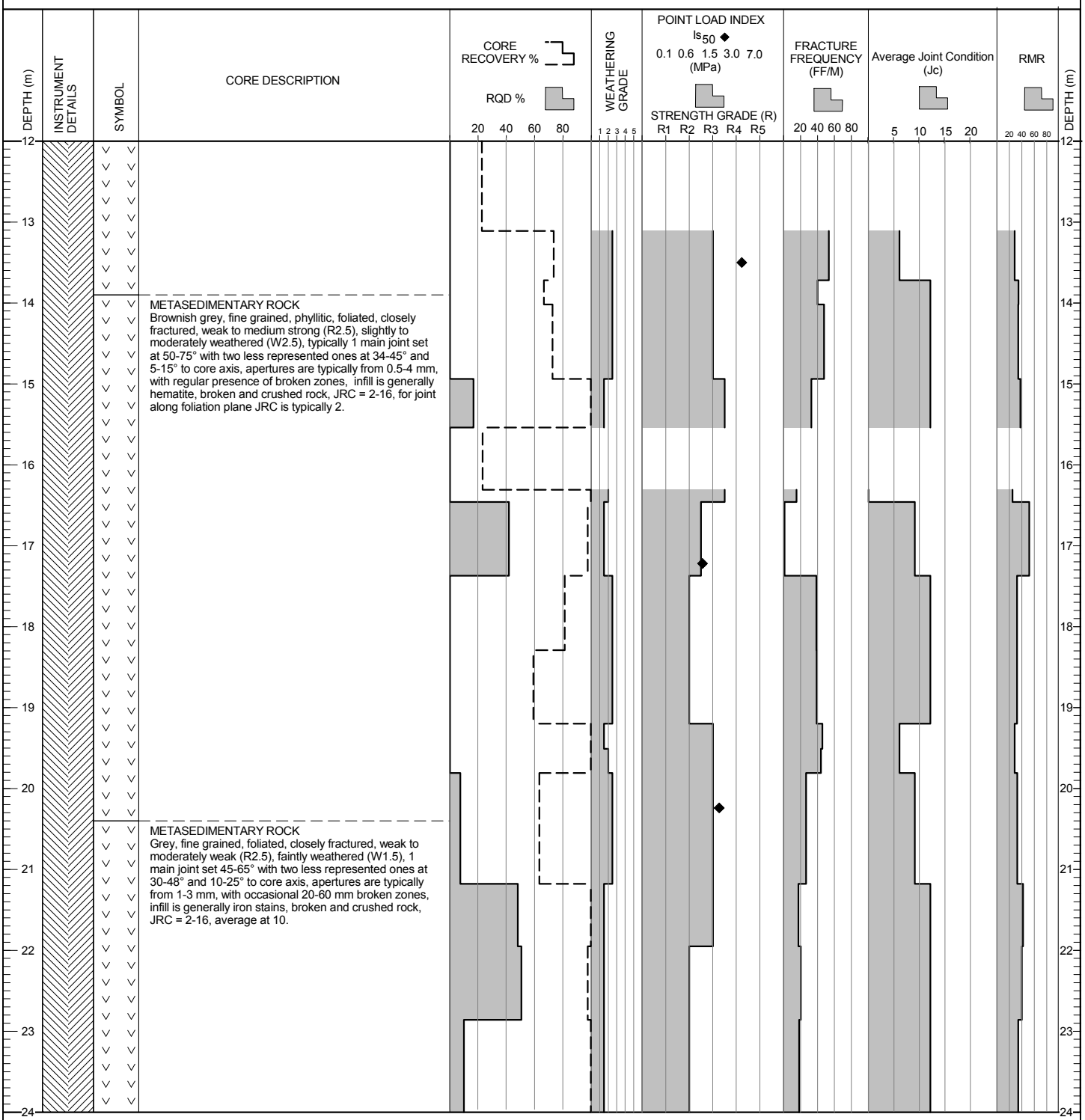
DRILL HOLE # BH-BGC11-27

LOCATION : ANN GULCH

CO-ORDINATES (m) 460,043.5E - 7,102,232.5N
GROUND ELEVATION (m) : 1,100.2m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 0

START DATE : 04 Jul 11
FINISH DATE : 05 Jul 11
FINAL DEPTH (m) : 26.5
DEPTH TO TOP OF ROCK (m) : 2.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



METASEDIMENTARY ROCK
Brownish grey, fine grained, phyllitic, foliated, closely fractured, weak to medium strong (R2.5), slightly to moderately weathered (W2.5), typically 1 main joint set at 50-75° with two less represented ones at 34-45° and 5-15° to core axis, apertures are typically from 0.5-4 mm, with regular presence of broken zones, infill is generally hematite, broken and crushed rock, JRC = 2-16, for joint along foliation plane JRC is typically 2.

METASEDIMENTARY ROCK
Grey, fine grained, foliated, closely fractured, weak to moderately weak (R2.5), faintly weathered (W1.5), 1 main joint set 45-65° with two less represented ones at 30-48° and 10-25° to core axis, apertures are typically from 1-3 mm, with occasional 20-60 mm broken zones, infill is generally iron stains, broken and crushed rock, JRC = 2-16, average at 10.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

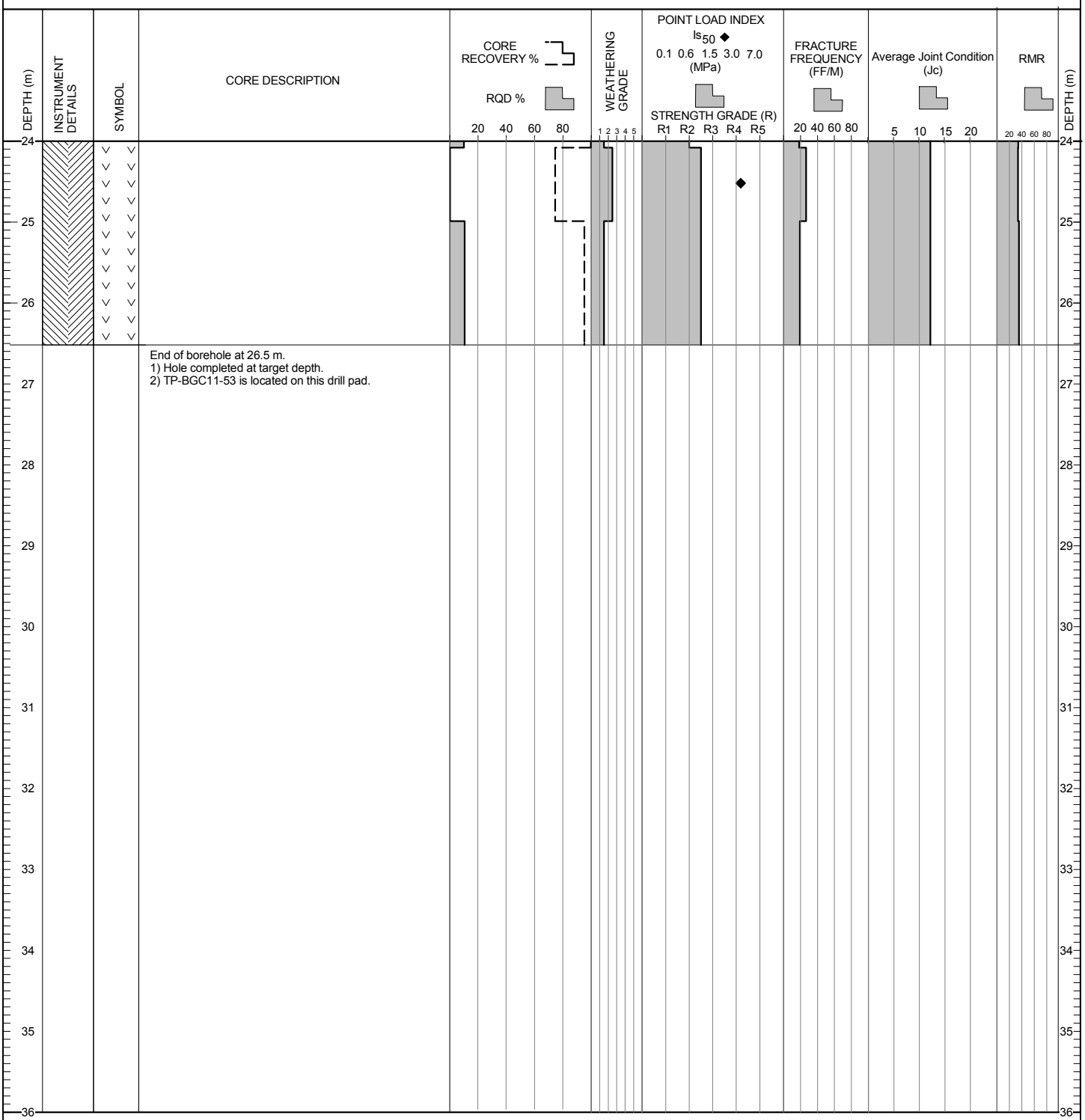
DRILL HOLE # BH-BGC11-27

LOCATION : ANN GULCH

CO-ORDINATES (m) 460,043.5E - 7,102,232.5N
GROUND ELEVATION (m) : 1,100.2m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 0

START DATE : 04 Jul 11
FINISH DATE : 05 Jul 11
FINAL DEPTH (m) : 26.5
DEPTH TO TOP OF ROCK (m) : 2.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-28

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,926.5E - 7,101,702.7N
GROUND ELEVATION (m) : 1,010.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 7.62

START DATE : 04 Jul 11
FINISH DATE : 06 Jul 11
FINAL DEPTH (m) : 40.8
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

METASEDIMENTARY ROCK
Brownish grey, fine grained, highly fractured, moderately weathered (W3). Rock breaks down to fine to coarse gravel, some sand, trace silt.

1.52 - 5.06 m - Highly fractured zone.

6.1 - 9.14 m - Highly fractured zone.

10.67 - 13.72 m - Highly fractured zone.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

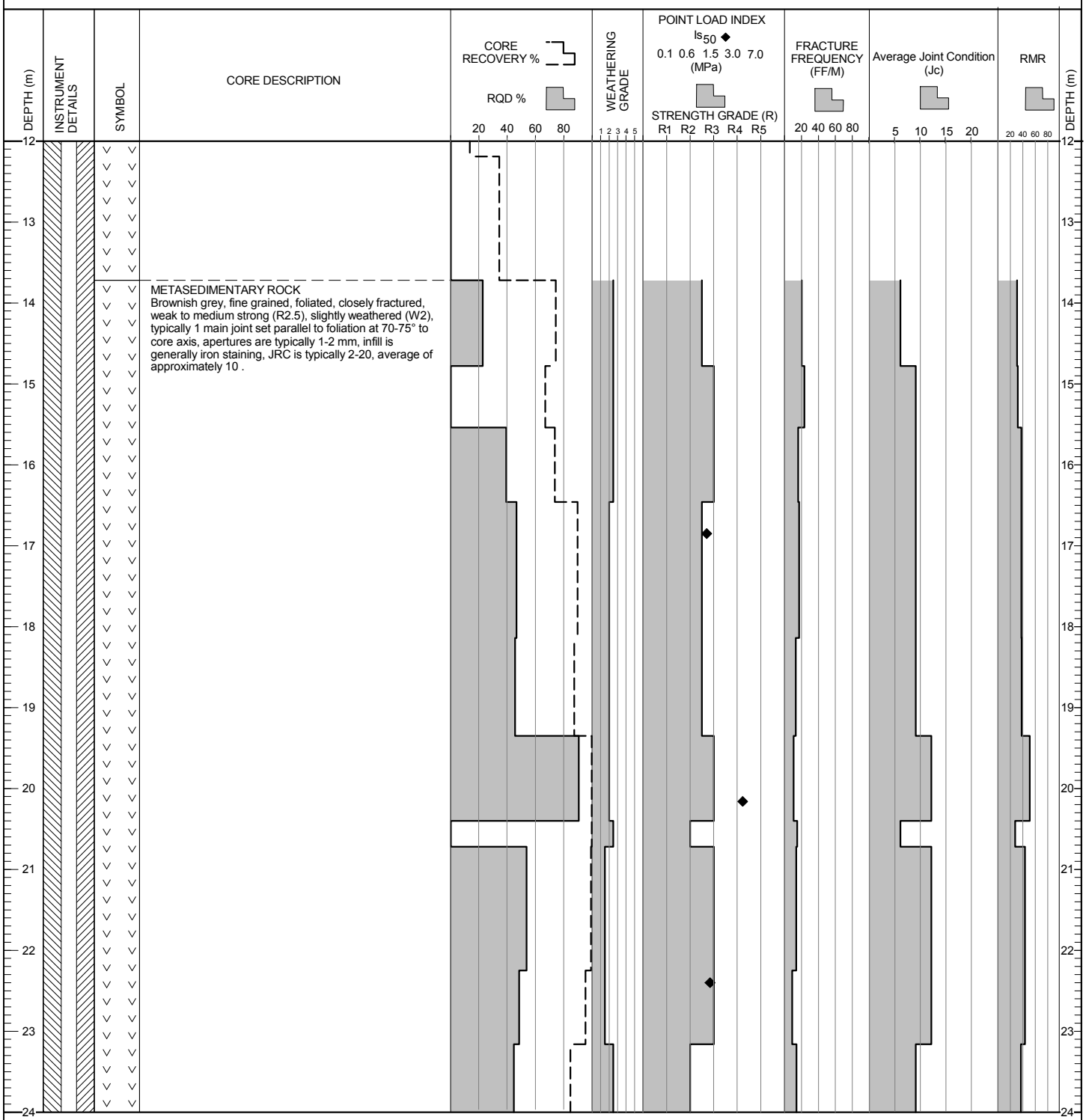
DRILL HOLE # BH-BGC11-28

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,926.5E - 7,101,702.7N
GROUND ELEVATION (m) : 1,010.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 7.62

START DATE : 04 Jul 11
FINISH DATE : 06 Jul 11
FINAL DEPTH (m) : 40.8
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

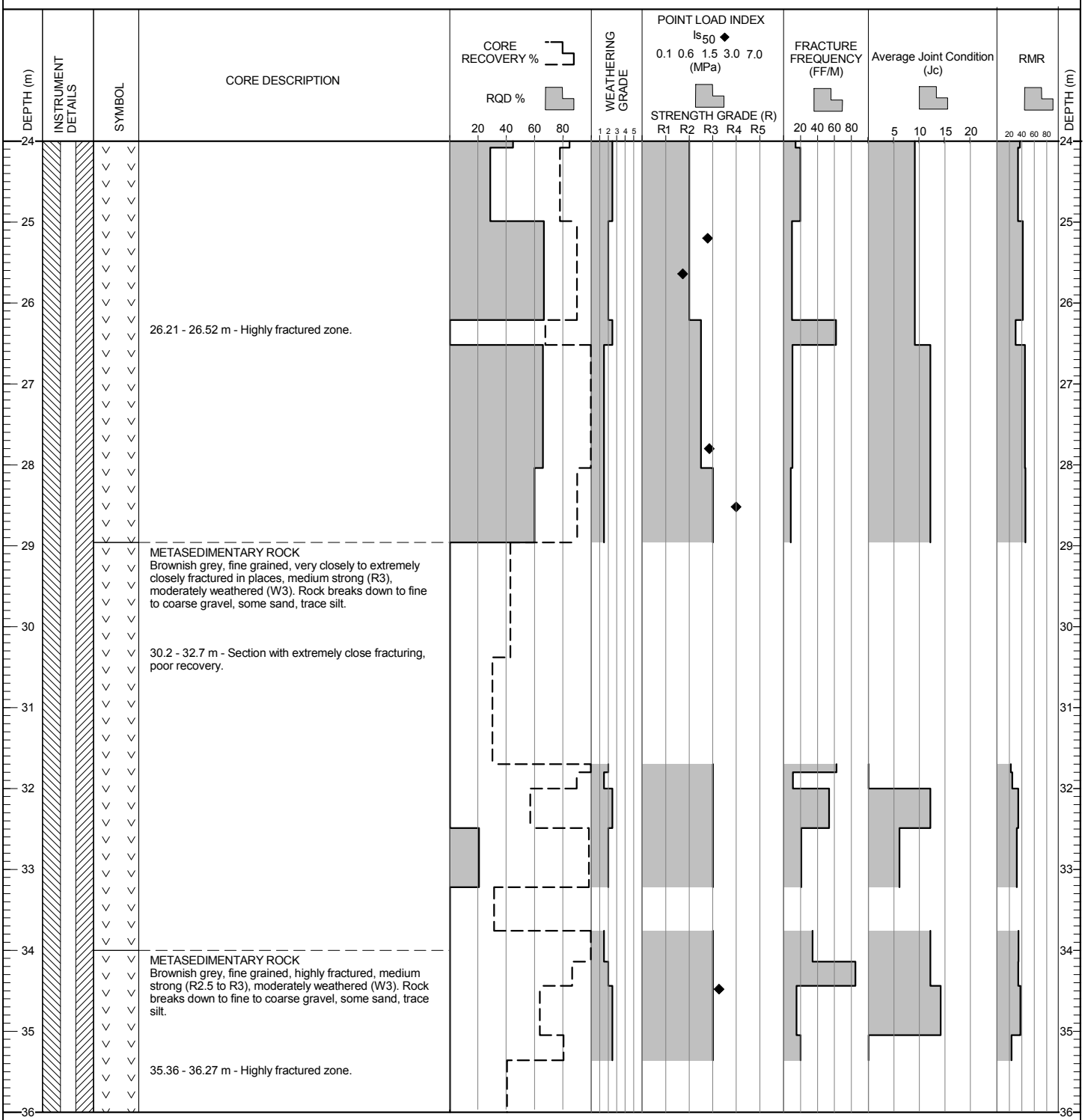
DRILL HOLE # BH-BGC11-28

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,926.5E - 7,101,702.7N
GROUND ELEVATION (m) : 1,010.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 7.62

START DATE : 04 Jul 11
FINISH DATE : 06 Jul 11
FINAL DEPTH (m) : 40.8
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-28

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,926.5E - 7,101,702.7N
GROUND ELEVATION (m) : 1,010.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 7.62

START DATE : 04 Jul 11
FINISH DATE : 06 Jul 11
FINAL DEPTH (m) : 40.8
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
36			
37			
38			37.79 - 40.84 m - Highly fractured zone.
39			
40			
41			End of borehole at 40.8 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" solid PVC for downhole seismic investigation.
42			
43			
44			
45			
46			
47			
48			

CORE RECOVERY %
RQD %
20 40 60 80

WEATHERING GRADE
1 2 3 4 5

POINT LOAD INDEX
Is_{50} ◆
0.1 0.6 1.5 3.0 7.0
(MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M)
20 40 60 80

Average Joint Condition (Jc)
5 10 15 20

RMR
20 40 60 80

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-29

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,977.8E - 7,101,802.1N
GROUND ELEVATION (m) : 1,045.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 08 Jul 11
FINISH DATE : 10 Jul 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

METASEDIMENTARY ROCK
Reddish brown, fine grained, highly fractured, recovered corestones are very weak to moderately strong (R1.5-R2.5), moderately to highly weathered (W3-W4). Rock breaks down to gravel, some sand, trace silt.
0.0 - 3.78 m - Highly fractured zone.

5.5 - 7.47 m - Highly fractured zone.

Aug 2011

9.14 - 10.67 m - Highly fractured zone.

METASEDIMENTARY ROCK
Quartzite, reddish brown, fine grained, foliated, extremely closely to very closely spaced fractures, recovered corestones are weak to moderately strong (R2.5), moderately weathered (W3), 3 main joint sets.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-29

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,977.8E - 7,101,802.1N
GROUND ELEVATION (m) : 1,045.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 08 Jul 11
FINISH DATE : 10 Jul 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / STRENGTH GRADE (R) (R1 R2 R3 R4 R5) | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

12.19 - 13.47 m - Highly fractured zone.

METASEDIMENTARY ROCK
Quartzite, light brownish grey, fine grained, foliated, phyllitic in places, closely fractured, weak to medium strong (R2 to R3), slightly to moderately weathered (W2-W3), 1 main joint set parallel to foliations at 45-65° to core axis, apertures are typically from 1-3 mm with some broken zones, infill is generally broken and decomposing rock with iron staining, JRC is 2-20 with an average of approximately 5, but ranges from 2 to 8 for the joint set along foliation plane.

17.37 - 18.59 m - Highly fractured zone.

METASEDIMENTARY ROCK
Grey, fine grained, some zones of close fractures, weak to strong (R2 to R4), faintly weathered (W1 to W1.5). Typically 1 main joint set parallel to foliations at 45-70° to core axis (75% of joints), apertures are typically from 1-3 mm, infill is generally talc, sericite and iron staining, JRC = 2-20, average of approximately 8, for joint along foliation plane, JRC ranges typically 2-20 with an average of approximately 9.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

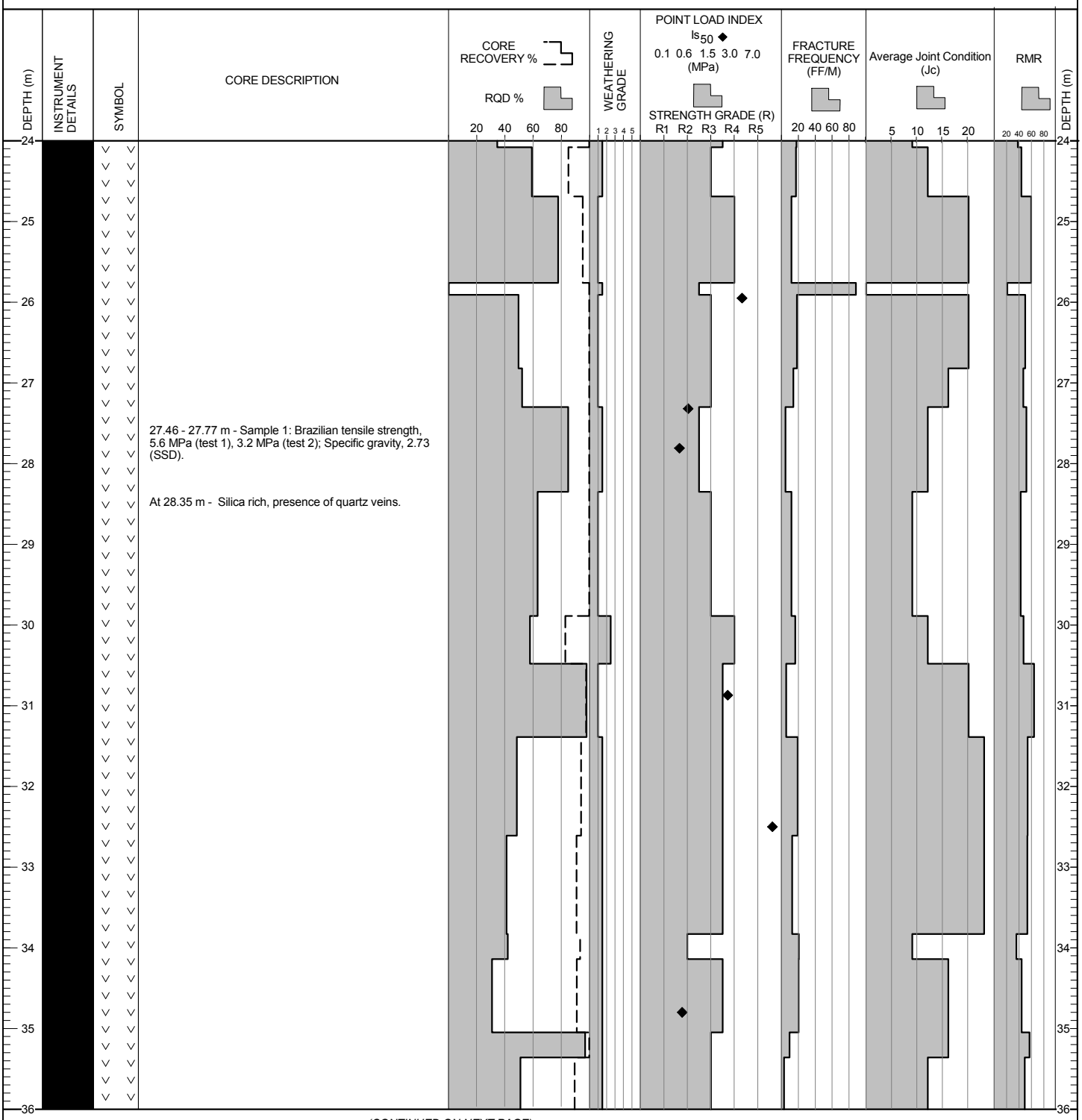
DRILL HOLE # BH-BGC11-29

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,977.8E - 7,101,802.1N
GROUND ELEVATION (m) : 1,045.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 08 Jul 11
FINISH DATE : 10 Jul 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

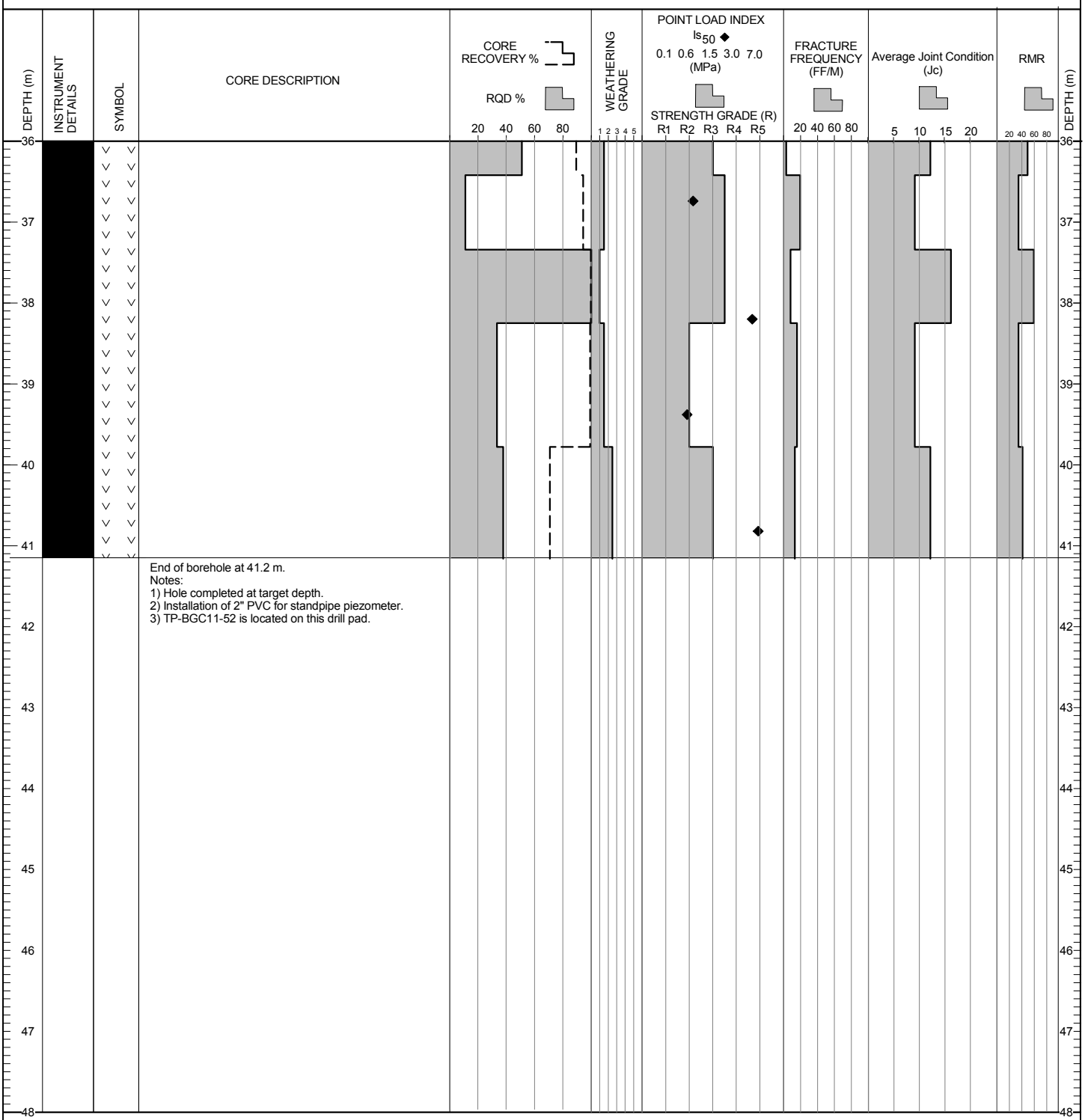
DRILL HOLE # BH-BGC11-29

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,977.8E - 7,101,802.1N
GROUND ELEVATION (m) : 1,045.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 08 Jul 11
FINISH DATE : 10 Jul 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 0.0
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



End of borehole at 41.2 m.
Notes:
1) Hole completed at target depth.
2) Installation of 2" PVC for standpipe piezometer.
3) TP-BGC11-52 is located on this drill pad.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-30

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m): 460,122.0E - 7,101,567.8N
GROUND ELEVATION (m) : 952.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 9.14

START DATE : 07 Jul 11
FINISH DATE : 08 Jul 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GM) Some cobbles, some sand, some silt, trace boulders, maximum particle size = 300 mm, subangular to subrounded, elongated to equidimensional, weak to medium strong (R2 to R3) clasts, light to medium brown, moist, non-plastic fines. Sampled at surface, not from core barrel. [COLLUVIUM]		
1						
1.52				Rock encountered at 1.52 m depth. Refer to rock log.		
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

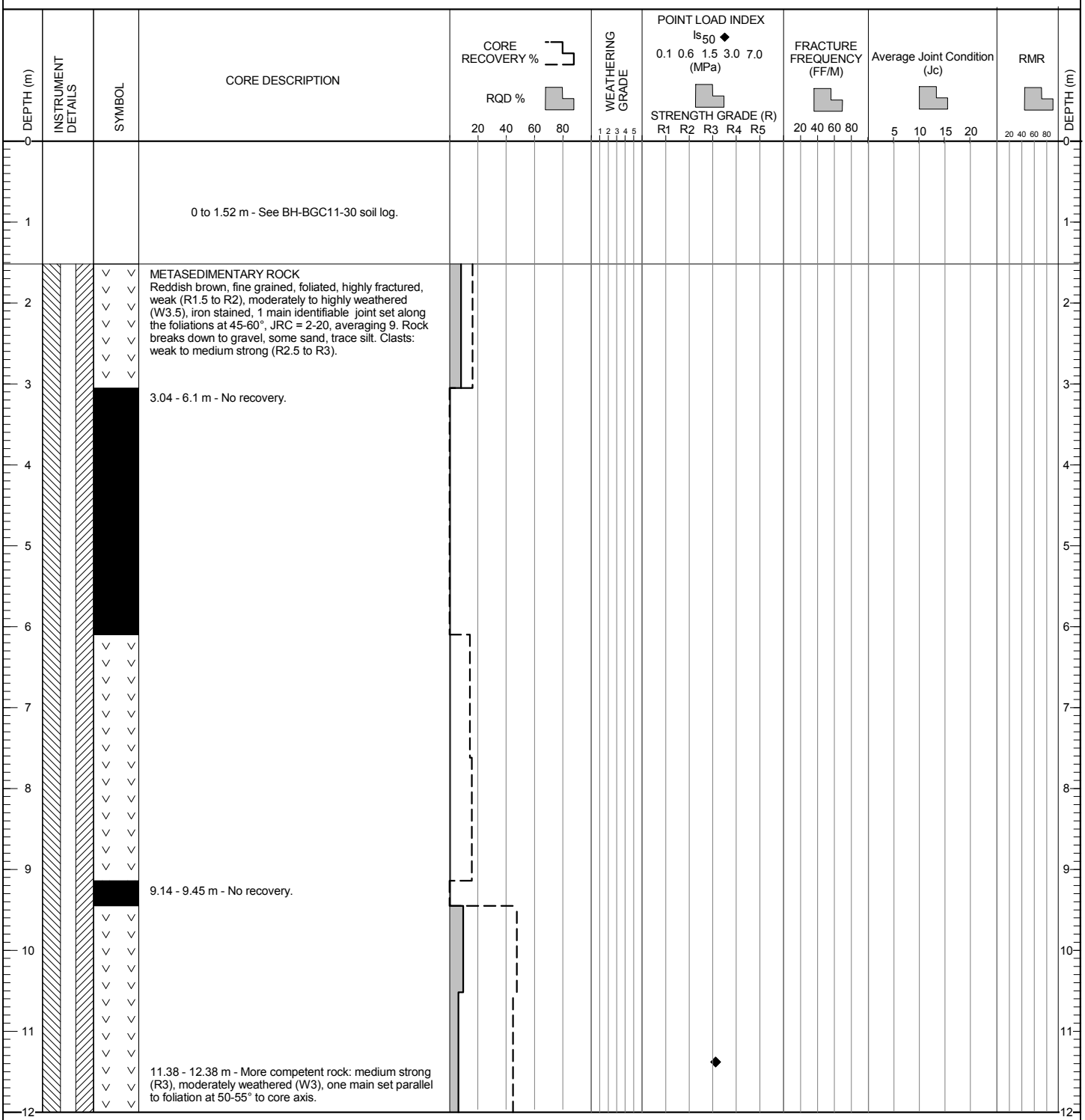
DRILL HOLE # BH-BGC11-30

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 460,122.0E - 7,101,567.8N
GROUND ELEVATION (m) : 952.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 07 Jul 11
FINISH DATE : 08 Jul 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

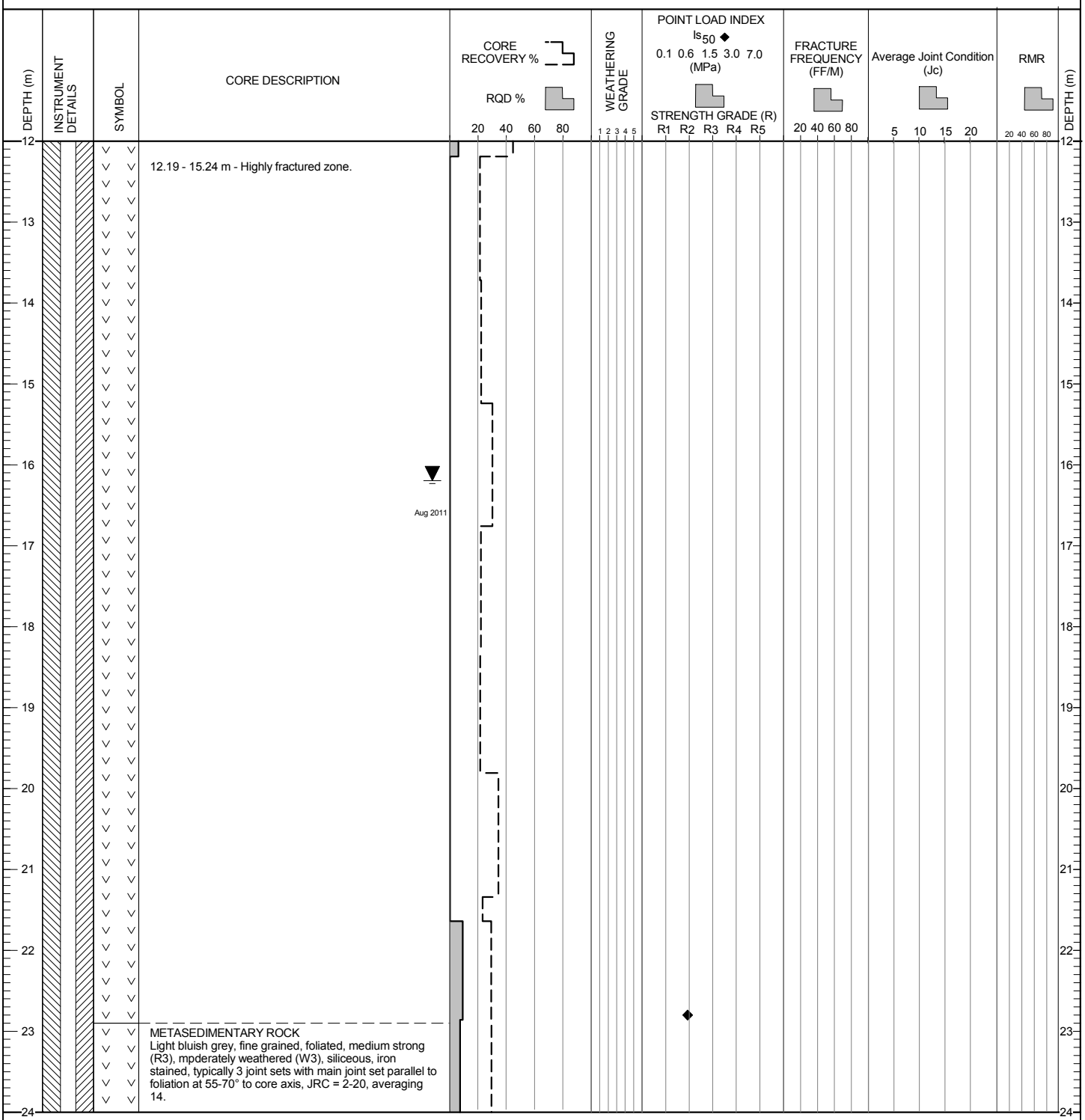
DRILL HOLE # BH-BGC11-30

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 460,122.0E - 7,101,567.8N
GROUND ELEVATION (m) : 952.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 07 Jul 11
FINISH DATE : 08 Jul 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

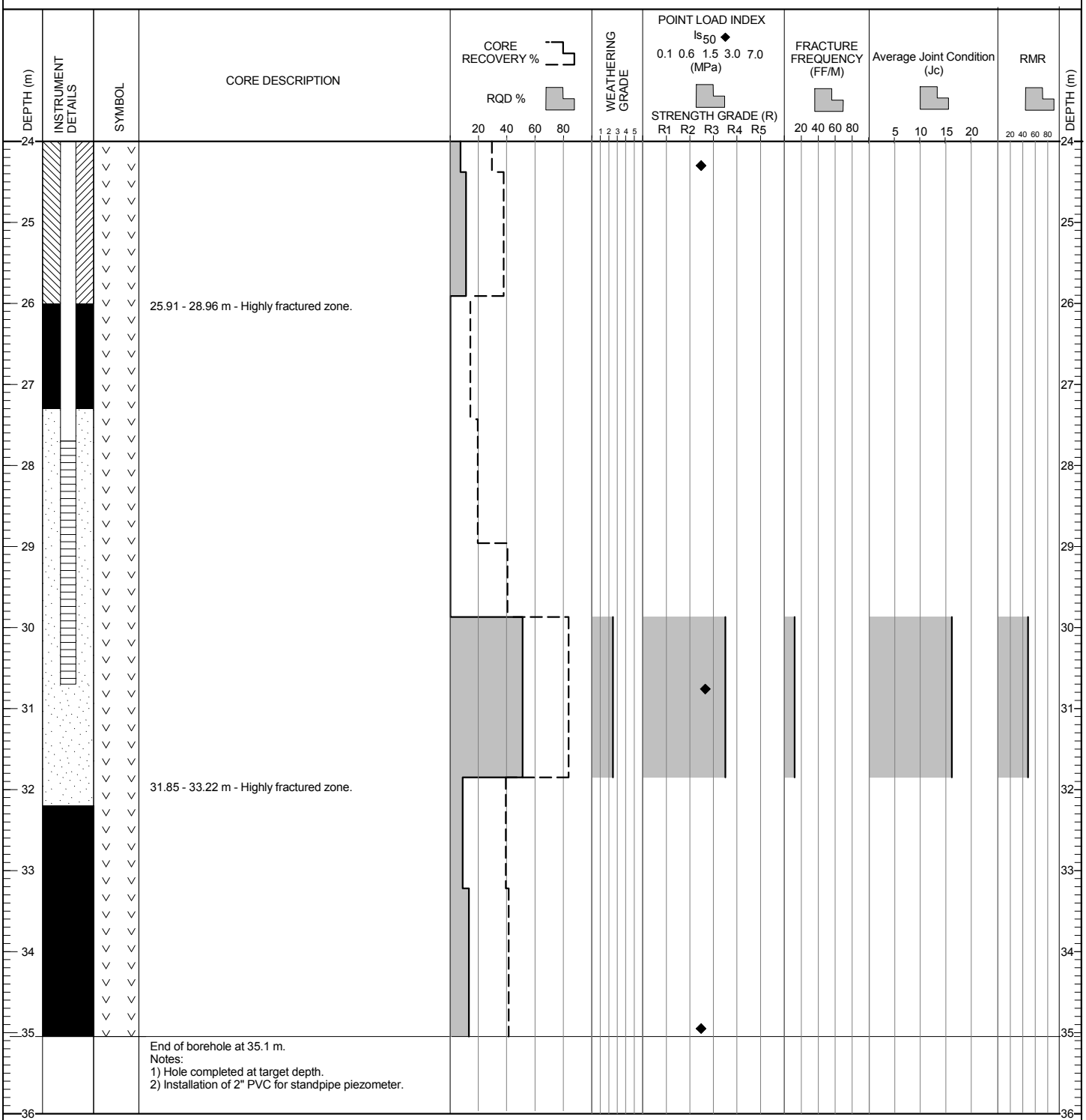
DRILL HOLE # BH-BGC11-30

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 460,122.0E - 7,101,567.8N
GROUND ELEVATION (m) : 952.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 07 Jul 11
FINISH DATE : 08 Jul 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

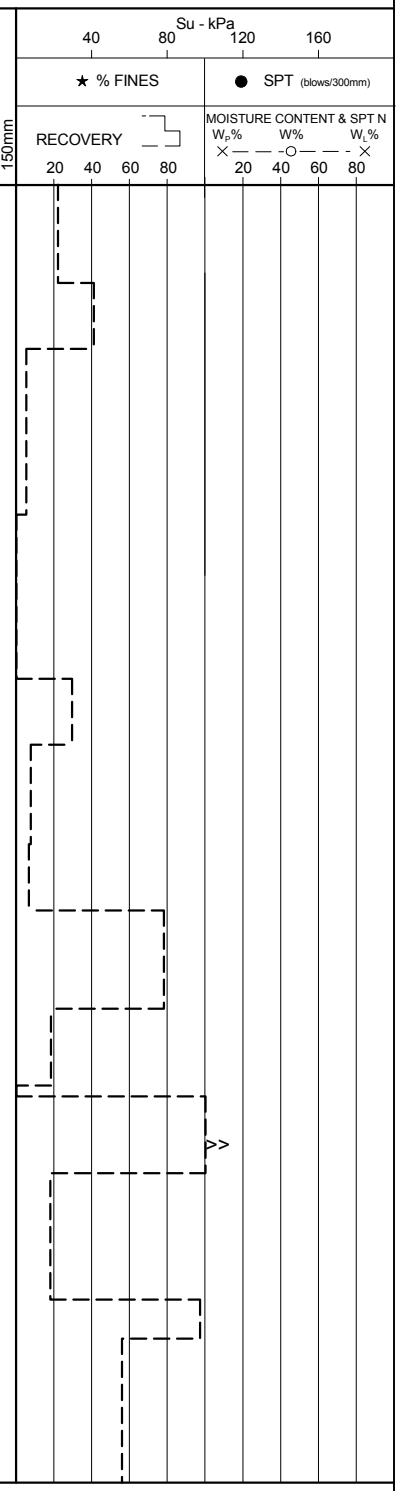
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-31

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m): 459,850.9E - 7,101,483.0N	DRILL DESIGNATION : CS-10	START DATE : 10 Jul 11
GROUND ELEVATION (m) : 917.8m	DRILLING CONTRACTOR : Lyncorp	FINISH DATE : 11 Jul 11
SURVEY METHOD : DGPS	DRILL METHOD : Rotary Diamond	FINAL DEPTH (m) : 35.1
DATUM : UTM NAD 83	CORE : HQ3	DEPTH TO TOP OF ROCK (m) : 16.8
PLUNGE (°) : -90	FLUID : Water/Polymer	LOGGED BY : EB/SD/KH
TREND (°) : N/A	CASED TO (m) : 6.10	REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GW) Silty, some fine sand, some cobbles, trace boulders, well graded, maximum particle size = 250 mm, flat, subangular to angular, reddish brown, wet (from drilling fluid), roots. Clasts: metasedimentary, very weak to weak (R1 to R2). [COLLUVIUM]		
3				3.05 - 4.57 m - No recovery.		
5				COBBLES Some boulders, some gravel, trace coarse sand, poorly (gap) graded, maximum particle size = 350 mm, metasedimentary clasts are typically flat and subangular to angular, granodiorite clasts are subrounded to subangular and equidimensional, metasedimentary clasts are reddish brown, granodiorite grey and white, occasional discontinuities present in metasedimentary and granodiorite boulders, clast strength is typically R3 or greater. Sand/fines likely washed away by drilling process (observed in cuttings). [DEBRIS FLOW]		



(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

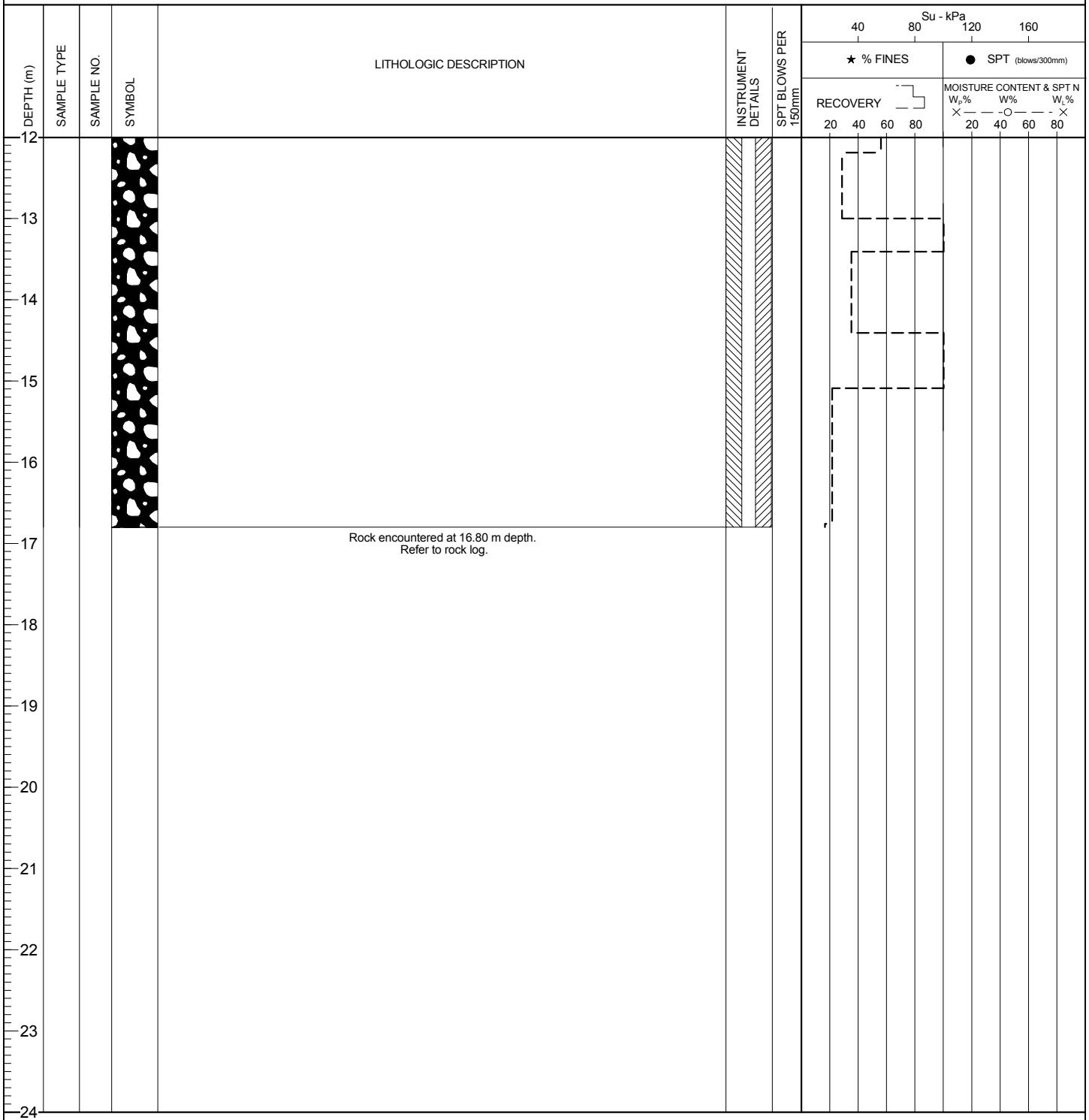
DRILL HOLE # BH-BGC11-31

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m): 459,850.9E - 7,101,483.0N
GROUND ELEVATION (m) : 917.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 6.10

START DATE : 10 Jul 11
FINISH DATE : 11 Jul 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 16.8
LOGGED BY : EB/SD/KH
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-31

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 459,850.9E - 7,101,483.0N
GROUND ELEVATION (m) : 917.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 6.1

START DATE : 10 Jul 11
FINISH DATE : 11 Jul 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 16.8
LOGGED BY : EB/SD/KH
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 16.80 m - See BH-BGC11-31 soil log.

METASEDIMENTARY ROCK
Phyllite, light bluish grey with iron oxide staining, very weak to weak (R1-R2), highly weathered (W4), foliated/bedded texture, highly fractured core recovery, occasional random joints, generally parallel to bedding/foliation, infill is typically iron oxide staining, clay, broken and disintegrated rock, joints typically smooth and planar, typical fracture spacing <20 mm, much of recovery is coarse gravel-sized pieces.

19.81 - 21.34 m - Highly fractured zone.

22.86 - 30.48 m - Highly fractured zone.

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-31

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 459,850.9E - 7,101,483.0N
GROUND ELEVATION (m) : 917.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 6.1

START DATE : 10 Jul 11
FINISH DATE : 11 Jul 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 16.8
LOGGED BY : EB/SD/KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
24			Below 24.0 m - Quartzite rich, minimal iron oxide staining.
25			
26			
27			
28			
29			
30			
31			
32			32.0 - 35.05 m - Highly fractured zone.
33			
34			
35			End of borehole at 35.1 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" solid PVC for potential downhole seismic investigation.
36			

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

DEPTH (m)

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-31

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 459,850.9E - 7,101,483.0N
GROUND ELEVATION (m) : 917.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 6.1

START DATE : 10 Jul 11
FINISH DATE : 11 Jul 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 16.8
LOGGED BY : EB/SD/KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
36			3) TP-BGC11-145 is located on this drill pad.
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-32

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m): 458,745.2E - 7,100,934.4N
GROUND ELEVATION (m) : 818.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 14.63

START DATE : 12 Jul 11
FINISH DATE : 13 Jul 11
FINAL DEPTH (m) : 24.4
DEPTH TO TOP OF ROCK (m) : 19.8
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				COBBLES AND BOULDERS Metasedimentary and granodiorite cobbles and boulders, some coarse gravel, maximum particle size = 150 mm, clasts are subangular to subrounded, elongated to equidimensional, weak to strong (R2 to R4), fines are non plastic, light reddish brown to dark bluish grey, wet (due to drilling). [PLACER TAILINGS]		
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11					▼ Aug 2011	
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

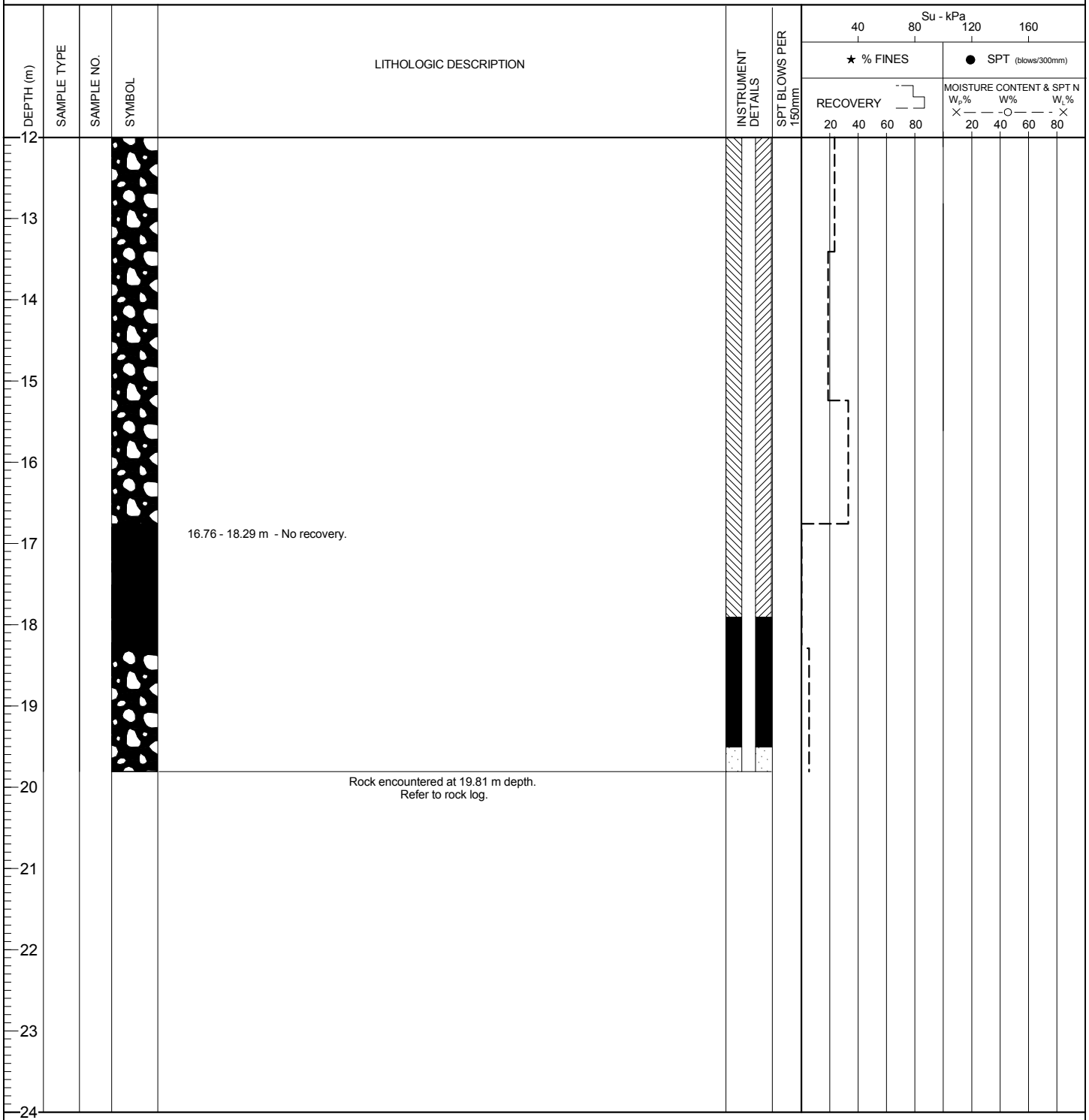
DRILL HOLE # BH-BGC11-32

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m): 458,745.2E - 7,100,934.4N
GROUND ELEVATION (m) : 818.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 14.63

START DATE : 12 Jul 11
FINISH DATE : 13 Jul 11
FINAL DEPTH (m) : 24.4
DEPTH TO TOP OF ROCK (m) : 19.8
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-32

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m) 458,745.2E - 7,100,934.4N
GROUND ELEVATION (m) : 818.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 14.63

START DATE : 12 Jul 11
FINISH DATE : 13 Jul 11
FINAL DEPTH (m) : 24.4
DEPTH TO TOP OF ROCK (m) : 19.8
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 19.81 m - See BH-BGC11-32 soil log.

METASEDIMENTARY ROCK
Dark grey, fine grained, foliated, weak (R0.5 - R1), highly weathered (W4), siliceous, some carbonate alteration, typically 2 joint sets: foliation at 60 to 85° and joint at 24 to 45° to core axis, JRC = 2-20, averaging 12.

21.34 - 24.38 m - Highly fractured zone.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-32

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m) 458,745.2E - 7,100,934.4N
GROUND ELEVATION (m) : 818.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 14.63

START DATE : 12 Jul 11
FINISH DATE : 13 Jul 11
FINAL DEPTH (m) : 24.4
DEPTH TO TOP OF ROCK (m) : 19.8
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
24			
			End of borehole at 24.4 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" PVC for standpipe piezometer and downhole seismic investigation.
36			

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-33

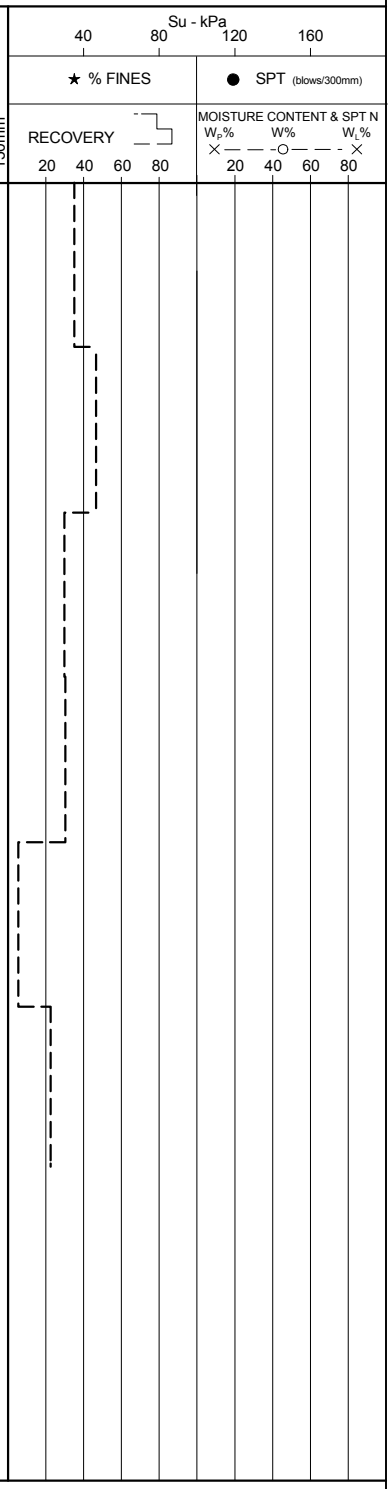
LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m): 459,115.7E - 7,100,983.6N
GROUND ELEVATION (m) : 833.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 11.58

START DATE : 13 Jul 11
FINISH DATE : 14 Jul 11
FINAL DEPTH (m) : 41.4
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL AND SAND (GW/SW) Some cobbles, trace boulders, trace silt, maximum particle size = 450 mm, greyish brown, moist, homogeneous, non cemented. Granodiorite clasts: rounded, equidimensional. Metasedimentary clasts: angular, elongated. [PLACER TAILINGS]		
4				Aug 2011		
9				Rock encountered at 9.10 m depth. Refer to rock log.		



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-33

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m) 459,115.7E - 7,100,983.6N
GROUND ELEVATION (m) : 833.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 11.58

START DATE : 13 Jul 11
FINISH DATE : 14 Jul 11
FINAL DEPTH (m) : 41.4
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0			0 to 9.10 m - See BH-BGC11-33 soil log.							0
9			METASEDIMENTARY ROCK Light grey, fine grained, foliated, pyrophyllite alteration, very weak to weak, moderately to highly weathered/altered, one main joint set parallel to foliations, running at 65-85° to core axis, apertures vary from 1 to 90 mm, infill is typically crushed and decomposed rock, sericite, clay. 9.14 - 18.29 m - Highly fractured zone. 10.67 - 12.19 m - Very low recovery, unable to determine representative joint condition and fracture frequency.							9
12										12

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

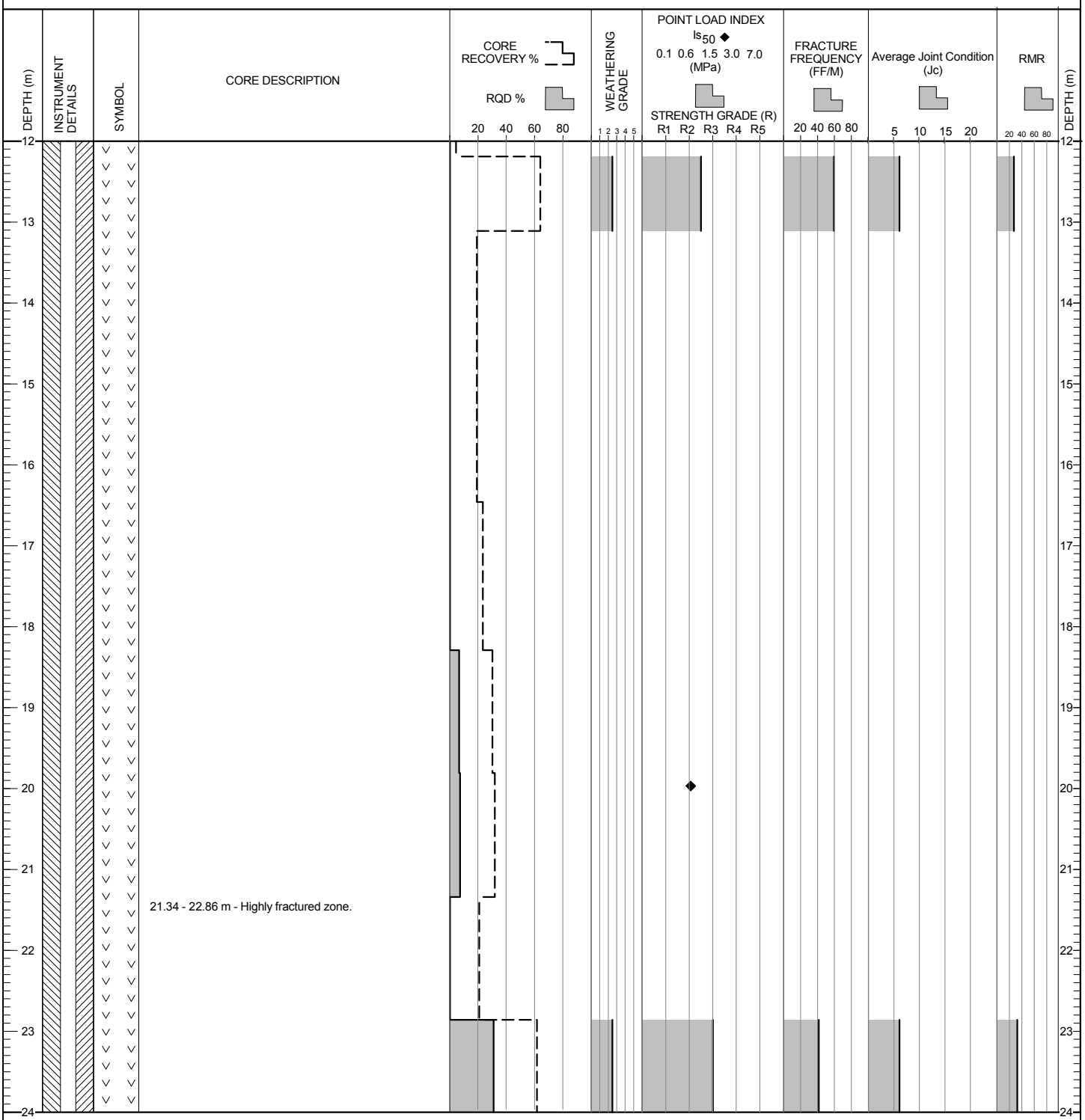
DRILL HOLE # BH-BGC11-33

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m) 459,115.7E - 7,100,983.6N
GROUND ELEVATION (m) : 833.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 11.58

START DATE : 13 Jul 11
FINISH DATE : 14 Jul 11
FINAL DEPTH (m) : 41.4
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-33

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m) 459,115.7E - 7,100,983.6N
GROUND ELEVATION (m) : 833.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 11.58

START DATE : 13 Jul 11
FINISH DATE : 14 Jul 11
FINAL DEPTH (m) : 41.4
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

24.38 - 25.91 m - Highly fractured zone.

27.43 - 35.05 m - Highly fractured zone.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-33

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m) 459,115.7E - 7,100,983.6N
GROUND ELEVATION (m) : 833.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 11.58

START DATE : 13 Jul 11
FINISH DATE : 14 Jul 11
FINAL DEPTH (m) : 41.4
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
36			
37			
38			
39			39.01 - 41.40 m - Hole final length extended during reaming/flushing of hole for installation, no recovery.
40			
41			
42			End of borehole at 41.4 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" PVC for standpipe piezometer and downhole seismic investigation.
43			
44			
45			
46			
47			
48			

CORE RECOVERY %
RQD % — 20 40 60 80

WEATHERING GRADE — 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆
0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 20 40 60 80

Average Joint Condition (Jc) — 5 10 15 20

RMR — 20 40 60 80

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-34

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m): 459,308.5E - 7,101,053.5N
GROUND ELEVATION (m) : 848.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 9.14

START DATE : 15 Jul 11
FINISH DATE : 16 Jul 11
FINAL DEPTH (m) : 38.1
DEPTH TO TOP OF ROCK (m) : 16.5
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m) | SAMPLE TYPE | SAMPLE NO. | SYMBOL | LITHOLOGIC DESCRIPTION | INSTRUMENT DETAILS | SPT BLOWS PER 150mm

GRAVEL AND SAND (GW/SW)
Cobbley, trace boulders, trace silt, maximum particle size = 450 mm, greyish brown, moist, homogeneous, non cemented. Granodiorite clasts: rounded, equidimensional. Metasedimentary clasts: sub-angular, elongated.
[PLACER TAILINGS]

1.52 - 3.05 m - No recovery.

Aug 2011

10.67 - 10.97 m - No recovery.

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

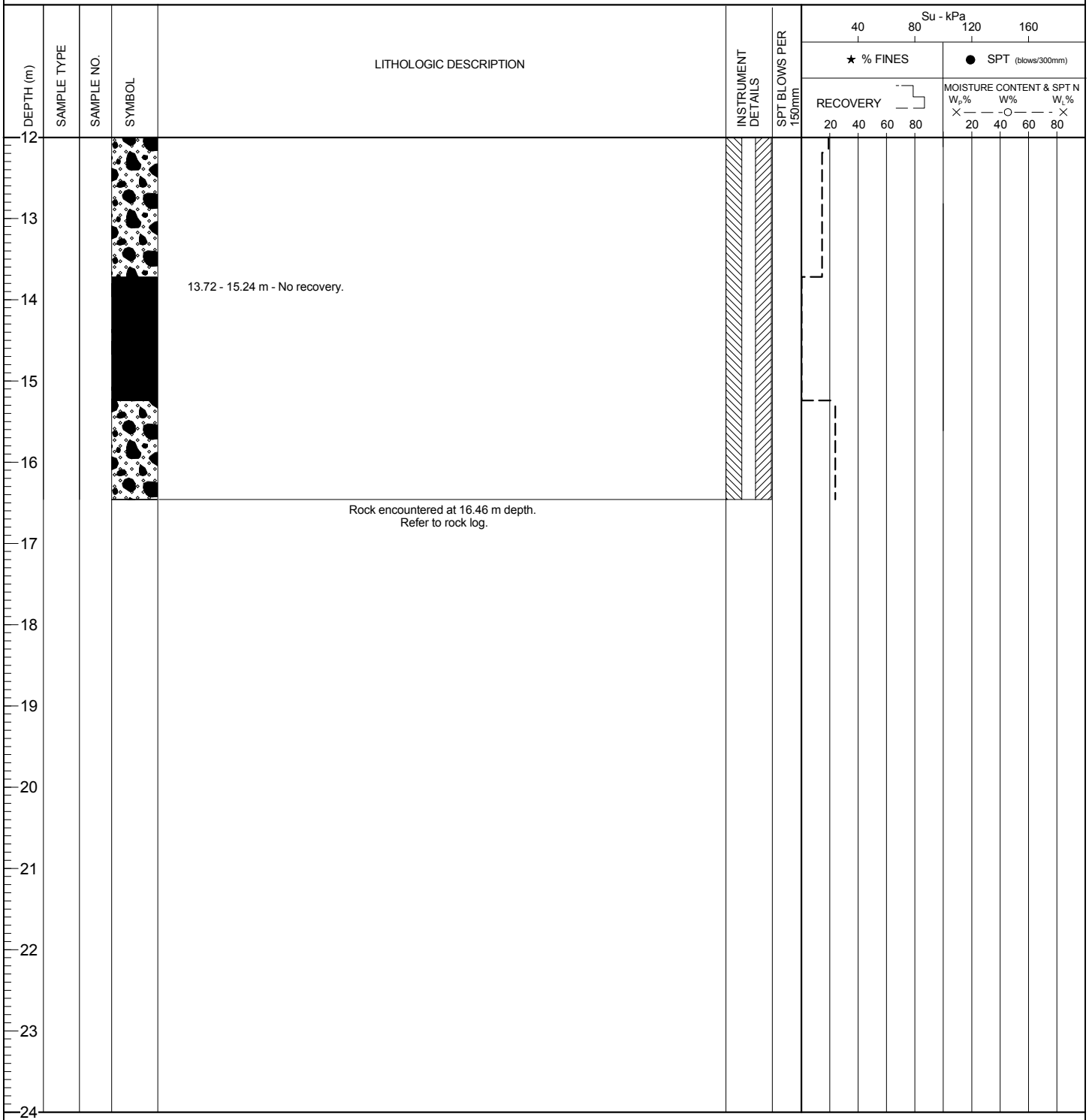
DRILL HOLE # BH-BGC11-34

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m): 459,308.5E - 7,101,053.5N
GROUND ELEVATION (m) : 848.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 9.14

START DATE : 15 Jul 11
FINISH DATE : 16 Jul 11
FINAL DEPTH (m) : 38.1
DEPTH TO TOP OF ROCK (m) : 16.5
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

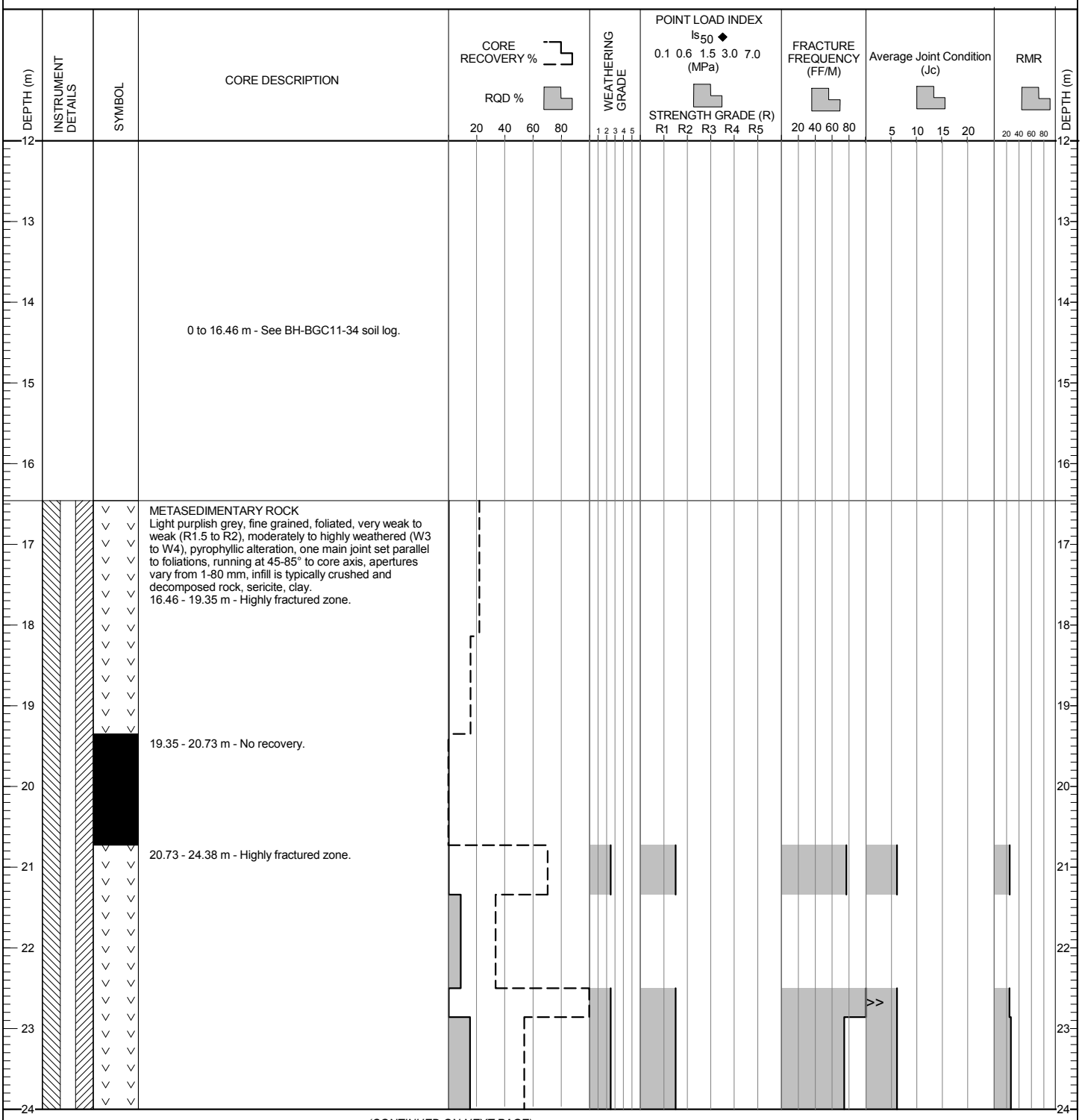
DRILL HOLE # BH-BGC11-34

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m) 459,308.5E - 7,101,053.5N
GROUND ELEVATION (m) : 848.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 15 Jul 11
FINISH DATE : 16 Jul 11
FINAL DEPTH (m) : 38.1
DEPTH TO TOP OF ROCK (m) : 16.5
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

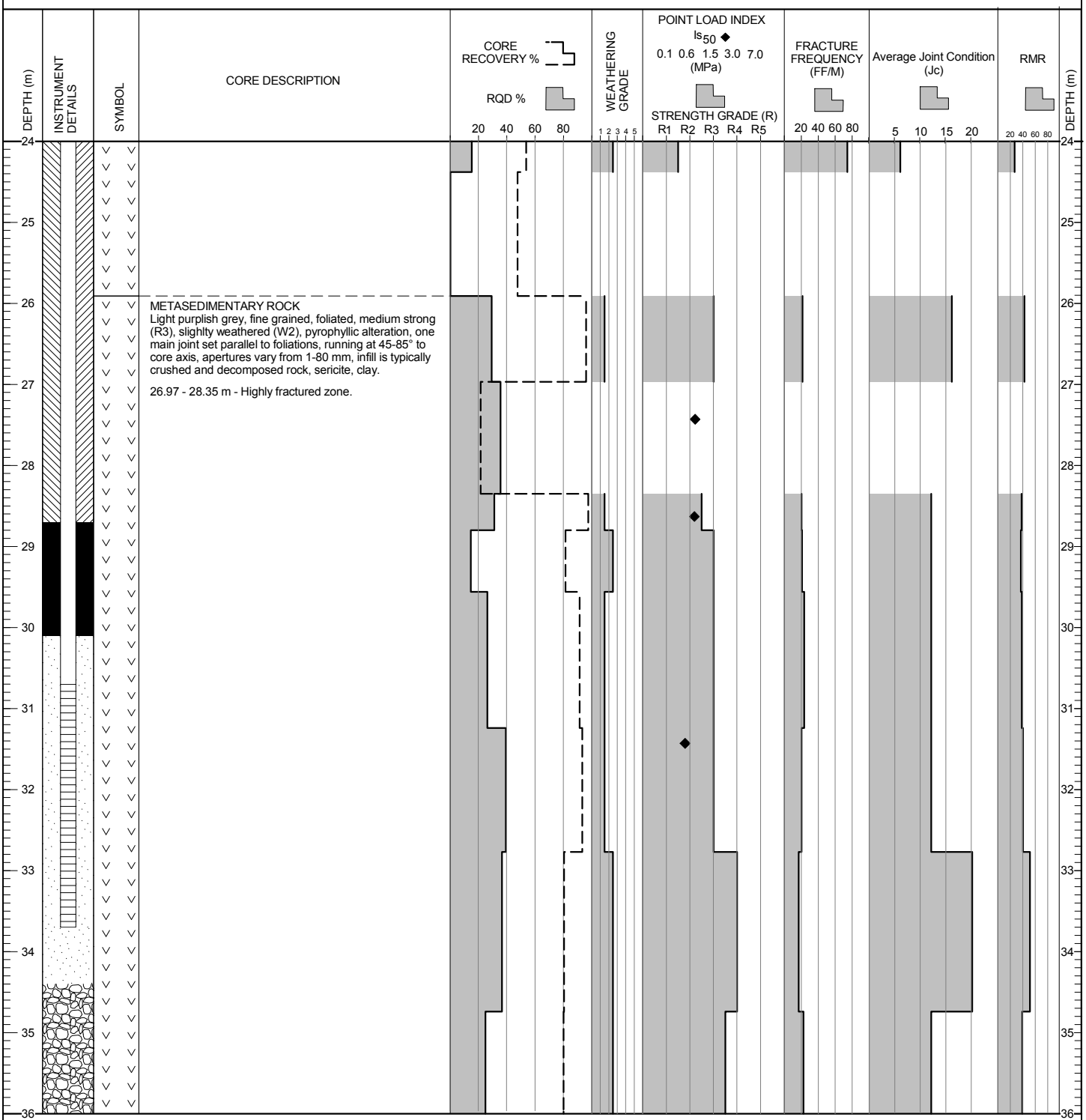
DRILL HOLE # BH-BGC11-34

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m) 459,308.5E - 7,101,053.5N
GROUND ELEVATION (m) : 848.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 15 Jul 11
FINISH DATE : 16 Jul 11
FINAL DEPTH (m) : 38.1
DEPTH TO TOP OF ROCK (m) : 16.5
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-34

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m) 459,308.5E - 7,101,053.5N
GROUND ELEVATION (m) : 848.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 15 Jul 11
FINISH DATE : 16 Jul 11
FINAL DEPTH (m) : 38.1
DEPTH TO TOP OF ROCK (m) : 16.5
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
36			
37			36.6 -36.86 m - Sample 1: UCS, 53.4 Mpa; Brazilian tensile strength, 9.2 MPa (test 1), 11.8 MPa (test 2); Specific gravity, 2.64 (SSD).
38			End of borehole at 38.1 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" PVC for standpipe piezometer and downhole seismic investigation.
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆
0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-35

LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,695.7E - 7,100,440.3N
GROUND ELEVATION (m) : 986.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 9.14

START DATE : 17 Jul 11
FINISH DATE : 19 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 15.2
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GW) Cobbley, some sand, medium to coarse, trace boulders, flat and elongated, subangular to subrounded, maximum particle size = 65 mm, light brown matrix, red-brown and blue-grey clasts, moist, clasts are metasedimentary quartz and intrusive. [COLLUVIUM]		
7.62				GRAVEL (GW) Cobbley, some sand, medium to coarse, trace boulders, flat and elongated, subangular to subrounded, light brown matrix, red-brown and blue-grey clasts, moist, clasts are metasedimentary. [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK] 7.62 - 9.14 m - No recovery.		
12						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

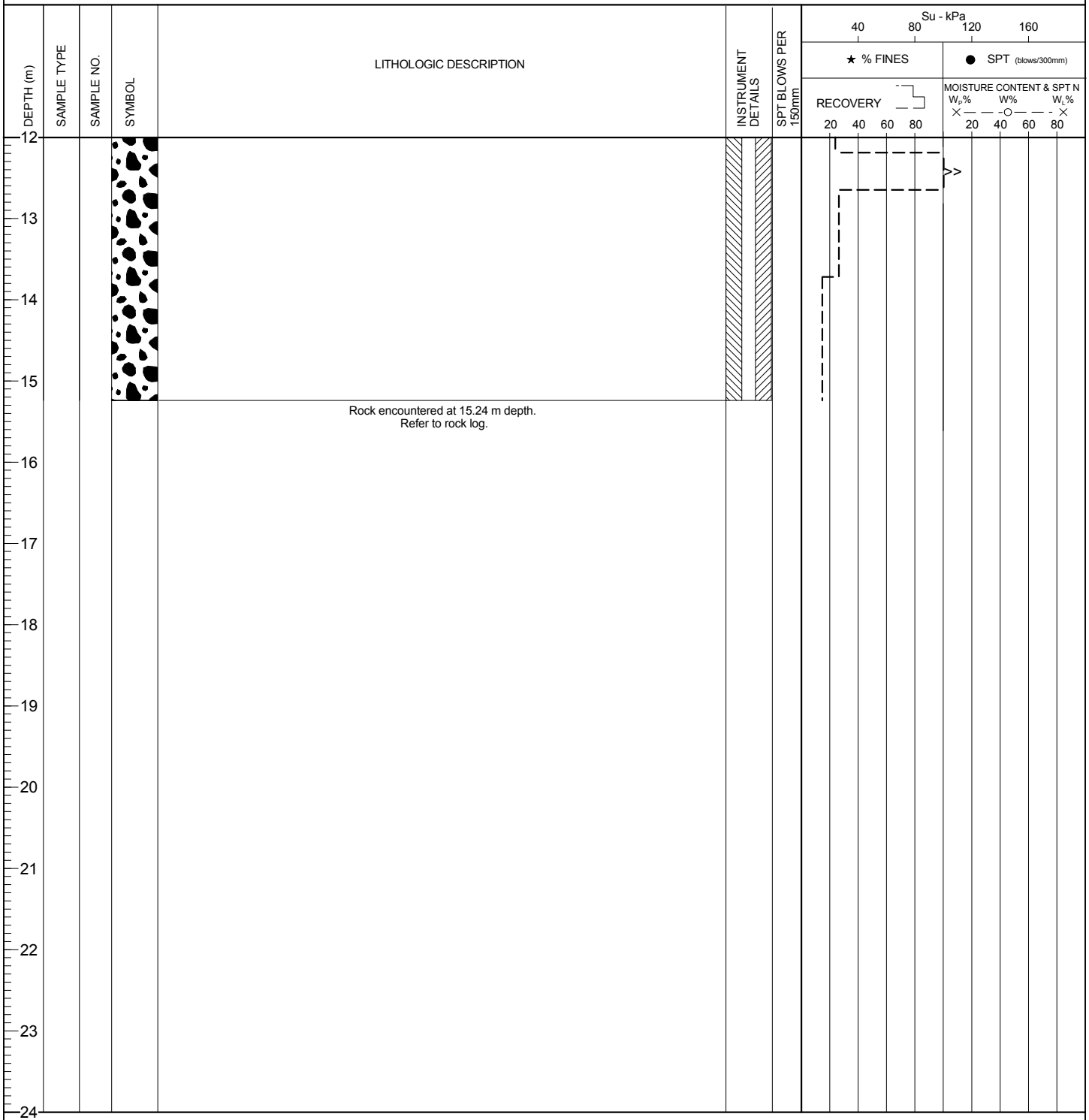
DRILL HOLE # BH-BGC11-35

LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,695.7E - 7,100,440.3N
GROUND ELEVATION (m) : 986.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 9.14

START DATE : 17 Jul 11
FINISH DATE : 19 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 15.2
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-35

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,695.7E - 7,100,440.3N
GROUND ELEVATION (m) : 986.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 17 Jul 11
FINISH DATE : 19 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 15.2
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 15.24 m - See BH-BGC11-35 soil log.

METASEDIMENTARY ROCK
Light brownish grey, fine grained, foliated, very weak (R1), highly weathered (W4), phyllitic, siliceous, iron stained.
15.24 - 22.86 m - Highly fractured zone.

METASEDIMENTARY ROCK
Light grey, fine grained, foliated, weak to moderately strong (R2.5), moderately to highly weathered (W2.5 to W3.5), phyllitic, siliceous, iron stained, typically 2 joint sets: one sub-parallel to foliations at 20-35° from core axis and the other at 50-70° from core axis, JRC = 2-20, averaging 11.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

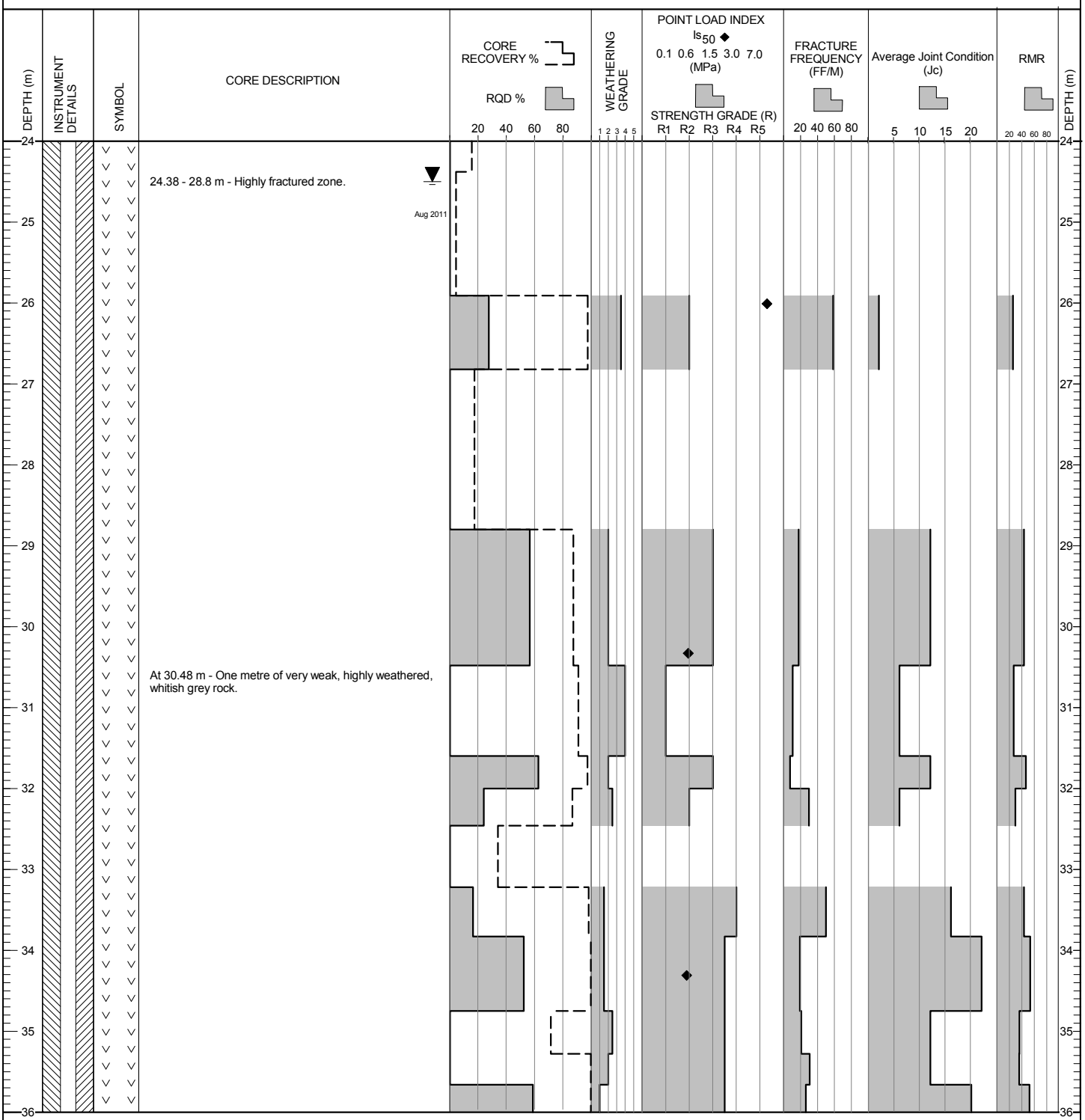
DRILL HOLE # BH-BGC11-35

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,695.7E - 7,100,440.3N
GROUND ELEVATION (m) : 986.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 17 Jul 11
FINISH DATE : 19 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 15.2
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

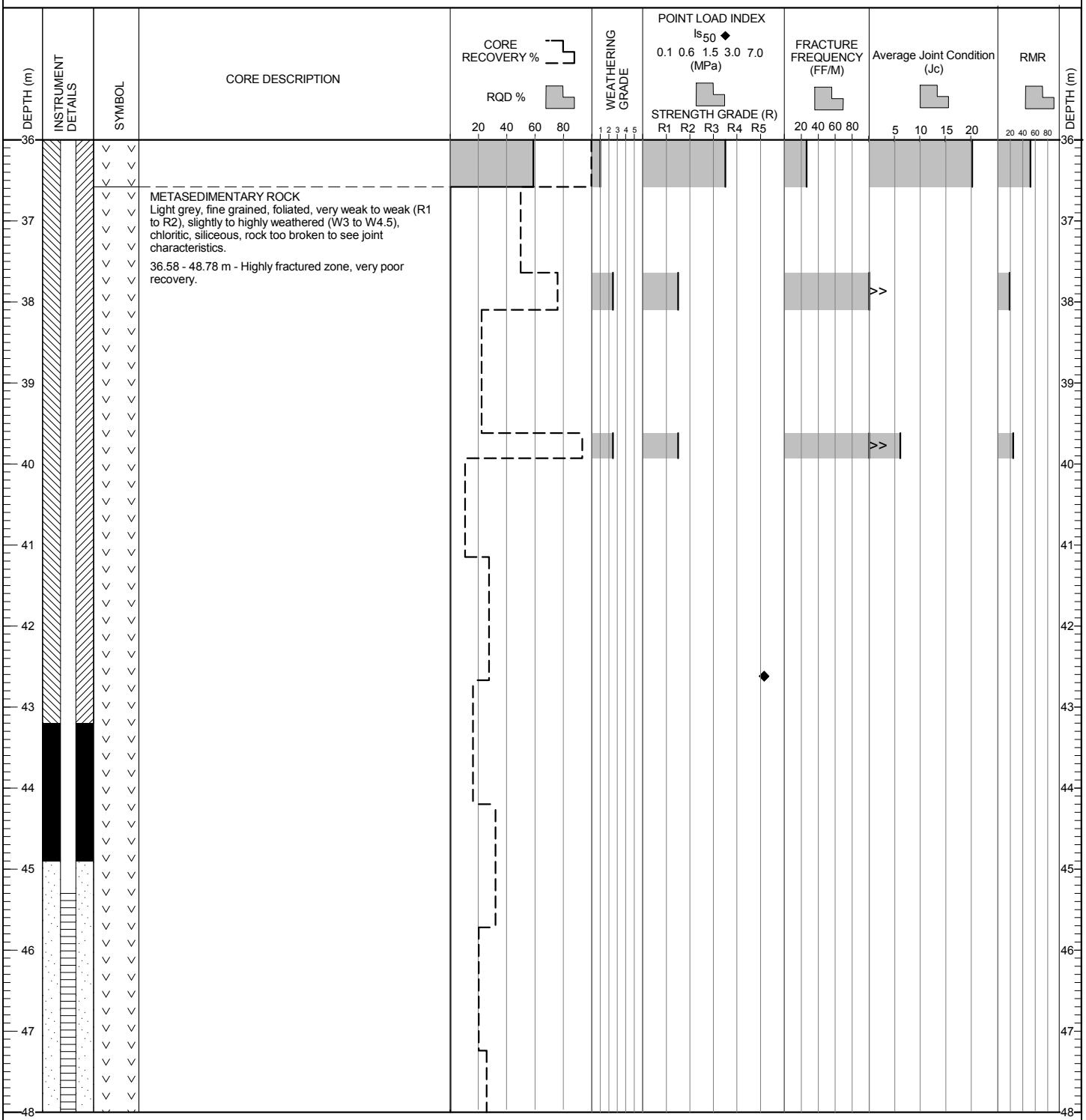
DRILL HOLE # BH-BGC11-35

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,695.7E - 7,100,440.3N
GROUND ELEVATION (m) : 986.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 17 Jul 11
FINISH DATE : 19 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 15.2
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-35

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,695.7E - 7,100,440.3N
GROUND ELEVATION (m) : 986.3m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 9.14

START DATE : 17 Jul 11
FINISH DATE : 19 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 15.2
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
48										48
49										49
50										50
51			End of borehole at 50.3 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" PVC for standpipe piezometer. 3) TP-BGC11-51 is located on this drill pad.							51
52										52
53										53
54										54
55										55
56										56
57										57
58										58
59										59
60										60

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-36

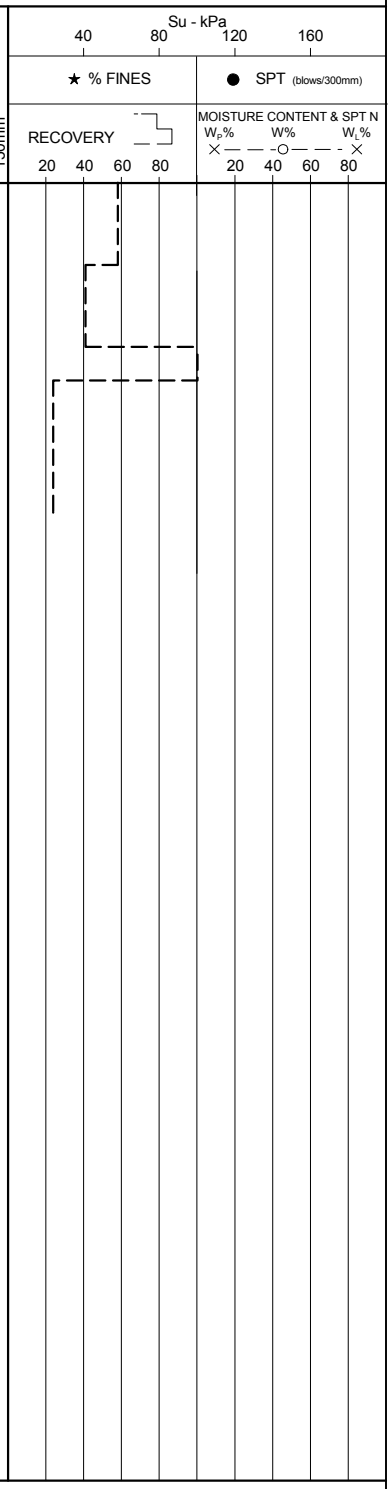
LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,699.9E - 7,100,274.7N
GROUND ELEVATION (m) : 1,002.5m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 3.05

START DATE : 19 Jul 11
FINISH DATE : 23 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GM) Coarse, silty, trace cobbles, trace boulders, well graded, angular, elongated, maximum particle size = 350 mm, yellowish brown, moist. Clasts: metasedimentary, weak to strong (R2 to R4). [COLLUVIUM]		
3				Rock encountered at 3.05 m depth. Refer to rock log.		



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

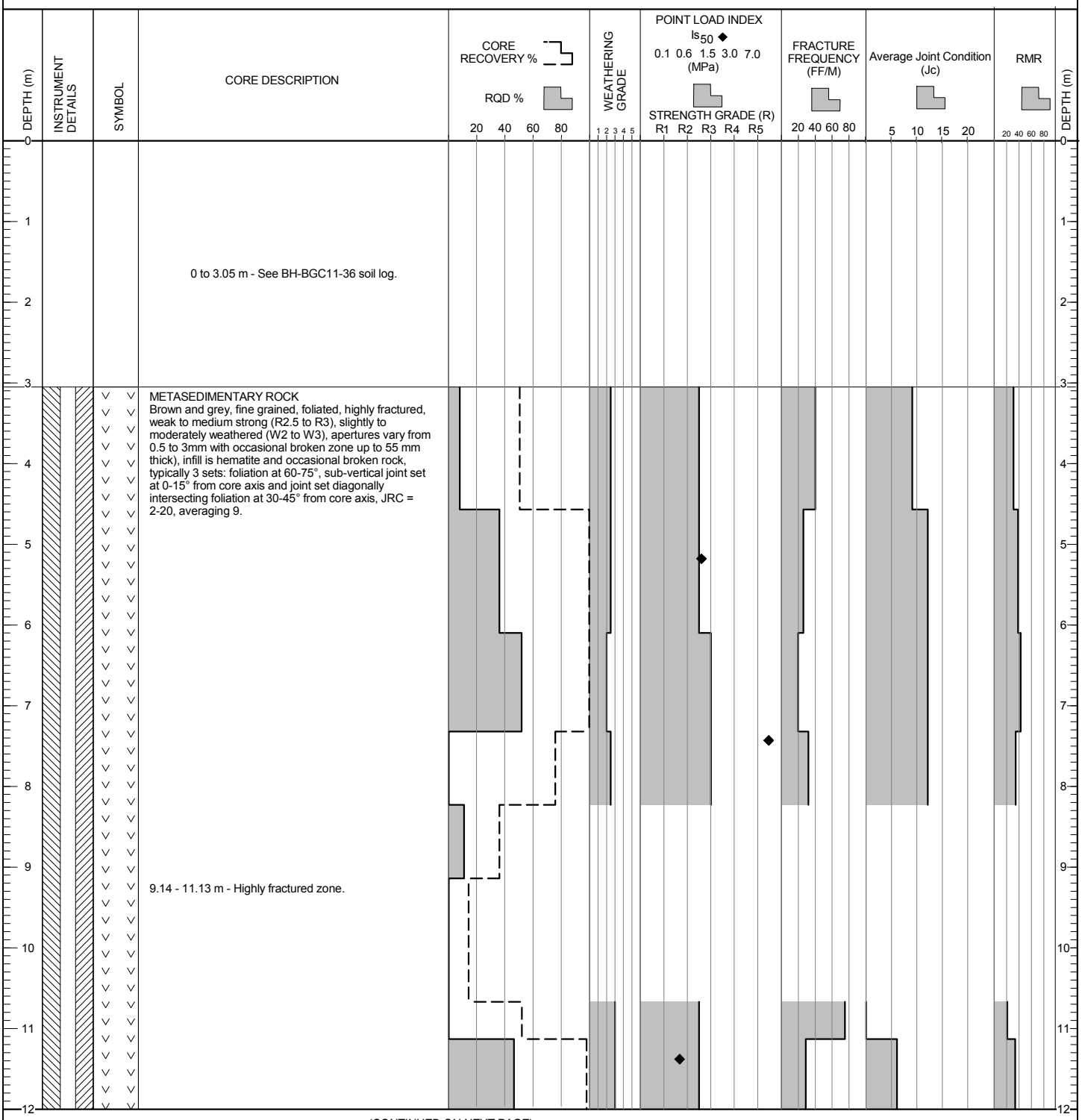
DRILL HOLE # BH-BGC11-36

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,699.9E - 7,100,274.7N
GROUND ELEVATION (m) : 1,002.5m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 19 Jul 11
FINISH DATE : 23 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-36

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,699.9E - 7,100,274.7N
GROUND ELEVATION (m) : 1,002.5m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 19 Jul 11
FINISH DATE : 23 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

12.19 - 13.41 m - Highly fractured zone.

17.98 - 22.55 m - Highly fractured zone.

Aug 2011

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

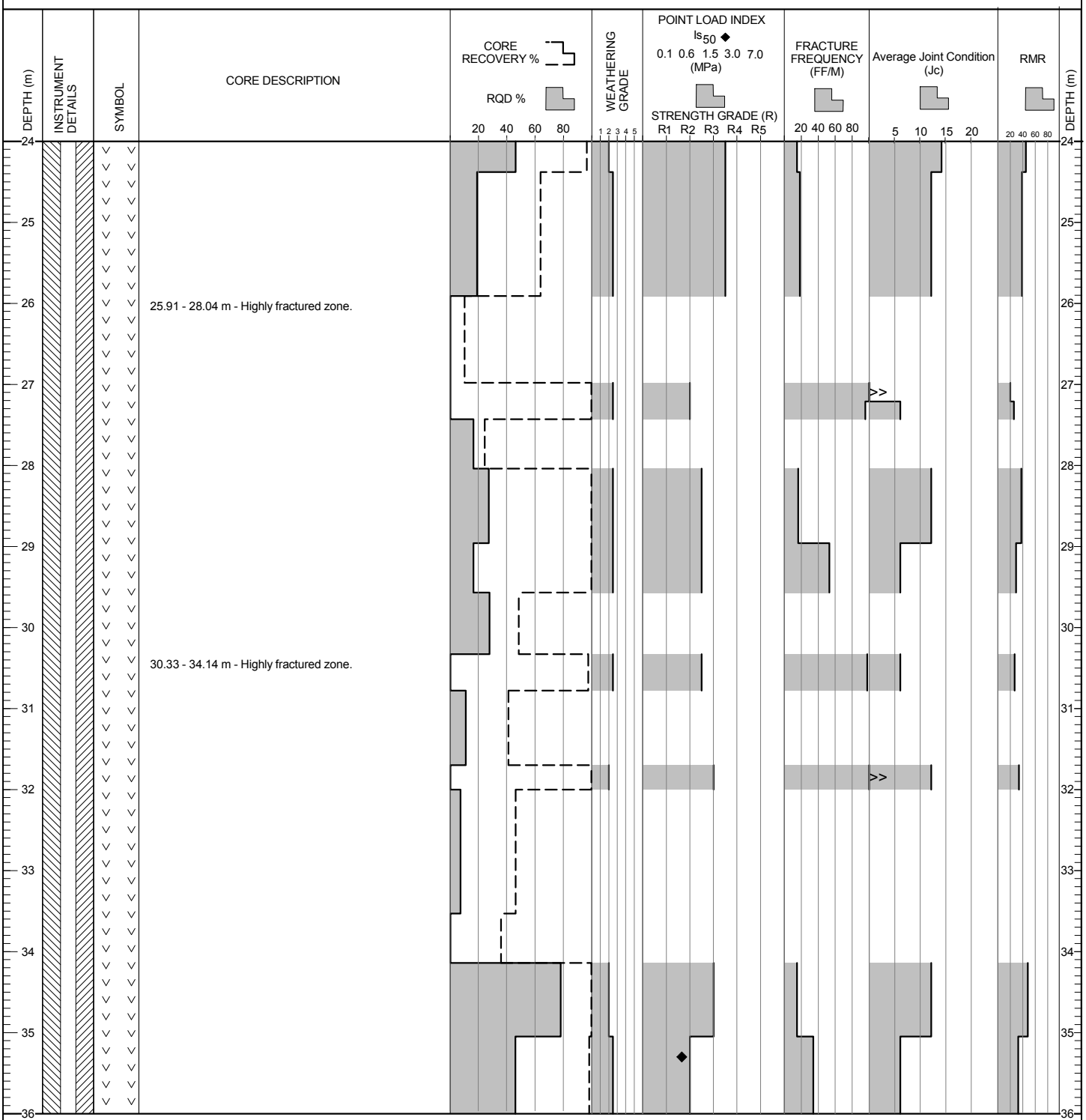
DRILL HOLE # BH-BGC11-36

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,699.9E - 7,100,274.7N
GROUND ELEVATION (m) : 1,002.5m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 19 Jul 11
FINISH DATE : 23 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

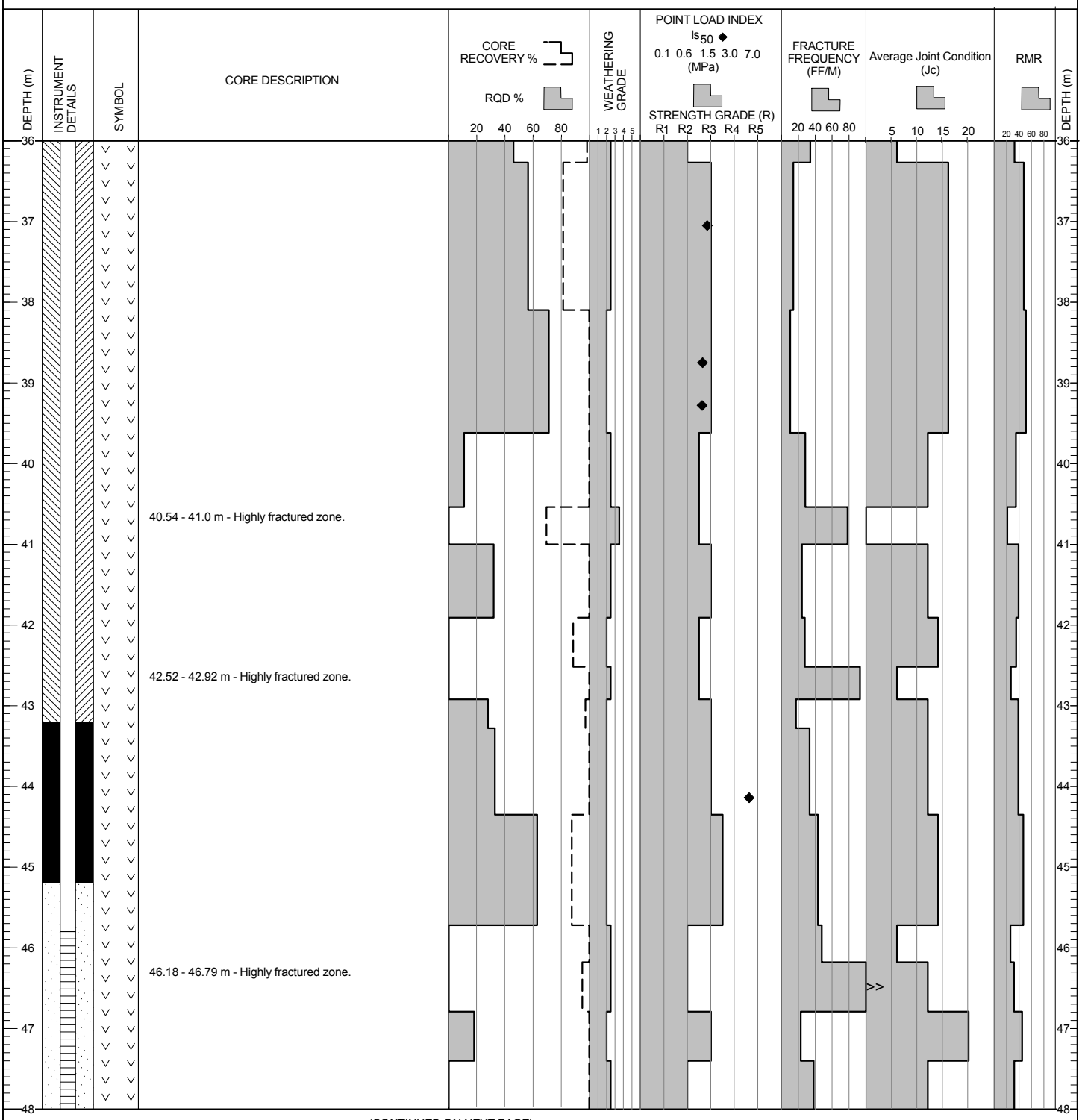
DRILL HOLE # BH-BGC11-36

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,699.9E - 7,100,274.7N
GROUND ELEVATION (m) : 1,002.5m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 19 Jul 11
FINISH DATE : 23 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

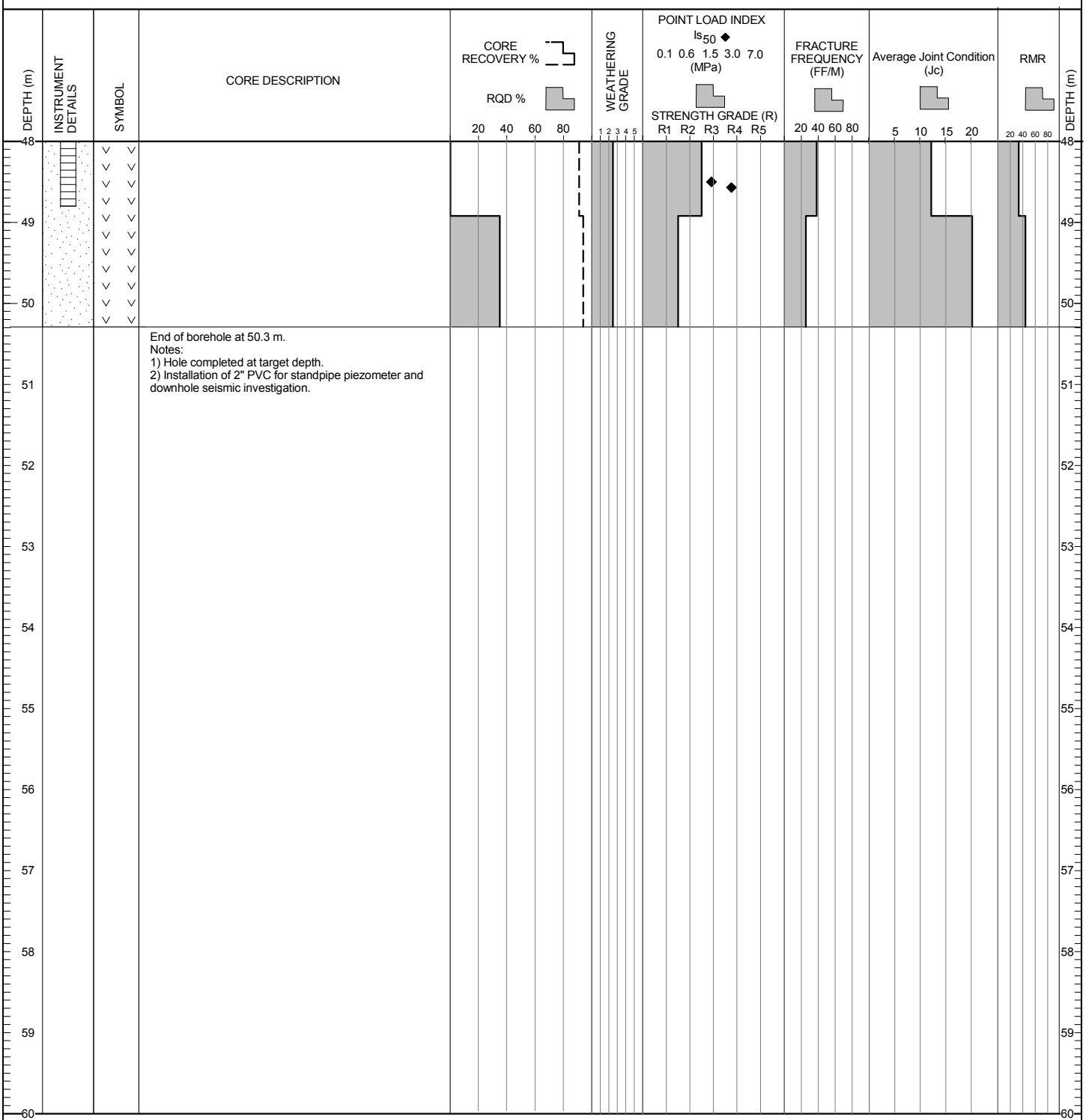
DRILL HOLE # BH-BGC11-36

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,699.9E - 7,100,274.7N
GROUND ELEVATION (m) : 1,002.5m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 19 Jul 11
FINISH DATE : 23 Jul 11
FINAL DEPTH (m) : 50.3
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-37

LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,762.8E - 7,100,180.5N
GROUND ELEVATION (m) : 1,034.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 3.75

START DATE : 24 Jul 11
FINISH DATE : 26 Jul 11
FINAL DEPTH (m) : 43.6
DEPTH TO TOP OF ROCK (m) : 3.8
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GW) Some cobbles, some boulders, metasedimentary, angular, iron stained. Fractured clasts from fill for drill pad. [FILL]		
4				Rock encountered at 3.75 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N: W_P% — W% — W_L%; 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-37

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,762.8E - 7,100,180.5N
GROUND ELEVATION (m) : 1,034.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.75

START DATE : 24 Jul 11
FINISH DATE : 26 Jul 11
FINAL DEPTH (m) : 43.6
DEPTH TO TOP OF ROCK (m) : 3.8
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 3.75 m - See BH-BGC11-37 soil log.

METASEDIMENTARY ROCK
Reddish brown-grey, fine grained, highly fractured, medium strong (R3.5), slightly to moderately weathered (W2 to W3), iron stained, typically 2 main joint sets: foliation at 46-60° and crossing joint set at 50-60° to core axis , JRC = 2-20, averaging 10.

5.79 - 6.25 m - Highly fractured zone.

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

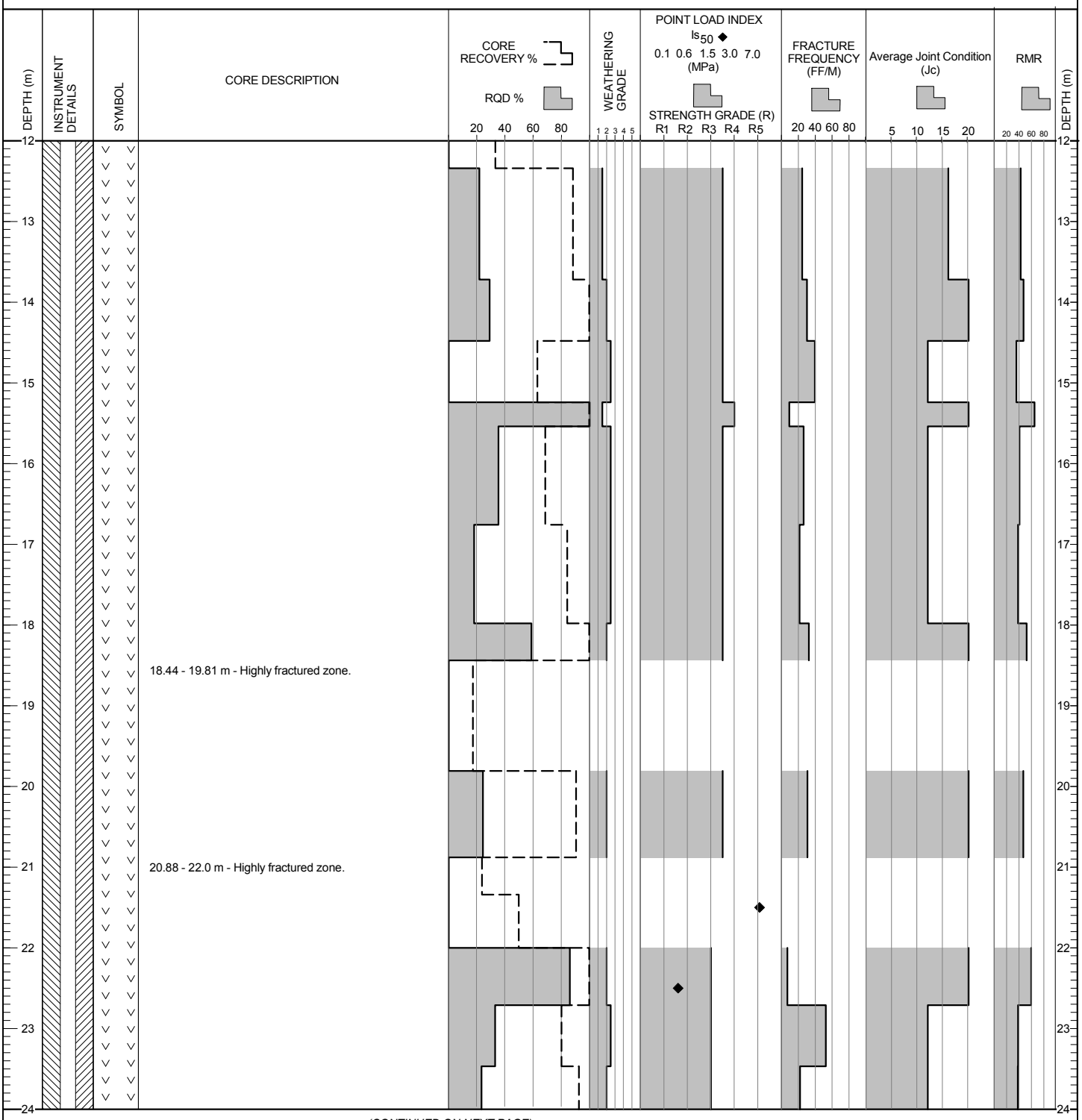
DRILL HOLE # BH-BGC11-37

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,762.8E - 7,100,180.5N
GROUND ELEVATION (m) : 1,034.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.75

START DATE : 24 Jul 11
FINISH DATE : 26 Jul 11
FINAL DEPTH (m) : 43.6
DEPTH TO TOP OF ROCK (m) : 3.8
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

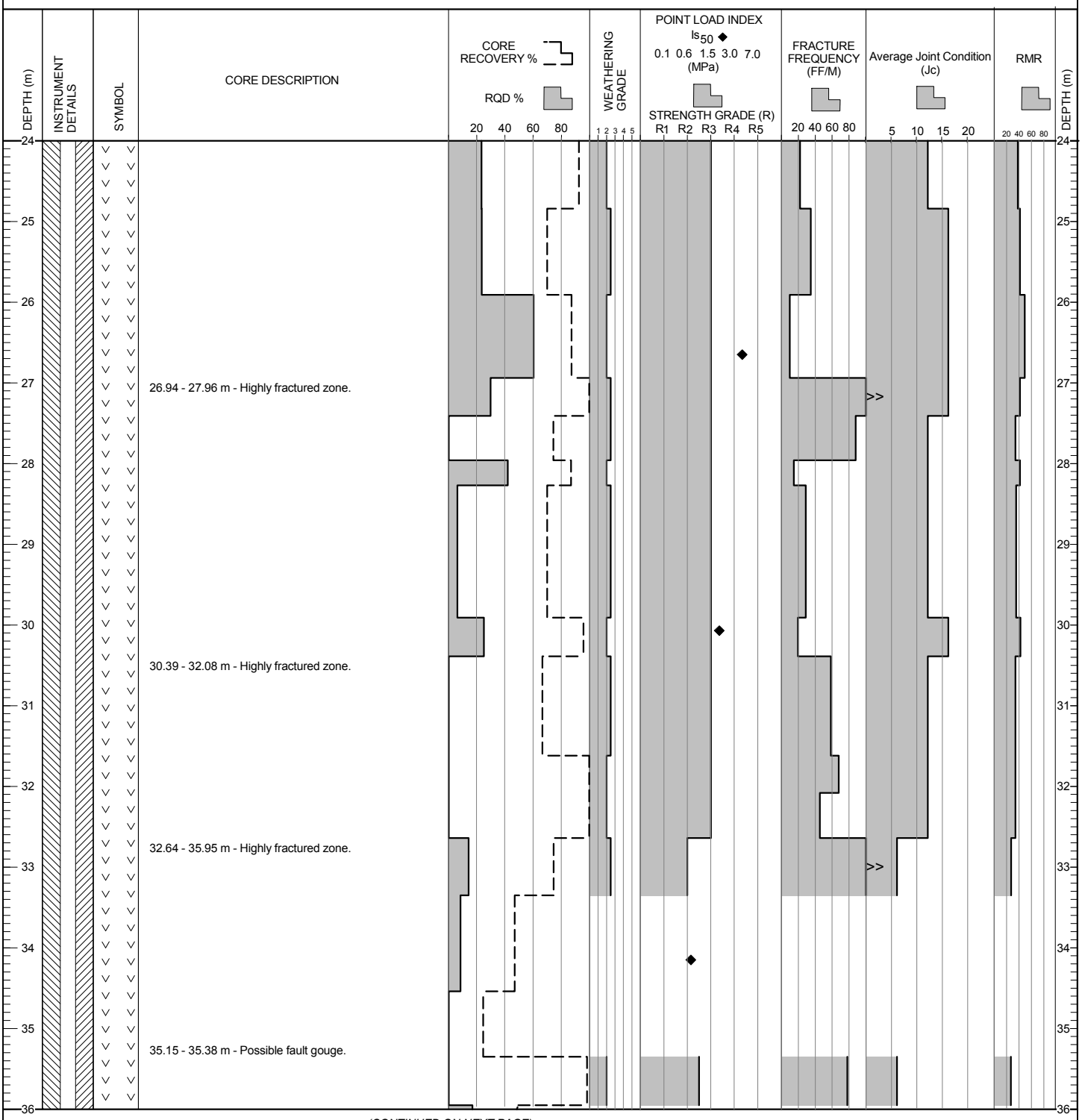
DRILL HOLE # BH-BGC11-37

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,762.8E - 7,100,180.5N
GROUND ELEVATION (m) : 1,034.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.75

START DATE : 24 Jul 11
FINISH DATE : 26 Jul 11
FINAL DEPTH (m) : 43.6
DEPTH TO TOP OF ROCK (m) : 3.8
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

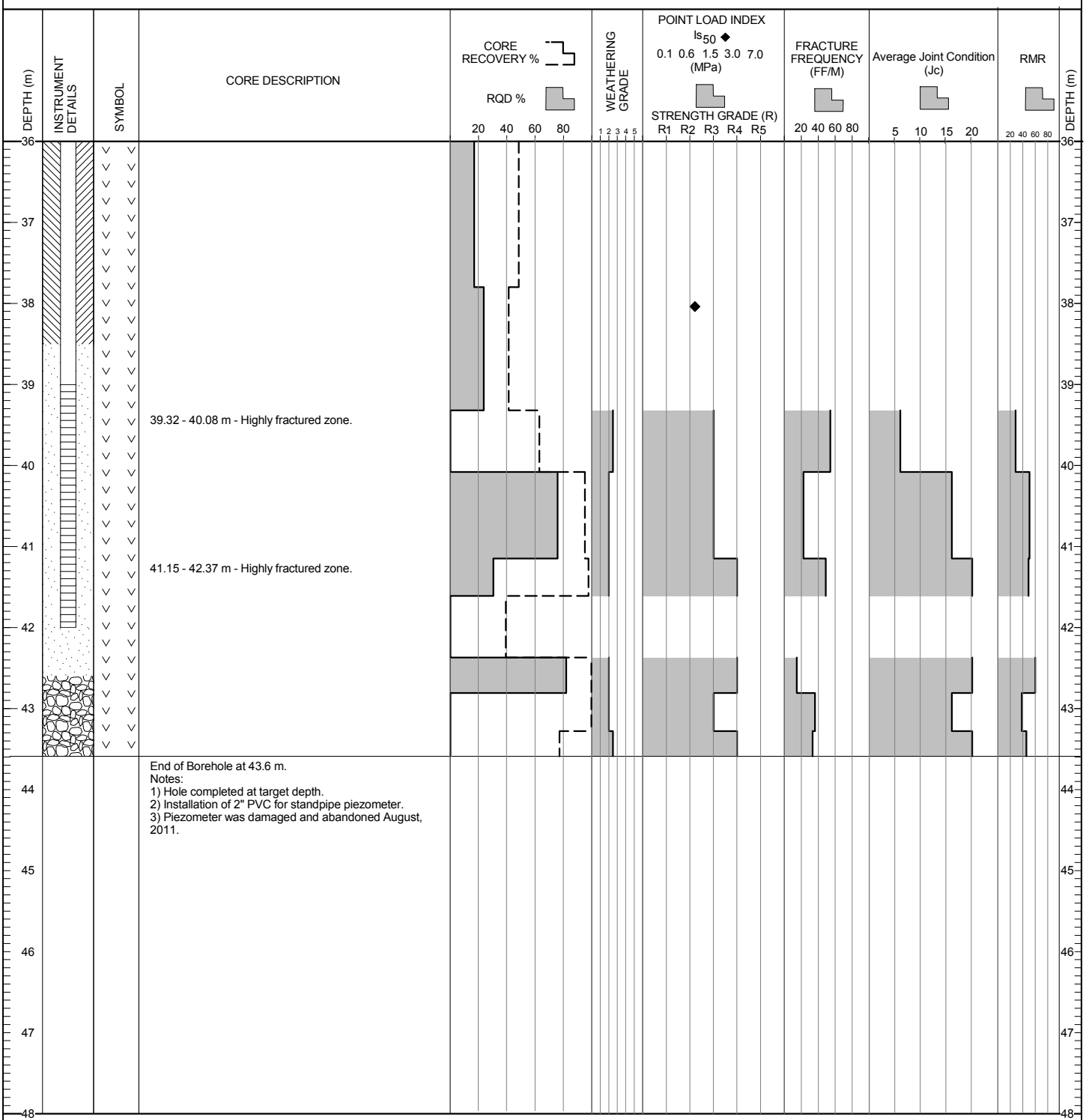
DRILL HOLE # BH-BGC11-37

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,762.8E - 7,100,180.5N
GROUND ELEVATION (m) : 1,034.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.75

START DATE : 24 Jul 11
FINISH DATE : 26 Jul 11
FINAL DEPTH (m) : 43.6
DEPTH TO TOP OF ROCK (m) : 3.8
LOGGED BY : EB/SD
REVIEWED BY : PQ/DW



End of Borehole at 43.6 m.
Notes:
1) Hole completed at target depth.
2) Installation of 2" PVC for standpipe piezometer.
3) Piezometer was damaged and abandoned August, 2011.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-38

LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,820.0E - 7,100,416.0N
GROUND ELEVATION (m) : 1,013.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 8.53

START DATE : 26 Jul 11
FINISH DATE : 27 Jul 11
FINAL DEPTH (m) : 50.5
DEPTH TO TOP OF ROCK (m) : 5.4
LOGGED BY : EB/SD/SP
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GW) Angular to subangular, maximum particle size=50mm, reddish brown. Clasts: metasedimentary, moderately strong (R3). [COLLUVIUM]		
5.35				5.35 - 11.58 m - Highly fractured zone. Rock encountered at 5.40 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-38

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,820.0E - 7,100,416.0N
GROUND ELEVATION (m) : 1,013.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 8.53

START DATE : 26 Jul 11
FINISH DATE : 27 Jul 11
FINAL DEPTH (m) : 50.5
DEPTH TO TOP OF ROCK (m) : 5.4
LOGGED BY : EB/SD/SP
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0										0
1										1
2										2
3			0 to 5.40 m - See BH-BGC11-38 soil log.							3
4										4
5										5
6			METASEDIMENTARY ROCK Reddish brown-grey, fine grained, highly fractured, foliated, weak to medium strong (R2 to R3), slightly to moderately weathered (W2 to W3), iron stained, siliceous, typically 2 joints sets: foliation at 40-65° from core axis, subhorizontal joint and sets diaginal to foliation at 25-65° from core axis, JRC = 2-20, averaging 12.							6
7										7
8										8
9										9
10										10
11										11
12										12

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

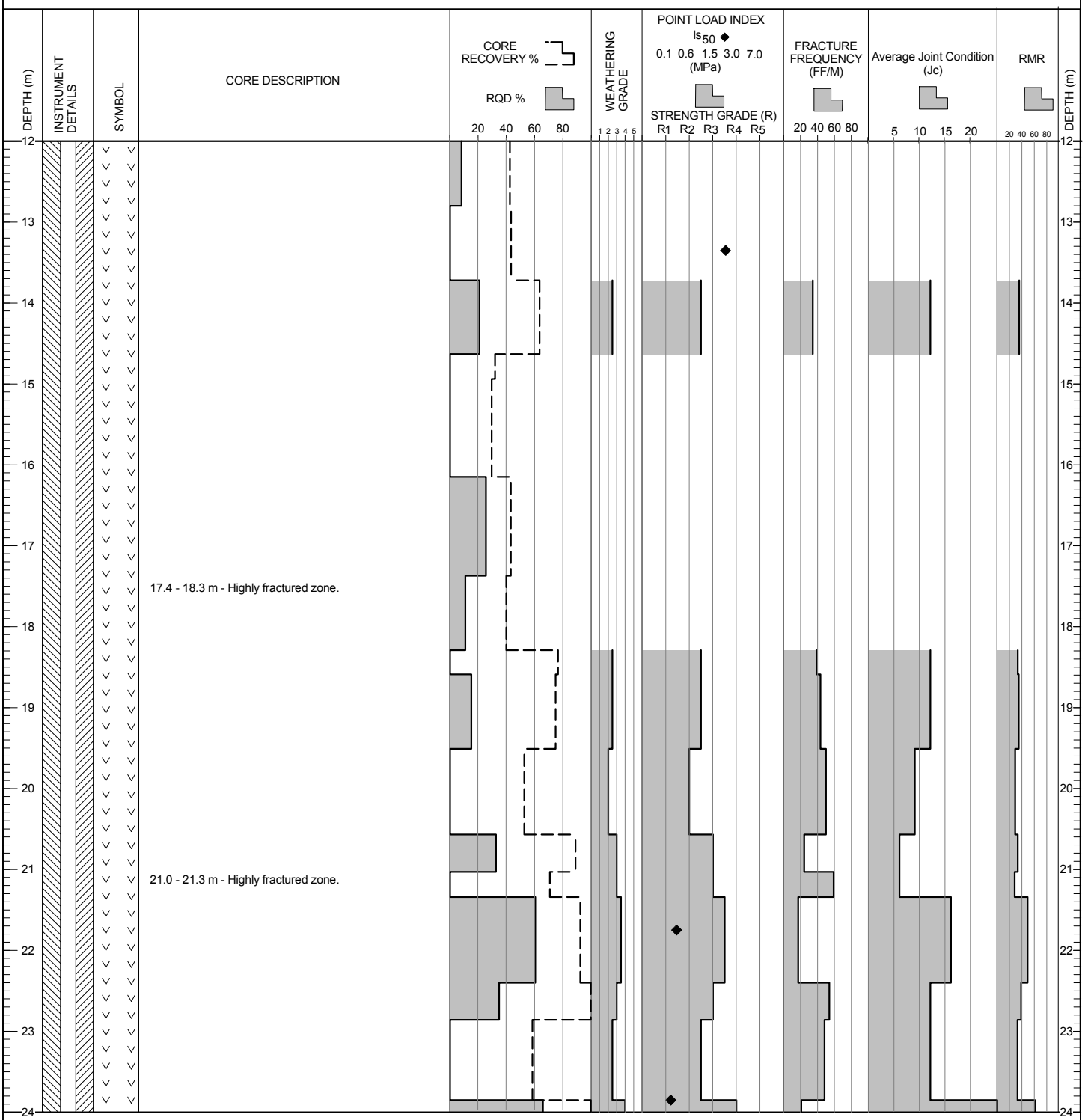
DRILL HOLE # BH-BGC11-38

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,820.0E - 7,100,416.0N
GROUND ELEVATION (m) : 1,013.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 8.53

START DATE : 26 Jul 11
FINISH DATE : 27 Jul 11
FINAL DEPTH (m) : 50.5
DEPTH TO TOP OF ROCK (m) : 5.4
LOGGED BY : EB/SD/SP
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

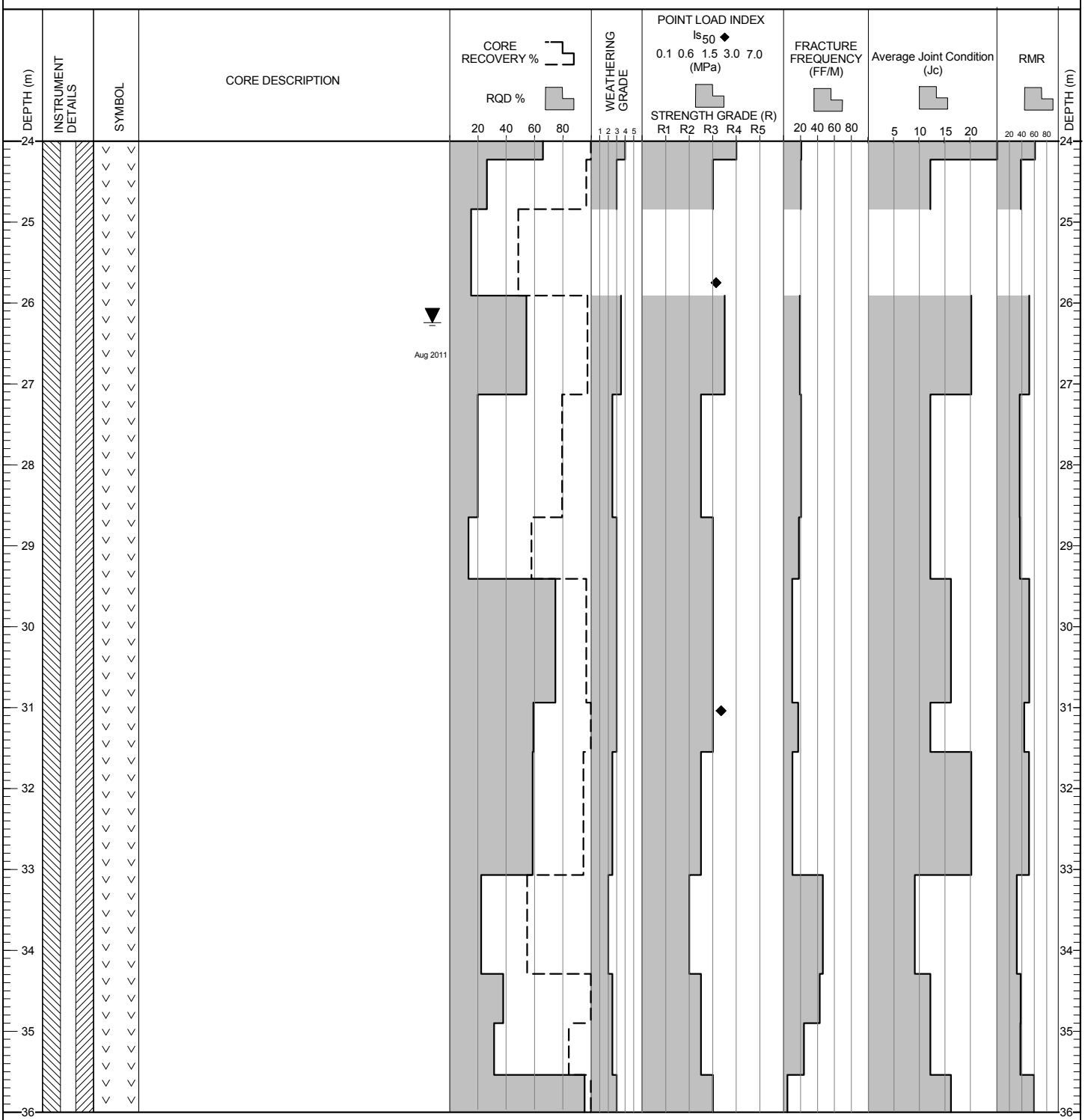
DRILL HOLE # BH-BGC11-38

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,820.0E - 7,100,416.0N
GROUND ELEVATION (m) : 1,013.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 8.53

START DATE : 26 Jul 11
FINISH DATE : 27 Jul 11
FINAL DEPTH (m) : 50.5
DEPTH TO TOP OF ROCK (m) : 5.4
LOGGED BY : EB/SD/SP
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

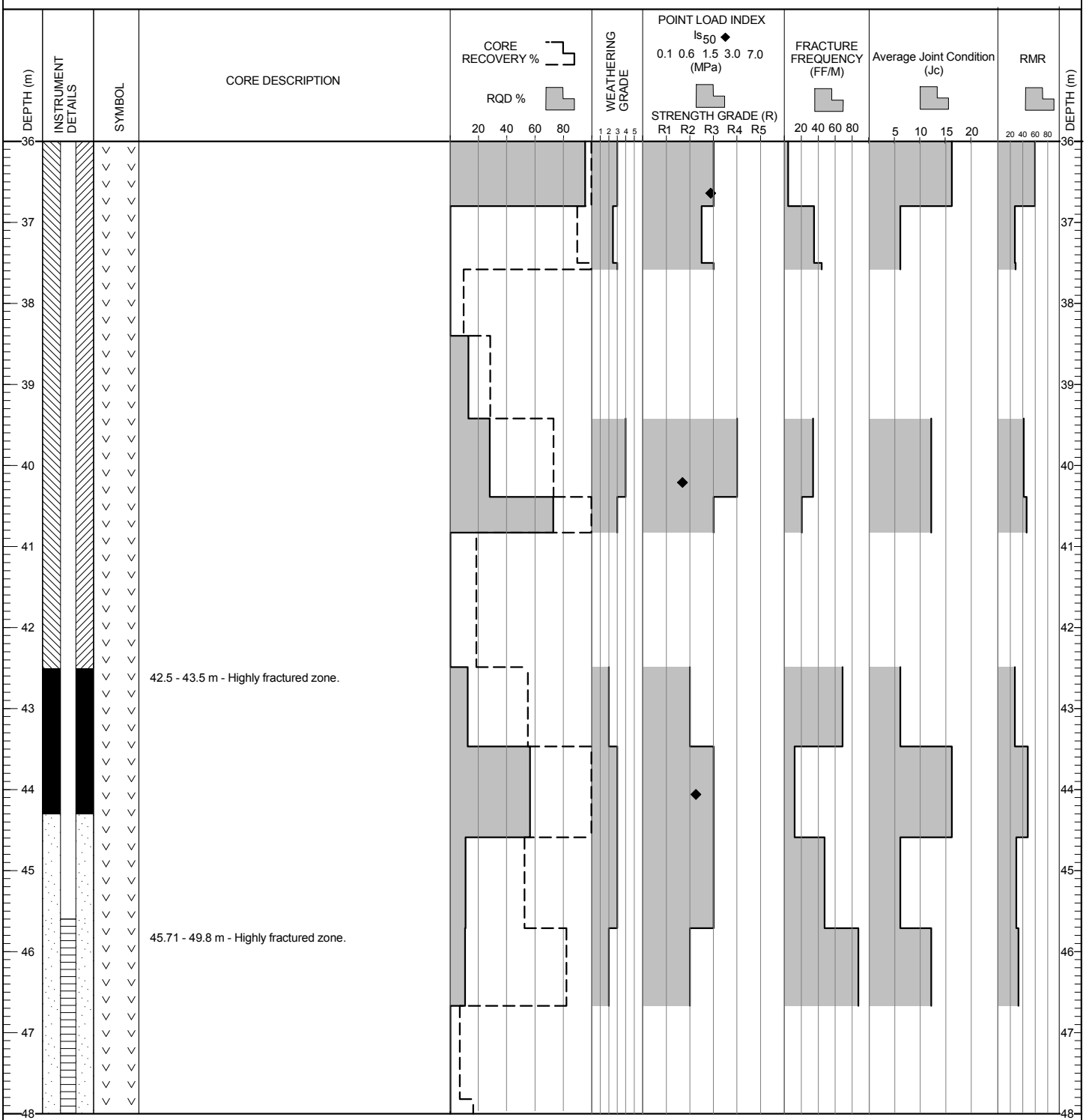
DRILL HOLE # BH-BGC11-38

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,820.0E - 7,100,416.0N
GROUND ELEVATION (m) : 1,013.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 8.53

START DATE : 26 Jul 11
FINISH DATE : 27 Jul 11
FINAL DEPTH (m) : 50.5
DEPTH TO TOP OF ROCK (m) : 5.4
LOGGED BY : EB/SD/SP
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

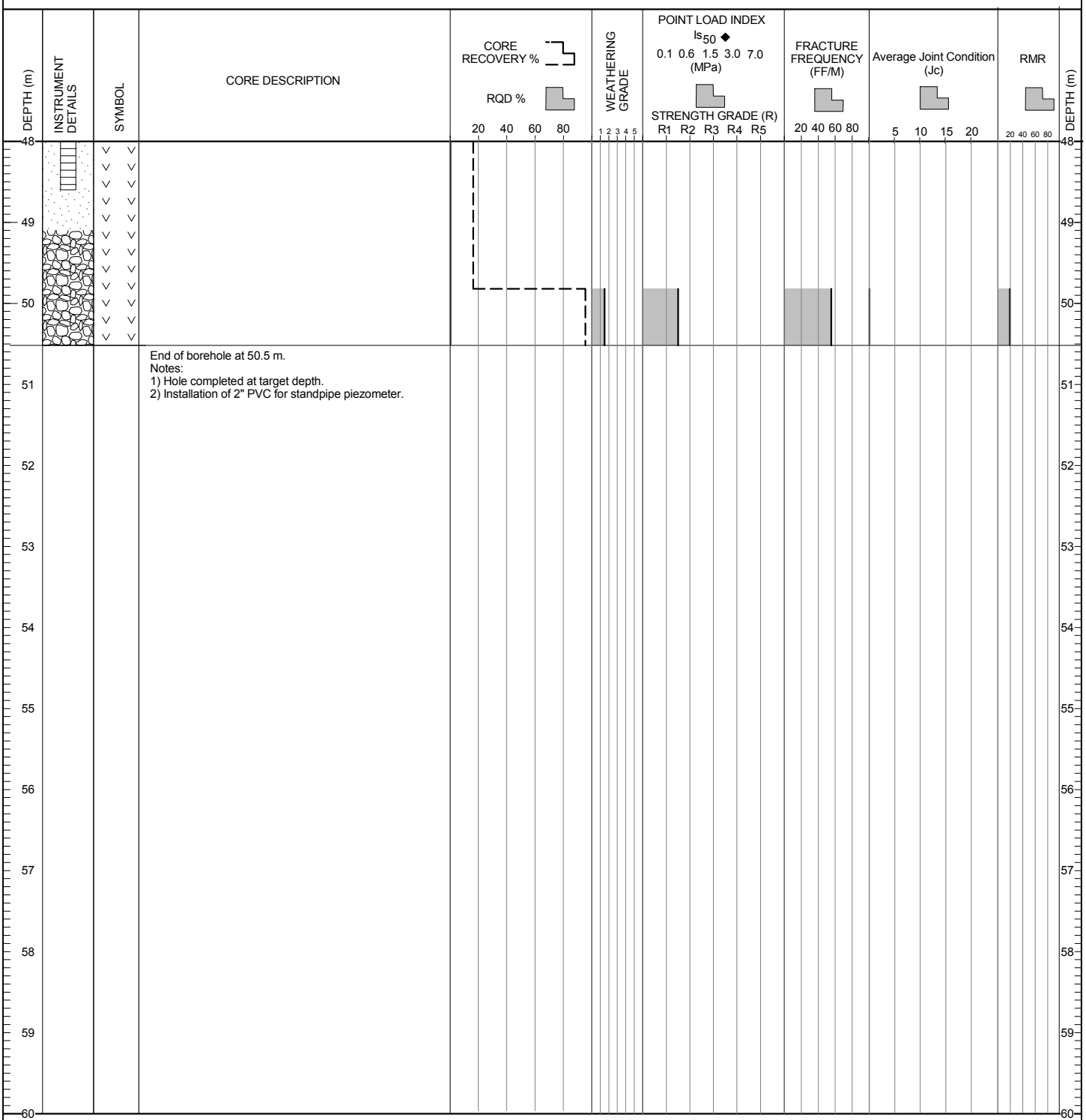
DRILL HOLE # BH-BGC11-38

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,820.0E - 7,100,416.0N
GROUND ELEVATION (m) : 1,013.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 8.53

START DATE : 26 Jul 11
FINISH DATE : 27 Jul 11
FINAL DEPTH (m) : 50.5
DEPTH TO TOP OF ROCK (m) : 5.4
LOGGED BY : EB/SD/SP
REVIEWED BY : PQ/DW



End of borehole at 50.5 m.
Notes:
1) Hole completed at target depth.
2) Installation of 2" PVC for standpipe piezometer.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

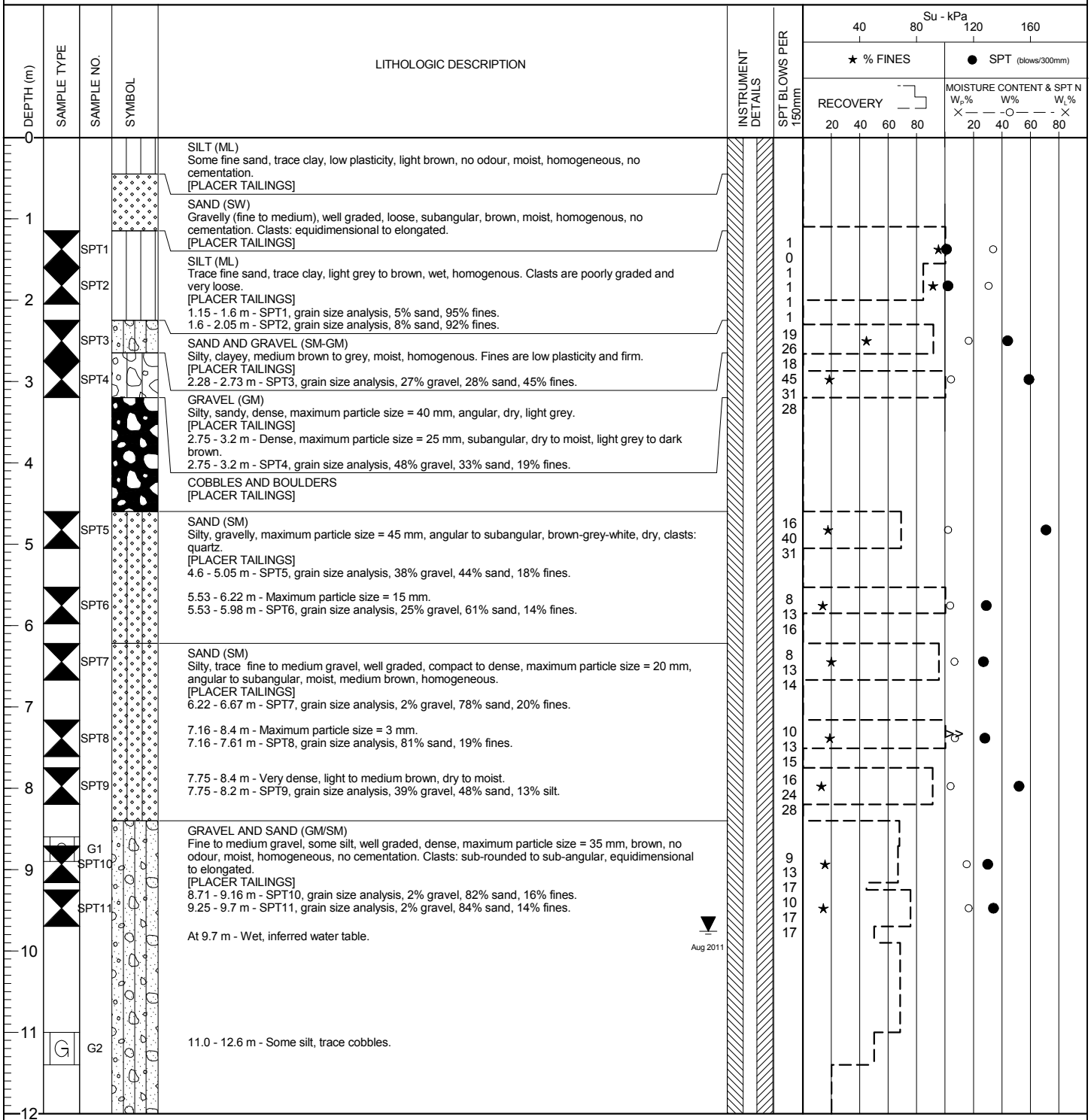
DRILL HOLE # BH-BGC11-39

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006
LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m): 458,462.0E - 7,101,056.0N
GROUND ELEVATION (m) : 797.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 27 Jul 11
FINISH DATE : 27 Jul 11
FINAL DEPTH (m) : 28.2
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT/EC/SD
REVIEWED BY : PQ/DW



(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-39

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m): 458,462.0E - 7,101,056.0N
GROUND ELEVATION (m) : 797.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 27 Jul 11
FINISH DATE : 27 Jul 11
FINAL DEPTH (m) : 28.2
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT/EC/SD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
12						
13	G	G3		SAND (SM) Fine, silty, gravelly, poorly graded (gap), loose, maximum particle size = 15 mm, brown, wet. Clasts: equidimensional to elongated, sub-angular to sub-rounded. [PLACER TAILINGS]		
14	G	G4				
	G	G5		SAND (SW) Gravelly, silty to some silt, loose, maximum particle size = 15 mm, brown, wet. Clasts: equidimensional to elongated, sub-angular to sub-rounded. [PLACER TAILINGS]		
15						
16	G	G6				
17	G	G7		SILT(MH) Clayey, high plasticity, stiff, grey mottled orange brown, no odour, moist, stratified/mottled. [PLACER TAILINGS]		
18				SILT (ML) Trace clay, trace gravel, low plasticity, orange brown, moist to wet, homogeneous. [PLACER TAILINGS]		
	G	G8				
19				19.05 - 19.6 m - No recovery.		
20	G	G9		GRAVEL (GP-GM) Silty, some sand, fine, trace clay, poorly graded, maximum particle size = 15 mm, equidimensional to elongated, sub-angular, matrix is low plastic, brown, wet. [PLACER TAILINGS]		
				20.4 - 21.7 m - No recovery.		
21						
22	G	G10		Silt (ML) Trace clay, trace gravel, low plasticity, stiff, light brown with orange brown lenses, wet, stratified. [PLACER TAILINGS]		
23	G	G11				
24						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-39

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m): 458,462.0E - 7,101,056.0N
GROUND ELEVATION (m) : 797.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 27 Jul 11
FINISH DATE : 27 Jul 11
FINAL DEPTH (m) : 28.2
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT/EC/SD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
24						
25	G	G12		24.6 - 25.25 m - Gravelly, some sand, wet. Poor recovery.		
				25.25 - 28.22 m - No recovery. Material would wash from the flights during travel back up through the water and mud infilled hole. Drilling indicates the bit was in gravel.		
26						
27						
28				End of borehole at 28.2 m. Notes: 1) Hole completed due to refusal on cobbles, gravel or weathered rock. 2) Installation of 2" PVC for standpipe piezometer. 3) A separate hole was drilled in direct vicinity of this hole in attempt to auger deeper despite the heaving. This twin hole was used for the piezometer installation.		
29						
30						
31						
32						
33						
34						
35						
36						

Su - kPa
40 80 120 160
★ % FINES
● SPT (blows/300mm)
RECOVERY
20 40 60 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-40A

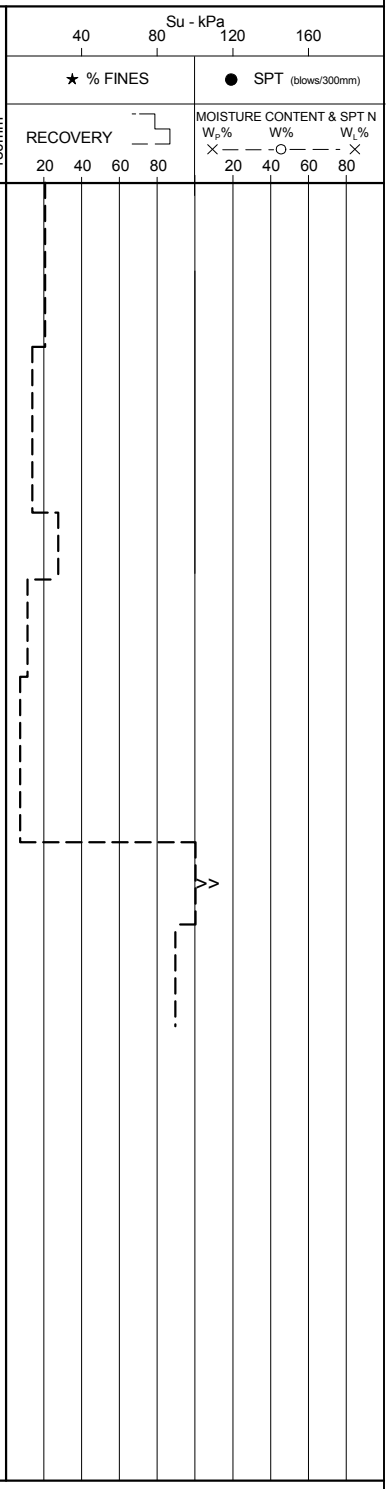
LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,763.0E - 7,100,038.0N
GROUND ELEVATION (m) : 1,050.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 12.19

START DATE : 29 Jul 11
FINISH DATE : 31 Jul 11
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 7.8
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				SAND AND GRAVEL (SW/GW) Well graded, maximum particle size = 250 mm, particles are elongated, angular, brown, moist, homogeneous, non cemented. [FILL]		
1						
2				GRAVEL (GP) Some sand, trace silt, maximum particle size = 60 mm, elongated, subangular to subrounded, blue grey, iron staining, some cementation, clasts are metasedimentary. [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK]		
3						
4						
5						
6						
7						
8				Rock encountered at 7.80 m depth. Refer to rock log.		
9						
10						
11						
12						



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-40A

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,763.0E - 7,100,038.0N
GROUND ELEVATION (m) : 1,050.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 12.19

START DATE : 29 Jul 11
FINISH DATE : 31 Jul 11
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 7.8
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0 – 7.80			0 to 7.80 m - See BH-BGC11-40A soil log.
7.80 – 11.50			METASEDIMENTARY ROCK Grey, organge brown-grey, fine grained, foliated, fractures are closely to very closely spaced,weak to medium strong (R2-R3), slightly to moderately weathered (W2 to W3.5), iron stained, apertures are typically 0.5-1 mm with occasional broken zones (up to 100 mm), average JRC = 12, infill is typically hematite and broken rock with trace calcite, 2 main sets: foliation at 50-65° to core axis, and joint at 10-25° to core axis.
11.50 – 12			METASEDIMENTARY ROCK Grey streaked white, fine grained, foliated, frequent quartz veins, fractures are closely spaced, medium

CORE RECOVERY %
RQD % 20 40 60 80
WEATHERING GRADE 1 2 3 4 5
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) 20 40 60 80
Average Joint Condition (Jc) 5 10 15 20
RMR 20 40 60 80

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

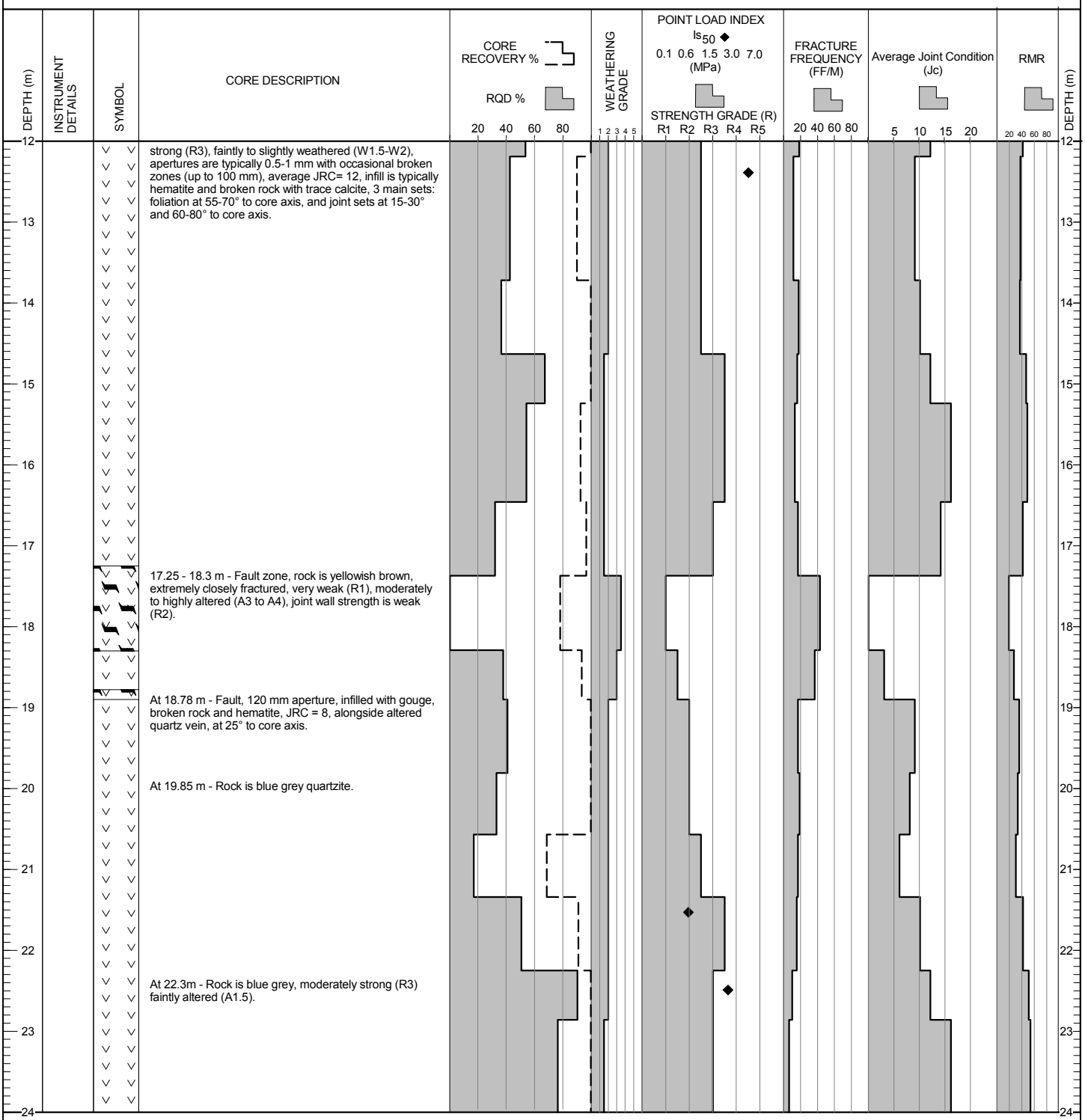
DRILL HOLE # BH-BGC11-40A

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,763.0E - 7,100,038.0N
GROUND ELEVATION (m) : 1,050.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 12.19

START DATE : 29 Jul 11
FINISH DATE : 31 Jul 11
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 7.8
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

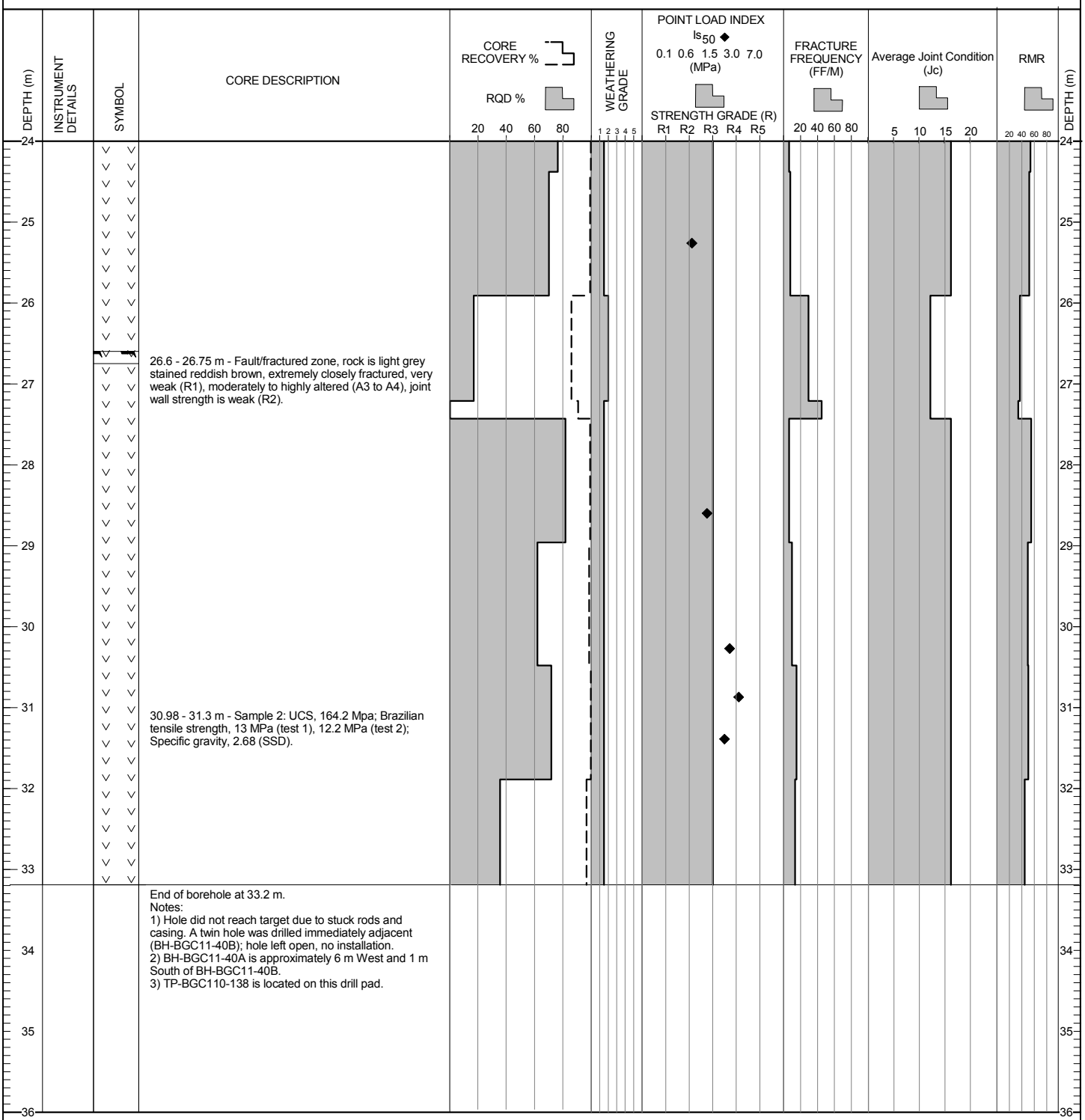
DRILL HOLE # BH-BGC11-40A

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,763.0E - 7,100,038.0N
GROUND ELEVATION (m) : 1,050.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 12.19

START DATE : 29 Jul 11
FINISH DATE : 31 Jul 11
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 7.8
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-40B

LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,767.0E - 7,100,038.8N
GROUND ELEVATION (m) : 1,049.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) :

START DATE : 31 Jul 11
FINISH DATE : 01 Aug 11
FINAL DEPTH (m) : 45.7
DEPTH TO TOP OF ROCK (m) : 8.7
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				0.0 - 8.69 m - No recovery. For soil description please refer to TP-BGC11-138.		
8.69				Rock encountered at 8.69 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

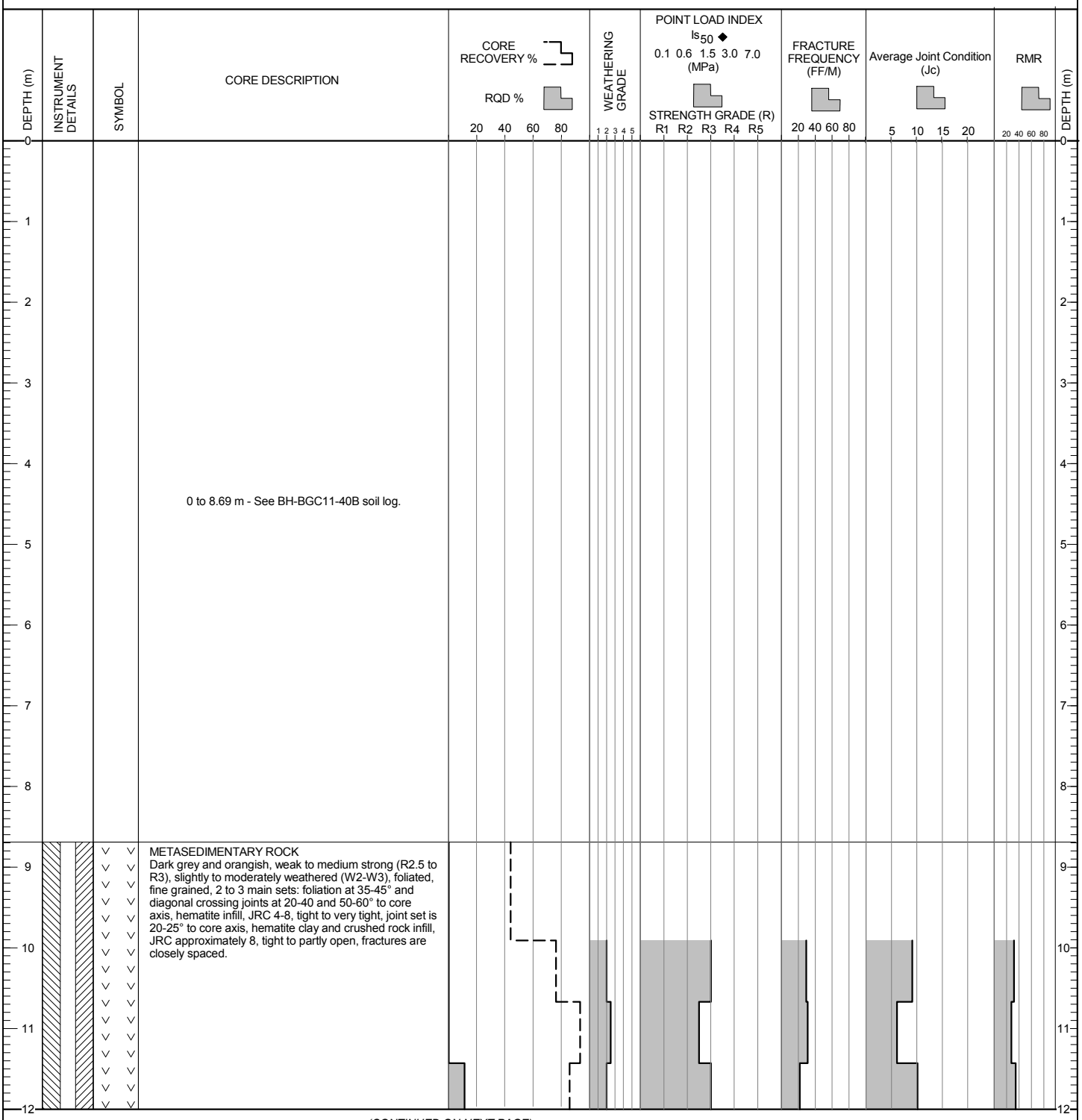
DRILL HOLE # BH-BGC11-40B

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,767.0E - 7,100,038.8N
GROUND ELEVATION (m) : 1,049.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 31 Jul 11
FINISH DATE : 01 Aug 11
FINAL DEPTH (m) : 45.7
DEPTH TO TOP OF ROCK (m) : 8.7
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

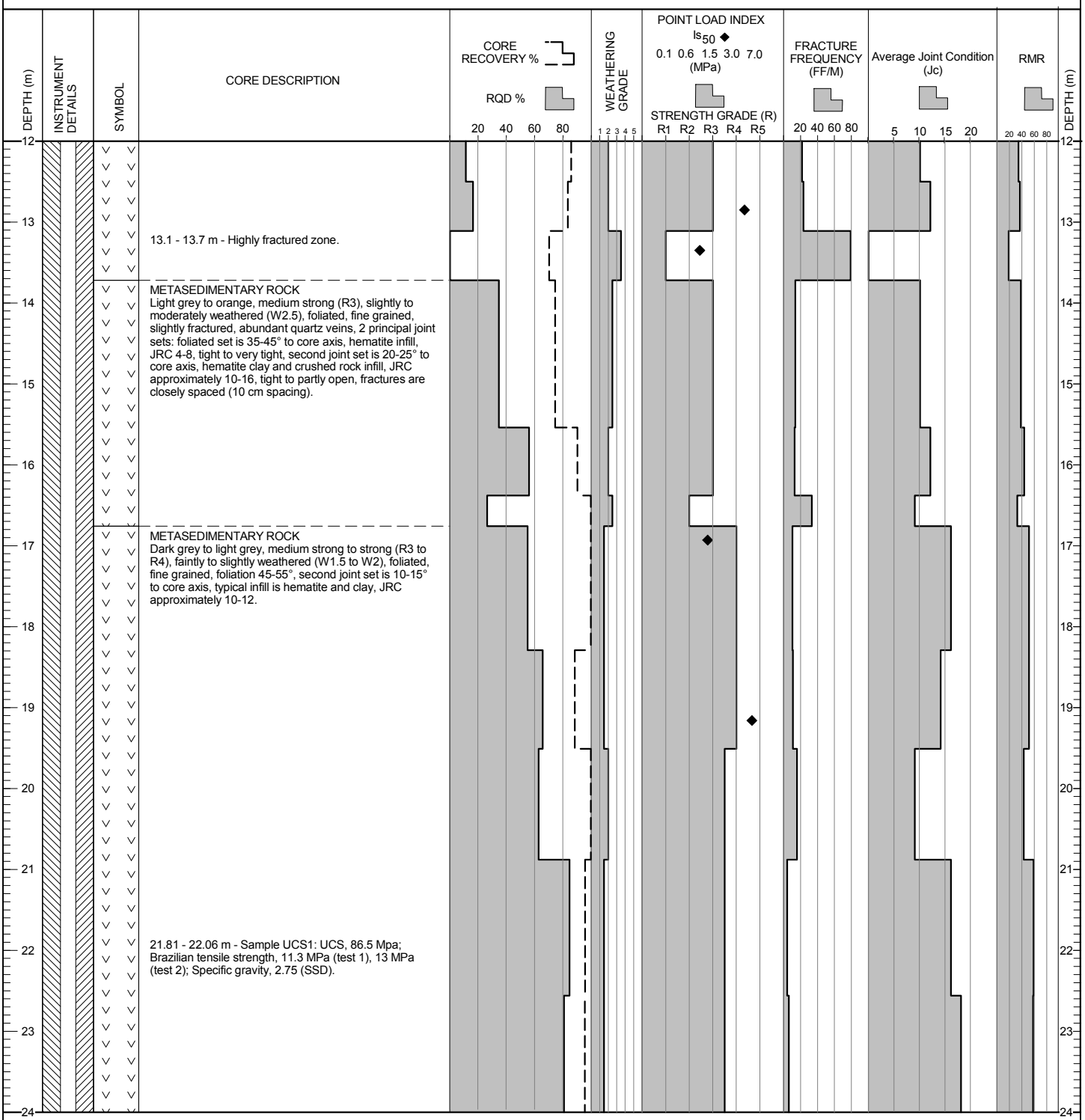
DRILL HOLE # BH-BGC11-40B

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,767.0E - 7,100,038.8N
GROUND ELEVATION (m) : 1,049.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 31 Jul 11
FINISH DATE : 01 Aug 11
FINAL DEPTH (m) : 45.7
DEPTH TO TOP OF ROCK (m) : 8.7
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

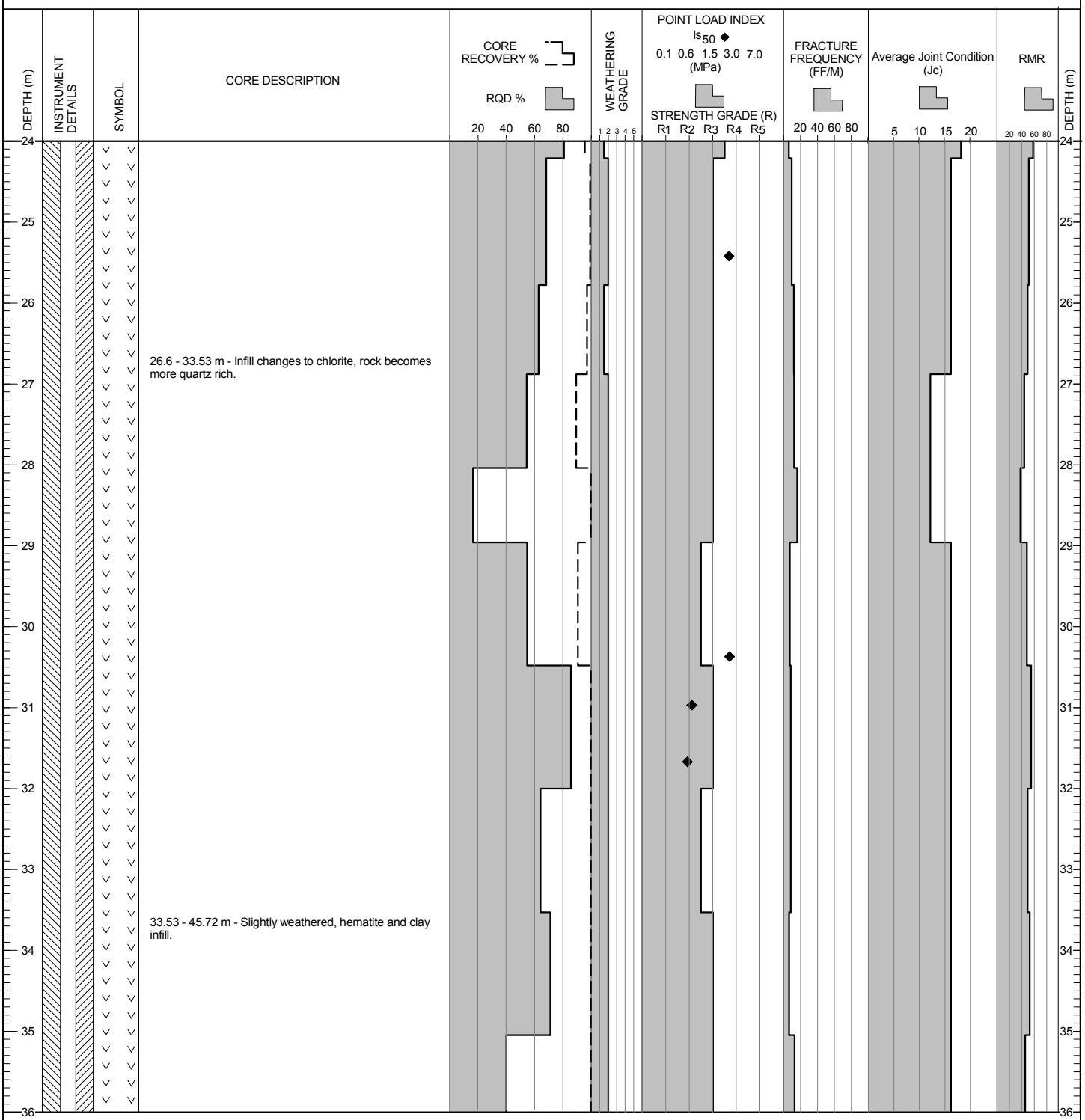
DRILL HOLE # BH-BGC11-40B

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,767.0E - 7,100,038.8N
GROUND ELEVATION (m) : 1,049.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 31 Jul 11
FINISH DATE : 01 Aug 11
FINAL DEPTH (m) : 45.7
DEPTH TO TOP OF ROCK (m) : 8.7
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

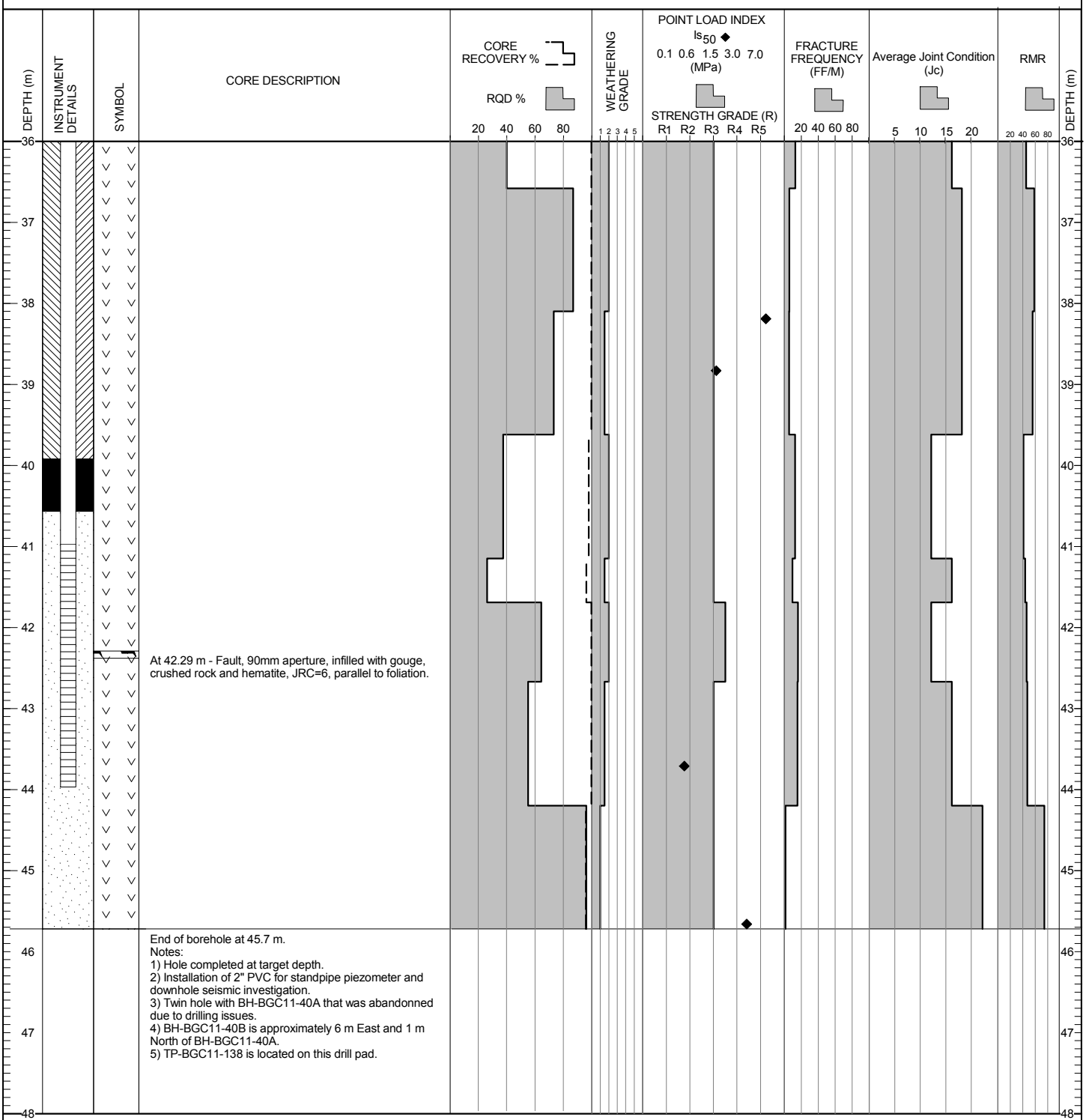
DRILL HOLE # BH-BGC11-40B

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,767.0E - 7,100,038.8N
GROUND ELEVATION (m) : 1,049.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-10
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 31 Jul 11
FINISH DATE : 01 Aug 11
FINAL DEPTH (m) : 45.7
DEPTH TO TOP OF ROCK (m) : 8.7
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

DRILL HOLE # BH-BGC11-41

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

LOCATION : EAGLE PUP

CO-ORDINATES (m): 459,777.0E - 7,100,999.0N
GROUND ELEVATION (m) : 914.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 29 Jul 11
FINISH DATE : 29 Jul 11
FINAL DEPTH (m) : 4.3
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				ORGANICS Rootmat, silt and sand, some organics, moist, brown. [TOPSOIL]		
	G	1		SAND AND GRAVEL (SW/GW) Trace silt, trace cobbles, trace boulders, well graded, loose, maximum particle size = 350 mm, greyish brown, dry to moist, homogeneous. Clasts: elongated to equidimensional, sub-rounded to angular, metasediment and granodiorite (the boulders are granodiorite). Metasedimentary clasts: strong (R4). Granodiorite clasts: very strong (R5) and faintly weathered (W1.5). [COLLUVIUM]		
3				SAND (SW) Gravelly, well graded, compact, maximum particle size= 50 mm, equidimensional to elongated, subangular to angular, greyish brown, dry to moist, homogeneous. Clasts: medium strong to strong (R3 to R4). [MODERATELY TO HIGHLY WEATHERED ROCK]		
4				End of borehole at 4.3 m. Notes: 1) Refusal on bedrock. 2) Backfilled with cuttings. 3) No water encountered. 4) Attempted to drill deeper in four different spots, but couldn't exceed a depth of 4.3 m. 5) 0.0-2.8 m logged from existing cut slope above pad, 2.8-4.3 m logged from auger hole (2.8m BGL was the pad level).		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-42

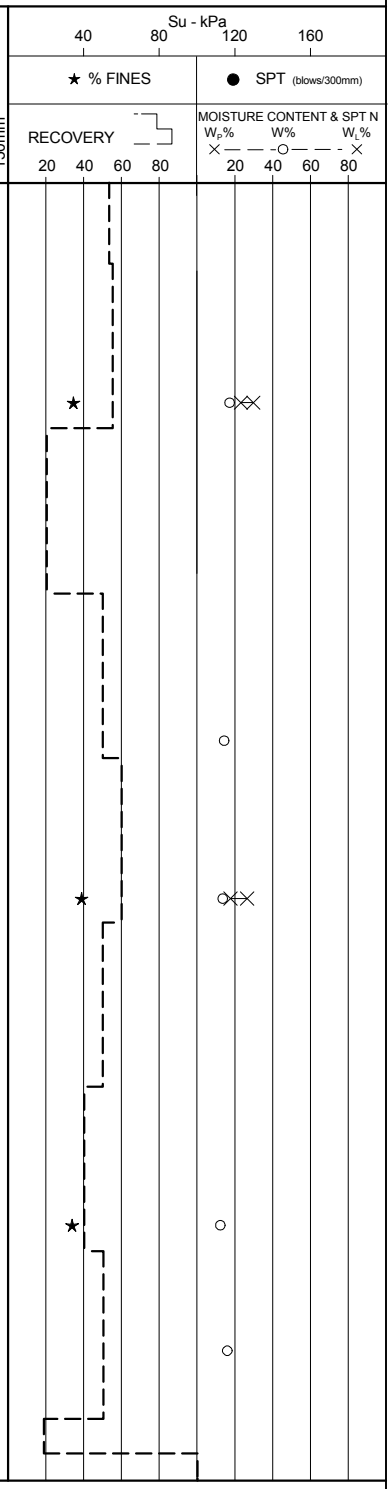
LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,272.3E - 7,100,150.1N
GROUND ELEVATION (m) : 1,098.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 29 Jul 11
FINISH DATE : 01 Aug 11
FINAL DEPTH (m) : 28.2
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0	G	1		ORGANICS Rootmat [TOPSOIL]		
				SAND (SW) Some gravel, some silt, well graded, loose, maximum particle size = 40 mm, yellow brown, moist, homogeneous, no odour. Clasts: equidimensional to elongated, subangular to angular. [ICE RICH COLLUVIUM]		
2	G	2		SAND (SM) Some silt, trace fine to medium gravel, trace clay, well graded, compact, maximum particle size = 15 mm, yellowish to dark brown, faint organic odour, moist, homogeneous. Clasts: subrounded, equidimensional to elongated, completely weathered granoidiorite. Fines are low plasticity. Frozen: Nbn. [ICE RICH COLLUVIUM] 1.8 - 2.27 m - Sample 2, grain size analysis, 7% gravel, 59% sand, 24% silt, 10% clay.		
3	G	3				
5	G	4		5.0 - 7.5 m - Sand is silty (SM), non to low plastic, trace fine gravel, well graded, maximum particle size = 15 mm, moderate dry strength. Frozen: Nbn.		
6	G	5		6.4 - 6.84 m - Sample 5, grain size analysis, 6% gravel, 55% sand, 27% silt, 12% clay. Specific gravity analysis, average specific gravity 2.65.		
7				7.5 - 11.6 m - Trace to some silt, maximum particle size = 7 mm. Frozen: Nbn.		
8	G	6		8.6 - 11.6 m - Frozen, less bonded.		
9	G	7		9.4 - 9.88 m - Sample 7, grain size analysis, 5% gravel, 61% sand, 34% fines.		
11	G	8				
12	G G	9 10		ICE Solid (100% Vx), no sediment inclusion.		



(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-42

LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,272.3E - 7,100,150.1N
GROUND ELEVATION (m) : 1,098.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 29 Jul 11
FINISH DATE : 01 Aug 11
FINAL DEPTH (m) : 28.2
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION
12				11.7 - 15.85 m - Drilled with CRREL barrel. 11.73 - 11.93 m - Bed of SAND (SW) Some silt, wet, brown. Frozen: Vx (20-30%), ice crystals, no sediment inclusions. 12.12 - 12.17 m - Ice with sediment inclusions (30-40%), presence of 2 subhorizontal fractures in the ice. 12.35 - 12.5 m - 0-2% sediment inclusions along subhorizontal beds. Below 12.9 m - Ice grades to ice with sediment inclusions (10-20%).
13	G	12		SAND AND GRAVEL (SM/GM) Some silt, well graded, maximum particle size = 60 mm, orange, wet, homogeneous. Clasts: equidimensional, subrounded, highly weathered granodiorite, very weak to weak (R1 to R2). Frozen: Vx (5-10%), occasional blocks of ice 30-50 mm thick, with 50% sediment inclusions. [ICE RICH COLLUVIUM]
14	G	13		13.3 - 13.65 m - Sample 12, grain size analysis, 31% gravel, 60% sand, 9% fines. At 13.86 m - A layer of Vx, 45 mm thick, <10% sediment inclusion. At 14.26 m - Vx (5-10%), large gravel size blocks of very weak granodiorite present. At 14.62 m - There is 170 mm of ICE, colourless, clear, no bubbles, organized in 3-5 mm subhorizontal lenses, <5% sediment inclusion. At 14.9 m - Frozen: Vx (5%).
15	G	15		SAND AND GRAVEL (SM/GM) Some silt, trace cobbles, well graded, maximum particle size = 80 mm, equidimensional to elongated, subrounded to angular, very weak to weak (R1 to R2) granodiorite, clasts are slightly to moderately weathered (W2.5 to W3), brownish grey, wet, homogeneous. Frozen: Nbn. [ICE RICH COLLUVIUM]
16	G	16		At 15.4 m - Frozen: Vx (5-10%), maximum particle size = 95 mm (granodiorite cobble, medium strong to strong (R3 to R4), slightly weathered (W2)). At 15.85 m - CRREL barrel refused on cobbles - switched to solid stem auger.
17	G	17		SAND (SM) Trace fine gravel, well graded, maximum particle size = 10 mm yellowish brown, wet, homogeneous. Clasts: granodiorite, subrounded, equidimensional, weak (R2), slightly to moderately weathered (W2.5). Frozen: Vx (5-10%). [ICE RICH COLLUVIUM] 17.53 - 18.3 m - Drilled with CRREL barrel.
18				At 17.9 m - Moderately weathered granodiorite boulder R0 to R1.
19				SAND AND GRAVEL (SM/GM) Fine to coarse, well graded, maximum particle size = 65 mm, pinkish brown, wet, homogeneous. Clasts: granodiorite, angular to subangular, weak (R2), slightly to moderately weathered (W2 to W2.5). Frozen: Vx (0-10%). [ICE RICH COLLUVIUM] At 19.0 m - Vx (<5%).
20	G	20		19.7 - 20.0 m - Sample 20, grain size analysis, 10% gravel, 64% sand, 16% silt, 10% clay.
	G	21		
21				
22	G	22		21.55 - 21.9 m - Sample 22, grain size analysis, 4% gravel, 66% sand, 18% silt, 12% clay. At 22.0 m - Not visible ice, penetration is more difficult for auger, disturbed.
23	G	23		
24				

INSTRUMENT DETAILS

SPT BLOWS PER 150mm

Su - kPa
40 80 120 160
★ % FINES
● SPT (blows/300mm)
RECOVERY
20 40 60 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-42

LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,272.3E - 7,100,150.1N
GROUND ELEVATION (m) : 1,098.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 29 Jul 11
FINISH DATE : 01 Aug 11
FINAL DEPTH (m) : 28.2
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	LITHOLOGIC DESCRIPTION
24			
25	G	S24	At 24.6 m - Vx (10%).
			ICE
26	G	S25	
27			SAND AND GRAVEL (SW/GW) Well graded, maximum particle size = 65 mm, pinkish brown, wet, homogeneous. Clasts: granodiorite, angular to subangular, weak (R2), slightly to moderately weathered (W2 to W2.5). Frozen: Nbn. [ICE RICH COLLUVIUM] 27.6 - 28.0 m - Sample S26, grain size analysis, 19% gravel, 59% sand, 22% fines.
28	G	S26	End of borehole at 28.2 m. Notes: 1) Hole completed due to limits of auger. 2) Installation of 2" solid PVC for thermistor, serial #26.5-2, annulus not backfilled. 3) TP-BGC11-95 is located on this drill pad. 4) Sloughing in hole during install. 5) No groundwater encountered. 6) 25 m thermistor installed on Aug. 25, 2011.
29			
30			
31			
32			
33			
34			
35			
36			

INSTRUMENT DETAILS

SPT BLOWS PER 150mm

Su - kPa
40 80 120 160
★ % FINES
● SPT (blows/300mm)
RECOVERY
20 40 60 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-43

LOCATION : PLATINUM GULCH

CO-ORDINATES (m): 459,658.1E - 7,099,106.6N
GROUND ELEVATION (m) : 1,034.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 1.52

START DATE : 02 Aug 11
FINISH DATE : 02 Aug 11
FINAL DEPTH (m) : 23.8
DEPTH TO TOP OF ROCK (m) : 0.9
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GP) Some sand, trace silt, maximum particle size = 60 mm, elongated, subangular to subrounded, blue grey, iron staining, some cementation, clasts are metasedimentary. [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK]		
1				Rock encountered at 0.90 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160

★ % FINES | ● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

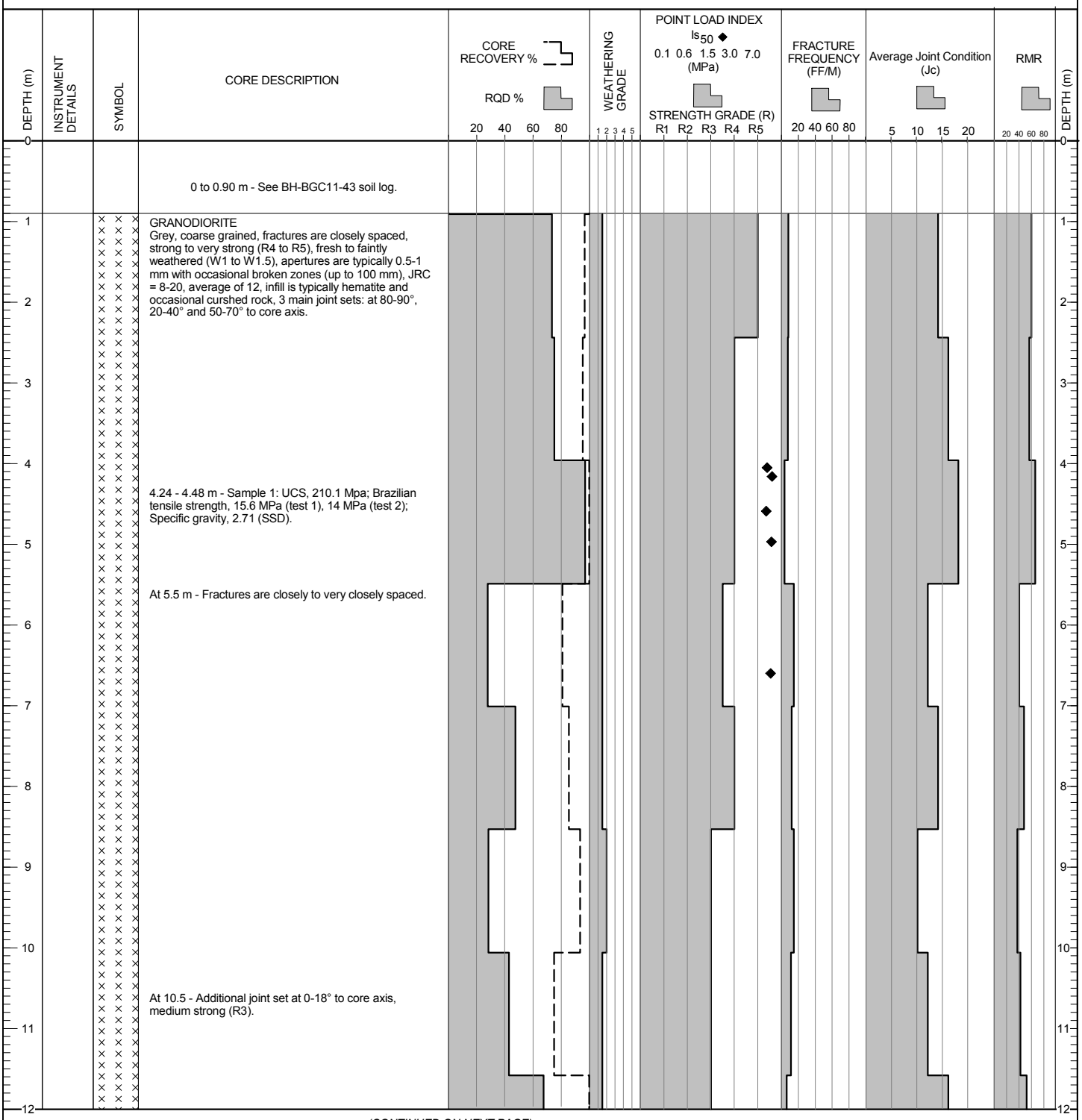
DRILL HOLE # BH-BGC11-43

LOCATION : PLATINUM GULCH

CO-ORDINATES (m) 459,658.1E - 7,099,106.6N
GROUND ELEVATION (m) : 1,034.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 1.52

START DATE : 02 Aug 11
FINISH DATE : 02 Aug 11
FINAL DEPTH (m) : 23.8
DEPTH TO TOP OF ROCK (m) : 0.9
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

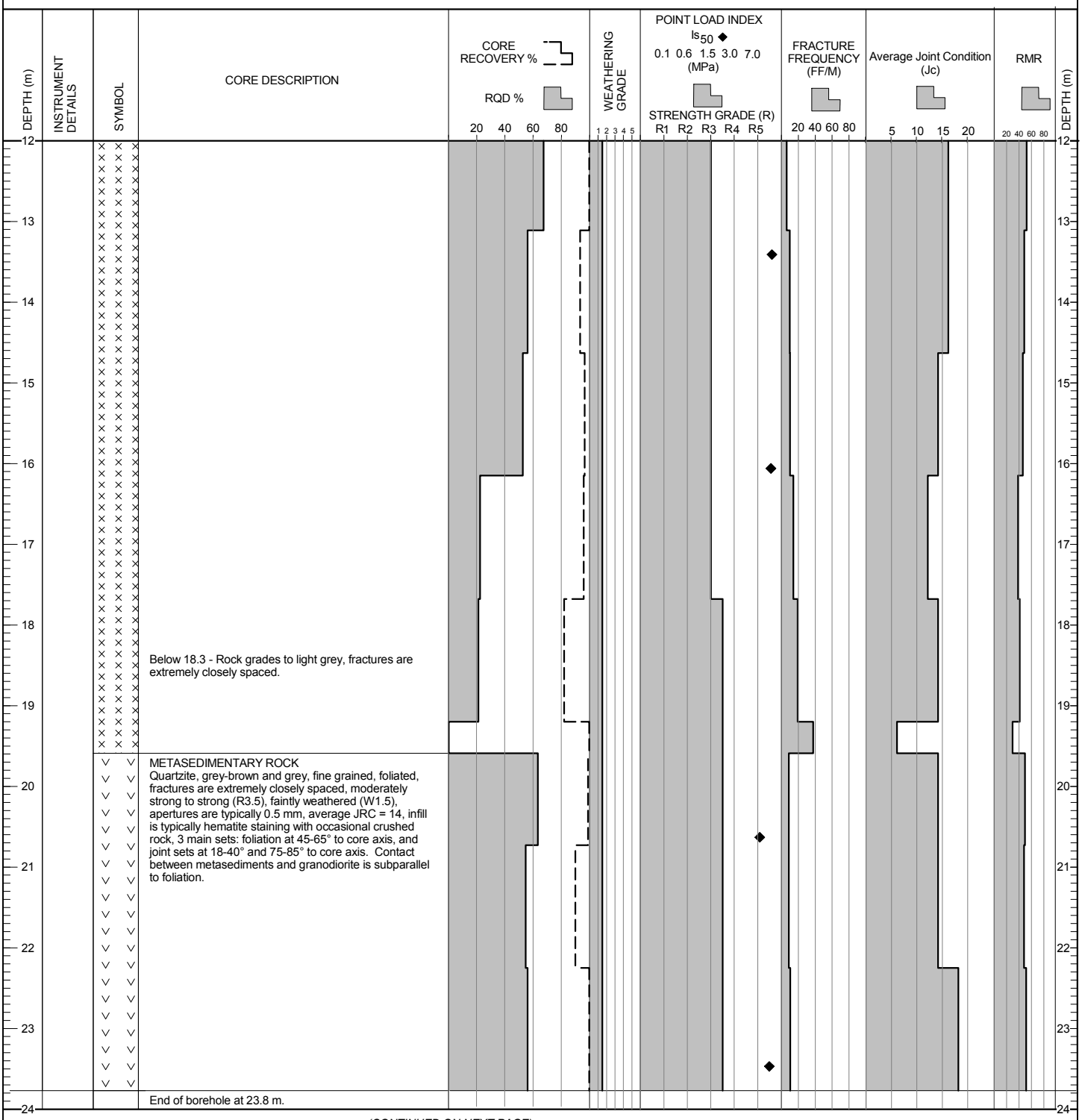
DRILL HOLE # BH-BGC11-43

LOCATION : PLATINUM GULCH

CO-ORDINATES (m) 459,658.1E - 7,099,106.6N
GROUND ELEVATION (m) : 1,034.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 1.52

START DATE : 02 Aug 11
FINISH DATE : 02 Aug 11
FINAL DEPTH (m) : 23.8
DEPTH TO TOP OF ROCK (m) : 0.9
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-43

LOCATION : PLATINUM GULCH

CO-ORDINATES (m) 459,658.1E - 7,099,106.6N
GROUND ELEVATION (m) : 1,034.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 1.52

START DATE : 02 Aug 11
FINISH DATE : 02 Aug 11
FINAL DEPTH (m) : 23.8
DEPTH TO TOP OF ROCK (m) : 0.9
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
24			Notes: 1) Hole completed at target depth. 2) No installation, hole left open.							24
25										25
26										26
27										27
28										28
29										29
30										30
31										31
32										32
33										33
34										34
35										35
36										36

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

DRILL HOLE # BH-BGC11-44

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

LOCATION : STEINER AREA

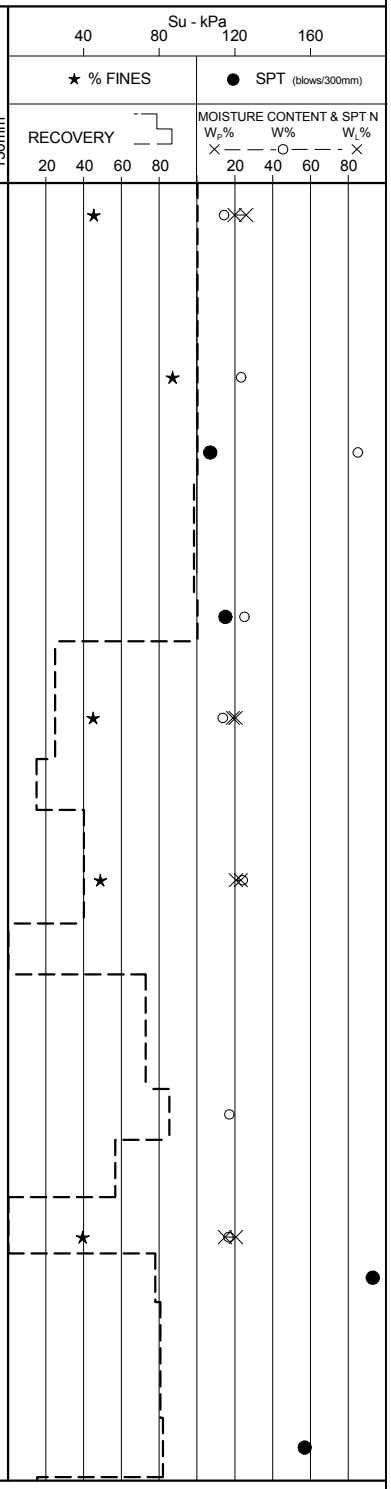
CO-ORDINATES (m): 458,690.4E - 7,100,547.3N
GROUND ELEVATION (m) : 830.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 03 Aug 11
FINISH DATE : 03 Aug 11
FINAL DEPTH (m) : 14.7
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0	G	S1		ORGANICS Rootmat and organic soil. [TOPSOIL]		
	G	S2		SILT (ML) Sandy, some gravel, trace clay, low plasticity, firm, brown, slight organic odour, moist, homogenous. [ALLUVIUM] 0.2 - 0.4 m - Sample S1, grain size analysis, 20% gravel, 35% sand, 32% silt, 13% clay.		
1				SILT AND SAND (ML-SM) Some gravel, non plastic, firm, light brown, no odour, moist, homogeneous. [ALLUVIUM]		
	G	S3		SILT (ML) Some sand, trace gravel, trace organics (decomposing wood), trace clay, low to non plastic, firm, stratified. [ALLUVIUM?]		
2		SPT1		Below 1.5 m - Soil is wet. At 1.52 m - A 1 cm thick lense of gravel, fine to medium, grey, metasedimentary, strong, faintly weathered.		2 3 4
3	G	S4		1.6 - 2.0 m - Sample S3, grain size analysis, 3% gravel, 10% sand, 72% silt, 15% clay. At 2.55 m - A 30 mm lense of silt, trace organics, slight organic odour, dark brown. 2.72 - 8.38 m - Turns to dark grey, slight organic odour, pocket penetrometer <0.5tsf.		
4		SPT2		SAND (SM) Silty, some gravel, dark grey, wet, stratified. Fines are low plasticity and firm. [ALLUVIUM] 4.22 - 4.8 m - Some fine gravel.		3 6 9
5	G	S5		4.8 - 5.1 m - Sample S5, grain size analysis, 33% gravel, 22% sand, 35% silt, 10% clay. 4.8 - 5.5 m - Gravelly.		
		SPT3 S6		5.5 - 6.1 m - Trace to some fine gravel, grey. Becomes frozen: Vx (<10%).		
6	G	S7		6.1 - 7.32 m - Some fine gravel, no excess ice, poor recovery. 6.3 - 6.6 m - Sample S7, grain size analysis, 29% gravel, 22% sand, 49% silt.		
7		SPT4 S8		7.32 - 8.38 m - Some medium to coarse sand, some fine gravel, trace cobbles, equidimensional to elongated, low plasticity, grey. Clasts: sub-angular to angular, excess ice Vx (10-20%), organized in lenses as thick as 25 mm in places.		
8	G	S9				
		SPT5		ICE No sediment inclusions.		
9	G	S10		SILT (ML) Sandy, some gravel, trace cobbles, equidimensional to elongated, low plasticity, grey, wet. Clasts: sub-angular to angular. Frozen: excess ice Vx (<10%), organized in lenses as thick as 25 mm in places.		
		SPT6		[ALLUVIUM?]		
		SPT7 S11		9.0 - 9.6 m - Trace sand, coarse, trace gravel, fine, trace cobbles. Frozen: Nbn. 9.6 - 9.9 m - Sample S11, grain size analysis, 20% gravel, 40% sand, 24% silt, 16% clay.		
10		SPT8		9.6 - 9.9 m - Trace to some gravel, fine, moist to wet. SILT (MH) Gravelly, fine to medium, trace sand, trace clay, stiff, maximum particle size = 25 mm, matrix has high plasticity, brownish grey, moist, not frozen. Clasts: gap graded, sub-rounded to angular, equidimensional to elongated, metasedimentary rock. [ALLUVIUM?]		19 41 52
11	G	S12		SILT (ML) Trace sand, fine, trace clay, low plasticity, hard, dark grey, wet. [ALLUVIUM?]		
		SPT9				13 19
12				SILT (MH)		

(Continued on next page)



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-44

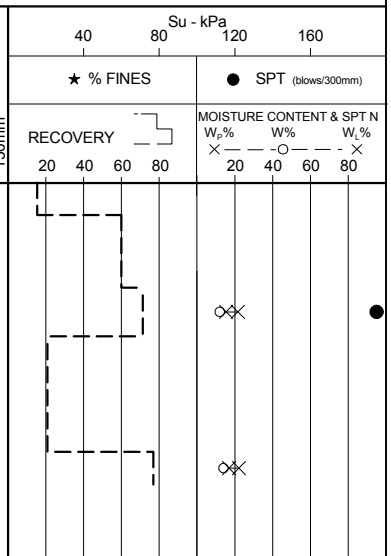
LOCATION : STEINER AREA

CO-ORDINATES (m): 458,690.4E - 7,100,547.3N
GROUND ELEVATION (m) : 830.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 03 Aug 11
FINISH DATE : 03 Aug 11
FINAL DEPTH (m) : 14.7
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
12				Some clay, high plasticity, hard, light brown, moist, homogeneous. [ALLUVIUM?]		38
	G	S13		SILT (ML) Some sand, some gravel, trace clay, low plasticity, hard, bownish grey, moist to wet. [ALLUVIUM?]		
13		SPT10		At 13.4 m - Maximum particle size = 45mm, metasedimentary clasts.		33 42 53
14	G	S14		At 14.0 m - Trace coarse gravel, trace cobbles. Frozen: NbN.		
		SPT11		End of borehole at 14.7 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" solid PVC for thermistor, serial #11.5-3, annulus not backfilled. 3) 10 m thermistor installed on Aug. 10, 2011. Thermistor was damaged on Aug. 28, no longer serviceable.		
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-45

LOCATION : PLATINUM GULCH

CO-ORDINATES (m): 460,556.2E - 7,099,109.5N
GROUND ELEVATION (m) : 1,354.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 3.05

START DATE : 03 Aug 11
FINISH DATE : 04 Aug 11
FINAL DEPTH (m) : 20.7
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				0.0 - 3.05 m - No recovery. For soil description refer to log of TP-BGC11-102, excavated on this drill pad.		
3				Rock encountered at 3.05 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

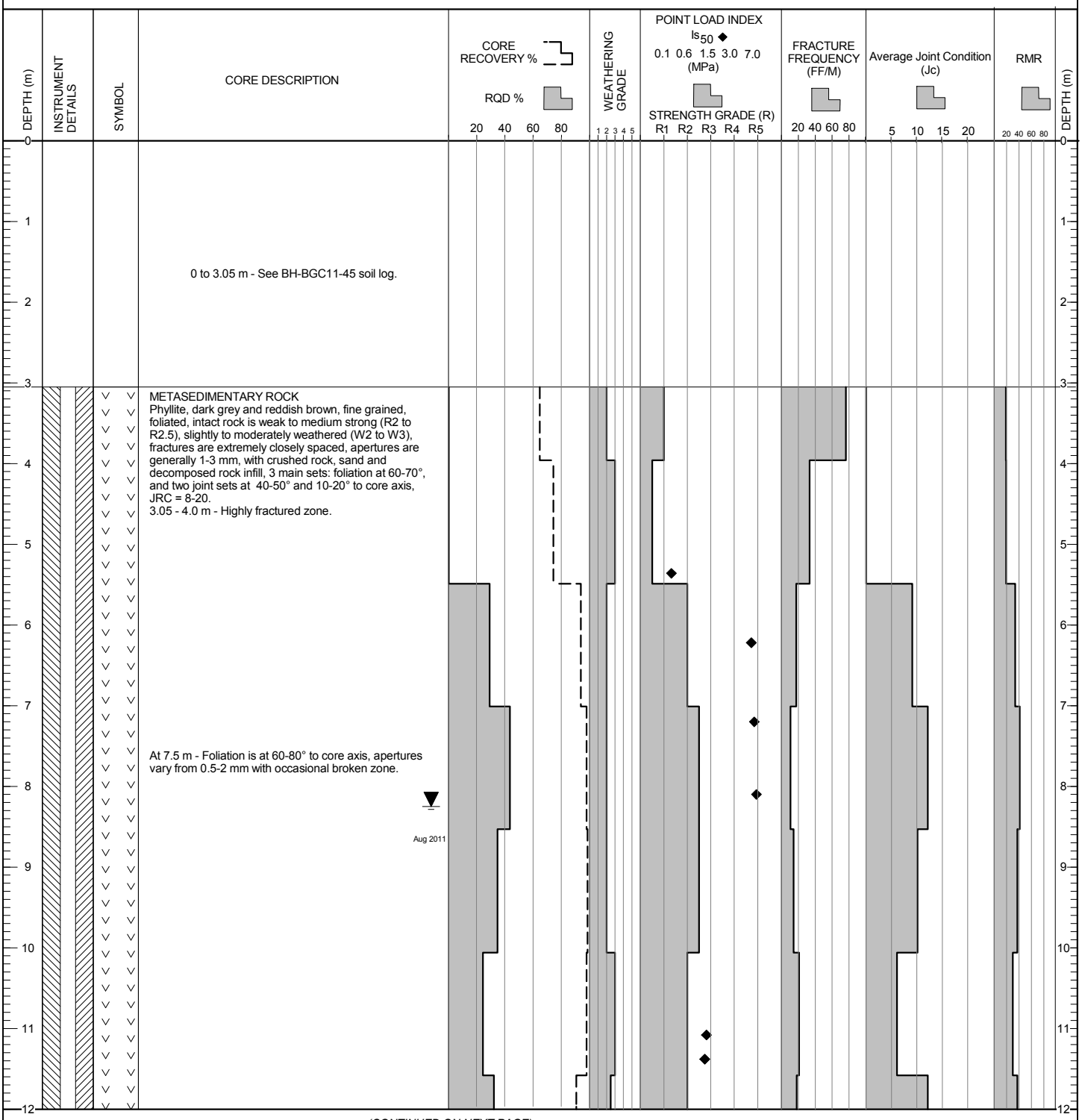
DRILL HOLE # BH-BGC11-45

LOCATION : PLATINUM GULCH

CO-ORDINATES (m) 460,556.2E - 7,099,109.5N
GROUND ELEVATION (m) : 1,354.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 03 Aug 11
FINISH DATE : 04 Aug 11
FINAL DEPTH (m) : 20.7
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

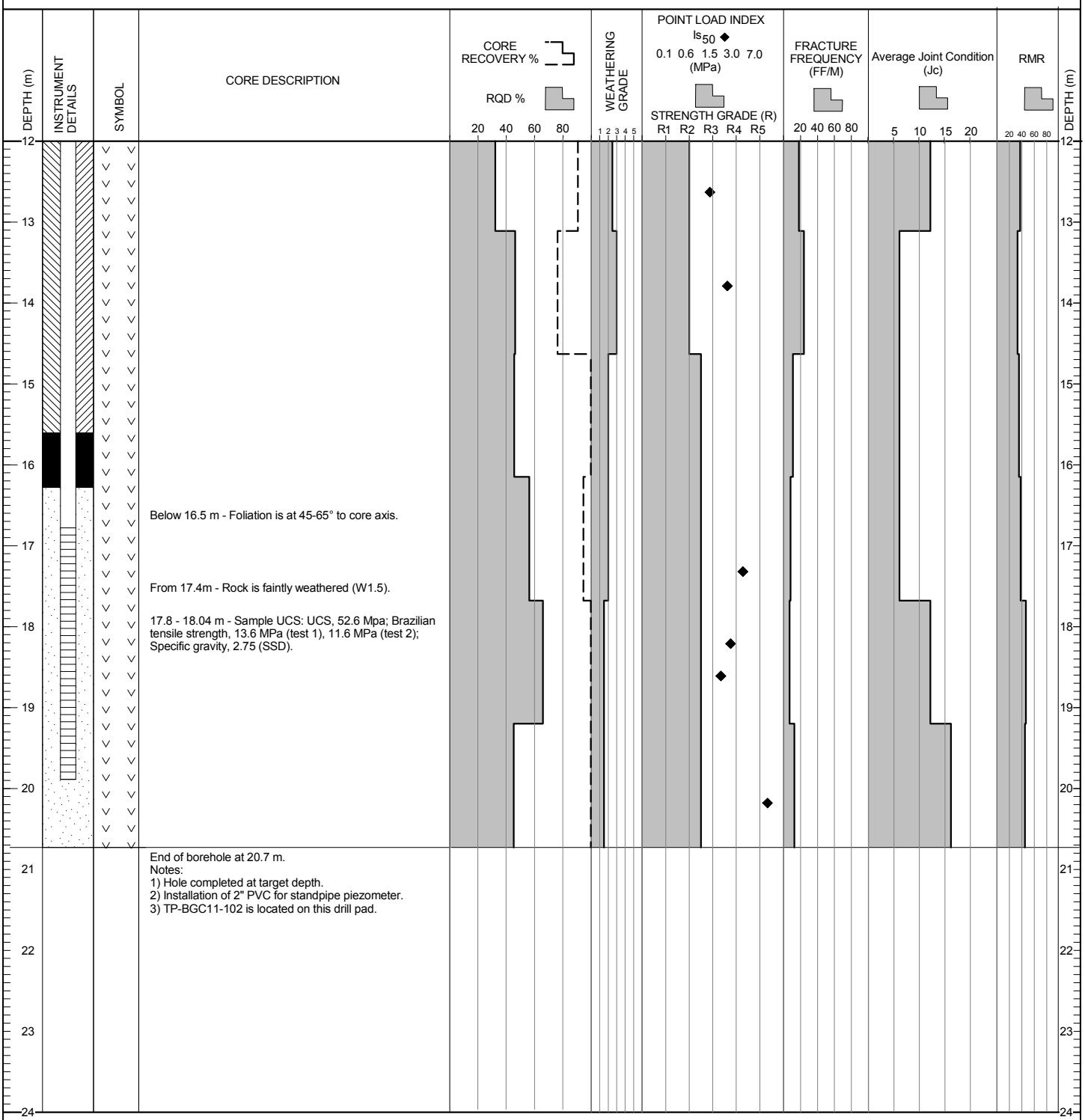
DRILL HOLE # BH-BGC11-45

LOCATION : PLATINUM GULCH

CO-ORDINATES (m) 460,556.2E - 7,099,109.5N
GROUND ELEVATION (m) : 1,354.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 03 Aug 11
FINISH DATE : 04 Aug 11
FINAL DEPTH (m) : 20.7
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-46

LOCATION : PLATINUM GULCH

CO-ORDINATES (m): 460,262.7E - 7,099,004.0N
GROUND ELEVATION (m) : 1,246.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 10.91

START DATE : 04 Aug 11
FINISH DATE : 04 Aug 11
FINAL DEPTH (m) : 20.1
DEPTH TO TOP OF ROCK (m) : 2.4
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				COBBLES Granodiorite and quartzite cobbles. [FILL/COLLUVIUM?]		
2.44				Rock encountered at 2.44 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

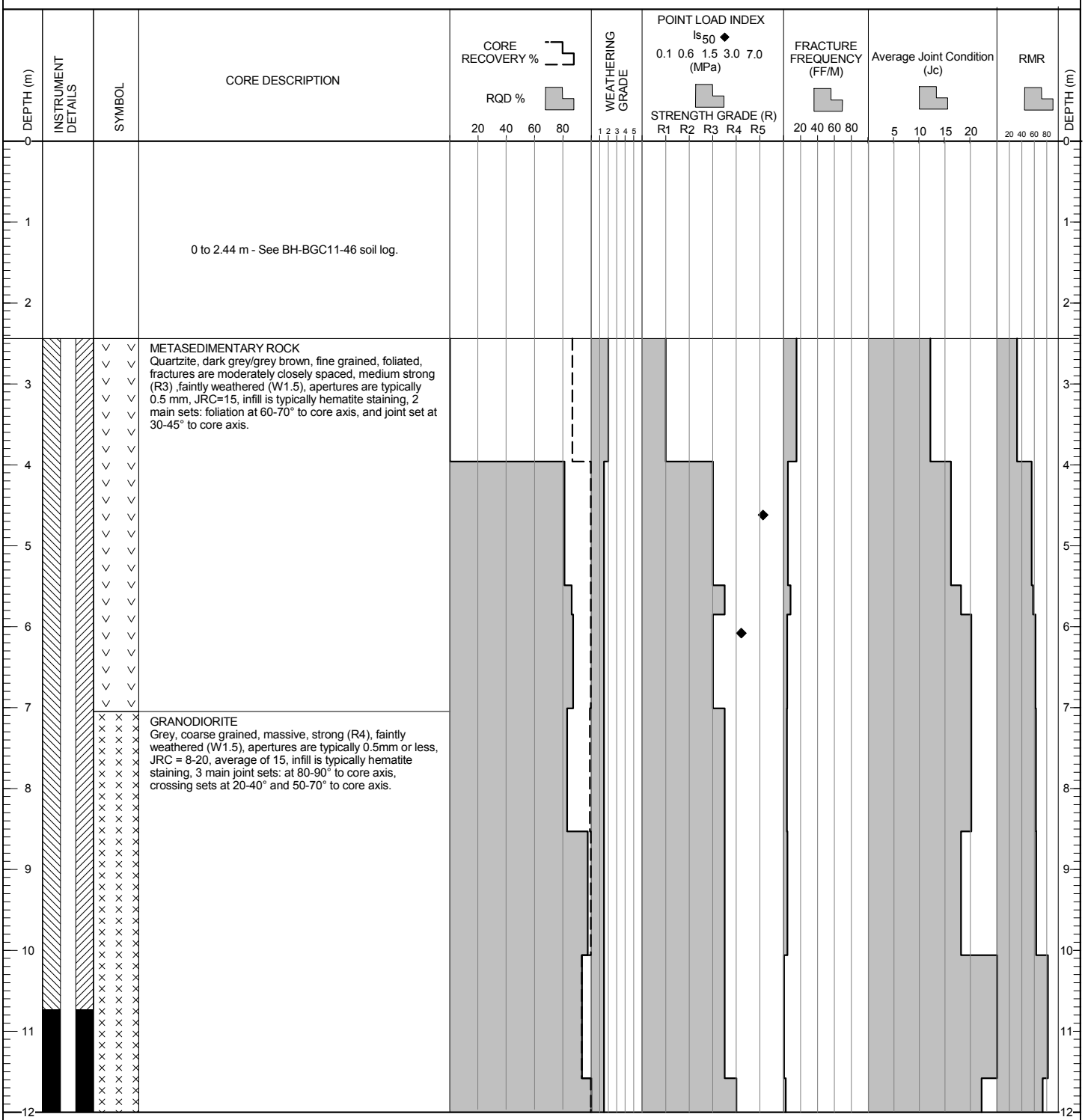
DRILL HOLE # BH-BGC11-46

LOCATION : PLATINUM GULCH

CO-ORDINATES (m) 460,262.7E - 7,099,004.0N
GROUND ELEVATION (m) : 1,246.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 10.91

START DATE : 04 Aug 11
FINISH DATE : 04 Aug 11
FINAL DEPTH (m) : 20.1
DEPTH TO TOP OF ROCK (m) : 2.4
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

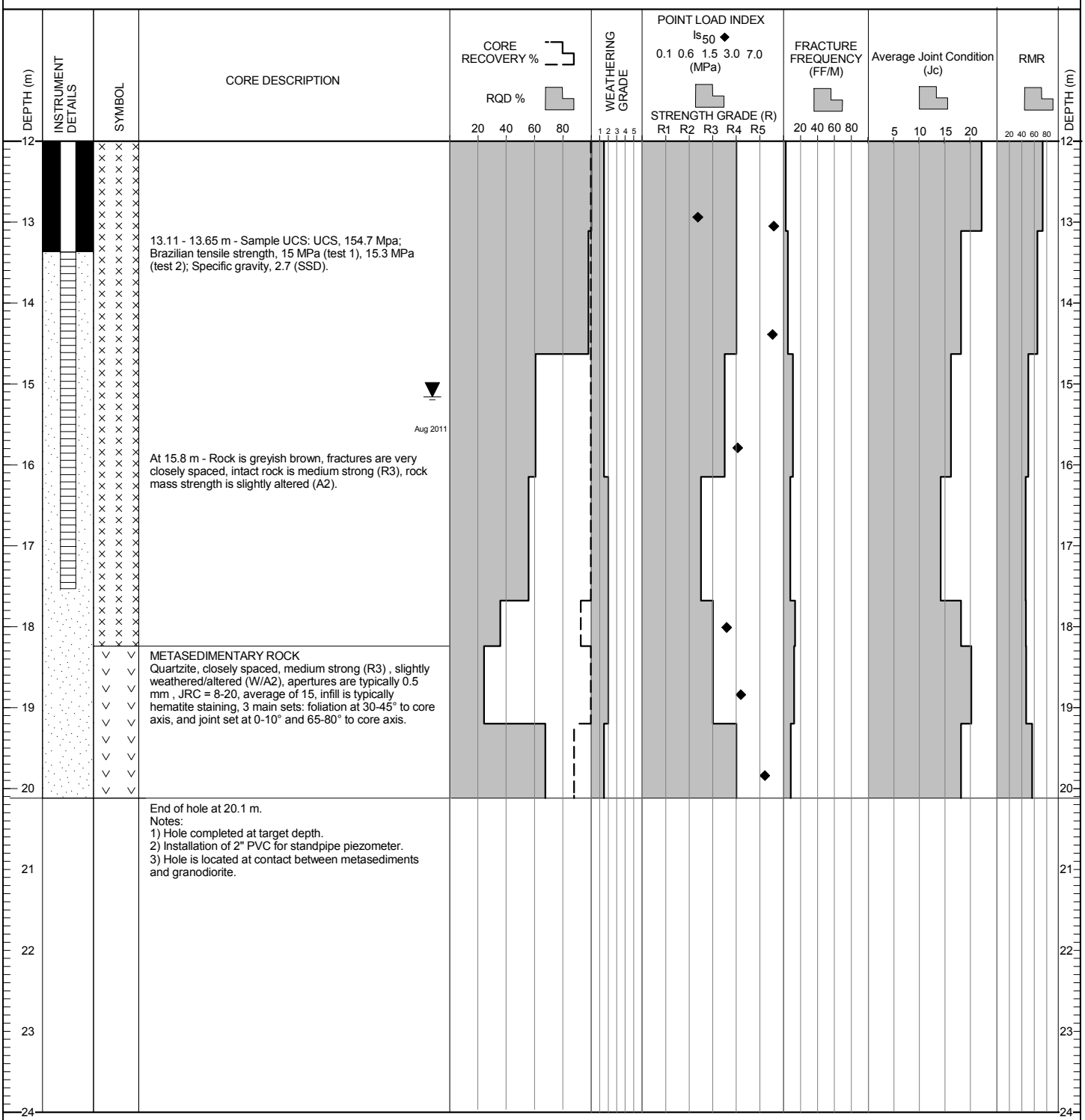
DRILL HOLE # BH-BGC11-46

LOCATION : PLATINUM GULCH

CO-ORDINATES (m) 460,262.7E - 7,099,004.0N
GROUND ELEVATION (m) : 1,246.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 10.91

START DATE : 04 Aug 11
FINISH DATE : 04 Aug 11
FINAL DEPTH (m) : 20.1
DEPTH TO TOP OF ROCK (m) : 2.4
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

DRILL HOLE # BH-BGC11-47

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,811.9E - 7,100,698.9N
GROUND ELEVATION (m) : 841.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/HSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 04 Aug 11
FINISH DATE : 04 Aug 11
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT/AKU
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION
0				ORGANICS Rootmat, organic silt. [TOPSOIL]
	G	G1		SILT (ML) Trace sand, trace gravel, trace organics, non-plastic, soft, yellowish brown, moist, homogeneous. [ALLUVIUM?]
1		SPT1		At 0.4 m - Brownish grey with a brown laminated structure. 0.75 - 1.2 m - SPT 1, grain size analysis, 1% gravel, 8% sand, 91% silt. 0.95 - 1.8 m - Becomes frozen: Nbn. Trace organics (rootlets).
	G	G2		
2	G	G3		1.8 - 3.8 m - Brown, moist to wet, non frozen. 2.0 - 2.27 m - Sample G3, grain size analysis, 8% sand, 78% silt, 14% clay. At 2.27 m - PP/2 = 14-34 kPa
	G	G4		
3		SPT2		SAND (SW) Fine to coarse, gravelly, trace silt, well graded, compact, maximum particle size = 25 mm, yellowish brown, homogeneous, no odour, moist. Clasts: equidimensional to elongated, subangular to angular, metasedimentary. [ALLUVIUM?] 3.0 - 3.8 m - Maximum particle size = 105 mm, some cobbles.
4		SPT3		SILT (ML) Gravelly, some sand, soft to firm, non plastic, maximum particle size = 12 mm, elongated to equidimensional, angular to subangular, moist, homogeneous, non cemented, rapid dilatancy. [ALLUVIUM?]
	G	G5		SAND (SM) Silty, gravelly, wet, dark grey, maximum particle size = 20 mm, elongated to equidimensional, subangular. Fines are non-plastic and stiff. [ALLUVIUM?] At 4.9 m - Frozen: Nbn.
5		SPT4		5.33 - 5.78 m - SPT 4, grain size analysis, 26% gravel, 45% sand, 29% fines. At 5.33 m - Freezing bond is lesser.
6	G	G6		SAND (SM) Silty, trace to some gravel, grey, no odour, moist to wet, homogeneous. Fines are low plasticity. Frozen: Nbn. [ALLUVIUM?]
7		SPT5		At 7.2 m - Quartz cobble (affected SPT), maximum particle size = 72 mm, frozen: less bonded.
	G	G7		
8		SPT6		8.38 - 8.58 m - SPT 6, grain size analysis, 13% gravel, 38% sand, 49% silt.
9	G	G8		SAND (SW) Trace to some silt, trace gravel, well graded, maximum particle size = 8 mm, brownish grey, moist, homogeneous. Clasts: elongated, subangular. [ALLUVIUM?]
10		SPT7		SILT (ML) Trace to some sand, trace gravel, trace cobbles, brownish grey, maximum particle size = 65 mm, homogeneous, clasts: subangular to angular, frozen: Nbn. [ALLUVIUM?]
11	G	G9		
		SPT8		
12	G			SAND (SM)

INSTRUMENT DETAILS

SPT BLOWS PER 150mm: 6 6 6 3 2 2 2

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

(Continued on next page)

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-47

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,811.9E - 7,100,698.9N
GROUND ELEVATION (m) : 841.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/HSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 04 Aug 11
FINISH DATE : 04 Aug 11
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : LGT/AKU
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
12	G	G10		Silty, some fine gravel, trace cobbles, brownish grey, maximum particle size = 75 mm, low plasticity. Clasts: subangular to angular. [ALLUVIUM?]		
	G	G11		11.8 - 12.1 m - Sample G10, grain size analysis, 15% gravel, 46% sand, 39% silt. Below 12.3 m - Sand content increases.		
13	G	G12		SILT (ML) Sandy, some fine gravel, trace cobbles, brownish grey, maximum particle size = 75 mm, low plasticity, clasts: subangular to angular. [ALLUVIUM?] At 13.0 m - Difficult to auger, machine stalls out.		
14	G	G13		SILT (ML) Sandy, gravelly, trace to some cobbles, grey, moist, frozen Nbn, clasts: gravel is subangular, cobbles are subrounded. [ALLUVIUM?] Below 13.5 m - Fine gravel and cobble content increases with depth.		
15	G	G14		SILT (ML) Sandy, subangular to angular, gravelly, trace to some cobbles, subrounded. Frozen: Nbn. [ALLUVIUM?]		
	G	G15				
16				End of borehole at 16.0 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" solid PVC for thermistor, serial #11.5-1, annulus not backfilled. 3) 10 m thermistor, serial #11.5-1, installed on Aug. 10, 2011. Thermistor removed from this hole on Aug. 28 for relocation to BH-BGC11-58.		
17						
18						
19						
20						
21						
22						
23						
24						

Su - kPa
40 80 120 160
★ % FINES
● SPT (blows/300mm)
RECOVERY
20 40 60 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-48

LOCATION : PLATINUM GULCH

CO-ORDINATES (m): 459,936.0E - 7,099,118.1N
GROUND ELEVATION (m) : 1,140.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 3.50

START DATE : 04 Aug 11
FINISH DATE : 05 Aug 11
FINAL DEPTH (m) : 32.9
DEPTH TO TOP OF ROCK (m) : 13.1
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				0.0 - 5.49 m - No recovery.		
5.49				SILT (ML) Trace sand, some gravel, low to medium plasticity, stiff, orange, moist, no cementation, clasts are metasedimentary. [COMPLETELY WEATHERED METASEDIMENTARY ROCK]		
7.01				SILT AND SAND (ML/SW) Trace gravel, subangular to angular, non-plastic, loose, orange, wet, no cementation, clasts are metasedimentary. [COMPLETELY WEATHERED ROCK]		
8.53				SAND AND GRAVEL(SM/GM) Fine to medium gravel, silty, angular, weak to moderate cementation, compact to dense, silt is non to low plastic, orange. [COMPLETELY WEATHERED ROCK]		
12						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-48

LOCATION : PLATINUM GULCH

CO-ORDINATES (m): 459,936.0E - 7,099,118.1N
GROUND ELEVATION (m) : 1,140.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 3.50

START DATE : 04 Aug 11
FINISH DATE : 05 Aug 11
FINAL DEPTH (m) : 32.9
DEPTH TO TOP OF ROCK (m) : 13.1
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
12						
13				Rock encountered at 13.10 m depth. Refer to rock log.		
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-48

LOCATION : PLATINUM GULCH

CO-ORDINATES (m) 459,936.0E - 7,099,118.1N
GROUND ELEVATION (m) : 1,140.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.5

START DATE : 04 Aug 11
FINISH DATE : 05 Aug 11
FINAL DEPTH (m) : 32.9
DEPTH TO TOP OF ROCK (m) : 13.1
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 13.10 m - See BH-BGC11-48 soil log.

METASEDIMENTARY ROCK
Quartzite, light yellowish grey, fine grained, foliated/microfractured, extremely weak to weak (R1.5 to R2), highly weathered (W3 to W4), iron stained, fractures are extremely to very closely spaced, typically 4 joint sets with foliations at 24-40° and various sets at 0-5°, 45-65°, 10-30° to core axis, JRC = 12-20, averaging 14.
11.58 - 13.11 m - Highly fractured zone.

17.85 - 20.8 m - Rock strength grades to extremely to very weak rock (R0.5), highly weathered (W4), rock crumbles to fine to medium gravel.

At 20.8 m - Rock grades to very weak to weak (R1-R2), rock is moderately to highly weathered (W2.5 to W3), increased presence of sub-vertical joints, highly fractured zone to 22.0 m.

At 22.0 m - Rock progressively turns to bluish grey stained brownish orange.

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

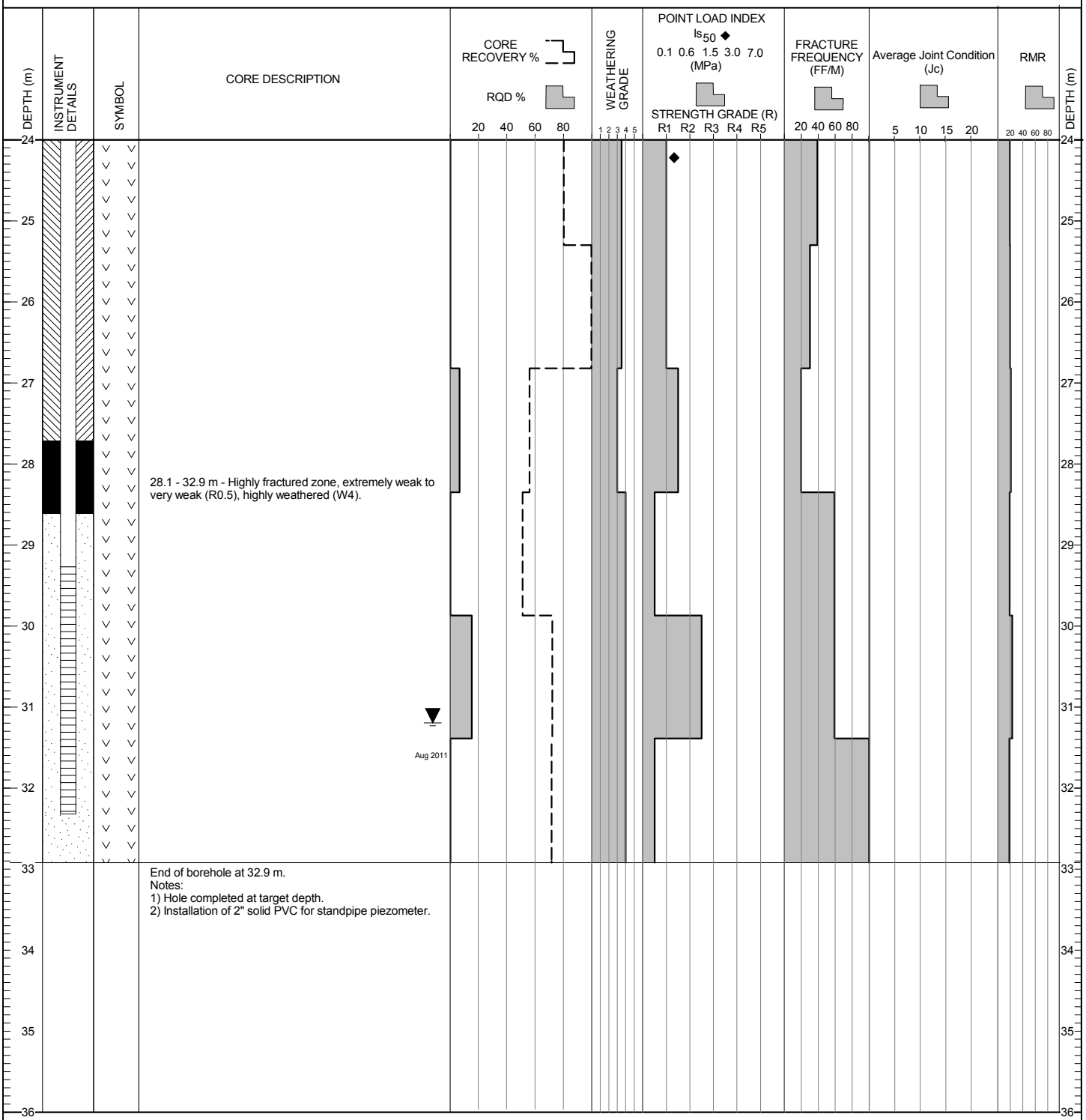
DRILL HOLE # BH-BGC11-48

LOCATION : PLATINUM GULCH

CO-ORDINATES (m) 459,936.0E - 7,099,118.1N
GROUND ELEVATION (m) : 1,140.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.5

START DATE : 04 Aug 11
FINISH DATE : 05 Aug 11
FINAL DEPTH (m) : 32.9
DEPTH TO TOP OF ROCK (m) : 13.1
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-49

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,746.5E - 7,100,635.9N
GROUND ELEVATION (m) : 835.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 05 Aug 11
FINISH DATE : 05 Aug 11
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	LITHOLOGIC DESCRIPTION	SPT BLOWS PER 150mm
0			ORGANIC SILT (OL) Trace to some sand, trace gravel, low plastic, firm, brown, organics black, moist, roots, rootlets.	
	G	G1	SILT (ML) Trace to some sand, trace gravel, low plastic, firm to stiff, brown, maximum particle size = 20 mm, gravel is angular, flat, metasedimentary pieces. [ALLUVIUM?]	
1	SPT	SPT1		2 3 9
2	G	G2	SAND (SW) Trace fine gravel, well graded, maximum particle size = 10 mm, elongated, subangular to angular, brownish grey, moist, metasedimentary clasts. [ALLUVIUM?]	
	SPT	SPT2	2.28 - 2.73 m - SPT2, grain size analysis, 7% gravel, 23% sand, 58% silt, 12% clay.	
	G	G3	SAND (SM) Silty, trace to some gravel, trace clay, brown, wet when thawed, low dry strength. Fines are low plasticity. Frozen: Nbe. [ALLUVIUM?]	
3	G	G4	Below 2.4m; non plastic, grey with red mottling, Vr/Vx 1-3%. 2.73 - 2.9 m - Drilled with CRREL barrel. Between 2.8-5.3m Nbn. Below 3m - Trace gravel, subangular to angular, multilithic. 3.4 - 3.6 m - Sample G4, grain size analysis, 28% gravel, 42% sand, 26% silt, 4% clay.	
4				
5	G	G5	Between 5.3-6.9m; Nbe.	
6				
	G	G6	6.4 - 6.6 m - Sample G6, grain size analysis, 33% gravel, 34% sand, 31% silt, 2% clay.	
7			Below 6.8m - Frozen: Vx (<3%).	
8	G	G7		
9				
	G	G8	9.4 - 9.9 m - Sample G8, grain size analysis, 6% gravel, 69% sand, 16% silt, 9% clay.	
10				
11	G	G9		
12				

INSTRUMENT DETAILS

Su - kPa: 40, 80, 120, 160

★ % FINES ● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-49

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,746.5E - 7,100,635.9N
GROUND ELEVATION (m) : 835.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 05 Aug 11
FINISH DATE : 05 Aug 11
FINAL DEPTH (m) : 16.0
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	LITHOLOGIC DESCRIPTION
12	G	G10	12.4 - 12.6 m - Sample G10, grain size analysis, 22% gravel, 36% sand, 29% silt, 13% clay.
14	G	G11	
15			Below 15m - Semi-frozen.
15	G	G12	
16			End of borehole at 16.0 m.

Notes:
1) Hole completed at target depth.
2) Installation of 2" solid PVC for thermistor.
3) 10 m thermistor installed on Aug. 10, 2011, serial # 11.5-2, annulus of PVC not backfilled; thermistor damaged and removed on August 26, 2011.

INSTRUMENT DETAILS

SPT BLOWS PER 150mm

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-50

LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,791.3E - 7,099,997.6N
GROUND ELEVATION (m) : 1,058.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -69
TREND (°) : 89

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 4.57

START DATE : 06 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 5.2
LOGGED BY : SP/JD/KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				0.0 - 3.66 m - No recovery. Drilled with casing. For soil description refer to log of TP-BGC11-59, excavated on this drill pad.		
4				GRAVEL (GW) Subrounded to subangular, medisedimentary. [COLLUVIUM]		
5				Rock encountered at 5.20 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P%, W%, W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-50

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,791.3E - 7,099,997.6N
GROUND ELEVATION (m) : 1,058.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -69
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 4.57

START DATE : 06 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 5.2
LOGGED BY : SP/JD/KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0 to 5.2			0 to 5.20 m - See BH-BGC11-50 soil log.
5.2 to 12			METASEDIMENTARY ROCK Dark bluish grey, weak (R2), moderately weathered (W3), foliated/bedded fabric, 2 joint sets: first set parallel to foliation at 70-80° to core axis, typically iron oxide infill with occasional broken rock, talc and calcite, joint surfaces typically planar and rough, second set at approximately 20-25° to core axis, typically iron oxide infill, joint surfaces typically planar and rough, occasionally stepped as breaks occurred perpendicular to foliation/bedding, some healed fractures parallel to this joint set, average fracture spacing approximatley 20 mm. Below 6.0 m - Average fracture spacing approximatley 50 mm. Below 7.0 m - Colour changes to light grey. 7.6 - 10.7 m - Zone of poor recovery, metasedimentary gravel and cobbles were recovered. 9.1 - 10.7 m - Highly fractured zone.

CORE RECOVERY %
RQD % (20 40 60 80)
WEATHERING GRADE (1 2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (20 40 60 80)
Average Joint Condition (Jc) (5 10 15 20)
RMR (20 40 60 80)

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

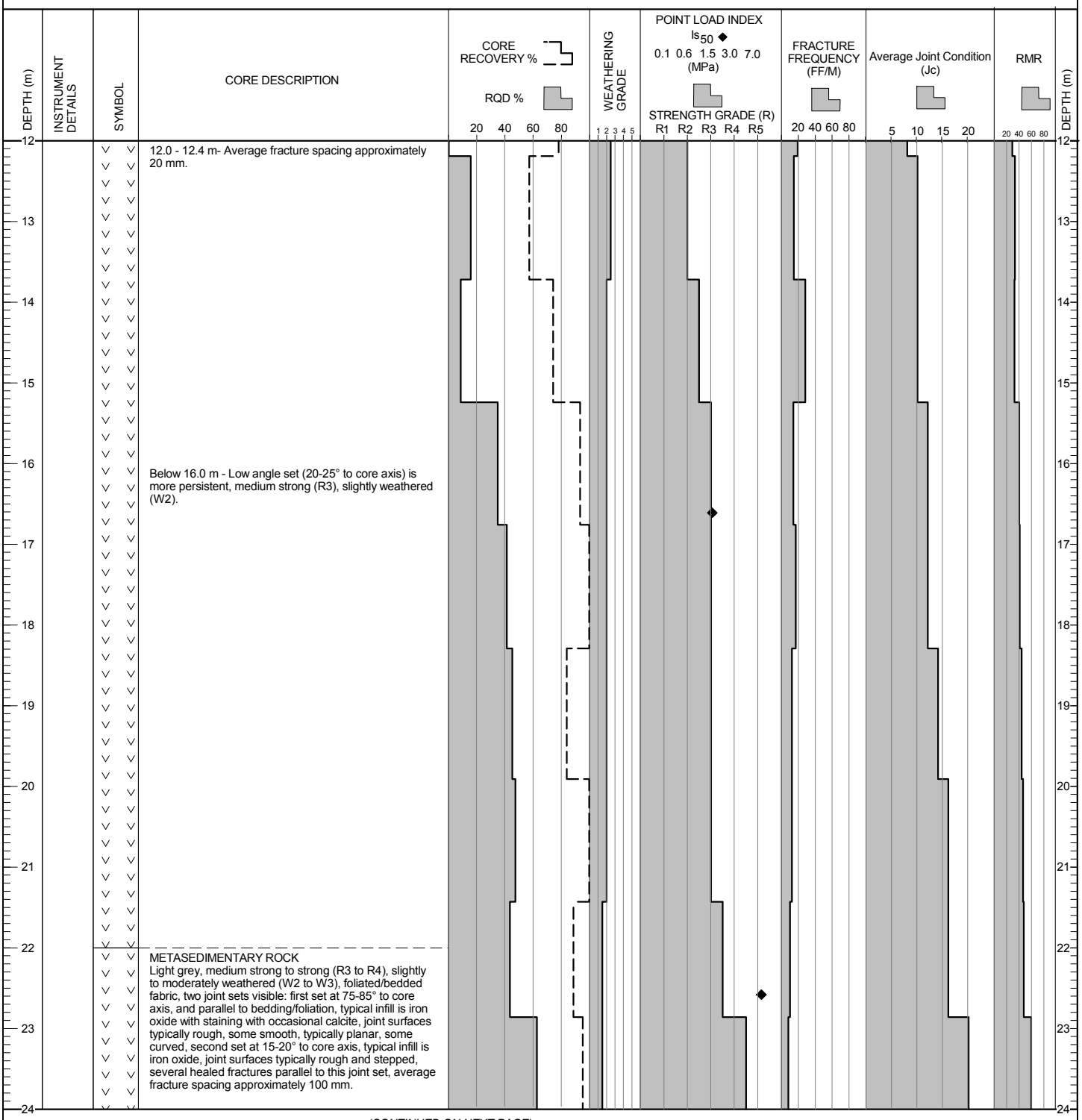
DRILL HOLE # BH-BGC11-50

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,791.3E - 7,099,997.6N
GROUND ELEVATION (m) : 1,058.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -69
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 4.57

START DATE : 06 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 5.2
LOGGED BY : SP/JD/KH
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-50

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,791.3E - 7,099,997.6N
GROUND ELEVATION (m) : 1,058.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -69
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 4.57

START DATE : 06 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 5.2
LOGGED BY : SP/JD/KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
24–36			30.9 - 33.7 m - Second joint set 15-20° to core axis is more frequent.
36			CONTACT ZONE BETWEEN GRANODIORITE AND METASEDIMENTS Alternating zones (approximately 1 m thick) of

CORE RECOVERY %
RQD % (20 40 60 80)
WEATHERING GRADE (1 2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (20 40 60 80)
Average Joint Condition (Jc) (5 10 15 20)
RMR (20 40 60 80)

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-50

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,791.3E - 7,099,997.6N
GROUND ELEVATION (m) : 1,058.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -69
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 4.57

START DATE : 06 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 5.2
LOGGED BY : SP/JD/KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
36			granodiorite and metasediments as follows: GRANODIORITE: light grey, medium strong (R3), slightly weathered (W2), massive crystalline structure, sand sized crystals, two joint sets, set 1 at approximately 80° to core axis, typically infilled with calcite, iron oxide and some clay, joint surfaces are typically rough and planar, some stepped, set 2 at approximately 10° to core axis (less persistant), typically infilled with calcite and iron oxide, joint surfaces are typically rough and planar, average fracture spacing is approximately 50 mm, increasing to 200 mm with depth. METASEDIMENTS: reddish grey, weak to medium strong (R2-R3), slightly weathered (W2), bedded/foliated fabric, one joint set parallel to foliation at approximately 80° to core axis, typically no infill, joint surfaces planar and smooth, average fracture spacing approximately 50 mm, increasing to 200 mm with depth.
37			
38			
39			
40			
41			End of borehole at 41.2 m. Notes: 1) Hole completed at target depth. 2) Hole left open; no installation. 3) TP-BGC11-59 is located on this drill pad. 4) Orientation data obtained by using ACT tool.
42			
43			
44			
45			
46			
47			
48			

CORE RECOVERY % / RQD % (20 40 60 80)

WEATHERING GRADE (1 2 3 4 5)

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)

STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) (20 40 60 80)

Average Joint Condition (Jc) (5 10 15 20)

RMR (20 40 60 80)

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-51

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,643.5E - 7,100,743.6N
GROUND ELEVATION (m) : 818.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 06 Aug 11
FINISH DATE : 06 Aug 11
FINAL DEPTH (m) : 25.2
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	LITHOLOGIC DESCRIPTION	SPT BLOWS PER 150mm
0	G	G1	SILT (ML) Trace to some gravel, trace clay, low plastic, firm, grey to brown, organic odour, dry to moist, no cementation, trace rootlets. [TOP SOIL]	
1		SPT1	SAND (SP) Fine, trace silt, trace gravel, uniformly graded, maximum particle size = 20 mm, rounded, greyish and yellowish brown, no odour, dry to moist, no cementation, gravel is multilithic. [ALLUVIUM]	9 7 7
			SILT (ML) Trace fine sand, trace clay, trace gravel, low plastic, stiff, brown with iron oxide staining, no odour, dry, no cementation. [ALLUVIUM]	
2	G	G2		
		SPT2	SAND (SP) Fine sand, silty, trace gravel, uniformly graded, loose, maximum particle size = 20 mm, rounded, greyish and yellowish brown, no odour, dry to moist, no cementation, gravel is multilithic. [ALLUVIUM] 2.3 - 2.75 m - Silt content reduced: trace silt.	4 3 3
3	G	G3	SILT (ML) Trace fine sand, non plastic, firm to stiff, grey to brown with iron oxide staining, no odour, dry, no cementation. [ALLUVIUM]	
4		SPT3		5 6 6
			SAND (SW) Trace to some gravel, trace silt, well graded, compact, maximum particle size = 30 mm, sub-rounded to sub-angular, greyish brown, no odour, dry to moist, no visible structure, no cementation. [ALLUVIUM]	
5	G	G4		
		SPT4		4 10 10
6	G	G5	SILT (ML) Some sand to sandy, trace to some gravel, low plastic, soft to firm, grey, no odour, dry to moist, no cementation, maximum particle size = 40 mm, gravel and sand are sub-angular to angular and multilithic. [ALLUVIUM]	
7				
8	G	G6	7.9 - 8.1 m - Sample G6, grain size analysis, 14% gravel, 27% sand, 50% silt, 9% clay.	
9				
	G	G7		
10		SPT5	9.9 - 10.25 m - SPT #5: three different materials, stratified: 1) non plastic fine sand and silt; 2) low plastic silt; and 3) well graded sand. At 10m - hole caving at this depth throughout drilling.	7 10 R
11	G	G8		
		SPT6	11.4 - 11.6 m - Lens of sand, fine to coarse, primarily coarse, trace silt. Frozen: Vx (< 2%). 11.6 - 14.5 m - Frozen: Nbe.	
12				

INSTRUMENT DETAILS

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-51

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,643.5E - 7,100,743.6N
GROUND ELEVATION (m) : 818.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 06 Aug 11
FINISH DATE : 06 Aug 11
FINAL DEPTH (m) : 25.2
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION
12	G	G9		
13				
14	G	G10		SAND (SM) Coarse sand, silty, trace fine gravel, gap graded, loose, maximum particle size = 50 mm, elongated, angular, grey, multilithic gravel, no odour, moist when thawed, low plastic silt. Frozen: Nbe. [ALLUVIUM] 13.9 - 14.1 m - Sample G10, grain size analysis, 21% gravel, 53% sand, 26% silt.
15	G	G11		
16				Below 16.0 m - Nbn.
17	G	G12		
18	G	G13		SILT (ML) Some coarse sand, trace gravel, low plastic, firm, grey, no odour, moist, no visible structure, no cementation, maximum particle size = 10 mm, gravel is multilithic and angular. [ALLUVIUM]
19				SAND (SW) Silty, some gravel, well graded, loose, maximum particle size = 20 mm, sub-angular to sub-rounded, grey, no odour, moist, no visible structure, no cementation, multilithic gravel. [ALLUVIUM]
20	G	G14		20.1 - 20.3 m - Sample G14, grain size analysis, 11% gravel, 63% sand, 26% fines.
		SPT7		SILT (ML) Sandy, low to non-plastic, soft to firm, grey, no odour, moist to wet, no cementation. [ALLUVIUM]
21	G	G15		
22		SPT8		22.1 - 22.25 m - Frozen: Vx (approximately 5%). 22.25 - 23.6 m - Partially frozen: Nbn.
23	G	G16		SAND AND SILT (SM/ML) Trace gravel (angular and multilithic), well graded, loose, maximum particle size = 20 mm, sub-angular, grey, no odour, dry to moist, unfrozen, no cementation, low plastic silt. [ALLUVIUM]
24				

INSTRUMENT DETAILS

SPT BLOWS PER 150mm

Su - kPa
40 80 120 160
★ % FINES
● SPT (blows/300mm)
RECOVERY
20 40 60 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-51

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,643.5E - 7,100,743.6N
GROUND ELEVATION (m) : 818.4m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 06 Aug 11
FINISH DATE : 06 Aug 11
FINAL DEPTH (m) : 25.2
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
24						
25	G	G17				
				End of borehole at 25.2 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" solid PVC for thermistor. 3) 10 m thermistor installed on Aug. 10, 2011, serial #11.5-2, annulus not backfilled. Thermistor removed from this hole on Aug. 25 for relocation to BH-BGC11-57 and replaced with a 25 m thermistor, serail #26.5-2, annulus not backfilled.		
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-52

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m): 459,891.2E - 7,101,316.4N
GROUND ELEVATION (m) : 909.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 12.19

START DATE : 07 Aug 11
FINISH DATE : 08 Aug 11
FINAL DEPTH (m) : 22.6
DEPTH TO TOP OF ROCK (m) : 11.9
LOGGED BY : SP/JD/KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				0.0 - 1.22 m - No recovery. For soil description refer to log of TP-BGC11-136, excavated on this drill pad.		
1				COBBLES Some gravel, trace boulders, poorly (uniformly) graded, maximum particle size = 250 mm, gravel subangular to subrounded, predominantly metasedimentary, cobbles and boulders predominantly granodiorite, sand/fines washed away by drilling process? [DEBRIS FLOW?]		
2						
3						
4					▼ Aug 2011	
5						
6						
7						
8						
9						
10						
11						
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

Rock encountered at 11.90 m depth.
Refer to rock log.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-52

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 459,891.2E - 7,101,316.4N
GROUND ELEVATION (m) : 909.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 12.19

START DATE : 07 Aug 11
FINISH DATE : 08 Aug 11
FINAL DEPTH (m) : 22.6
DEPTH TO TOP OF ROCK (m) : 11.9
LOGGED BY : SP/JD/KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0										0
1										1
2										2
3										3
4										4
5										5
6			0 to 11.90 m - See BH-BGC11-52 soil log.							6
7										7
8										8
9										9
10										10
11										11
12										12

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

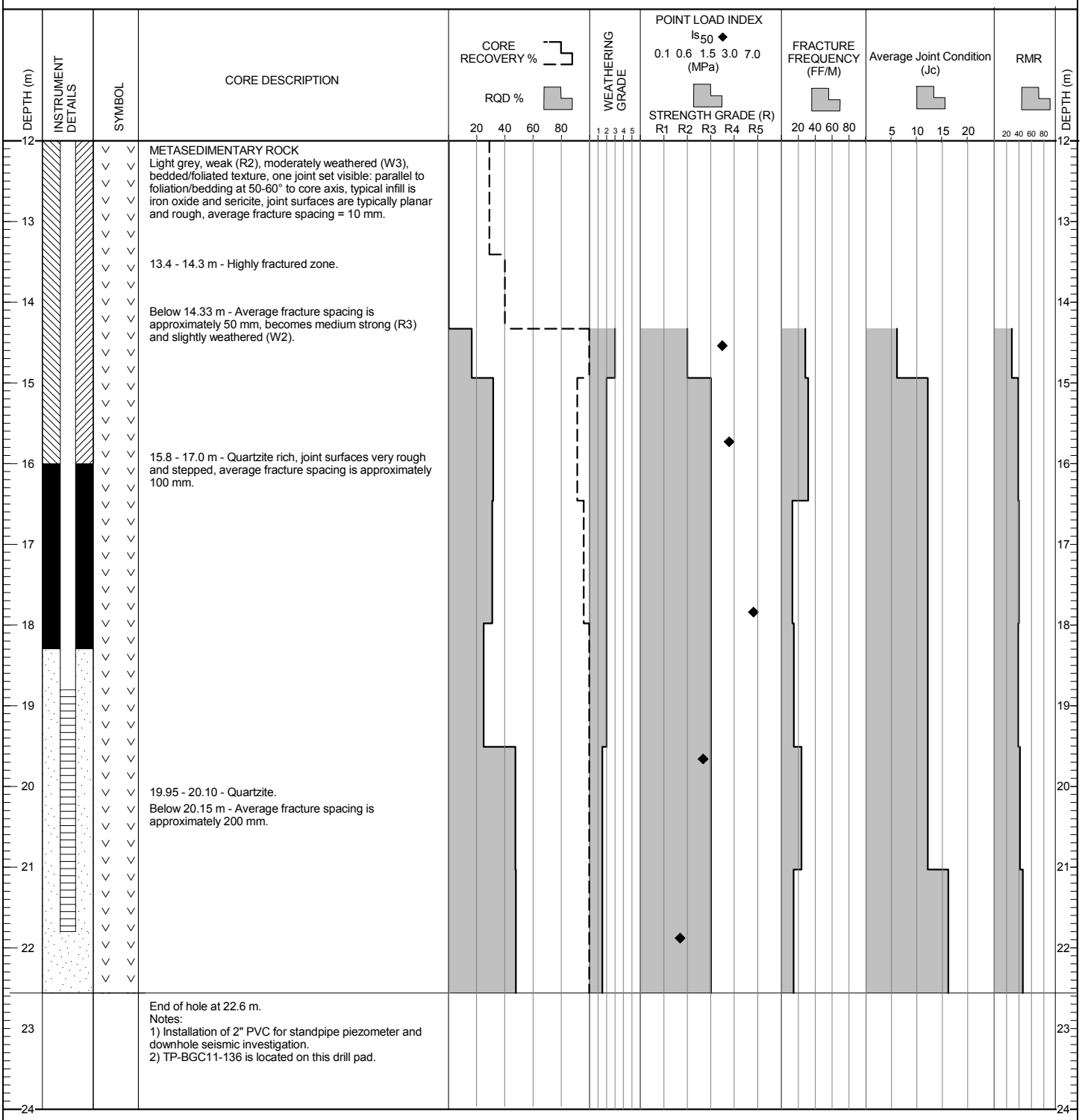
DRILL HOLE # BH-BGC11-52

LOCATION : MIDDLE REACH DUBLIN GULCH

CO-ORDINATES (m) 459,891.2E - 7,101,316.4N
GROUND ELEVATION (m) : 909.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 12.19

START DATE : 07 Aug 11
FINISH DATE : 08 Aug 11
FINAL DEPTH (m) : 22.6
DEPTH TO TOP OF ROCK (m) : 11.9
LOGGED BY : SP/JD/KH
REVIEWED BY : PQ/DW



METASEDIMENTARY ROCK
Light grey, weak (R2), moderately weathered (W3), bedded/foliated texture, one joint set visible: parallel to foliation/bedding at 50-60° to core axis, typical infill is iron oxide and sericite, joint surfaces are typically planar and rough, average fracture spacing = 10 mm.

13.4 - 14.3 m - Highly fractured zone.

Below 14.33 m - Average fracture spacing is approximately 50 mm, becomes medium strong (R3) and slightly weathered (W2).

15.8 - 17.0 m - Quartzite rich, joint surfaces very rough and stepped, average fracture spacing is approximately 100 mm.

19.95 - 20.10 - Quartzite.
Below 20.15 m - Average fracture spacing is approximately 200 mm.

End of hole at 22.6 m.
Notes:
1) Installation of 2" PVC for standpipe piezometer and downhole seismic investigation.
2) TP-BGC11-136 is located on this drill pad.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-53

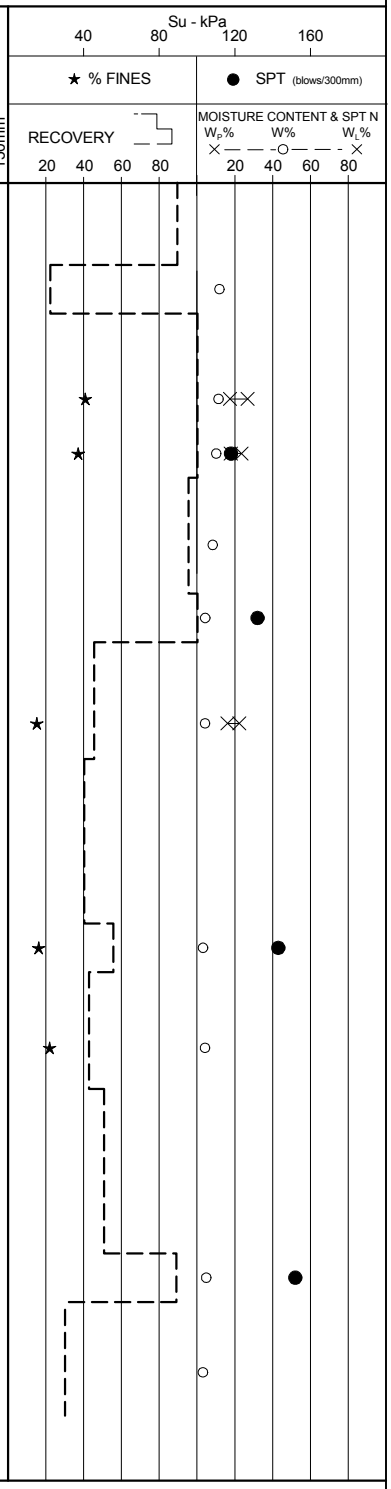
LOCATION : EAGLE PUP

CO-ORDINATES (m): 459,483.6E - 7,100,993.0N
GROUND ELEVATION (m) : 875.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 07 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 14.5
DEPTH TO TOP OF ROCK (m) : 11.4
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0						
	G	G1		SAND (SM) Silty, some gravel, trace clay, angular, flat, elongated, maximum particle size = 20 mm metasedimentary clasts. Fines: low plastic, firm to stiff, brown, no odour, moist, no cementation. [TILL] 0.3 - 2.7 m - Gravelly.		
1		SPT1				
2	G	G2		1.9 - 2.1 m - Sample G2, grain size analysis, 19% gravel, 40% sand, 38% silt, 3% clay.		
		SPT2		2.28 - 2.73 m - SPT 2, grain size analysis, 22% gravel, 41% sand, 28% silt, 9% clay.		6 8 10
3	G	G3		2.7 - 3.8 m - Some sand, reddish brown.		
4		SPT3		SAND (SW) Some gravel, trace to some silt, well graded, dense, maximum particle size = 50 mm, sub-angular, to sub-rounded, reddish brown, no odour, moist, no visible structure, no cementation, sand and gravel are metasedimentary with occasional granodiorite clasts. [TILL]		16 15 17
5	G	G4		4.9 - 5.1 m - Sample G4, grain size analysis, 41% gravel, 44% sand, 14% silt, 1% clay. 5.3 - 6.9 m - Gravelly.		
6	G	G5				
7		SPT4		6.85 - 7.3 m - SPT4, grain size analysis, 8% gravel, 76% sand, 13% silt, 3% clay. 7.3m - 8.4 m - Some silt, some gravel, brown.		13 20 23
8	G	G6		7.9 - 8.1 m - Sample G6, grain size analysis, 31% gravel, 47% sand, 22% fines.		
9	G	G7				
10		SPT5				10 24 28
11	G	G8				
12				Rock encountered at 11.40 m depth. Refer to rock log.		



EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-53

LOCATION : EAGLE PUP

CO-ORDINATES (m) 459,483.6E - 7,100,993.0N
GROUND ELEVATION (m) : 875.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 07 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 14.5
DEPTH TO TOP OF ROCK (m) : 11.4
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0										0
1										1
2										2
3										3
4										4
5										5
6			0 to 11.40 m - See BH-BGC11-53 soil log.							6
7										7
8										8
9										9
10										10
11										11
12		V V V V V V	SAND (SM) Some silt, some gravel, angular, elongated, metasedimentary, well graded, dense, maximum particle							12

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-53

LOCATION : EAGLE PUP

CO-ORDINATES (m) 459,483.6E - 7,100,993.0N
GROUND ELEVATION (m) : 875.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 07 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 14.5
DEPTH TO TOP OF ROCK (m) : 11.4
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
12			size = 20 mm, angular, orange, no odour, dry, no visible structure, no cementation, moderately weathered (W3) metasedimentary rock. Note - rock is broken down by drilling process and logged as soil.
13			
14			
			End of borehole at 14.5 m. Notes: 1) Hole completed at target depth. 2) Backfilled with cuttings.

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-54

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m): 458,886.2E - 7,101,245.6N
GROUND ELEVATION (m) : 883.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -75
TREND (°) : 4

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) :

START DATE : 08 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 19.8
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				0.0 - 4.57 m - No recovery.		
4.57				GRAVEL (GM) Sandy, silty to some silt, maximum particle size = 110 mm, subangular to subrounded, blue grey, heavy iron staining, some cementation, clasts are metasedimentary. [COMPLETELY WEATHERED METASEDIMENTARY ROCK]		
9.14				9.14 - 10.67 m - No recovery.		
12						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

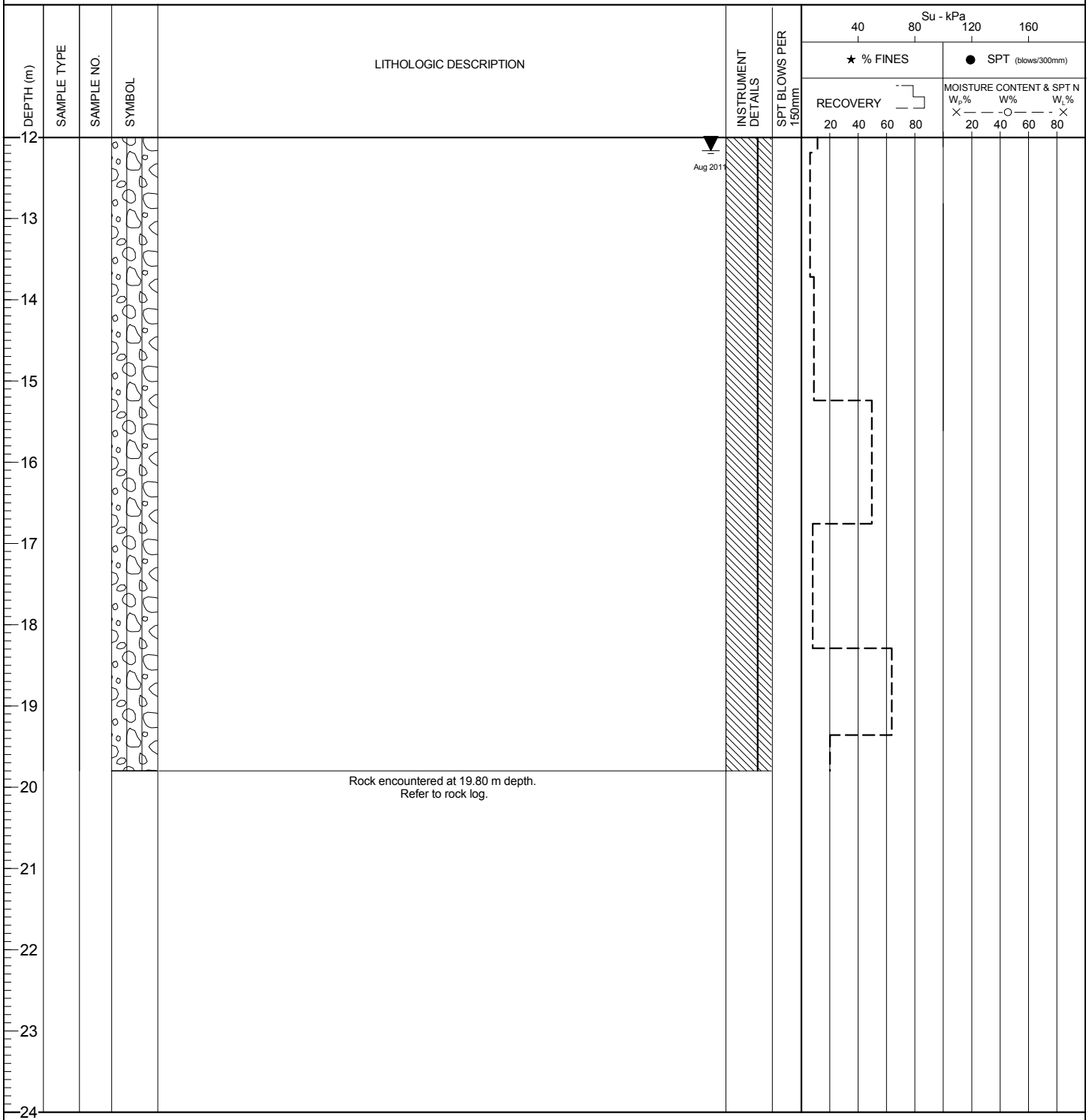
DRILL HOLE # BH-BGC11-54

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m): 458,886.2E - 7,101,245.6N
GROUND ELEVATION (m) : 883.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -75
TREND (°) : 4

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) :

START DATE : 08 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 19.8
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-54

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m) 458,886.2E - 7,101,245.6N
GROUND ELEVATION (m) : 883.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -75
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 08 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 19.8
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
12			Aug 2011
13			
14			
15			
16			0 to 19.80 m - See BH-BGC11-54 soil log.
17			
18			
19			
20			METASEDIMENTARY ROCK Quartzite, grey/greenish grey, fine grained, foliated, intact rock is very weak (R1), rockmass crumbles apart when disturbed, moderately weathered (W2.5), fractures are extremely closely to very closely spaced, apertures are generally 1-4 mm with broken zones, infill is typically crushed and decomposed rock with hematite staining, 3 main sets: 55-68° (foliation), and two joint sets at 40-50° and 15-21° to core axis, JRC typically = 12-20.
21			
22			
23			
24			

CORE RECOVERY %
RQD %
20 40 60 80

WEATHERING GRADE
1 2 3 4 5

POINT LOAD INDEX
Is_{50} ◆
0.1 0.6 1.5 3.0 7.0
(MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M)
20 40 60 80

Average Joint Condition (Jc)
5 10 15 20

RMR
20 40 60 80

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-54

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m) 458,886.2E - 7,101,245.6N
GROUND ELEVATION (m) : 883.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -75
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 08 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 19.8
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

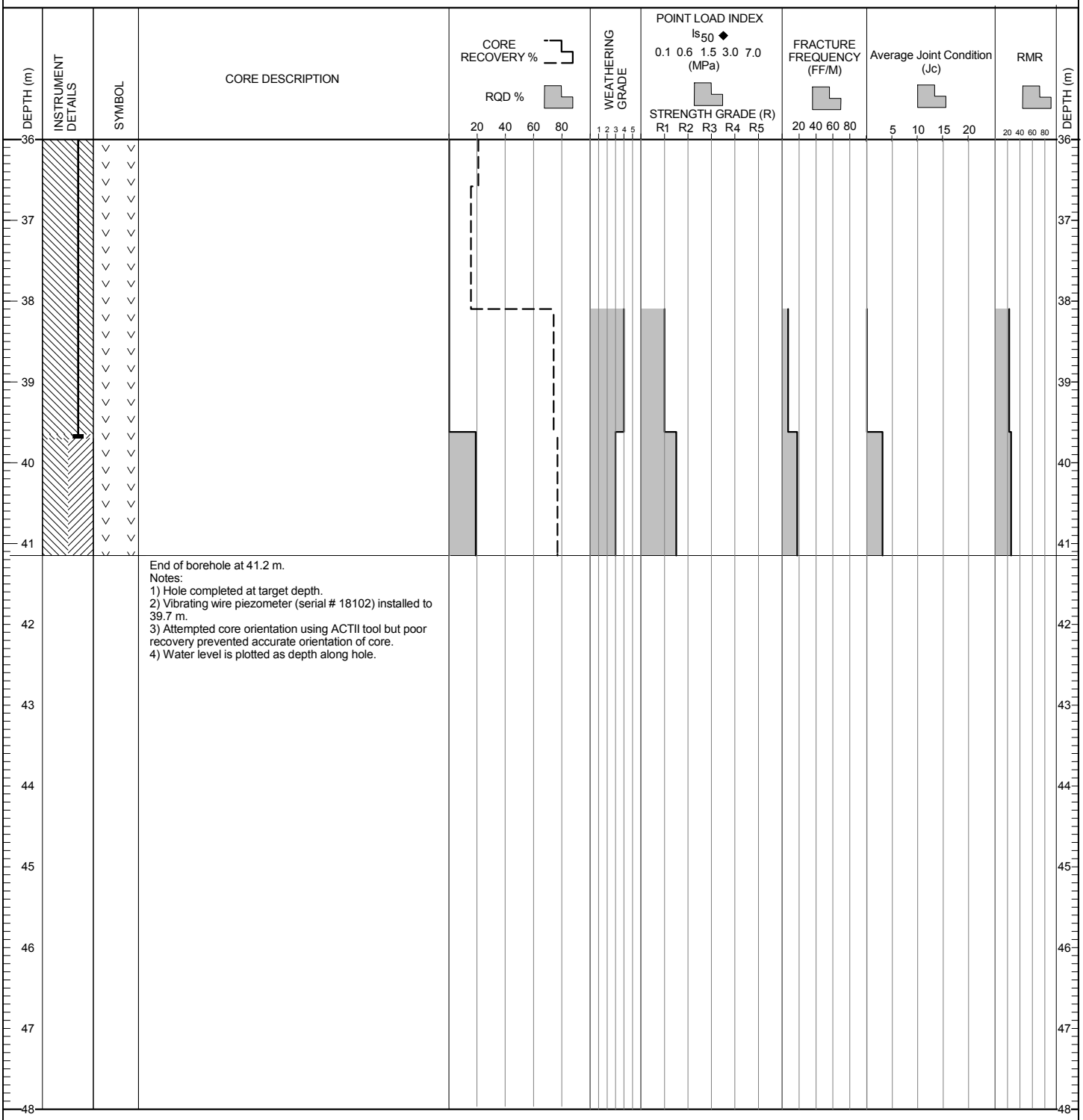
DRILL HOLE # BH-BGC11-54

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m) 458,886.2E - 7,101,245.6N
GROUND ELEVATION (m) : 883.8m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -75
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 08 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 41.2
DEPTH TO TOP OF ROCK (m) : 19.8
LOGGED BY : SP/JD
REVIEWED BY : PQ/DW



End of borehole at 41.2 m.

Notes:
1) Hole completed at target depth.
2) Vibrating wire piezometer (serial # 18102) installed to 39.7 m.
3) Attempted core orientation using ACTII tool but poor recovery prevented accurate orientation of core.
4) Water level is plotted as depth along hole.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-55

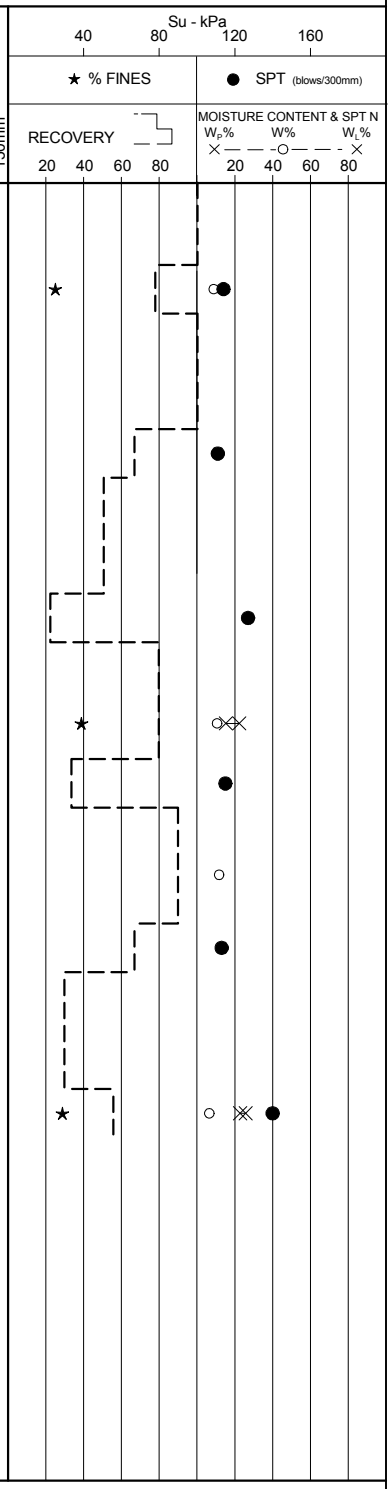
LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,440.6E - 7,100,918.4N
GROUND ELEVATION (m) : 881.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 07 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 14.5
DEPTH TO TOP OF ROCK (m) : 8.8
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0	G	G1		GRAVEL (GM) Silty, sandy, trace clay, well graded, sub-angular to sub-rounded, metasedimentary clasts. Fines: low plastic, stiff, grey brown, no odour, moist, no cementation. [COLLUVIUM]		
1	SPT	SPT1		0.76 - 1.21 m - SPT 1, grain size analysis, 38% gravel, 37% sand, 25% fines. Below 1.2 m - Some sand.		3 6 8
2	G	G2				
	SPT	SPT2				5 4 7
3	G	G3		SAND (SM) Fine sand, silty, trace to some gravel, trace clay, gravel is angular and metasedimentary. Fines: low plastic, stiff to very stiff, grey, no odour, dry to moist, no cementation, low dry strength. [DEBRIS FLOW DEPOSIT]		
4	SPT	SPT3				4 14 13
5	G	G4		4.9 - 5.1 m - Sample G4, grain size analysis, 20% gravel, 41% sand, 36% silt, 3% clay.		
	SPT	SPT4				6 7 8
6	G	G5				
7	SPT	SPT5		7.3 - 8.8 m - Greyish black: possible buried organic layer.		2 6 7
8	G	G6				
	SPT	SPT6		8.38 - 8.83 m - SPT 6, grain size analysis, 31% gravel, 40% sand, 23% silt, 6% clay.		7 17 23
9				Rock encountered at 8.80 m depth. Refer to rock log.		
10						
11						
12						



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-55

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,440.6E - 7,100,918.4N
GROUND ELEVATION (m) : 881.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 07 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 14.5
DEPTH TO TOP OF ROCK (m) : 8.8
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0			0 to 8.80 m - See BH-BGC11-55 soil log.							0
9			SILT (ML) Some sand to sandy, some gravel, low to non plastic, hard (based on auger difficulty), yellowish brown, no odour, dry, no cementation, moderately weathered (W3) metasedimentary rock. Clasts: metasedimentary, angular, elongated, talc present on clast surfaces. Note - rock is broken down by drilling process and logged as soil.							9
12										12

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

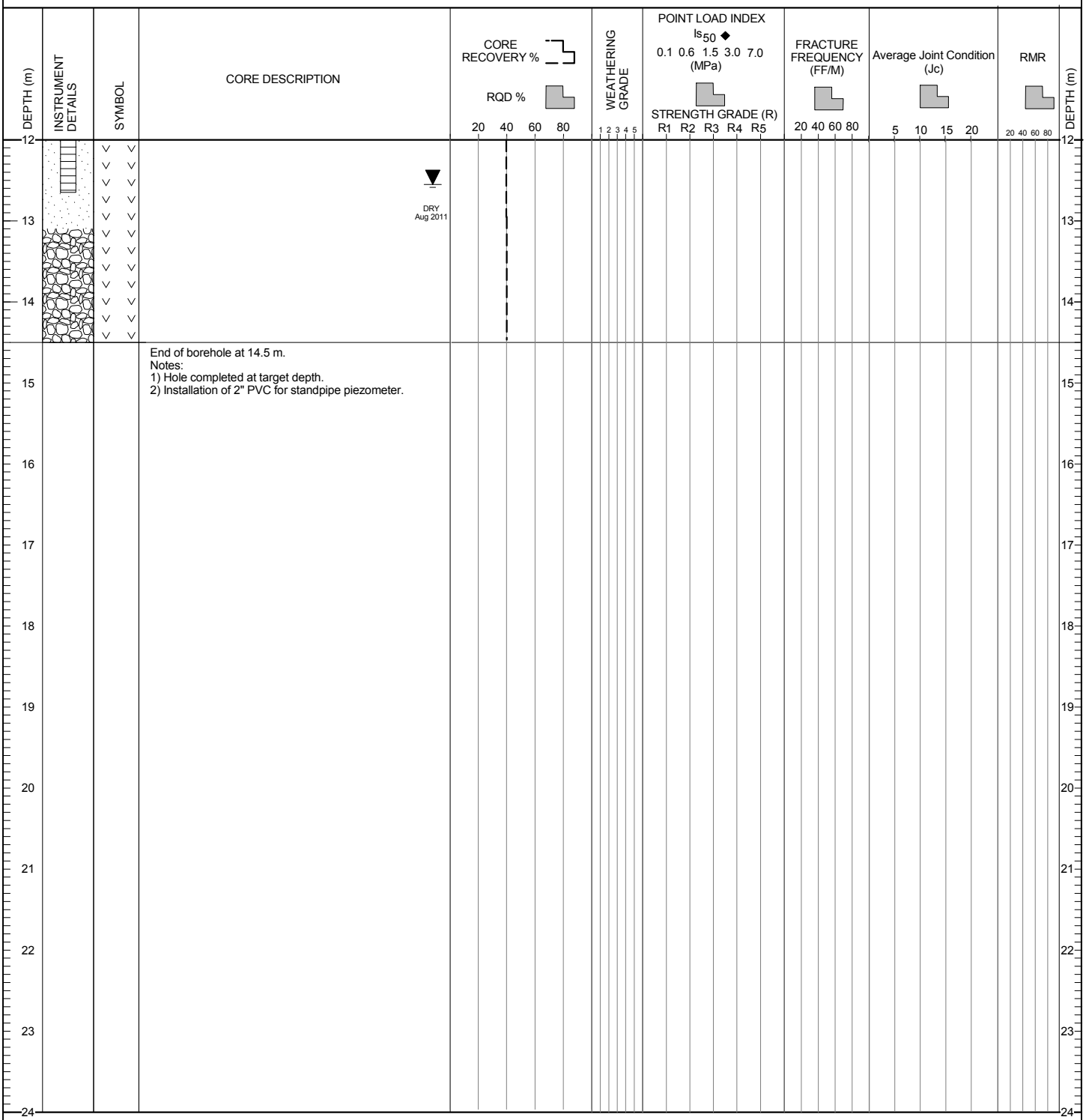
DRILL HOLE # BH-BGC11-55

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,440.6E - 7,100,918.4N
GROUND ELEVATION (m) : 881.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 07 Aug 11
FINISH DATE : 07 Aug 11
FINAL DEPTH (m) : 14.5
DEPTH TO TOP OF ROCK (m) : 8.8
LOGGED BY : KH
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-56

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,774.8E - 7,099,822.7N
GROUND ELEVATION (m) : 845.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 08 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 13.7
DEPTH TO TOP OF ROCK (m) : 7.2
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				ORGANICS		
	G	G1		SAND (SM) Gravelly, some silt, well graded, dense, maximum particle size = 30 mm, sub-angular to sub-rouded, brown, no odour, moist, no visible structure, no cementation. Clasts: typically elongated and metasedimentary rock. [COLLUVIUM]		
1		SPT1				12 11 9
2	G	G2		1.9 - 2.1 m - Sample G2, grain size analysis, 40% gravel, 37% sand, 23% silt.		
		SPT2		2.28 - 2.43 m - SPT #2: no recovery.		
3	G	G3				
4		SPT3		4.0 - 4.15 m - Silt (ML) layer, trace sand, fine, trace gravel, hard, low plastic, light brown.		18 23 R
5	G	G4				
		SPT4		5.3 - 5.5 m - Silt (ML) layer, sandy, trace gravel, low plastic, hard, light brown.		
6						
	G	G5				
7		SPT5				
				Rock encountered at 7.15 m depth. Refer to rock log.		
8						
9						
10						
11						
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-56

LOCATION : STEINER AREA

CO-ORDINATES (m) 458,774.8E - 7,099,822.7N
GROUND ELEVATION (m) : 845.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 08 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 13.7
DEPTH TO TOP OF ROCK (m) : 7.2
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0 to 7.15			0 to 7.15 m - See BH-BGC11-56 soil log.
7 to 13.7			SILT (ML) Sandy, trace gravel, low plastic, hard, light brown, no odour, dry, no visible structure, no cementation, sand and gravel are angular, and metasedimentary rock, moderately weathered (W3) metasedimentary rock. Note - rock is broken down by drilling process and logged as soil.

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-56

LOCATION : STEINER AREA

CO-ORDINATES (m) 458,774.8E - 7,099,822.7N
GROUND ELEVATION (m) : 845.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 08 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 13.7
DEPTH TO TOP OF ROCK (m) : 7.2
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
12										12
13										13
14			End of borehole at 13.7 m. Notes: 1) Hole therminated due to refusal of auger on rock. 2) Installation of 2" solid PVC for potential thermistor.							14
15										15
16										16
17										17
18										18
19										19
20										20
21										21
22										22
23										23
24										24

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-57

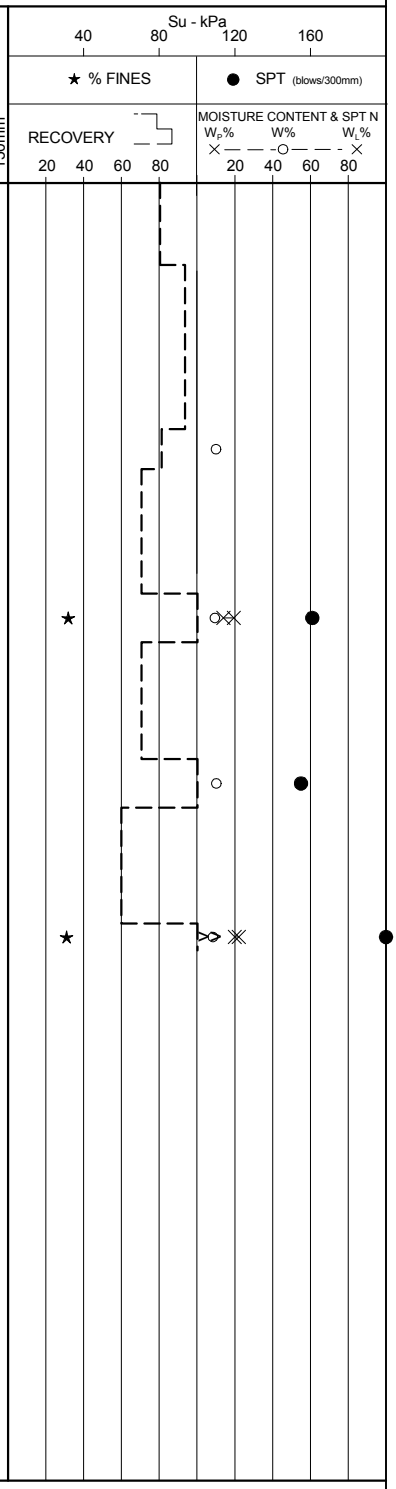
LOCATION : STEINER AREA

CO-ORDINATES (m): 458,798.6E - 7,099,978.2N
GROUND ELEVATION (m) : 859.2m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 09 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 12.1
DEPTH TO TOP OF ROCK (m) : 7.1
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				ORGANICS		
	G	G1		SILT (ML) Trace fine sand, trace gravel, low to non plastic, grey and iron oxide mottling, no odour, wet when thawed, no visible structure, no cementation, clasts are subrounded. Frozen: Vx (5-10%). [COLLUVIUM]		
1				SAND (SM) Fine sand, silty, some gravel, trace to some clay, gravel is sub-angular to sub-rounded and metasedimentary rock, maximum particle size = 30 mm. Fines: low plastic, light brown, no odour, moist, no visible structure, no cementation, frozen. [COLLUVIUM]		
2	G	G2				
		SPT1		2.3 - 4.3 m - Partially frozen zones of Nbe. At 2.45 m - One ice lens <5 mm thick, colourless, transparent, sand sized crystals.		
3	G	G3				
4		SPT2		3.8 - 4.25 m - SPT 2, grain size analysis, 19% gravel, 49% sand, 28% silt, 4% clay.		22 29 32
5	G	G4				
		SPT3				12 25 30
6				Below 5.8 m - Sandy.		
	G	G5				
7		SPT4		6.85 -7.1 m - SPT 4, grain size analysis, 27% gravel, 42% sand, 23% silt, 8% clay.		26 R
				Rock encountered at 7.10 m depth. Refer to rock log.		
8						
9						
10						
11						
12						



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-57

LOCATION : STEINER AREA

CO-ORDINATES (m) 458,798.6E - 7,099,978.2N
GROUND ELEVATION (m) : 859.2m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 09 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 12.1
DEPTH TO TOP OF ROCK (m) : 7.1
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 7.10 m - See BH-BGC11-57 soil log.

SILT (ML)
Some sand, some gravel, low to non-plastic, hard (based on augering difficulty), light brown, no odour, dry to moist, no visible structure, no cementation, gravel and sand are angular metasedimentary rock, some break by finger pressure and others broken by SPT action, maximum particle size = 20 mm, moderately weathered (W3), metasedimentary rock.
Note - rock is broken down by drilling process and logged as soil.
Below 8.3 m - Dry.
8.33 m - 8.43 m - SPT #5, refusal in first six inches.

9.9 m - 10.2 m - SPT#6, 17/38/refusal in final six inches.
DRY Aug 2011
Below 10.2 m - Gravelly, some sand, flat and elongated.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-57

LOCATION : STEINER AREA

CO-ORDINATES (m) 458,798.6E - 7,099,978.2N
GROUND ELEVATION (m) : 859.2m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 09 Aug 11
FINISH DATE : 09 Aug 11
FINAL DEPTH (m) : 12.1
DEPTH TO TOP OF ROCK (m) : 7.1
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
12			End of borehole at 12.1 m. Notes: 1) Hole terminated due to refusal of auger. 2) Installation of 2" PVC for standpipe piezometer. 3) 10 m thermistor installed on Aug. 26, 2011, serial #11.5-2, annulus not backfilled.							12
13										13
14										14
15										15
16										16
17										17
18										18
19										19
20										20
21										21
22										22
23										23
24										24

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-58

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,799.8E - 7,100,119.4N
GROUND ELEVATION (m) : 859.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 10 Aug 11
FINISH DATE : 10 Aug 11
FINAL DEPTH (m) : 10.8
DEPTH TO TOP OF ROCK (m) : 8.4
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				ORGANICS		
	G	G1		SAND (SM) Fine, silty, some clay, trace to some gravel, trace cobbles, light brown to grey with orange mottling, no odour, wet to moist when thawed, no visible structure, no cementation. Clasts are metasedimentary, angular, maximum particle size = 100 mm. Fines are low plasticity. Frozen: Vx (approximately 10%). [COLLUVIUM] 0.8 - 2.3 m - Frozen: Nbn and zones of Vx (1-3%).		
1						
2	G	G2		1.9 - 2.1 m - Sample G2, grain size analysis, 11% gravel, 44% sand, 40% silt, 5% clay.		
	G	G3		2.3 - 5.5 m - Drilled with CRREL barrel. 2.3 - 8.4 m - Frozen: Nbn.		
3	G	G4		2.9 - 3.0 m - Silt as between 0.1 and 2.3 m. 2.9 - 4.0 m - Frozen: Vs/Vx (1-3%). 3.2 - 3.6 m - Sample G4, grain size analysis, 23% gravel, 51% sand, 26% silt.		
4	G	G5				
	G	G6		4.4 - 4.6 m - Sample G6, grain size analysis, 29% gravel, 54% sand, 16% silt, 1% clay.		
	G	G7		4.6 - 4.9 m - Frozen: Vx (<1%).		
5	G	G8		4.9 - 5.5 m - Occasional granodiorite clasts.		
		SPT1		5.4 - 5.5 m - Sample G8, grain size analysis, 37% gravel, 35% sand, 26% silt, 2% clay. Below 5.5 m - Sandy, trace gravel, maximum particle size = 20 mm.		
6						
	G	G9				
7		SPT2				
8	G	G10		7.9 - 8.1 m - Sample G10, grain size analysis, 15% gravel, 51% sand, 32% silt, 2% clay.		
				Rock encountered at 8.40 m depth. Refer to rock log.		
9						
10						
11						
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-58

LOCATION : STEINER AREA

CO-ORDINATES (m) 458,799.8E - 7,100,119.4N
GROUND ELEVATION (m) : 859.0m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 10 Aug 11
FINISH DATE : 10 Aug 11
FINAL DEPTH (m) : 10.8
DEPTH TO TOP OF ROCK (m) : 8.4
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0 to 8.40			0 to 8.40 m - See BH-BGC11-58 soil log.
8.40 to 10.80			SILT (ML) Some sand, trace gravel, low to non plastic, hard (based on augering difficulty), light brown, no odour, dry, no visible structure, no cementation, gravel and sand are metasedimentary and angular, slight powdery texture, moderately weathered (W3), metasedimentary rock. Note - rock is broken down by drilling process and logged as soil.
10.80			End of hole at 10.8 m. Notes: 1) Hole terminated due to refusal of auger. 2) Installation of 2" solid PVC for thermistor. 3) 10 m thermistor installed on Aug. 29, 2011, serial #11.5-1, annulus not backfilled.

CORE RECOVERY % / RQD % (20 40 60 80)

WEATHERING GRADE (1 2 3 4 5)

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) (20 40 60 80)

Average Joint Condition (Jc) (5 10 15 20)

RMR (20 40 60 80)

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-59

LOCATION : ANN GULCH

CO-ORDINATES (m): 459,113.1E - 7,101,239.4N
GROUND ELEVATION (m) : 883.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 5.79

START DATE : 10 Aug 11
FINISH DATE : 11 Aug 11
FINAL DEPTH (m) : 30.2
DEPTH TO TOP OF ROCK (m) : 5.8
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GM) Sandy, silty, maximum particle size = 40 mm, flat and elongated, angular to subangular, brown and orange, wet, homogeneous, non-cemented. Clasts: metasedimentary, extremely weak to medium strong (R0 to R3). Matrix is non plastic. [COLLUVIUM]		
1				At 1.2 m - Frozen: Vx (<1%). 1.22 - 2.74 m - No recovery.		
2						
3						
4						
5				GRAVEL (GW-GM) Sandy, silty to some silt, well graded, blue grey, heavy iron staining, some cementation, clasts are metasedimentary. [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY]		
6				Rock encountered at 5.80 m depth. Refer to rock log.		
7						
8						
9						
10						
11						
12						

Su - kPa
40 80 120 160
★ % FINES
● SPT (blows/300mm)
RECOVERY
20 40 60 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-59

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,113.1E - 7,101,239.4N
GROUND ELEVATION (m) : 883.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 5.79

START DATE : 10 Aug 11
FINISH DATE : 11 Aug 11
FINAL DEPTH (m) : 30.2
DEPTH TO TOP OF ROCK (m) : 5.8
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 5.80 m - See BH-BGC11-59 soil log.

METASEDIMENTARY ROCK
Brown-greyish, very weak to weak (R1.5 to R2), moderately to highly weathered (W3 to W4), foliated, fine grained, 2 joint sets: first set along foliation 70° from core axis, second set is 30° from core axis, hematite staining in joints and smooth and planar joint surfaces.
6.25 - 6.7 m - Highly fractured zone.

METASEDIMENTARY ROCK
Grey, weak (R2), slightly to moderately weathered (W2 to W3), foliated, fine grained, 2 joint sets: first set along foliation is approximately 70° from core axis, second set is approximately 35-45° from core axis, hematite infill, JRC 10-12.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

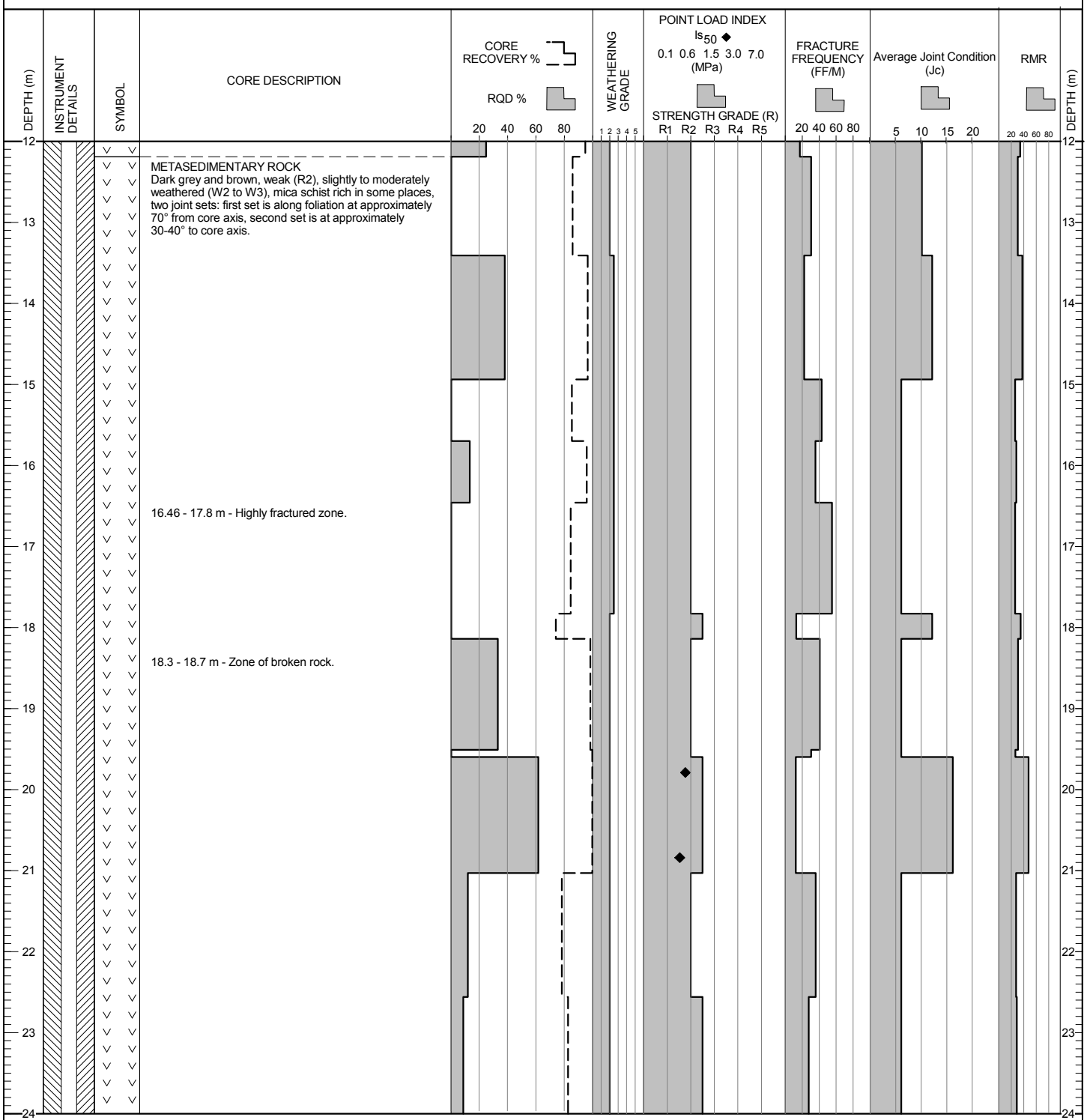
DRILL HOLE # BH-BGC11-59

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,113.1E - 7,101,239.4N
GROUND ELEVATION (m) : 883.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 5.79

START DATE : 10 Aug 11
FINISH DATE : 11 Aug 11
FINAL DEPTH (m) : 30.2
DEPTH TO TOP OF ROCK (m) : 5.8
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

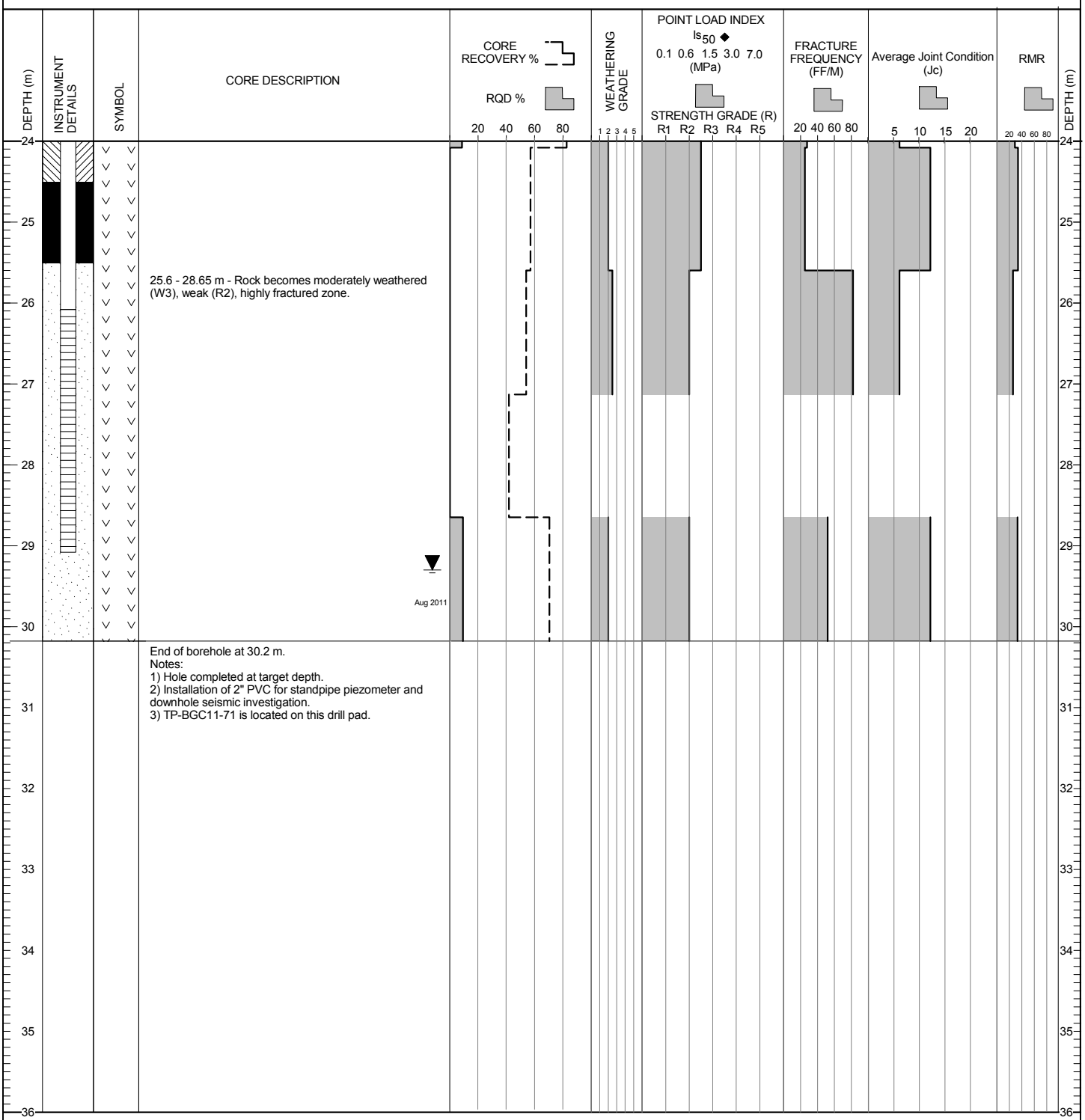
DRILL HOLE # BH-BGC11-59

LOCATION : ANN GULCH

CO-ORDINATES (m) 459,113.1E - 7,101,239.4N
GROUND ELEVATION (m) : 883.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 5.79

START DATE : 10 Aug 11
FINISH DATE : 11 Aug 11
FINAL DEPTH (m) : 30.2
DEPTH TO TOP OF ROCK (m) : 5.8
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-60

LOCATION : STEINER AREA

CO-ORDINATES (m): 458,795.6E - 7,100,041.6N
GROUND ELEVATION (m) : 859.2m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 10 Aug 11
FINISH DATE : 10 Aug 11
FINAL DEPTH (m) : 9.2
DEPTH TO TOP OF ROCK (m) : 7.0
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	LITHOLOGIC DESCRIPTION
0			ORGANICS
	G	G1	SAND (SM) Silty, some clay, trace to some gravel. Fines: low plastic, grey, no odour, wet when thawed, no visible structure, no cementation. Frozen: Vx (approximately 5%), colourless, transparent, sand sized crystals. [COLLUVIUM?] Below 0.75 m - Frozen: Nbn.
2	G	G2	
			2.28 - 4.6 m - Drilled with CRREL barrel.
	G	G3	SILT (ML) Trace fine sand, trace gravel, low plastic, mottled grey and light brown, no odour, dry to moist when thawed, homogeneous, no cementation, metasedimentary clasts. Frozen: Nbn. [COLLUVIUM] 2.7 - 2.8 m - Sample G3, grain size analysis, 20% gravel, 42% sand, 25% silt, 13% clay. Below 2.8 m - Some sand, some gravel.
	G	G4	3.4 - 4.0 m - Trace Vx (<1%).
	G	G5	3.7 - 3.8 m - Sample G5, grain size analysis, 21% gravel, 45% sand, 25% silt, 9% clay.
4			Below 4.0 m - Unfrozen.
	SPT	SPT1	
5	G	G6	
6			
	G	G7	6.3 - 6.6 m - Sample G7, grain size analysis, 43% gravel, 30% sand, 17% silt, 10% clay.
7	SPT	SPT2	6.85 - 7.0 m - SPT 2, grain size analysis, 39% gravel, 31% sand, 19% silt, 11% clay.
			Rock encountered at 7.00 m depth. Refer to rock log.
8			
9			
10			
11			
12			

INSTRUMENT DETAILS

SPT BLOWS PER 150mm

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-60

LOCATION : STEINER AREA

CO-ORDINATES (m) 458,795.6E - 7,100,041.6N
GROUND ELEVATION (m) : 859.2m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 10 Aug 11
FINISH DATE : 10 Aug 11
FINAL DEPTH (m) : 9.2
DEPTH TO TOP OF ROCK (m) : 7.0
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0			0 to 7.00 m - See BH-BGC11-60 soil log.
7			SILT (ML) Sandy, some gravel, low plastic, hard (based on augering difficulty), light reddish brown, no odour, dry, no visible structure, no cementation, talc present on clast surfaces, angular and metasedimentary rock clasts, moderately weathered (W3), metasedimentary rock. Note - rock is broken down by drilling process and logged as soil. DRY Aug 2011
9			End of borehole at 9.2 m. Notes: 1) Hole terminated due to refusal of auger. 2) Installation of 2" PVC for standpipe piezometer. 3) TP-BGC11-85 is located on this drill pad.

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-61

LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,367.0E - 7,100,013.0N
GROUND ELEVATION (m) : 1,152.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 11 Aug 11
FINISH DATE : 11 Aug 11
FINAL DEPTH (m) : 2.7
DEPTH TO TOP OF ROCK (m) : 0.8
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				DRILL PAD FILL		
	G	G1		SAND (SM) Some silt, some gravel, well graded, maximum particle size = 10 mm, subangular to subrounded, grey, wet when thawed, no cementation. Frozen: Vx (approximately 10%). [COLLUVIUM]		
1				Rock encountered at 0.75 m depth. Refer to rock log.		
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-61

LOCATION : EAGLE PUP

CO-ORDINATES (m) 460,367.0E - 7,100,013.0N
GROUND ELEVATION (m) : 1,152.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 11 Aug 11
FINISH DATE : 11 Aug 11
FINAL DEPTH (m) : 2.7
DEPTH TO TOP OF ROCK (m) : 0.8
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0			0 to 0.75 m - See BH-BGC11-61 soil log.
1			SAND (SP) Fine sand, trace silt, trace gravel, maximum particle size = 20 mm, angular, light brown, no odour, dry, no cementation, granodiorite clasts, moderately weathered (W3) granodiorite. Note - rock is broken down by drilling process and logged as soil.
2			
3			End of borehole at 2.7 m. Notes: 1) Hole terminated due to refusal of auger. 2) Backfilled with cuttings. 3) TP-BGC11-106 and BH-BGC11-66 are located on this drill pad.

CORE RECOVERY %
RQD % (20 40 60 80)
WEATHERING GRADE (1 2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (20 40 60 80)
Average Joint Condition (Jc) (5 10 15 20)
RMR (20 40 60 80)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-62

LOCATION : STUTTLE GULCH

CO-ORDINATES (m): 459,785.9E - 7,100,334.1N
GROUND ELEVATION (m) : 1,017.9m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) :

START DATE : 11 Aug 11
FINISH DATE : 12 Aug 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : JD/SP/KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GP) Some cobbles, poorly (uniformly) graded, subangular, metasedimentary clasts. [COLLUVIUM]		
1						
				Rock encountered at 1.50 m depth. Refer to rock log.		
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

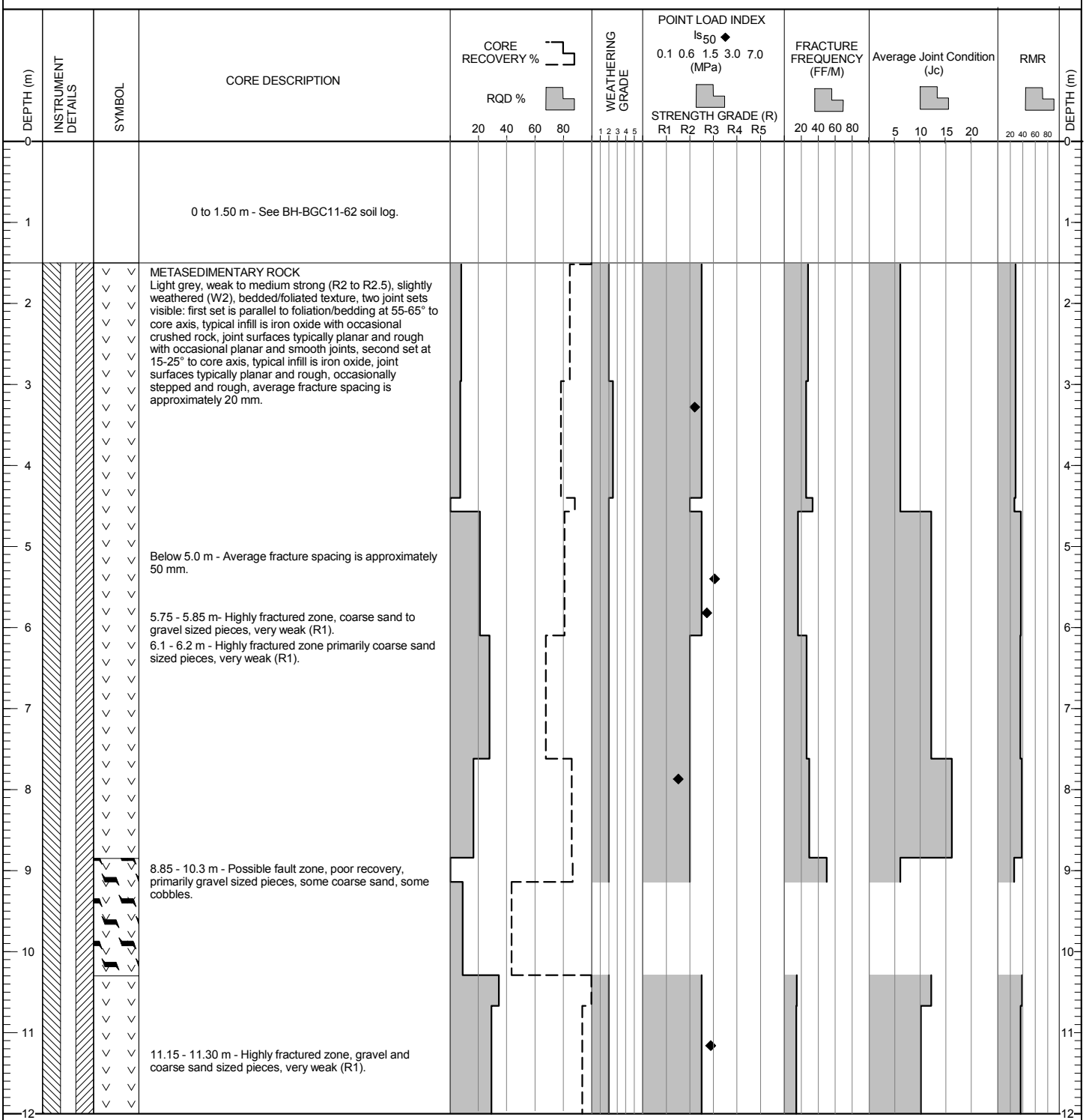
DRILL HOLE # BH-BGC11-62

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,785.9E - 7,100,334.1N
GROUND ELEVATION (m) : 1,017.9m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 11 Aug 11
FINISH DATE : 12 Aug 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : JD/SP/KH
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

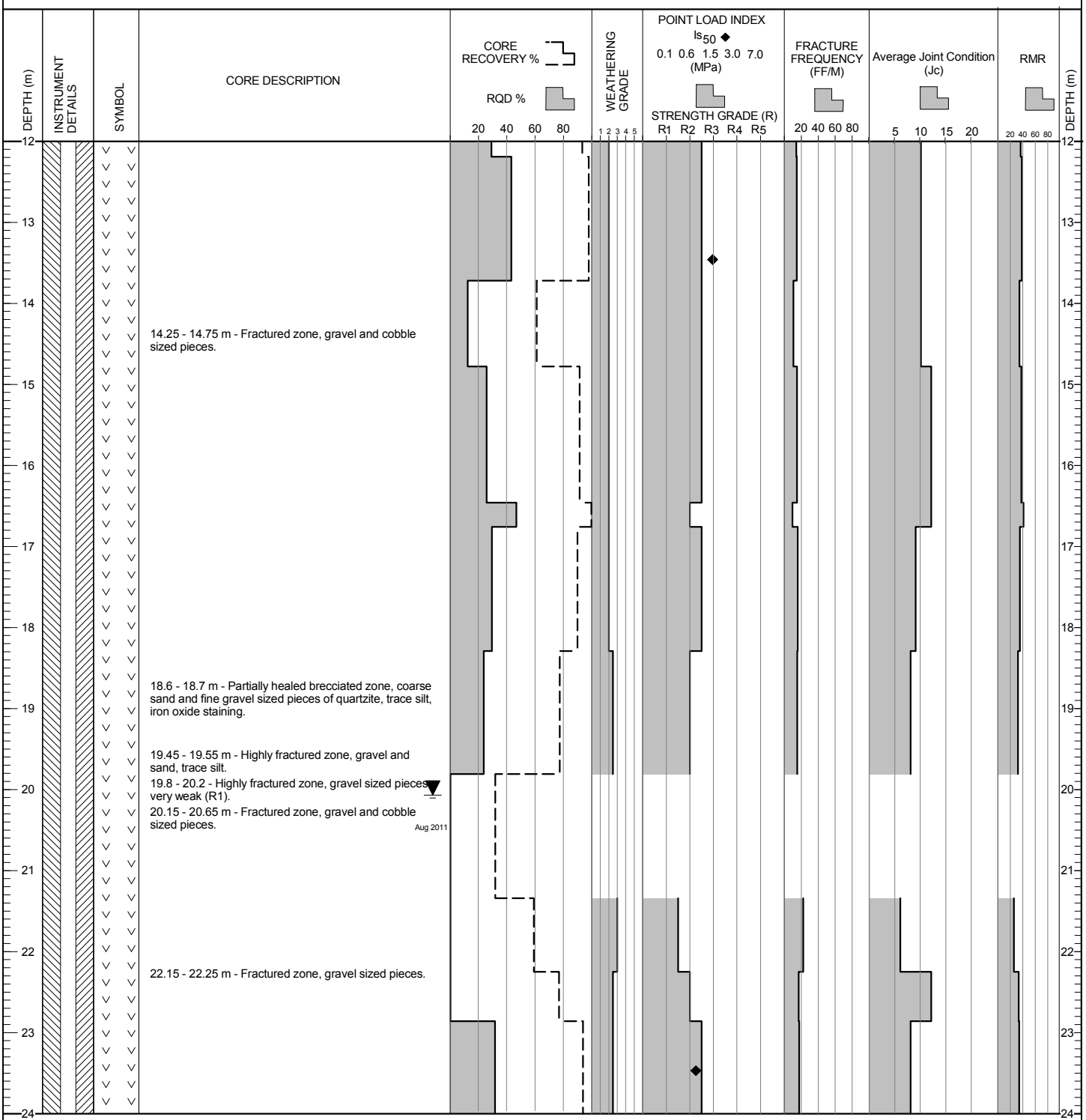
DRILL HOLE # BH-BGC11-62

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,785.9E - 7,100,334.1N
GROUND ELEVATION (m) : 1,017.9m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 11 Aug 11
FINISH DATE : 12 Aug 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : JD/SP/KH
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

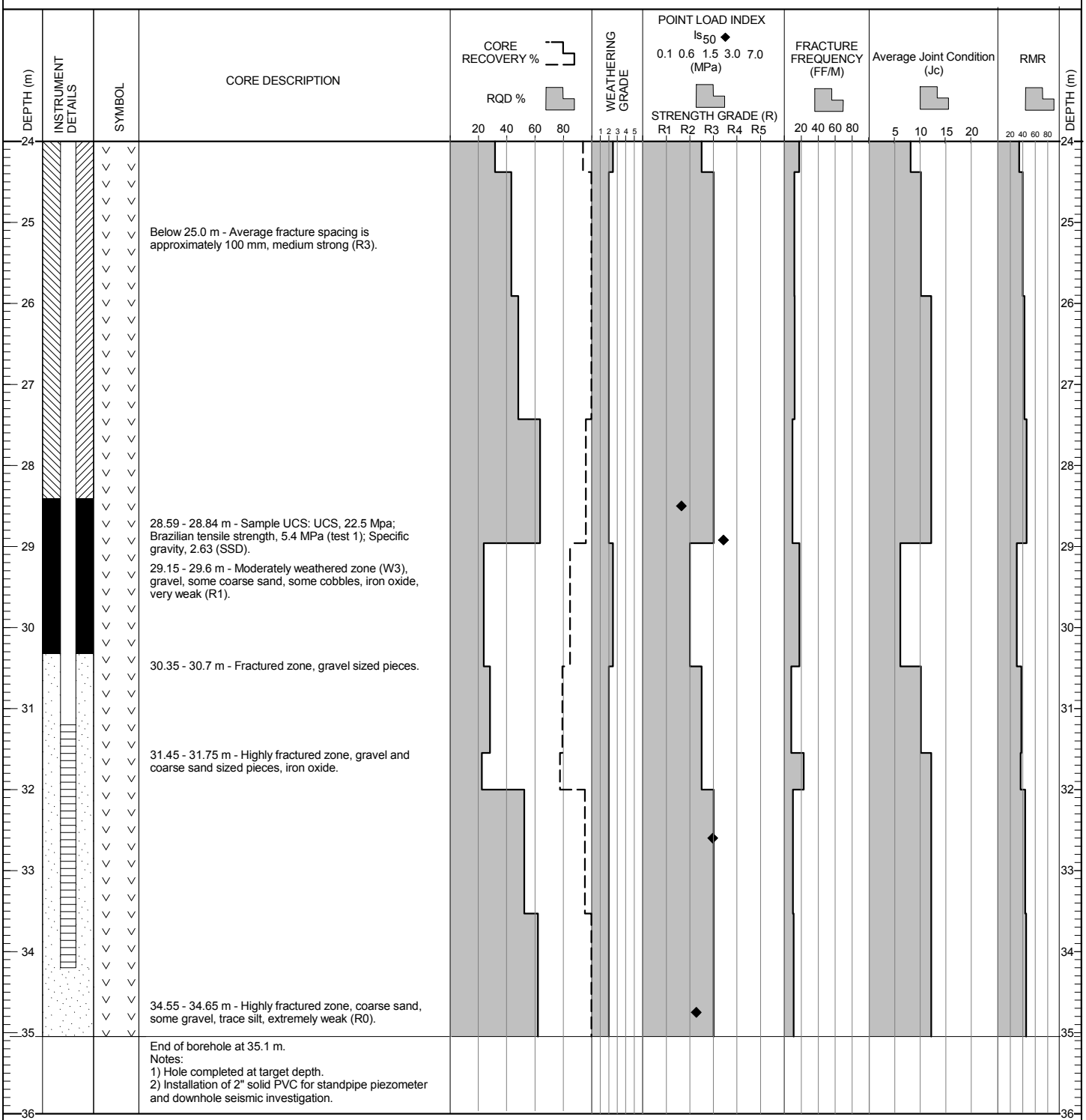
DRILL HOLE # BH-BGC11-62

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) 459,785.9E - 7,100,334.1N
GROUND ELEVATION (m) : 1,017.9m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 11 Aug 11
FINISH DATE : 12 Aug 11
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 1.5
LOGGED BY : JD/SP/KH
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

DRILL HOLE # BH-BGC11-63

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006
LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,302.9E - 7,100,114.1N
GROUND ELEVATION (m) : 1,100.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 12 Aug 11
FINISH DATE : 13 Aug 11
FINAL DEPTH (m) : 26.7
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	LITHOLOGIC DESCRIPTION
0			ORGANICS
	G	G-1	SAND (SM) Silty, some gravel, maximum particle size = 20 mm, subangular, grey, no odour, no cementation, gravel is metasedimentary. Frozen: Nbe. [COLLUVIUM]
1			SAND (SM) Silty, trace gravel, trace clay, yellow, no odour, no cementation, completely weathered granodiorite? Fines are low plastic. Frozen: Vx (<1%). [ICE RICH COLLUVIUM]
2	G	G-2	1.9 - 2.1 m - Sample G-2, grain size analysis, 1% gravel, 54% sand, 25% silt, 20% clay.
			2.3 - 14.1 m - Drilled with CRREL barrel. 2.3 - 3.0 m - Light yellowish brown with white mottling, ice -Nbn, coarse sand sized quartz clasts.
3	G	G-3	
	G	G-4	3.2 - 3.5 m - Sandy, some sand particles break down with finger pressure. Frozen: Vx (approximately 10%). 3.5 - 4.5 m - Frozen: Vx (approximately 30-40%), some silt inclusions.
4	G	G-5	3.9 - 4.0 m - Sample G-5, grain size analysis 54% sand, 33% silt, 13% clay.
			4.5 - 4.7 m - Primarily ICE with sand inclusions. 4.7 - 5.1 m - Frozen: Vx (approximatley 5%) occuring as sand sized crystals.
5			5.1 -5.3 m - Primarily ICE. 5.3 - 9.0 m - Frozen: Vx (approximately 20-30%), occurs as sand & gravel sized crystals within soil fabric.
6	G	G-6	6.2 - 6.4 m - Primarily ICE with silt & sand inclusions.
7	G	G-7	6.8 - 7.1 m - Less weathered granodiorite, mafic minerals still present.
			7.5 - 7.6 m - Primarily ICE with silt & sand inclusions.
8			At 8.1 m - 30mm ice lens, cloudy, white.
	G	G-8	
9			SAND (SM) Some silt, trace gravel, trace clay, yellowish brown, no odour, no visible structure, no cementation, completely weathered metasedimentary rock? Fines are low plastic. Frozen: Vx (approximately 10-30%), clear & colourless, occurs as sand and gravel sized crystals in soil fabric. [ICE RICH COLLUVIUM]
10			9.2 - 9.9 m - Primarily ICE, with silt and sand inclusions, cloudy and white.
	G	G-9	10.15 - 10.25 m - Sample G-9, grain size analysis, 1% gravel, 57% sand, 20% silt, 22% clay.
11			11.0 - 11.5 m - Primarily ICE with silt inclusions.
	G	G-10	
12			

INSTRUMENT DETAILS

SPT BLOWS PER 150mm

Su - kPa
40 80 120 160
★ % FINES
● SPT (blows/300mm)
RECOVERY
20 40 60 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-63

LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,302.9E - 7,100,114.1N
GROUND ELEVATION (m) : 1,100.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 12 Aug 11
FINISH DATE : 13 Aug 11
FINAL DEPTH (m) : 26.7
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
12				At 12.3 m - 30mm ICE lens, silt and sand inclusions.		
13		G-11		13.2 - 13.6 m - Primarily ICE with silt and sand inclusions, ice breaks up easily with knife.		
14				At 13.8 m - 250 mm weathered metasedimentary boulder. 14.1 - 16.0 m - Drilled with solid stem auger, refusal of CRREL barrel.		
15				At 15.0 m - Sandy SILT (ML), grey/black, weathered metasedimentary boulder.		
16		G-12		16.0 - 19.8 m - Drilled with CRREL barrel. 16.0 - 16.7 m - Orange and black banding, Vx (approximately 5%). 16.2 - 16.3 m - Sample G-12, grain size analysis, 12% gravel, 59% sand, 19% silt, 10% clay.		
17				16.7 - 17.5 m - Frozen: Vx (approximately 15-20%), Vs (approximatley 1-3%), up to 5 mm thick, oriented perpendicular to core axis.		
18				17.9 - 18.0 m - Primarily ICE with silt inclusions.	Aug 2011	
19				19.0 - 19.8 m - Frozen: Vs (approximately 40%), lenses approximately 10 mm thick oriented perpendicular to core axis.		
20				Below 19.8 m - Sandy, drilled with solid stem auger, refusal of CRREL barrel due CRREL barrel filling with water and preventing advancement. Water in hole likely from melting ice near surface and possibly from surface runoff (heavy rain during drilling).		
21						
22				22.1 - 23.6 m - May have drilled through massive ice as drilling was difficult, then got easier.		
23						
24						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-63

LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,302.9E - 7,100,114.1N
GROUND ELEVATION (m) : 1,100.7m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 12 Aug 11
FINISH DATE : 13 Aug 11
FINAL DEPTH (m) : 26.7
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
24				At 26.1 m - Possibly end of frozen material, final run is unfrozen and drilling difficulty decreased, SAND (SM) some silt, trace gravel, well graded, dry to moist.		
25				At 26.7 m - Encountered flowing water.		
26				End of borehole at 26.7 m.		
27				Notes:		
28				1) Hole completed at target depth.		
29				2) Installation of 2" solid PVC for thermistor, serial #26.5-3, annulus not backfilled.		
30				3) Vibrating wire piezometer, serial #18103, installed to 26.3 m.		
31				4) 25 m thermistor installed on Aug. 25, 2011.		
32						
33						
34						
35						
36						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-64

LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,182.4E - 7,100,262.9N
GROUND ELEVATION (m) : 1,044.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) :

START DATE : 13 Aug 11
FINISH DATE : 14 Aug 11
FINAL DEPTH (m) : 48.8
DEPTH TO TOP OF ROCK (m) : 16.4
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL AND SAND (GW/SW) Medium to coarse, trace to some silt, well graded, compact, maximum particle size = 100 mm, flat and elongated, subangular to subrounded, light grey to brown, moist, homogeneous, non cemented. Clats: mixture of metasedimentary and granodiorite. Frozen: Vx<1%, up to 5.8m. [COLLUVIUM]		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

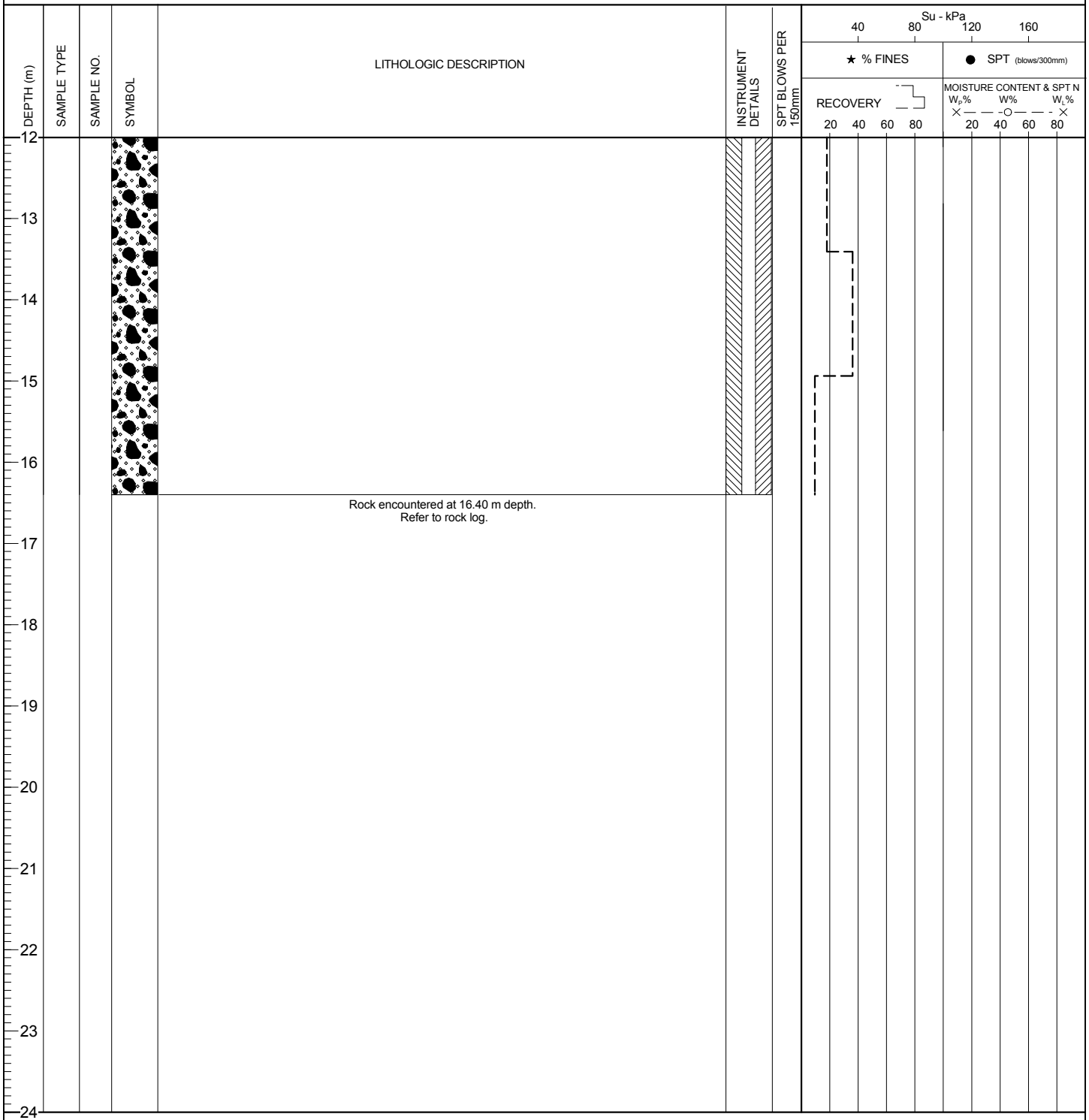
DRILL HOLE # BH-BGC11-64

LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,182.4E - 7,100,262.9N
GROUND ELEVATION (m) : 1,044.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) :

START DATE : 13 Aug 11
FINISH DATE : 14 Aug 11
FINAL DEPTH (m) : 48.8
DEPTH TO TOP OF ROCK (m) : 16.4
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-64

LOCATION : EAGLE PUP

CO-ORDINATES (m) 460,182.4E - 7,100,262.9N
GROUND ELEVATION (m) : 1,044.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 13 Aug 11
FINISH DATE : 14 Aug 11
FINAL DEPTH (m) : 48.8
DEPTH TO TOP OF ROCK (m) : 16.4
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
12			0 to 16.40 m - See BH-BGC11-64 soil log.
16			GRANODIORITE ROCK Light grey, highly to completely altered/weathered (A4 to A5), extremely weak to weak (R0 to R1), massive, crystaline, medium grained, two joint sets: first set is approximately 50° to core axis, second set is approximately 90° to core axis, hematite and clay infill, JRC is approximately 2-4. 18.0 - 28.7 m - Highly fractured zone.
24			

CORE RECOVERY %
RQD % (20 40 60 80)
WEATHERING GRADE (1 2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (20 40 60 80)
Average Joint Condition (Jc) (5 10 15 20)
RMR (20 40 60 80)

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

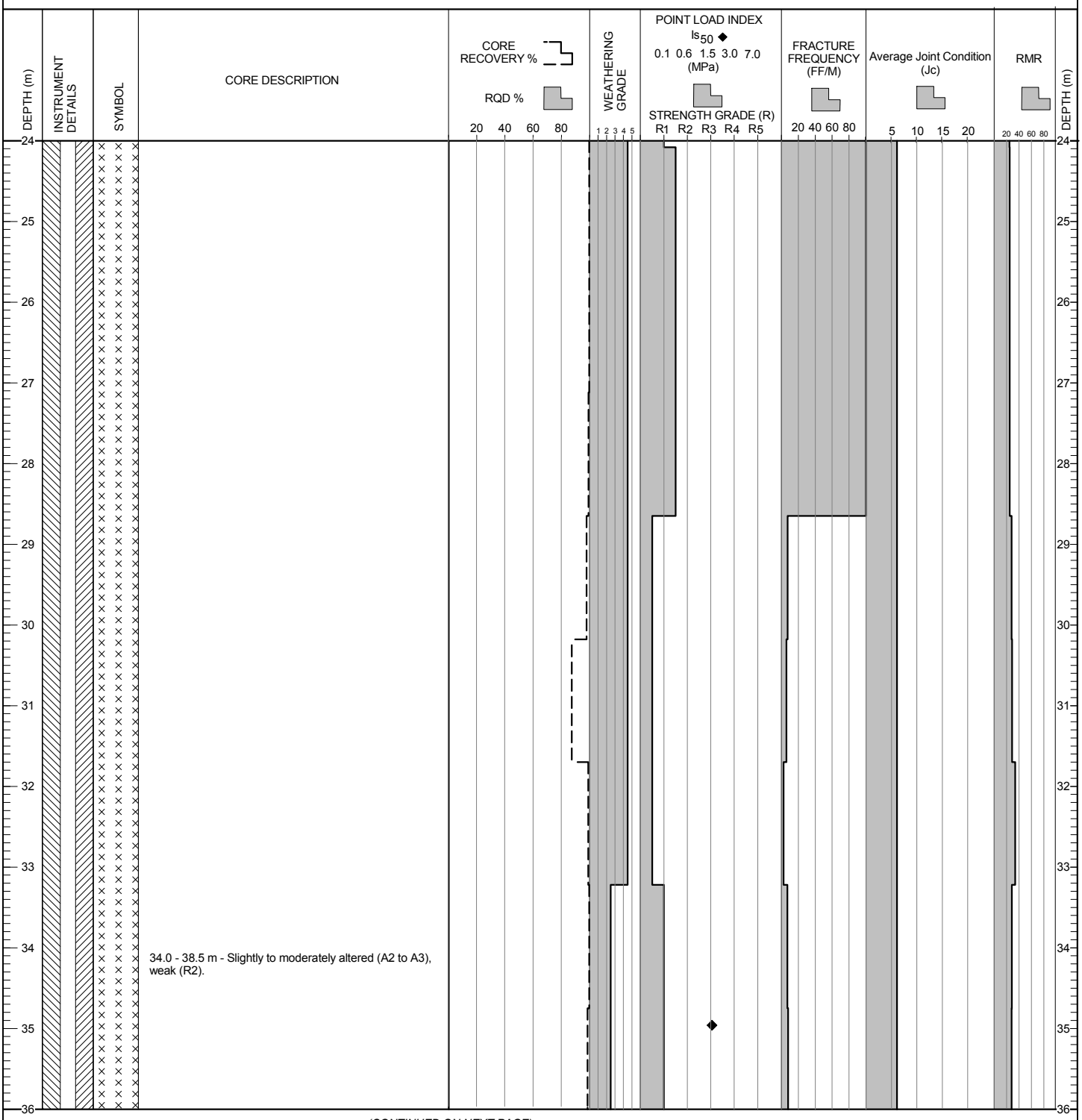
DRILL HOLE # BH-BGC11-64

LOCATION : EAGLE PUP

CO-ORDINATES (m) 460,182.4E - 7,100,262.9N
GROUND ELEVATION (m) : 1,044.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 13 Aug 11
FINISH DATE : 14 Aug 11
FINAL DEPTH (m) : 48.8
DEPTH TO TOP OF ROCK (m) : 16.4
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

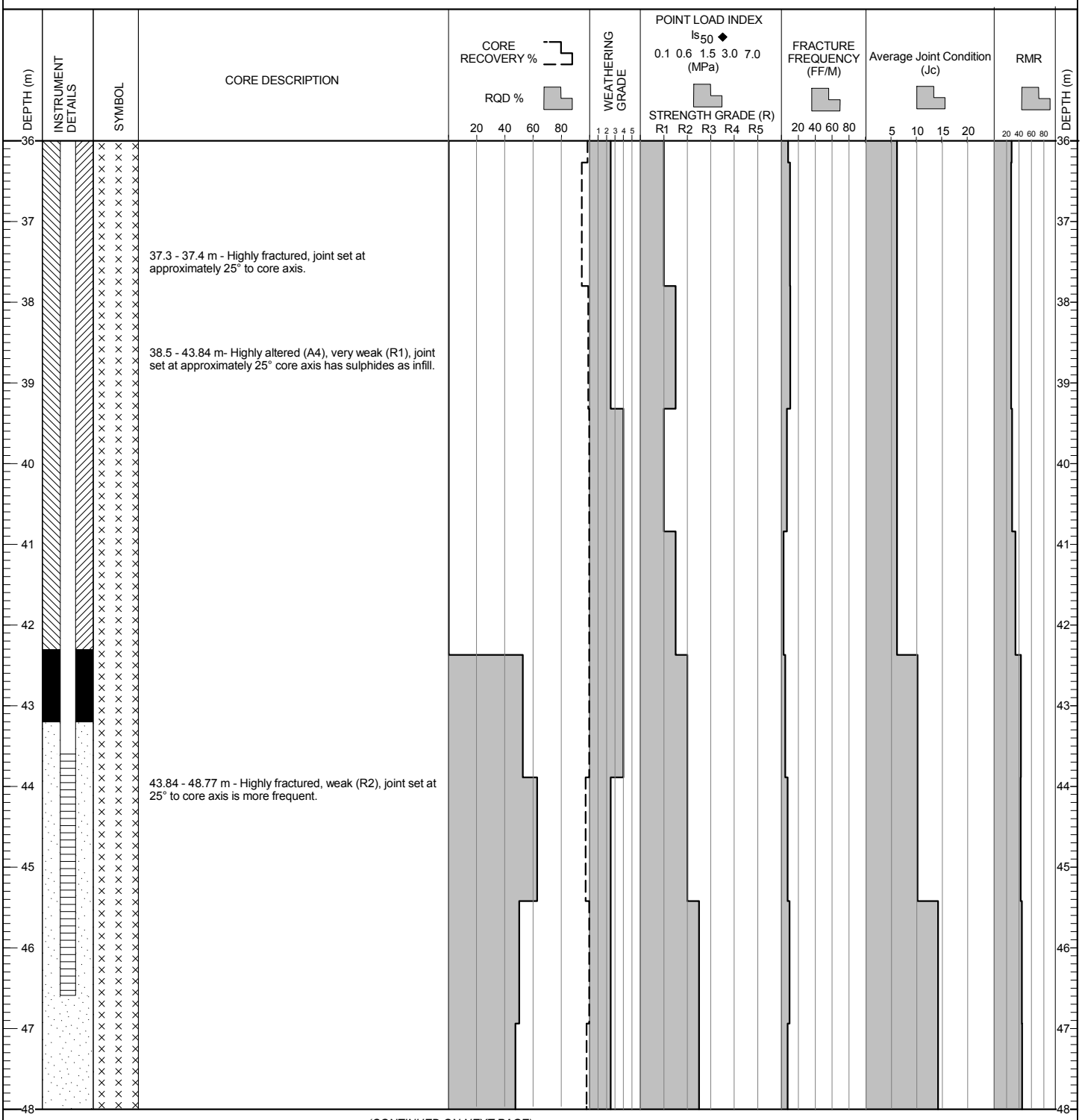
DRILL HOLE # BH-BGC11-64

LOCATION : EAGLE PUP

CO-ORDINATES (m) 460,182.4E - 7,100,262.9N
GROUND ELEVATION (m) : 1,044.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 13 Aug 11
FINISH DATE : 14 Aug 11
FINAL DEPTH (m) : 48.8
DEPTH TO TOP OF ROCK (m) : 16.4
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

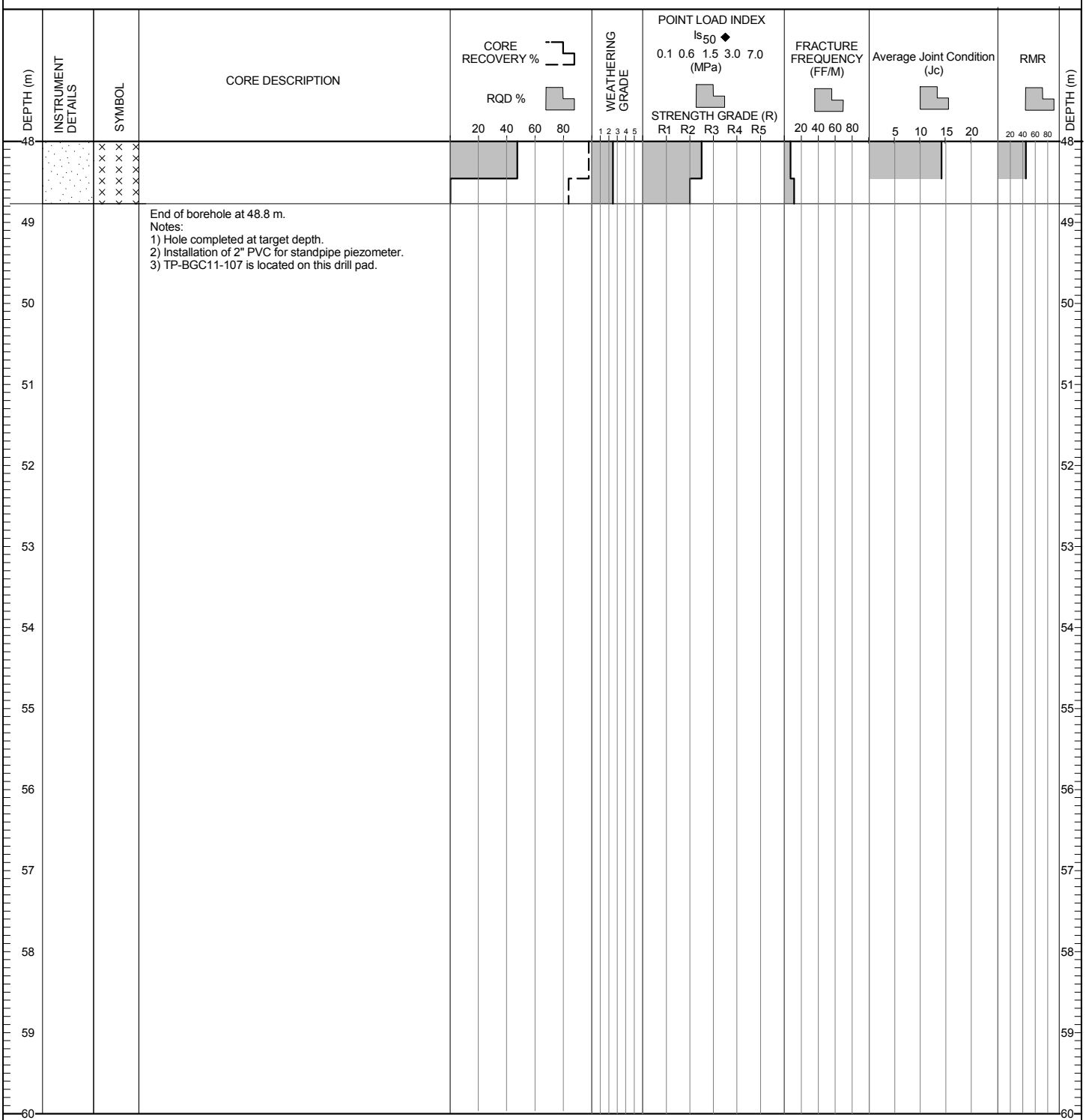
DRILL HOLE # BH-BGC11-64

LOCATION : EAGLE PUP

CO-ORDINATES (m) 460,182.4E - 7,100,262.9N
GROUND ELEVATION (m) : 1,044.1m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 13 Aug 11
FINISH DATE : 14 Aug 11
FINAL DEPTH (m) : 48.8
DEPTH TO TOP OF ROCK (m) : 16.4
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-65

LOCATION : DUBLIN GULCH VALLEY BOTTOM

CO-ORDINATES (m): 458,771.0E - 7,100,939.0N
GROUND ELEVATION (m) : 825.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger HSA
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 14 Aug 11
FINISH DATE : 14 Aug 11
FINAL DEPTH (m) : 6.9
DEPTH TO TOP OF ROCK (m) :
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				SAND AND GRAVEL (SW-GW) Trace boulders, trace cobbles, trace to some silt, well graded, compact, maximum particle size = 400 mm, (visible on surface in area of drill pad), subangular to subrounded, greyish brown, dry to moist, no visible structure, no cementation, gravel/cobbles/boulders are metasedimentary and granodiorite. [PLACER TAILINGS]		
1		SPT1		0.76 - 1.21 m - SPT 1, grain size analysis, 26% gravel, 60% sand, 14% fines.		10 14 14
2		SPT2		1.52 - 1.97 m - SPT 2, grain size analysis, 40% gravel, 48% sand, 12% fines.		8 11 8
3		SPT3		2.28 - 2.73 m- SPT 3, grain size analysis, 53% gravel, 38% sand, 9% fines.		4 6 7
4		SPT4		3.04 - 3.49 m - SPT 4, grain size analysis, 63% gravel, 29% sand, 8% fines.		6 10 9
5		SPT5		3.8 - 4.25 m - SPT 5, grain size analysis, 76% gravel, 19% sand, 5% fines.		
6		SPT6		4.56 - 5.01 m - SPT 6, grain size analysis, 40% gravel, 44% sand, 16% fines.		15 13 12
7		SPT7		5.33 - 5.75 m - SPT 7, grain size analysis, 64% gravel, 26% sand, 10% fines. At 5.7 m - Wet; possibly groundwater level.		
8		SPT8		6.09 - 6.54 m - SPT 8, grain size analysis, 53% gravel, 38% sand, 9% fines.		
9		SPT9		End of borehole at 6.9 m. Notes: 1) Hole terminated due to refusal of augers & SPT. 2) Backfilled with cuttings. 3) A second attempt was made approximately 1.0 m west, refusal met at 3.8 m. 4) Adjacent diamond hole BH-BGC11-32, located approximately 10 m west and 2-3 m lower. 5) Description based on SPT recovery and material visible on drill pad. No recovery between SPTs as drilling was completed with hollow stem augers which were left in the ground as casing during SPT testing.		
10						
11						
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-66

LOCATION : EAGLE PUP

CO-ORDINATES (m): 460,360.2E - 7,100,011.1N
GROUND ELEVATION (m) : 1,151.9m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) :

START DATE : 15 Aug 11
FINISH DATE : 16 Aug 11
FINAL DEPTH (m) : 33.5
DEPTH TO TOP OF ROCK (m) : 3.9
LOGGED BY : JD/SP
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL (GW) Cobbley, sandy, some boulders, wet, yellowish brown, homogeneous. Clasts: granodiorite, elongated to equidimensional, angular to subangular, strong to very strong (R4 to R5), fresh to faintly weathered (W1 to W1.5). Frozen: Vx. [COLLUVIUM]		
2				GRAVEL (GW) Sandy, maximum particle size = 50 mm. Clasts: elongated to equidimensional, angular to subangular, moderately weathered granodiorite, very weak to weak (R1 to R2), highly weathered (W4), wet when thawed, yellowish brown, stratified/laminated. Frozen: Vx with visible ice infilling some of the fractures. [HIGHLY TO COMPLETELY WEATHERED ROCK]		
4				Rock encountered at 3.90 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-66

LOCATION : EAGLE PUP

CO-ORDINATES (m) 460,360.2E - 7,100,011.1N
GROUND ELEVATION (m) : 1,151.9m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 15 Aug 11
FINISH DATE : 16 Aug 11
FINAL DEPTH (m) : 33.5
DEPTH TO TOP OF ROCK (m) : 3.9
LOGGED BY : JD/SP
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0 to 3.90			0 to 3.90 m - See BH-BGC11-66 soil log.
4 to 12			GRANODIORITE Grey, coarse grained, fractures are very closely spaced, medium strong (R3), slightly weathered (W2), apertures are typically 0.25-1 mm with broken soft zones up to 270 mm , JRCs range from 8 to 20 with an average of 16, infill is typically hematite staining, crushed rock, 3 main joint sets: at 30-40°, 50-55° and 10-27° to core axis. Frozen: with Vx infilling some of the fractures.

CORE RECOVERY %
RQD % (20 40 60 80)
WEATHERING GRADE (1 2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (20 40 60 80)
Average Joint Condition (Jc) (5 10 15 20)
RMR (20 40 60 80)

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

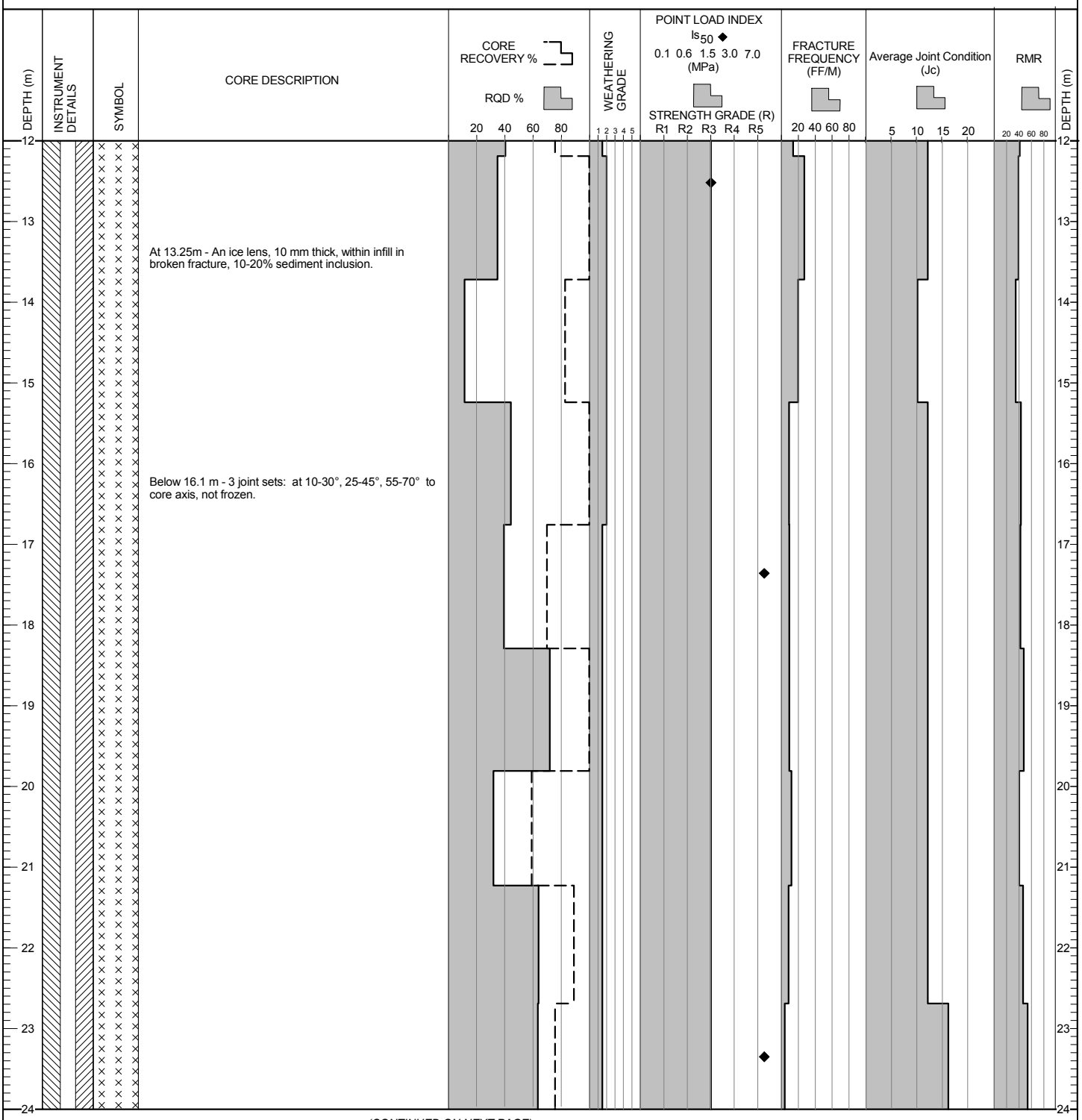
DRILL HOLE # BH-BGC11-66

LOCATION : EAGLE PUP

CO-ORDINATES (m) 460,360.2E - 7,100,011.1N
GROUND ELEVATION (m) : 1,151.9m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 15 Aug 11
FINISH DATE : 16 Aug 11
FINAL DEPTH (m) : 33.5
DEPTH TO TOP OF ROCK (m) : 3.9
LOGGED BY : JD/SP
REVIEWED BY : PQ/DW



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

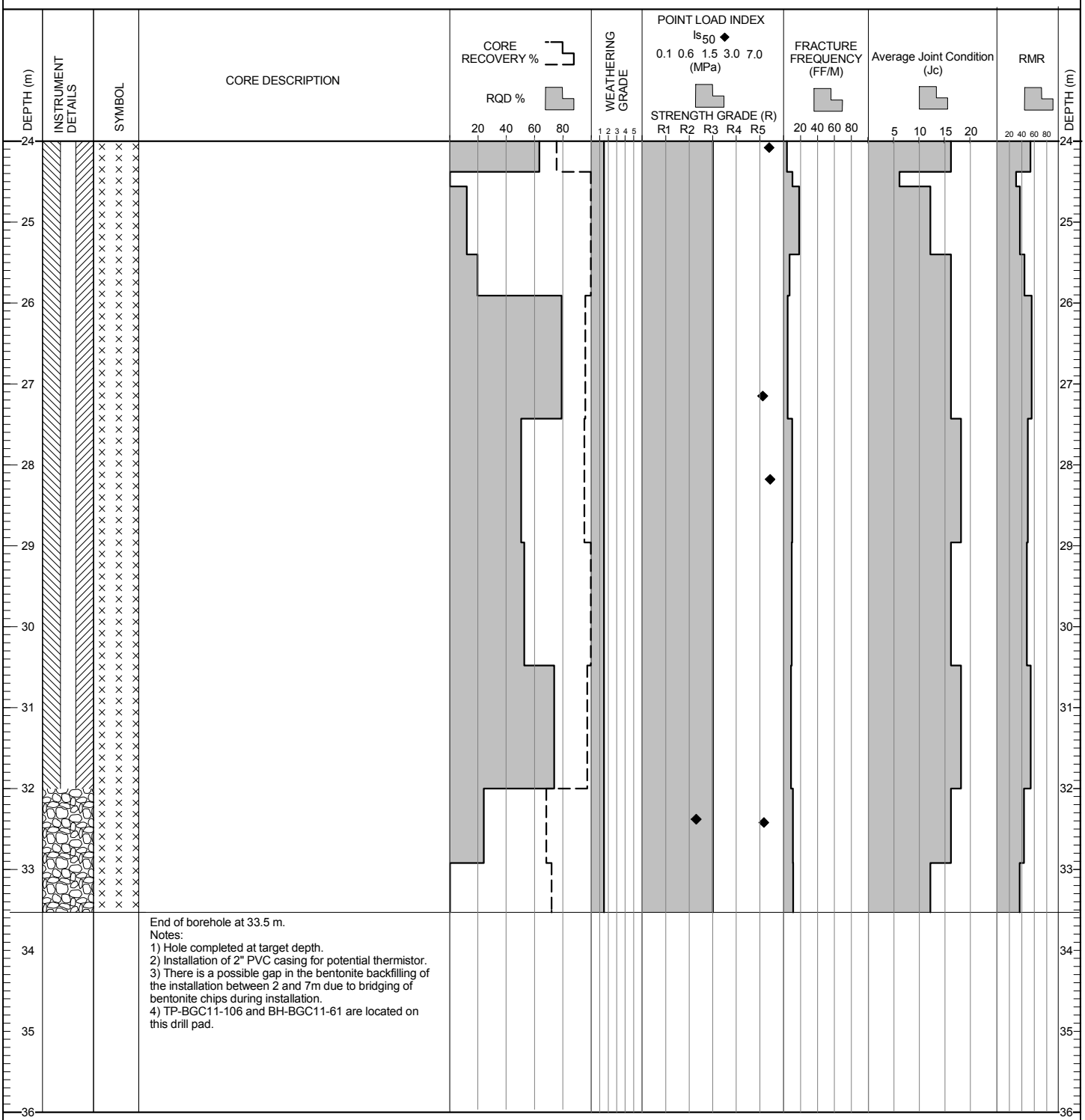
DRILL HOLE # BH-BGC11-66

LOCATION : EAGLE PUP

CO-ORDINATES (m) 460,360.2E - 7,100,011.1N
GROUND ELEVATION (m) : 1,151.9m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m):

START DATE : 15 Aug 11
FINISH DATE : 16 Aug 11
FINAL DEPTH (m) : 33.5
DEPTH TO TOP OF ROCK (m) : 3.9
LOGGED BY : JD/SP
REVIEWED BY : PQ/DW



End of borehole at 33.5 m.
Notes:
1) Hole completed at target depth.
2) Installation of 2" PVC casing for potential thermistor.
3) There is a possible gap in the bentonite backfilling of the installation between 2 and 7m due to bridging of bentonite chips during installation.
4) TP-BGC11-106 and BH-BGC11-61 are located on this drill pad.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-67

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m): 458,823.0E - 7,101,148.0N
GROUND ELEVATION (m) : 862.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) :

START DATE : 15 Aug 11
FINISH DATE : 15 Aug 11
FINAL DEPTH (m) : 9.9
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	G-1		SAND (SM) Some silt to silty, trace gravel, well graded, dense, maximum particle size = 20 mm, angular, silt is orange (iron oxide?), sand and gravel are grey and red, no odour, dry, no visible structure, no cementation. [HIGHLY WEATHERED METASEDIMENTARY ROCK] 0.76 - 0.9 m - No recovery due to hole cleanout.
1				0.9 - 1.5 m - Drilled with CRREL barrel.
2				2.05 - 6.0 m - Drilled with CRREL barrel.
3		G-2		2.7 - 2.9 m - Black and grey. 2.9 - 3.2 m - SILT (ML), Trace sand, non plastic, very stiff/R0 rock, greenish grey to grey, no odour, dry, some banding visible, weak cementation, sheen when water added, talc present.
4				3.45 - 4.35 m - SILT (ML), Trace to some sand, non plastic, stiff?, grey/black and orange banding, some sections become slippery with added water - talc?.
5		G-3		4.35 - 4.75 m - SAND (SM), Trace to some silt, trace gravel, bands visible - white/yelow/reddish brown, extremely weak (R0). 5.05 - 5.25 m - SILT (ML), Trace to some sand, non plastic, very stiff?, grey/black and orange banding, some sections become slippery with added water - talc?.
6		G-4		5.6 - 6.0 m - SILT (ML), Trace to some sand, non plastic, very stiff/R0 rock, grey/black and orange banding, talc present on clast surfaces. Below 6.0 m - Drilled with solid stem auger, sample extraction difficult with CRREL barrel. 6.0 - 9.1 m - Brown; may be a blend of orange and grey/black as above but combined by augering process.
7				
8				
9				Rock encountered at 9.10 m depth. Refer to rock log.
10				
11				
12				

INSTRUMENT DETAILS

SPT BLOWS PER 150mm

Su - kPa
40 80 120 160
★ % FINES
● SPT (blows/300mm)
RECOVERY
20 40 60 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-67

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m) 458,823.0E - 7,101,148.0N
GROUND ELEVATION (m) : 862.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 15 Aug 11
FINISH DATE : 15 Aug 11
FINAL DEPTH (m) : 9.9
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0			0 to 9.10 m - See BH-BGC11-67 soil log.
9			SAND (SW) Trace silt, trace gravel, well graded, dense?, maximum particle size = 10 mm, angular, some flat gravel, light orange, no odour, dry, no visible structure, no cementation, slight powdery texture, moderately weathered (W3) metasedimentary rock. Note - rock is broken down by drilling process and logged as soil.
10			End of borehole at 9.9 m. Notes: 1) Hole terminated due to refusal of auger. 2) Backfilled with cuttings. 3) TP-BGC11-103 is located on this drill pad. 4) 4 DCPT tests completed within 4 m of this hole, met refusal at 2.5 m, 3.22m, 0.45 m and 0.6 m. 5) Drill pad approximately 5.0 m below ground surface in plate load testing pit (PT-BGC11-01), BH-BGC11-69
12			

CORE RECOVERY % / RQD % (20 40 60 80)

WEATHERING GRADE (1 2 3 4 5)

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) (20 40 60 80)

Average Joint Condition (Jc) (5 10 15 20)

RMR (20 40 60 80)

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-67

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m) 458,823.0E - 7,101,148.0N
GROUND ELEVATION (m) : 862.0m
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Auger SSA/CRREL
CORE SIZE :
FLUID :
CASED TO (m):

START DATE : 15 Aug 11
FINISH DATE : 15 Aug 11
FINAL DEPTH (m) : 9.9
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : KH
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
12			(rotary diamond) was drilled adjacent to this hole.							12
13										13
14										14
15										15
16										16
17										17
18										18
19										19
20										20
21										21
22										22
23										23
24										24

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-69

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m): 458,829.3E - 7,101,144.3N
GROUND ELEVATION (m) : 861.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Water/Polymer
CASED TO (m) : 3.05

START DATE : 17 Aug 11
FINISH DATE : 17 Aug 11
FINAL DEPTH (m) : 21.3
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				0.0 - 1.52 m - No recovery. For shallow subsurface conditions refer to log of TP-BGC11-103, excavated at this drill pad.		
1						
2				GRAVEL (GM) Some sand, some silt, subangular to subrounded, dark blue grey, heavy iron staining, some cementation, clasts are metasedimentary. [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK]		
3				3.05 - 4.57 m - No recovery.		
4						
5						
6						
7						
8						
9				Rock encountered at 9.10 m depth. Refer to rock log.		
10						
11						
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 1/20/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-69

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m) 458,829.3E - 7,101,144.3N
GROUND ELEVATION (m) : 861.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 17 Aug 11
FINISH DATE : 17 Aug 11
FINAL DEPTH (m) : 21.3
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0										0
1										1
2										2
3										3
4										4
5			0 to 9.10 m - See BH-BGC11-69 soil log.							5
6										6
7										7
8										8
9										9
10			METASEDIMENTARY ROCK Dark grey and brown, extremely weak to very weak (R0 to R1.5), moderately to highly weathered (W3 to W4), foliated, fine grained, 2 joint sets: one parallel to foliation at 45-50° from core axis, second set is at 20-25° from core axis. 10.0 - 12.26 m - Weak (R2), moderately weathered (W3).							10
11										11
12										12

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-006

DRILL HOLE # BH-BGC11-69

LOCATION : WEST FLANK TIN DOME

CO-ORDINATES (m) 458,829.3E - 7,101,144.3N
GROUND ELEVATION (m) : 861.6m
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : CS-1000
DRILLING CONTRACTOR : Lyncorp
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Water/Polymer
CASED TO (m): 3.05

START DATE : 17 Aug 11
FINISH DATE : 17 Aug 11
FINAL DEPTH (m) : 21.3
DEPTH TO TOP OF ROCK (m) : 9.1
LOGGED BY : JD/SP/DW
REVIEWED BY : PQ/DW

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} (0.1 0.6 1.5 3.0 7.0 MPa) / STRENGTH GRADE (R) (R1 R2 R3 R4 R5) | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

METASEDIMENTARY ROCK

Quartzite, weak (R2), with layers of mica rich schist: very weak to weak (R1 to R2), bands are <10 cm thick, quartz rich bands are yellowish/light grey, foliation is at 40-60° to core axis, apertures vary from 0.5 to 3mm with occasional decomposed rock zones (up to 90mm thick), JRC vary from 2 to 12 on the micaceous joints and from 8 to 20 on the quartzite joint walls.

12.26 - 12.54 m - Sample UCS1: UCS, 45.1 Mpa; Brazilian tensile strength, 2.8 MPa (test 1), 6.3 MPa (test 2); Specific gravity, 2.59 (SSD).

15.24 - 17.22 m - More mica rich bands and fewer quartz rich layers.

16.76 - 17.22 m - No recovery.

Below 17.22 m - grades to more quartz rich, with layers of mica rich rock 25-35 cm thick.

At 18.29 m - Two joint sets: one is parallel to foliation at 60-70° from core axis, second set is a joint at 20° from core axis.

End of borehole at 21.3 m.

Notes:
1) Hole completed at target depth.
2) Installation of 2" solid PVC for downhole seismic investigation.
3) TP-BGC11-103 is located on this drill pad.
4) BH-BGC11-67 drilled adjacent to this hole.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 1/20/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 1/20/12

APPENDIX F
BOREHOLE PHOTOS



BH-BGC11-24 Box 1 – 0.00 m to 5.41 m



BH-BGC11-24 Box 2 – 5.41 m to 9.30 m



BH-BGC11-24 Box 3 – 9.30 m to 13.30 m



BH-BGC11-24 Box 4 – 13.30 m to 18.99 m



BH-BGC11-24 Box 5 – 18.99 m to 20.88 m



BH-BGC11-25 Box 1 – 0.00 m to 4.91 m



BH-BGC11-25 Box 2 – 4.91 m to 9.10 m



BH-BGC11-25 Box 3 – 9.10 m to 13.11 m



BH-BGC11-25 Box 4 – 13.11 m to 17.98 m



BH-BGC11-25 Box 5 – 17.98 m to 20.42 m



BH-BGC11-26 Box 1 – 0.00 m to 10.21 m



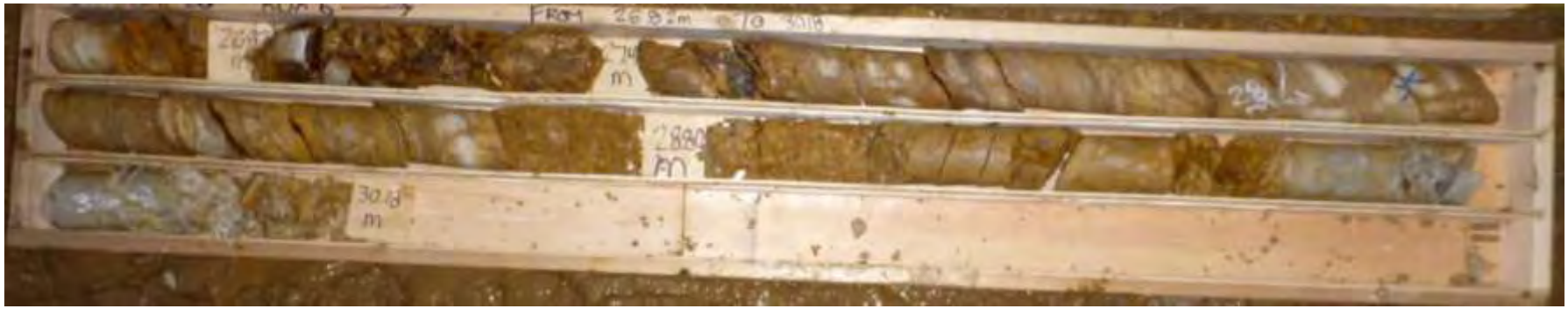
BH-BGC11-26 Box 2 – 10.21 m to 15.38 m



BH-BGC11-26 Box 3 – 15.38 m to 21.34 m



BH-BGC11-26 Box 4 – 21.34 m to 26.82 m



BH-BGC11-26 Box 5 – 26.82 m to 30.18 m



BH-BGC11-27 Box 1 – 0.00 m to 14.02 m



BH-BGC11-27 Box 2 – 14.02 m to 18.29 m



BH-BGC11-27 Box 3 – 18. 29 m to 22.30 m



BH-BGC11-27 Box 4 – 22.30 m to 26.52 m



BH-BGC11-28 Box 1 – 0.00 m to 12.19 m



BH-BGC11-28 Box 2 – 12.19 m to 18.14 m



BH-BGC11-28 Box 3 – 18.14 m to 22.10 m



BH-BGC11-28 Box 4 – 22.10 m to 26.21 m



BH-BGC11-28 Box 5 – 26.21 m to 32.00 m



BH-BGC11-28 Box 6 – 32.00 m to 40.84 m



BH-BGC11-29 Box 1 – 0.00 m to 15.54 m



BH-BGC11-29 Box 2 – 15.54 m to 22.83 m



BH-BGC11-29 Box 3 – 22.83 m to 26.72 m



BH-BGC11-29 Box 4 – 26.72 m to 30.69 m



. BH-BGC11-30 Box 1 – 0.00 m to 18.29 m



BH-BGC11-30 Box 2 – 18.29 m to 30.85 m



BH-BGC11-30 Box 3 – 30.85 m to 35.05 m



BH-BGC11-31 Box 1 – 0.00 m to 11.94 m



BH-BGC11-31 Box 2 – 11.94 m to 22.86 m



BH-BGC11-31 Box 3 – 22.86 m to 35.05 m



BH-BGC11-32 Box 1 – 0.00 m to 19.95 m



BH-BGC11-32 Box 2 – 19.95 m to 24.38 m



BH-BGC11-33 Box 1 – 0.00 m to 16.46 m



BH-BGC11-33 Box 2 – 16.46 m to 27.43 m



BH-BGC11-33 Box 3 – 27.43 m to 39.01 m



BH-BGC11-34 Box 1 – 0.00 m to 21.34 m



BH-BGC11-34 Box 2 – 21.34 m to 27.62 m



BH-BGC11-34 Box 3 – 27.62 m to 32.10 m



BH-BGC11-34 Box 4 – 32.10 m to 36.86 m



BH-BGC11-34 Box 5 – 36.86 m to 38.10 m



BH-BGC11-35 Box 1 – 0.00 m to 19.81 m



BH-BGC11-35 Box 2 – 19.81 m to 30.20 m



BH-BGC11-35 Box 3 – 30.20 m to 34.70 m

.



BH-BGC11-35 Box 4 – 34.70 m to 45.72 m



BH-BGC11-35 Box 5 – 45.72 m to 50.29 m



BH-BGC11-36 Box 1 – 0.00 m to 6.44 m



BH-BGC11-36 Box 2 – 6.44 m to 12.19 m



BH-BGC11-36 Box 3 – 12.19 m to 16.10 m



BH-BGC11-36 Box 4 – 16.10 m to 22.55 m



BH-BGC11-36 Box 5 – 22.55 m to 28.54 m



BH-BGC11-36 Box 6 – 28.54 m to 34.14 m



BH-BGC11-36 Box 7 – 34.14 m to 38.36 m



BH-BGC11-36 Box 8 – 38.36 m to 42.52 m



BH-BGC11-36 Box 9 – 42.52 m to 46.47 m



BH-BGC11-36 Box 10 – 46.47 m to 49.83 m



BH-BGC11-36 Box 11 – 49.83 m to 50.29 m



BH-BGC11-37 Box 1 – 0.00 m to 7.16 m



BH-BGC11-37 Box 2 – 7.16 m to 11.11 m



BH-BGC11-37 Box 3 – 11.11 m to 16.08 m



BH-BGC11-37 Box 4 – 16.08 m to 22.00 m



BH-BGC11-37 Box 5 – 22.00 m to 26.53 m



BH-BGC11-37 Box 6 – 26.53 m to 31.42 m



BH-BGC11-37 Box 7 – 31.42 m to 36.90 m



BH-BGC11-37 Box 8 – 36.90 m to 42.37 m



BH-BGC11-37 Box 9 – 42.37 m to 43.59 m



BH-BGC11-38 Box 1 – 0.00 m to 16.15 m



BH-BGC11-38 Box 2 – 16.15 m to 21.97 m



BH-BGC11-38 Box 3 – 21.97 m to 26.50 m



BH-BGC11-38 Box 4 – 26.50 m to 31.14 m



BH-BGC11-38 Box 5 – 31.14 m to 35.80 m



BH-BGC11-38 Box 6 – 35.80 m to 40.83 m



BH-BGC11-38 Box 7 – 40.83 m to 50.00 m



BH-BGC11-38 Box 8 – 50.00 m to 50.52 m



BH-BGC11-39 SPT 1 – 1.15 m to 1.60 m



BH-BGC11-39 SPT 2 – 1.60 m to 2.05 m



BH-BGC11-39 SPT 3 – 2.28 m to 2.73 m



BH-BGC11-39 SPT 4 – 2.75 m to 3.20 m



BH-BGC11-39 SPT 5 – 4.60 m to 5.05 m



BH-BGC11-39 SPT 6 – 5.53 m to 5.98 m



BH-BGC11-39 SPT 7 – 6.22 m to 6.67 m



BH-BGC11-39 SPT 8 – 7.16 m to 7.61 m



BH-BGC11-39 SPT 9 – 7.75 m to 8.20 m



BH-BGC11-39 SPT 10 – 8.71 m to 9.16 m



BH-BGC11-39 SPT 11 – 9.25 m to 9.70 m



BH-BGC11-40A Box 1 – 0.00 m to 9.48 m



BH-BGC11-40A Box 2 – 9.48 m to 13.53 m



BH-BGC11-40A Box 3 – 13.53 m to 17.56 m



BH-BGC11-40A Box 4 – 17.56 m to 21.90 m



BH-BGC11-40A Box 5 – 21.90 m to 25.82 m



BH-BGC11-40A Box 6 – 25.82 m to 29.88 m



BH-BGC11-40A Box 7 – 29.88 m to 33.19 m



BH-BGC11-40B Box 1 – 8.69 m to 13.72 m



BH-BGC11-40B Box 2 – 13.72 m to 18.29 m



BH-BGC11-40B Box 3 – 18.29 m to 22.56 m



BH-BGC11-40B Box 4 – 22.56 m to 26.77 m



BH-BGC11-40B Box 5 – 26.77 m to 30.80 m



BH-BGC11-40B Box 6 – 30.80 m to 34.73 m



BH-BGC11-40B Box 7 – 34.73 m to 38.70 m



BH-BGC11-40B Box 8 – 38.70 m to 42.67 m



BH-BGC11-40B Box 9 – 42.67 m to 45.72 m

	
BH-BGC11-41 Run 1 – 0.00 m to 1.53 m	



BH-BGC11-42 Run 1 – 0.0 m to 0.75 m



BH-BGC11-42 Run 2 – 0.75 m to 2.27 m



BH-BGC11-42 Run 3 – 2.27 m to 3.80 m



BH-BGC11-42 Run 4 – 3.80 m to 5.32 m



BH-BGC11-42 Run 5 – 5.32 m to 6.84 m



BH-BGC11-42 Run 6 – 6.84 m to 8.36 m



BH-BGC11-42 Run 7 – 8.36 m to 9.88 m



BH-BGC11-42 Run 8 – 9.88 m to 11.43 m

	
BH-BGC11-42 Run 9 – 11.43 m to 11.75 m	BH-BGC11-42 Run 10 – 11.75 m to 12.50 m
	
BH-BGC11-42 Run 11 – 12.50 m to 13.11 m	BH-BGC11-42 Run 12 – 13.11 m to 13.71 m



BH-BGC11-42 Run 13 – 13.71 m to 14.16 m



BH-BGC11-42 Run 14 – 14.16 m to 14.73 m



BH-BGC11-42 Run 15 – 14.73 m to 15.40 m



BH-BGC11-42 Run 16 – 15.40 m to 15.85 m



BH-BGC11-42 Run 17 – 15.85 m to 17.53 m



BH-BGC11-42 Run 18 – 17.53 m to 18.0 m



BH-BGC11-42 Run 19 – 18.0 m to 18.30 m



BH-BGC11-42 Run 20 – 18.30 m to 19.05 m

	
BH-BGC11-42 Run 21 – 19.05 m to 20.57 m	BH-BGC11-42 Run 21 – 20.57 m to 22.04 m
	
BH-BGC11-42 Run 23 – 22.04 m to 23.62 m	BH-BGC11-42 Run 24 – 23.62 m to 25.15 m

	
BH-BGC11-42 Run 25 – 25.15 m to 26.67 m	BH-BGC11-42 Run 26 – 26.67 m to 28.19 m



BH-BGC11-43 Box 1 – 0.00 m to 4.48 m



BH-BGC11-43 Box 2 – 4.48 m to 8.96 m



BH-BGC11-43 Box 3 – 8.96 m to 13.54 m



BH-BGC11-43 Box 4 – 13.54 m to 18.15 m



BH-BGC11-43 Box 5 – 18.15 m to 22.37 m



BH-BGC11-43 Box 6 – 22.37 m to 23.77 m

	
BH-BGC11-44 Run 1 – 0.0 m to 0.75 m	BH-BGC11-44 Run 2 – 0.75 m to 2.27 m
	
BH-BGC11-44 Run 3 – 2.72 m to 3.79 m	BH-BGC11-44 Run 4 – 4.24 m to 5.33 m

	
BH-BGC11-44 Run 5 – 5.80 m to 6.85 m	BH-BGC11-44 Run 6 – 7.32 m to 8.38 m
	
BH-BGC11-44 Run 7 – 8.85 m to 9.38 m	BH-BGC11-44 Run 8 – 9.38 m to 9.90 m



BH-BGC11-44 Run 9 – 10.35 m to 11.42 m



BH-BGC11-44 Run 10 – 11.97 m to 12.35 m



BH-BGC11-44 Run 11 – 13.42 m to 14.49 m



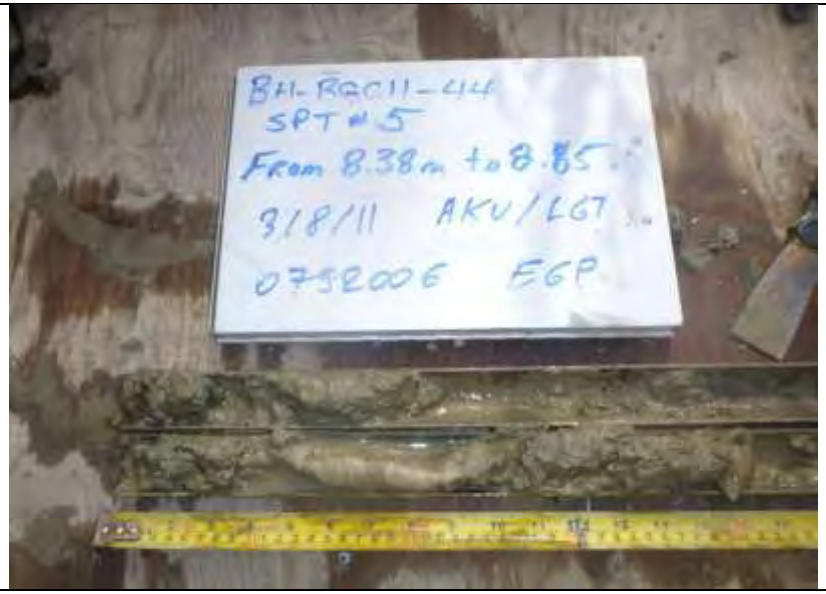
BH-BGC11-44 SPT 1 – 2.27 m to 2.72 m



BH-BGC11-44 SPT 2 – 3.79 m to 4.24 m



BH-BGC11-44 SPT 3 – 5.33 m to 5.80 m



BH-BGC11-44 SPT 5 – 8.38 m to 8.85 m



BH-BGC11-44 SPT 8 – 9.90 m to 10.35 m



BH-BGC11-44 SPT 9 – 11.42 m to 11.97 m



BH-BGC11-44 SPT 10 – 12.97 m to 13.42 m



BH-BGC11-44 SPT 11 – 14.49 m to 14.79 m



BH-BGC11-45 Box 1 – 3.05 m to 7.93 m



BH-BGC11-45 Box 2 – 7.93 m to 12.22 m



BH-BGC11-45 Box 3 – 12.22 m to 16.76 m



BH-BGC11-45 Box 4 – 16.76 m to 20.73 m



BH-BGC11-46 Box 1 – 0.00 m to 6.21 m



BH-BGC11-46 Box 2 – 6.21 m to 10.36 m



BH-BGC11-46 Box 3 – 10.36 m to 14.40 m



BH-BGC11-46 Box 4 – 14.40 m to 18.31 m



BH-BGC11-46 Box 5 – 18.31 m to 20.12 m



BH-BGC11-47 Run 1 – 0.00 m to 0.75 m



BH-BGC11-47 Box 1 – 1.2 m to 2.27 m



BH-BGC11-47 Run 2 – 2.30 m to 2.95 m



BH-BGC11-47 Run 4 – 2.95 m to 3.35 m

	
BH-BGC11-47 Run 5 – 4.25 m to 5.33 m	BH-BGC11-47 Run 6 – 5.78 m to 6.85 m
	
BH-BGC11-47 Run 7 – 7.30 m to 8.38 m	BH-BGC11-47 Run 9 – 8.58 m to 9.90 m

	
BH-BGC11-47 Run 10 – 10.05 m to 11.43 m	BH-BGC11-47 Run 11 – 11.60 m to 12.95 m
	
BH-BGC11-47 Run 12 – 12.95 m to 14.48 m	BH-BGC11-47 Run 13 – 14.48 m to 16.0 m



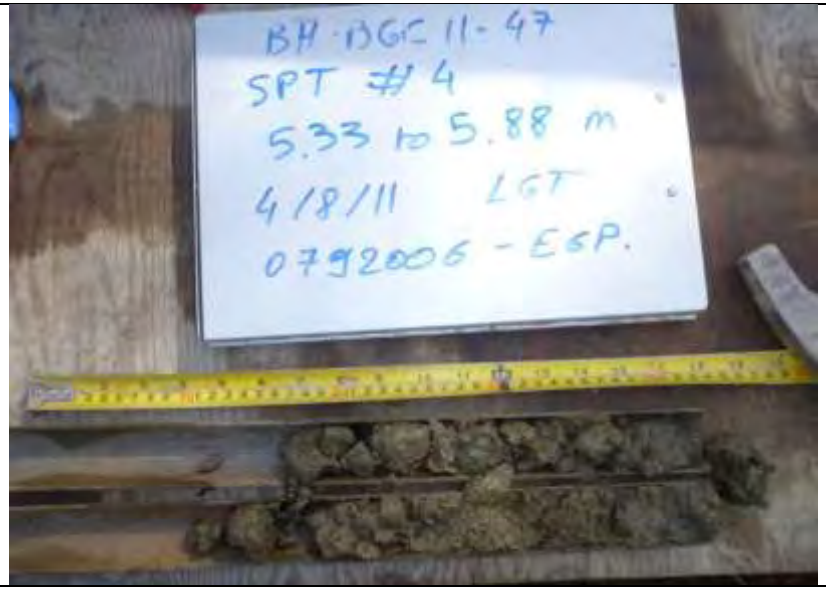
BH-BGC11-47 SPT 1 – 0.75 m to 1.20 m



BH-BGC11-47 SPT 2 – 3.35 m to 3.80 m



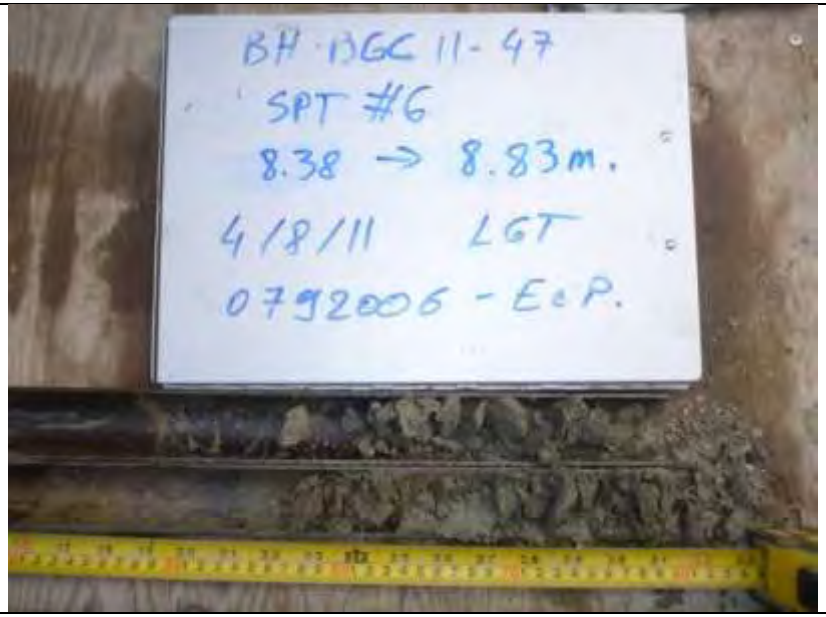
BH-BGC11-47 SPT 3 – 3.80 m to 4.25 m



BH-BGC11-47 SPT 4 – 5.33 m to 5.88 m



BH-BGC11-47 SPT 5 – 6.85 m to 7.30 m



BH-BGC11-47 SPT 6 – 8.38 m to 8.83 m



BH-BGC11-47 SPT 7 – 9.90 m to 10.05 m



BH-BGC11-47 SPT 8 – 11.43 m to 11.70 m



BH-BGC11-48 Box 1 – 0.00 m to 13.11 m



BH-BGC11-48 Box 2 – 13.11 m to 18.96 m



BH-BGC11-48 Box 3 – 18.96 m to 23.38 m



BH-BGC11-48 Box 4 – 23.98 m to 28.00 m



BH-BGC11-48 Box 5 – 28.00 m to 32.92 m

	
BH-BGC11-49 Run 1 – 0.00 m to 0.76 m	BH-BGC11-49 Run 2 – 1.23 m to 2.28 m
	
BH-BGC11-49 Run 3 – 2.73 m to 2.90 m	BH-BGC11-49 Run 4 – 2.90 m to 3.80 m

	
BH-BGC11-49 Run 5 – 3.80 m to 5.33 m	BH-BGC11-49 Run 6 – 5.33 m to 6.85 m
	
BH-BGC11-49 Run 7 – 6.85 m to 8.38 m	BH-BGC11-49 Run 8 – 8.38 m to 9.90 m

	
BH-BGC11-49 Run 9 – 9.90 m to 11.43 m	BH-BGC11-49 Run 10 – 11.43 m to 12.95 m
	
BH-BGC11-49 Run 11 – 12.95 m to 14.47 m	BH-BGC11-49 Run 12 – 14.47 m to 16.0 m



BH-BGC11-49 SPT 1 – 0.76 m to 1.21 m



BH-BGC11-49 SPT 2 – 2.28 m to 2.73 m



BH-BGC11-50 Box 1 – 3.66 m to 11.53 m



BH-BGC11-50 Box 2 – 11.53 m to 16.50 m



BH-BGC11-50 Box 3 – 16.50 m to 20.67 m



BH-BGC11-50 Box 4 – 20.67 m to 24.93 m



BH-BGC11-50 Box 5 – 24.93 m to 29.11 m



BH-BGC11-50 Box 6 – 29.11 m to 33.28 m



BH-BGC11-50 Box 7 – 33.28 m to 37.41 m



BH-BGC11-50 Box 8 – 37.41 m to 41.15 m

	
BH-BGC11-51 Run 1 – 0.00 m to 0.76 m	BH-BGC11-51 Run 2 – 1.21 m to 2.28 m
	
BH-BGC11-51 Run 3 – 2.73 m to 3.80 m	BH-BGC11-51 Run 4 – 4.25 m to 5.33 m

	
BH-BGC11-51 Run 5 – 5.78 m to 6.85 m	BH-BGC11-51 Run 6 – 6.85 m to 8.38 m
	
BH-BGC11-51 Run 7 – 8.38 m to 9.90 m	BH-BGC11-51 Run 8 – 10.25 m to 11.43 m

	
BH-BGC11-51 Run 9 – 11.58 m to 12.95 m	BH-BGC11-51 Run 10 – 12.95 m to 14.47 m
	
BH-BGC11-51 Run 11 – 14.47 m to 16.00 m	BH-BGC11-51 Run 12 – 16.00 m to 17.52 m

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC11-51 Run 13 – 17.52 m to 19.05 m</td><td>BH-BGC11-51 Run 14 – 19.05 m to 20.57 m</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC11-51 Run 15 – 20.62 m to 22.10 m</td><td>BH-BGC11-51 Run 16 – 22.25 m to 23.62 m</td></tr>
</table>



BH-BGC11-51 Run 17 – 23.62 m to 25.15 m



BH-BGC11-51 SPT 1 – 0.76 m to 1.21 m



BH-BGC11-51 SPT 2 – 2.28 m to 2.73 m



BH-BGC11-51 SPT 3 – 3.80 m to 4.25 m



BH-BGC11-51 SPT 4 – 5.33 m to 5.78 m



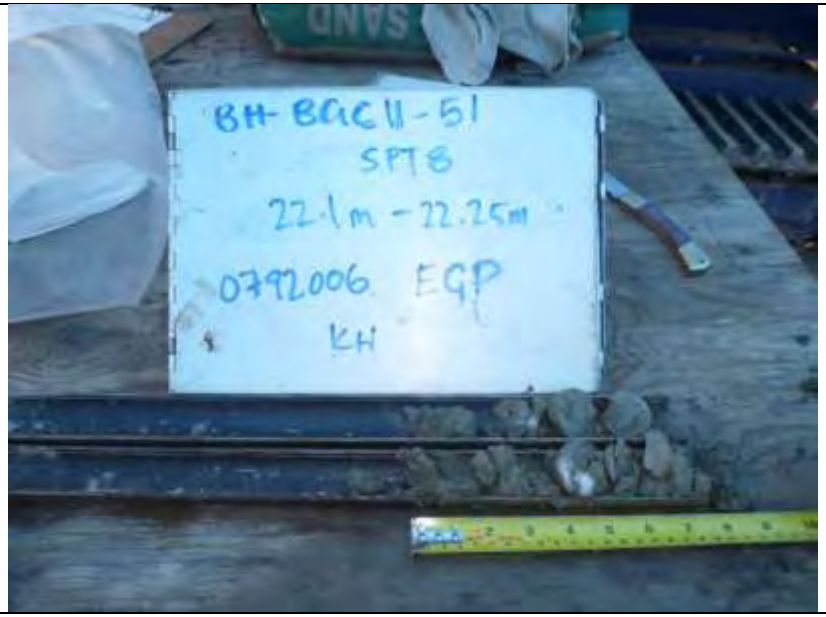
BH-BGC11-51 SPT 5 – 9.90 m to 10.25 m



BH-BGC11-51 SPT 6 – 11.43 m to 11.58 m



BH-BGC11-51 SPT 6 – 20.57 m to 20.62 m

	
BH-BGC11-51 SPT 8 – 22.1 m to 22.25 m	



BH-BGC11-52 Box 1 – 1.22 m to 11.09 m



BH-BGC11-52 Box 2 – 11.09 m to 16.85 m



BH-BGC11-52 Box 3 – 16.85 m to 21.03 m



BH-BGC11-52 Box 4 – 21.03 m to 22.56 m

	
BH-BGC11-53 Run 1 – 0.00 m to 0.76 m	BH-BGC11-53 Run 2 – 1.21 m to 2.28 m
	
BH-BGC11-53 Run 3 – 2.73 m to 3.80 m	BH-BGC11-53 Run 4 – 4.25 m to 5.33 m

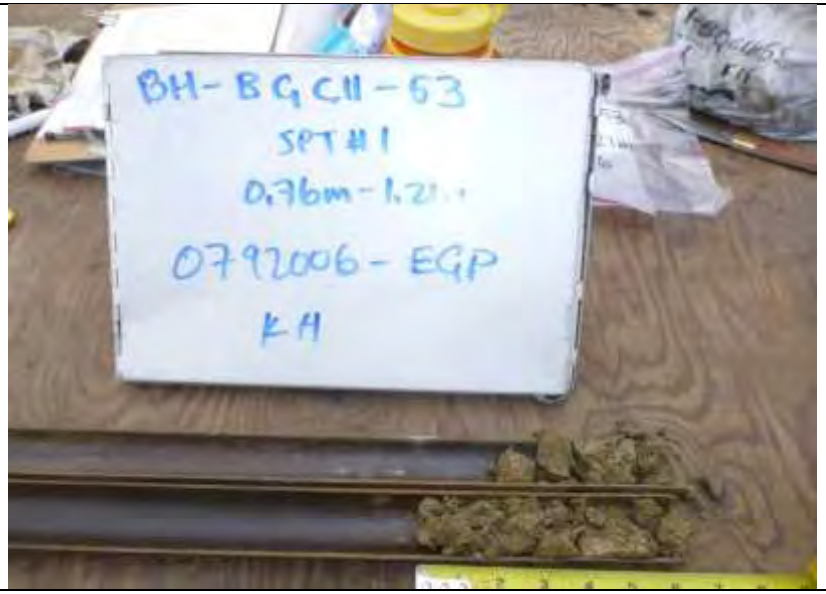
	
BH-BGC11-53 Run 5 – 5.33 m to 6.85 m	BH-BGC11-53 Run 6 – 7.30 m to 8.37 m
	
BH-BGC11-53 Run 7 – 8.37 m to 9.90 m	BH-BGC11-53 Run 8 – 10.35 m to 11.42 m



BH-BGC11-53 Run 9 – 11.42 m to 12.95 m



BH-BGC11-53 Run 10 – 12.95 m to 14.47 m



BH-BGC11-53 SPT 1 – 0.76 m to 1.21 m



BH-BGC11-53 SPT 2 – 2.28 m to 2.73 m



BH-BGC11-53 SPT 3 – 3.80 m to 4.25 m



BH-BGC11-53 SPT 4 – 6.85 m to 7.3 m



BH-BGC11-53 SPT 5 – 9.90 m to 10.35 m



BH-BGC11-54 Box 1 – 0.00 m to 18.29 m



BH-BGC11-54 Box 2 – 18.29 m to 24.60 m



BH-BGC11-54 Box 3 – 24.60 m to 32.94 m



BH-BGC11-54 Box 4 – 32.94 m to 39.71 m



BH-BGC11-54 Box 5 – 39.71 m to 41.15 m

	
BH-BGC11-55 Run 1 – 0.00 m to 0.76 m	BH-BGC11-55 Run 2 – 1.21 m to 2.27 m
	
BH-BGC11-55 Run 3 – 2.73 m to 3.80 m	BH-BGC11-55 Run 4 – 4.25 m to 5.33 m

	
BH-BGC11-55 Run 5 – 5.78 m to 6.85 m	BH-BGC11-55 Run 6 – 7.30 m to 8.38 m
	
BH-BGC11-55 Run 7 – 8.83 m to 9.90 m	BH-BGC11-55 Run 8 – 10.35 m to 11.42 m



BH-BGC11-55 Run 9 – 11.42 m to 12.95 m



BH-BGC11-55 Box 1 – 12.95 m to 14.47 m



BH-BGC11-55 SPT 1 – 0.76 m to 1.21 m



BH-BGC11-55 SPT 2 – 2.28 m to 2.73 m



BH-BGC11-55 SPT 3 – 3.80 m to 4.25 m



BH-BGC11-55 SPT 4 – 5.33 m to 5.78 m



BH-BGC11-55 SPT 5 – 6.85 m to 7.30 m



BH-BGC11-55 SPT 6 – 8.38 m to 8.83 m

	
BH-BGC11-55 SPT 7 – 9.90 m to 10.35 m	

	
BH-BGC11-56 Run 1 – 0.00 m to 0.76 m	BH-BGC11-56 Run 2 – 1.21 m to 2.28 m
	
BH-BGC11-56 Run 3 – 2.43 m to 3.80 m	BH-BGC11-56 Run 4 – 4.25 m to 5.33 m

	
BH-BGC11-56 Run 5 – 5.53 m to 6.85 m	BH-BGC11-56 Run 6 – 7.15 m to 8.38 m
	
BH-BGC11-56 Run 7 – 8.53 m to 9.90 m	BH-BGC11-56 Run 8 – 9.90 m to 11.42 m



BH-BGC11-56 Run 9 – 11.42 m to 12.95 m



BH-BGC11-56 Run 10 – 12.95 m to 13.70 m



BH-BGC11-56 SPT 1 – 0.76 m to 1.21 m



BH-BGC11-56 SPT 2 – 2.28 m to 2.43 m



BH-BGC11-56 SPT 3 – 3.80 m to 4.25 m



BH-BGC11-56 SPT 4 – 5.33 m to 5.53 m



BH-BGC11-56 SPT 5 – 6.85 m to 7.15 m



BH-BGC11-56 SPT 6 – 8.38 m to 8.53 m

	
BH-BGC11-57 Run 1 – 0.00 m to 0.76 m	BH-BGC11-57 Run 2 – 0.76 m to 2.28 m
	
BH-BGC11-57 Run 3 – 2.65 m to 3.90 m	BH-BGC11-57 Run 4 – 4.25 m to 5.33 m

	
BH-BGC11-57 Run 5 – 5.78 m to 6.85 m	BH-BGC11-57 Run 6 – 7.10 m to 8.43 m
	
BH-BGC11-57 Run 7 – 8.53 m to 9.90 m	BH-BGC11-57 Run 8 – 10.20 m to 11.47 m



BH-BGC11-57 Run 9 – 11.47 m to 12.10 m



BH-BGC11-57 SPT 1 – 2.28 m to 2.65 m



BH-BGC11-57 SPT 2 – 3.80 m to 4.25 m



BH-BGC11-57 SPT 3 – 5.33 m to 5.78 m



BH-BGC11-57 SPT 4 – 6.85 m to 7.10 m



BH-BGC11-57 SPT 5 – 8.43 m to 8.53 m



BH-BGC11-57 SPT 6 – 9.90 m to 10.20 m



BH-BGC11-58 Run 1 – 0.00 m to 0.76 m



BH-BGC11-58 Run 2 – 0.76 m to 2.28 m



BH-BGC11-58 Run 3 – 2.28 m to 2.90 m



BH-BGC11-58 Run 4 – 2.90 m to 3.40 m



BH-BGC11-58 Run 5 – 3.40 m to 4.00 m



BH-BGC11-58 Run 6 – 4.00 m to 4.60 m



BH-BGC11-58 Run 7 – 4.60 m to 4.90 m



BH-BGC11-58 Run 8 – 4.90 m to 5.50 m



BH-BGC11-58 Run 9 – 5.50 m to 6.85 m



BH-BGC11-58 Run 10 – 6.90 m to 8.43 m



BH-BGC11-58 Run 11 – 8.43 m to 9.90 m



BH-BGC11-58 Run 12 – 9.90 m to 10.70 m

	
BH-BGC11-58 SPT 2 – 6.85 m to 6.90 m	



BH-BGC11-59 Box 1 – 0.00 m to 7.58 m



BH-BGC11-59 Box 2 – 7.58 m to 11.58 m



BH-BGC11-59 Box 3 – 11.58 m to 15.70 m



BH-BGC11-59 Box 4 – 15.70 m to 19.56 m



BH-BGC11-59 Box 5 – 19.56 m to 23.95 m



BH-BGC11-59 Box 6 – 23.95 m to 30.18 m

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC11-60 Run 1 – 0.00 m to 0.76 m</td><td>BH-BGC11-60 Run 2 – 0.76 m to 2.28 m</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>BH-BGC11-60 Run 3 – 2.28 m to 2.80 m</td><td>BH-BGC11-60 Run 4 – 2.80 m to 3.40 m</td></tr>
</table>

<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>BH-BGC11-60 Run 5 – 3.40 m to 4.00 m</td><td>BH-BGC11-60 Run 6 – 4.00 m to 4.60 m</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC11-60 Run 7 – 4.75 m to 5.33 m</td><td>BH-BGC11-60 Run 8 – 5.33 m to 6.85 m</td></tr>
</table>



BH-BGC11-60 Run 9 – 7.00 m to 8.38 m



BH-BGC11-60 Run 10 – 8.38 m to 9.15 m



BH-BGC11-60 SPT 1 – 4.60 m to 4.75 m



BH-BGC11-60 SPT 2 – 6.85 m to 7.00 m



BH-BGC11-61 Run 1 – 0.00 m to 0.76m



BH-BGC11-61 Run 2 – 0.76m to 2.28 m



BH-BGC11-61 Run 3 – 2.28 m to 2.70 m



BH-BGC11-62 Box 1 – 0.00 m to 5.47 m



BH-BGC11-62 Box 2 – 5.47 m to 10.32 m



BH-BGC11-62 Box 3 – 10.32 m to 14.78 m



BH-BGC11-62 Box 4 – 14.78 m to 19.33 m



BH-BGC11-62 Box 5 – 19.33 m to 24.59 m



BH-BGC11-62 Box 6 – 24.59 m to 28.84 m



BH-BGC11-62 Box 7 – 28.84 m to 33.42 m



BH-BGC11-62 Box 8 – 33.42 m to 35.05 m



BH-BGC11-63 Run 1 – 0.00 m to 0.76 m



BH-BGC11-63 Run 2 – 0.76 m to 2.28 m



BH-BGC11-63 Run 3 – 2.28 m to 3.00 m



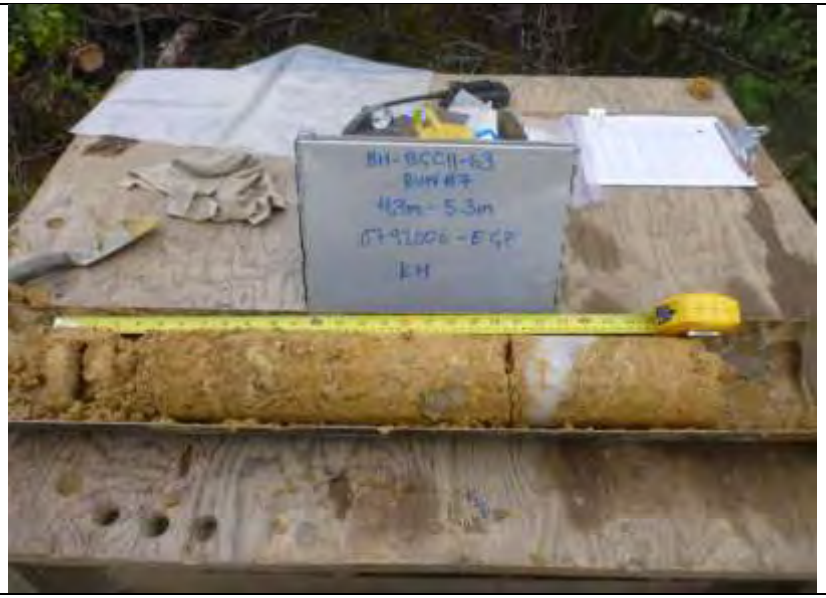
BH-BGC11-63 Run 4 – 3.00 m to 3.50 m



BH-BGC11-63 Run 5 – 3.50 m to 4.10 m



BH-BGC11-63 Run 6 – 4.10 m to 4.70 m



BH-BGC11-63 Run 7 – 4.70 m to 5.30 m



BH-BGC11-63 Run 8 – 5.30 m to 5.90 m

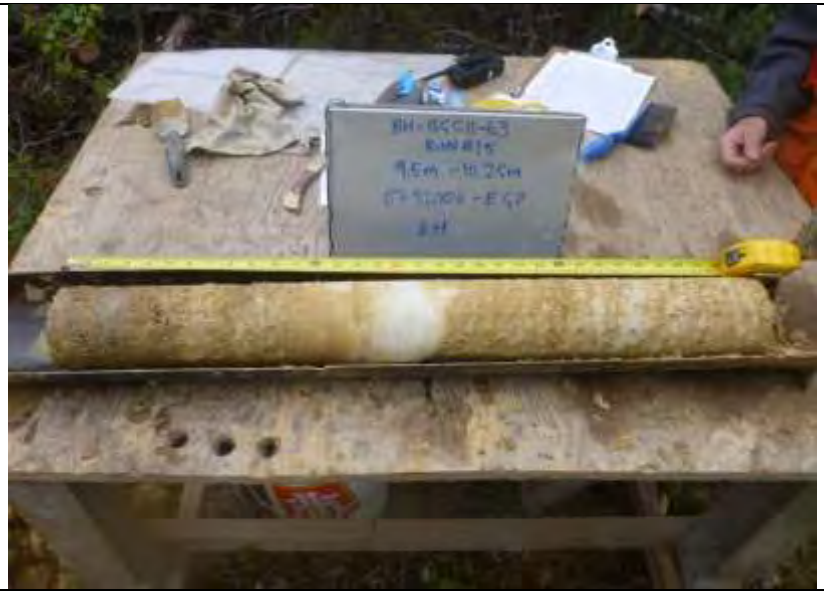
	
BH-BGC11-63 Run 9 – 5.90 m to 6.50 m	BH-BGC11-63 Run 10 – 6.50 m to 7.10 m
	
BH-BGC11-63 Run 11 – 7.10 m to 7.70 m	BH-BGC11-63 Run 12 – 7.70 m to 8.30 m



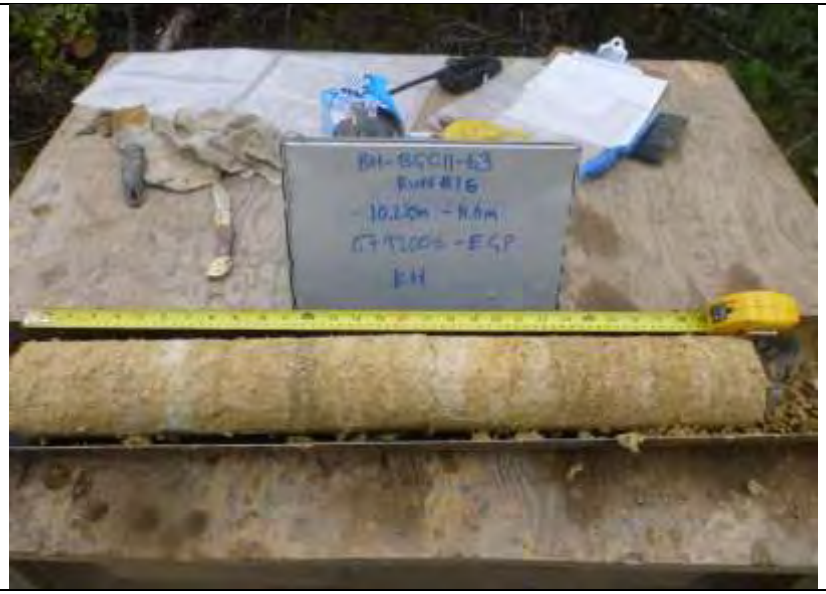
BH-BGC11-63 Run 13 – 8.30 m to 8.90 m



BH-BGC11-63 Run 14 – 8.90 m to 9.50 m



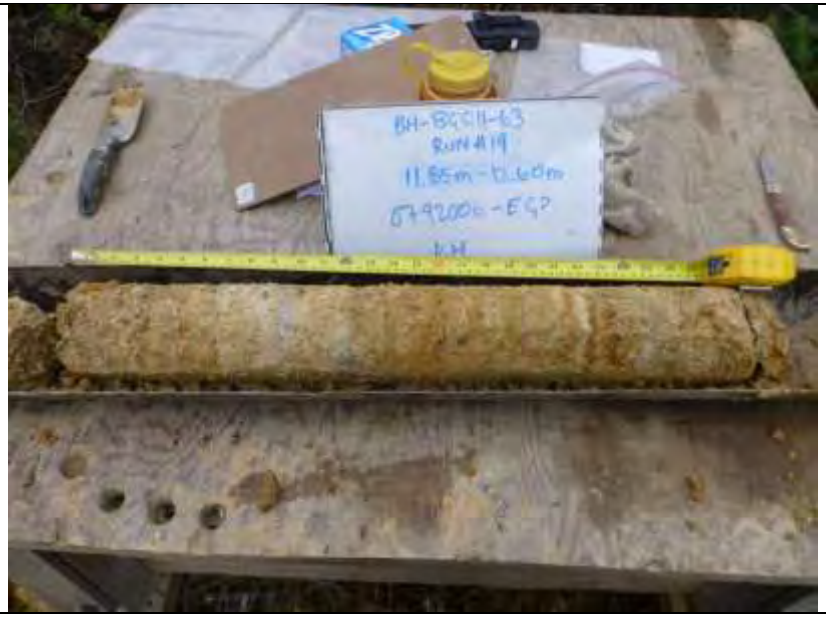
BH-BGC11-63 Run 15 – 9.50 m to 10.25 m



BH-BGC11-63 Run 16 – 10.25 m to 11.00 m



BH-BGC11-63 Run 17 –11.00 m to 11.75 m



BH-BGC11-63 Run 19 – 11.85 m to 12.60 m



BH-BGC11-63 Run 20 – 12.60 m to 13.30 m



BH-BGC11-63 Run 21 – 13.30 m to 14.10 m

	
BH-BGC11-63 Run 23 – 14.48 m to 16.00 m	BH-BGC11-63 Run 24 – 16.00 m to 16.70 m
	
BH-BGC11-63 Run 25 – 16.70 m to 17.45 m	BH-BGC11-63 Run 26 – 17.45 m to 17.85 m



BH-BGC11-63 Run 27 – 17.85 m to 18.45 m



BH-BGC11-63 Run 28 – 18.45 m to 19.00 m



BH-BGC11-63 Run 29 – 19.00 m to 19.75 m



BH-BGC11-63 Run 30 – 19.75 m to 20.57 m



BH-BGC11-63 Run 31 – 20.57 m to 22.10 m



BH-BGC11-63 Run 32 – 22.10 m to 23.62 m



BH-BGC11-63 Run 33 – 23.62 m to 25.15 m



BH-BGC11-63 Run 34 – 25.15 m to 26.67 m



BH-BGC11-64 Box 1 – 0.00 m to 6.40 m



BH-BGC11-64 Box 2 – 6.40 m to 16.46 m



BH-BGC11-64 Box 3 – 16.46 m to 20.97 m



BH-BGC11-64 Box 4 – 20.97 m to 24.91 m



BH-BGC11-64 Box 5 – 24.91 m to 28.65 m



BH-BGC11-64 Box 6 – 28.65 m to 32.99 m



BH-BGC11-64 Box 7 – 32.99 m to 36.75 m



BH-BGC11-64 Box 8 – 36.75 m to 40.84 m



BH-BGC11-64 Box 9 – 40.84 m to 44.74 m



BH-BGC11-64 Box 10 – 44.74 m to 48.77 m



BH-BGC11-65 Run 1 – 0.00 m to 0.76 m



BH-BGC11-65 SPT 1 – 0.76 m to 1.21 m



BH-BGC11-65 SPT 2 – 1.52 m to 1.97 m



BH-BGC11-65 SPT 3 – 2.28 m to 2.73 m



BH-BGC11-65 SPT 4 – 3.04 m to 3.49 m



BH-BGC11-65 SPT 5 – 3.80 m to 4.25 m



BH-BGC11-65 SPT 6 – 4.56 m to 5.01 m



BH-BGC11-65 SPT 7 – 5.33 m to 5.78 m



BH-BGC11-65 SPT 8 – 6.09 m to 6.54 m



BH-BGC11-65 SPT 9 – 6.85 m to 6.90 m



BH-BGC11-66 Box 1 – 0.00 m to 5.04 m



BH-BGC11-66 Box 2 – 5.04 m to 9.57 m



BH-BGC11-66 Box 3 – 9.57 m to 13.72 m



BH-BGC11-66 Box 4 – 13.72 m to 18.48 m



BH-BGC11-66 Box 5 – 18.48 m to 23.24 m



BH-BGC11-66 Box 6 – 23.24 m to 27.17 m



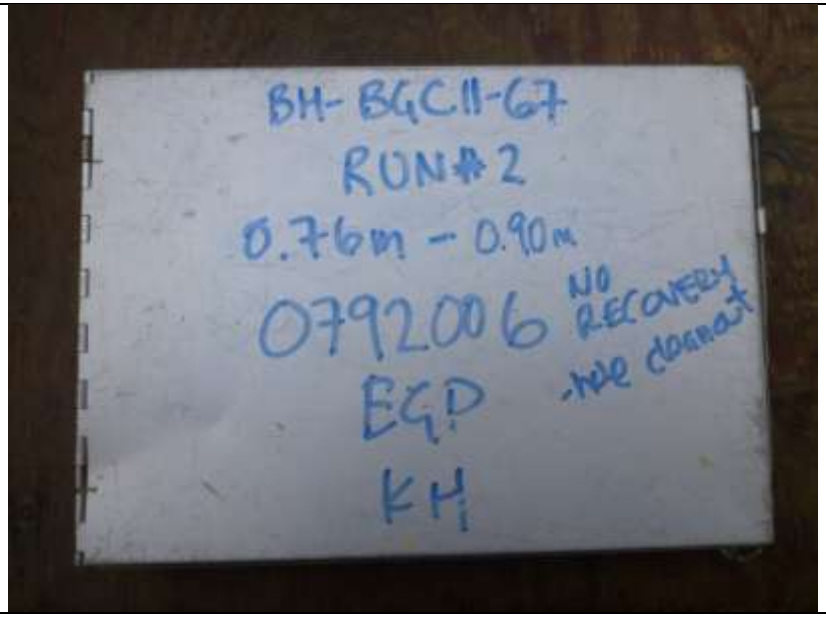
BH-BGC11-66 Box 7 – 27.17 m to 31.19 m



BH-BGC11-66 Box 8 – 31.19 m to 33.53 m



BH-BGC11-67 Run 1 – 0.00 m to 0.76 m



BH-BGC11-67 Run 2 – 0.76 m to 0.90 m



BH-BGC11-67 Run 3 – 0.90 m to 1.50 m



BH-BGC11-67 Run 4 – 1.50 m to 2.05 m



BH-BGC11-67 Run 5 – 2.05 m to 2.65 m



BH-BGC11-67 Run 6 – 2.65 m to 2.95 m



BH-BGC11-67 Run 7 – 2.95 m to 3.45 m



BH-BGC11-67 Run 8 – 3.45 m to 4.05 m



BH-BGC11-67 Run 9 – 4.05 m to 4.75 m



BH-BGC11-67 Run 10 – 4.75 m to 5.25 m



BH-BGC11-67 Run 11 – 5.25 m to 6.00 m



BH-BGC11-67 Run 13 – 6.00 m to 6.85 m

	
BH-BGC11-67 Run 14 – 6.85 m to 8.36 m	BH-BGC11-67 Run 15 – 8.36 m to 9.90 m



BH-BGC11-69 Box 1 – 0.00 m to 8.62 m



BH-BGC11-69 Box 2 – 8.62 m to 13.14 m



BH-BGC11-69 Box 3 – 13.14 m to 17.63 m



BH-BGC11-69 Box 4 – 17.63 m to 21.34 m

APPENDIX G
PENETRATION TESTING

PENETRATION TESTING

1.0 INTRODUCTION

This Appendix describes the methods and observations of three specific types of in-situ penetration testing completed in support of geotechnical investigations for mine site infrastructure.

2.0 TEST LOCATIONS

Three types of penetration testing were completed as part of the 2011 geotechnical investigation program. Standard Penetration Testing (SPT) was completed in 12 of the 16 auger holes completed. Dynamic Cone Penetration Testing (DCPT) was completed adjacent to BH-BGC11-67/69. Wildcat Penetrometer testing, which is completed using a hand-operated penetration testing device, was completed to depths of up to 5 m at 25 locations. Test locations are illustrated on Drawing 06, and Table G.1 summarizes all penetration testing completed.

Table G.1 Location of Penetration Testing

Location	Northing[1,2] (m)	Easting[1,2] (m)	Elevation[3] (masl)	Type of Penetration Testing
BH-BGC11-39	7101056	458462	804	SPT
BH-BGC11-44	7100547	458690	830	SPT
BH-BGC11-47	7100698	458811	841	SPT
BH-BGC11-49	7100635	458764	835	SPT
BH-BGC11-51	7100743	458643	818	SPT
BH-BGC11-53	7100993	459483	875	SPT
BH-BGC11-55	7100918	459440	881	SPT
BH-BGC11-56	7099822	458774	845	SPT
BH-BGC11-57	7099978	458798	859	SPT
BH-BGC11-58	7100119	458799	859	SPT
BH-BGC11-60	7100041	458795	859	SPT
BH-BGC11-65	7100939	458771	825	SPT
BH-BGC11-67/69	7101148	458823	867	DCPT
near TP-BGC11-90	7100513	459695	977	Wildcat Penetrometer
near BH-BGC10-24	7101012	458500	801	Wildcat Penetrometer
near BH-BGC10-13	7100942	458844	824	Wildcat Penetrometer
near BH-BGC10-14	7100980	458580	808	Wildcat Penetrometer
near BH-BGC10-22	7101098	458391	794	Wildcat Penetrometer
near TP-BGC11-62	7099924	459251	972	Wildcat Penetrometer
near TP-BGC11-69 (test A)	7099457	458915	878	Wildcat Penetrometer
near TP-BGC11-69 (test B)	7099457	458915	878	Wildcat Penetrometer
Placer Tailings (PQ12-A)	7101199	459747	891	Wildcat Penetrometer
Placer Tailings (PQ12-B)	7101199	459747	891	Wildcat Penetrometer
Placer Tailings (PQ13)	7101284	459832	902	Wildcat Penetrometer
Placer Tailings (PQ7-A)	7101061	459307	860	Wildcat Penetrometer
Placer Tailings (PQ7-B)	7101061	459307	860	Wildcat Penetrometer
Placer Tailings (PQ6-A)	7101008	459196	842	Wildcat Penetrometer
Placer Tailings (PQ6-B)	7101008	459196	842	Wildcat Penetrometer

Location	Northing[1,2] (m)	Easting[1,2] (m)	Elevation[3] (masl)	Type of Penetration Testing
near TP-BGC11-94 (test A)	7101517	459980	937	Wildcat Penetrometer
near TP-BGC11-94 (test B)	7101517	459980	937	Wildcat Penetrometer
near BH-BGC11-53	7100984	459486	890	Wildcat Penetrometer
near BH-BGC11-55 (test A)	7100913	459448	889	Wildcat Penetrometer
near BH-BGC11-55 (test B)	7100913	459448	889	Wildcat Penetrometer
near TP-BGC11-103 (test A)	7101147	458821	866	Wildcat Penetrometer
near TP-BGC11-103 (test B)	7101148	458828	866	Wildcat Penetrometer
near TP-BGC11-105	7101199	458935	878	Wildcat Penetrometer
PQ14 (test A)	7100285	459722	1009	Wildcat Penetrometer
PQ14 (test B)	7100285	459722	1009	Wildcat Penetrometer

1. Boreholes surveyed by Underhill in August and September 2011 using a differential GPS, with the exception of BH-BGC11-39, 65 and 67 and which were surveyed by BGC staff using a handheld GPS. Test pits and PQ locations were surveyed by BGC staff using a handheld GPS.
2. UTM coordinates in NAD 83, zone 8N.
3. masl – metres above sea level

3.0 SPT TESTING

Standard Penetration Test (SPT) sampling involves an open sample tube driven into the formation at the base of a borehole using repeated blows of a steel weight that impacts a jar assembly or anvil at the top of the drill rods to cause the sampler to penetrate a standard distance, usually 45 cm, into the formation. The number of blows needed to achieve this penetration is taken as an indicator of the density or consistency of the formation material. The standard procedure for penetration testing, i.e. the Standard Penetration Test (SPT), utilizes a sampler with an internal diameter of 34.9 mm (1 3/8") and divides the blowcount into three segments (150 mm each) and considers only the two last segments (final 300 mm) for calculation of the blowcount, or N value. The first 150 mm segment is ignored, as it often represents penetration of the sampler through sloughed or disturbed material at the bottom of the hole rather than intact in-situ materials. In geological formations containing a significant proportion of coarse fragments, the sampler will often meet refusal on a large clast, and the resulting high blowcount can lead to a false indication of a high density deposit.

The SPT-tested geological formations in the Eagle Gold project are known from past investigations to contain gravel, cobbles and boulders. In an attempt to identify interference by coarse materials, SPT blowcounts were typically recorded for each 25 mm interval during the SPT tests, rather than every 150 mm. Where interference was known to have occurred from observation of bouncing of the drill string, or as evidenced by low recovery in the sampler, the raw blowcounts are considered suspect, and estimated N values are extrapolated from the initial per 25 mm penetration values. In this situation, an 'equivalent' N value was estimated for the initial portion of the test by multiplying the sum of the meaningful per 25 mm blow counts over the selected test interval by a factor that yielded a projected blowcount for the full 300 mm. This methodology was followed only for samples with more than 150 mm of recovery and only blows within the last 300 mm were considered. All the SPT testing was done following the per 25 mm methodology except for three tests (BH-BGC11-51, SPT 3; BH-BGC11-51, SPT 6; and BH-BGC11-65, SPT 3) where materials were

too soft to allow per 25 mm blowcounts, and in these cases blowcounts were recorded over the standard 150 mm increments.

Energy measurements were made to determine the hammer efficiency. The sum of blows between 150 mm and 450 mm was corrected to 60% hammer efficiency to yield $(N)_{60}$.

SPT tests that were completed in frozen ground were omitted from the analysis.

The blow count details for all SPT tests, including blows per 25 mm, are shown in Table G.2. Plots of cumulative blowcounts versus recovery are found in Figures G-1 to G-10. Out of a total of 77 SPT tests, 46 are considered valid. Of the 77 tests, 7 were completed in frozen ground and are not considered valid, 19 tests had less than 150 mm of recovery and are not considered valid and 5 were influenced by coarse clasts prior to reaching 150 mm of penetration and are not considered valid. Raw blow counts for invalid tests are included below, but are not shown on borehole logs (Appendix E).

Table G.2 SPT Testing Results

				Blow Counts per 25 mm Increment																				
Hole	SPT #	Depth From (m)	Depth To (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	N - Raw	N – Corrected for Gravel Effects	N_{60}	Comments
BH-BGC11-39	SPT1	1.15	1.6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	
BH-BGC11-39	SPT2	1.6	2.05	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2	2	3	
BH-BGC11-39	SPT3	2.28	2.73	1	0	5	6	4	3	4	3	5	5	5	4	2	3	3	3	4	3	44	44	56	
BH-BGC11-39	SPT4	2.75	3.2	1	8	19	7	6	4	4	4	3	2	9	9	7	4	5	4	5	3	59	39	50	
BH-BGC11-39	SPT5	4.6	5.05	1	4	2	3	3	3	3	5	6	9	9	8	6	7	4	5	4	5	71	48	62	
BH-BGC11-39	SPT6	5.53	5.98	1	1	1	2	2	1	3	2	2	2	2	2	3	2	2	3	3	3	29	27	35	
BH-BGC11-39	SPT7	6.22	6.67	1	1	1	2	2	1	2	2	2	2	3	2	2	2	3	2	2	3	27	29	37	
BH-BGC11-39	SPT8	7.16	7.61	1	1	2	2	2	2	3	2	2	2	2	2	2	3	2	3	3	2	28	28	36	
BH-BGC11-39	SPT9	7.75	8.2	1	1	2	4	3	5	3	4	4	5	4	4	4	6	5	4	5	4	52	52	67	
BH-BGC11-39	SPT10	8.71	9.14	1	1	2	2	2	1	3	2	2	2	2	2	3	2	3	3	3	3	30	30	39	
BH-BGC11-39	SPT11	9.25	9.7	1	1	2	2	2	2	3	2	3	3	3	3	3	2	3	3	3	3	34	34	44	
BH-BGC11-44	SPT1	2.27	2.72	1	0	0	0	0	1	1	0	0	1	0	1	0	1	1	1	1	0	7	7	9	
BH-BGC11-44	SPT2	3.79	4.24	1	0	1	0	1	0	0	1	1	1	2	1	2	1	2	1	2	1	15	15	19	
BH-BGC11-44	SPT3	5.33	5.8	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	4	-	-	less than 150 mm recovery
BH-BGC11-44	SPT4	6.85	7.32	1	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0	1	1	6	-	-	less than 150 mm recovery
BH-BGC11-44	SPT5	8.38	8.83	1	1	3	5	4	2	4	4	3	4	3	3	5	5	4	6	7	6	54	-	-	frozen - invalid test
BH-BGC11-44	SPT6	9.38	9.45	1	1	1	R															R	-	-	less than 150 mm recovery
BH-BGC11-44	SPT7	9.4	9.85	4	40	6	7	6	6	6	6	6	8	6	6	10	6	8	5	9	6	82	-	-	less than 150 mm recovery
BH-BGC11-44	SPT8	9.9	10.35	3	3	3	4	2	4	3	3	4	12	10	9	6	9	13	10	7	7	93	40	51	
BH-BGC11-44	SPT9	11.42	11.97	2	2	2	2	2	3	3	3	3	4	3	3	6	6	8	6	6	6	57	57	73	
BH-BGC11-44	SPT10	12.97	13.42	5	6	4	8	5	5	5	6	9	6	6	10	8	9	10	7	7	12	95	77	99	
BH-BGC11-44	SPT11	14.49	14.79	1	0	0	1	0	1	5	6	6	5	5	6	R						R	-	-	gravel effects at 150 mm
BH-BGC11-47	SPT1	0.75	1.2	1	0	0	1	0	0	1	0	0	1	2	2	1	2	2	1	1	2	15	-	-	Frozen
BH-BGC11-47	SPT2	3.35	3.8	1	1	2	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	12	12	15	
BH-BGC11-47	SPT3	3.8	4.25	1	1	0	1	0	0	1	0	0	0	1	0	0	1	0	1	0	0	4	4	5	
BH-BGC11-47	SPT4	5.33	5.88	1	0	1	1	1	1	1	1	0	1	1	1	1	0	1	2	1	1	11	-	-	Frozen
BH-BGC11-47	SPT5	6.85	7.3	1	2	1	3	2	2	4	6	5	4	4	5	4	10	10	11	8	8	79	-	-	Frozen
BH-BGC11-47	SPT6	8.38	8.58	1	2	2	3	7	7	11	13											R	-	-	gravel effects before 150 mm
BH-BGC11-47	SPT7	9.9	10.05	1	2	6	45	24	29													R	-	-	less than 150 mm recovery
BH-BGC11-47	SPT8	11.43	11.605	4	4	5	15	10	17	25												R	-	-	gravel effects before 150 mm
BH-BGC11-49	SPT1	0.76	1.22	1	0	0	0	1	0	0	1	0	1	0	1	1	1	1	2	2	2	12	8	10	
BH-BGC11-49	SPT2	2.28	2.73	2	2	4	4	4	6	4	4	3	2	2	2	3	3	3	3	3	2	34	-	-	Frozen
BH-BGC11-51	SPT1	0.76	1.21	1	2	1	2	1	2	1	2	1	1	1	1	1	1	1	2	1	1	14	14	18	
BH-BGC11-51	SPT2	2.28	2.73	1	1	0	1	0	1	1	0	0	0	1	1	0	1	0	1	1	0	6	6	8	
BH-BGC11-51	SPT3	3.8	4.25																			12	12	15	N=12, blow counts not recorded by 25 mm
BH-BGC11-51	SPT4	5.33	5.78	0	0	1	1	1	1	0	1	3	3	2	1	1	1	1	2	2	3	20	20	26	
BH-BGC11-51	SPT5	9.9	10.25	1	1	1	2	1	2	1	1	2	2	1	3	4	4	3	10			R	17	22	
BH-BGC11-51	SPT6	11.43	11.52																			R	-	-	N = R, blow counts not recorded by 25 mm, less than 150 mm of recovery
BH-BGC11-51	SPT7	20.57	20.62	1	2	R																R	-	-	less than 150 mm recovery
BH-BGC11-51	SPT8	22.1	22.25	15	R																	R	-	-	Frozen
BH-BGC11-53	SPT1	0.76	1.21	0	1	1	1	1	1	1	0	0	1	0	1	0	1	0	1	1	1	7	-	-	less than 150 mm recovery
BH-BGC11-53	SPT2	2.28	2.73	0	1	1	1	2	1	1	2	1	2	1	1	1	2	1	2	1	3	18	18	23	
BH-BGC11-53	SPT3	3.8	4.25	0	1	3	4	3	5	3	2	3	2	2	3	3	2	3	2	3	4	32	32	41	
BH-BGC11-53	SPT4	6.85	7.3	1	1	2	2	3	4	3	3	3	4	4	3	2	4	3	5	5	4	43	43	55	
BH-BGC11-53	SPT5	9.9	10.35	1	1	1	2	2	3	3	5	3	5	4	4	2	3	3	4	8	8	52	43	55	
BH-BGC11-55	SPT1	0.76	1.21	0	0	1	0	1	1	1	1	1	1	1	1	1	2	1	1	1	2	14	14	18	

				Blow Counts per 25 mm Increment																				
Hole	SPT #	Depth From (m)	Depth To (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	N - Raw	N – Corrected for Gravel Effects	N_{60}	Comments
BH-BGC11-55	SPT2	2.28	2.73	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	2	1	1	11	11	14	
BH-BGC11-55	SPT3	3.8	4.25	0	1	0	1	1	1	1	1	2	4	2	4	2	2	2	2	2	3	27	27	35	
BH-BGC11-55	SPT4	5.33	5.78	1	0	1	2	1	1	2	1	1	1	1	1	2	1	1	1	2	1	15	15	19	
BH-BGC11-55	SPT5	6.85	7.3	0	0	0	1	0	1	0	1	0	1	2	2	1	1	1	1	1	2	13	13	17	
BH-BGC11-55	SPT6	8.38	8.83	1	1	1	2	1	1	1	1	3	4	4	4	4	4	4	4	4	3	40	12	15	
BH-BGC11-55	SPT7	9.9	10.35	1	1	1	3	4	6	6	6	3	5	6	6	7	7	6	5	5	5	67	67	86	
BH-BGC11-56	SPT1	0.76	1.21	2	2	2	2	2	2	2	2	1	3	2	1	2	1	2	1	1	2	20	20	26	
BH-BGC11-56	SPT2	2.28	2.43	1	1	1	2	1	R													R	-	-	less than 150 mm recovery
BH-BGC11-56	SPT3	3.8	4.25	1	1	3	5	5	3	4	4	4	6	3	2	4	4	5	R			R	48	62	
BH-BGC11-56	SPT4	5.33	5.53	1	3	3	4	4	7	7	R											R	-	-	gravel effects before 150 mm
BH-BGC11-56	SPT5	6.85	7.15	1	0	1	2	2	2	5	5	5	7	9	6	R						R	-	-	gravel effects before 150 mm
BH-BGC11-56	SPT6	8.38	8.53	0	1	1	7	10	R													R	-	-	less than 150 mm recovery
BH-BGC11-57	SPT1	2.28	2.65	0	0	0	2	1	2	3	7	7	4	5	6	6	5	R				R	-	-	frozen
BH-BGC11-57	SPT2	3.8	4.25	2	2	3	4	5	6	4	4	5	5	6	5	7	5	5	7	4	4	61	61	78	
BH-BGC11-57	SPT3	5.33	5.78	2	1	1	1	4	3	4	2	4	5	5	5	5	5	3	4	6	7	55	55	71	
BH-BGC11-57	SPT4	6.85	7.1	2	1	3	6	7	7	7	9	9	R									R	100	100	N_{60} maximum of 100, calculated N_{60} is 128
BH-BGC11-57	SPT5	8.43	8.53	1	1	2	4	R														R	-	-	less than 150 mm recovery
BH-BGC11-57	SPT6	9.9	10.2	0	1	1	2	4	9	5	5	8	5	7	8	R						R	76	98	gravelly sample
BH-BGC11-58	SPT1	5.5	5.5	1	R																	R	-	-	less than 150 mm recovery
BH-BGC11-58	SPT2	6.85	6.9	1	2	R																R	-	-	less than 150 mm recovery
BH-BGC11-60	SPT1	4.6	4.75	3	4	8	7	8	10	R												R	-	-	less than 150 mm penetration
BH-BGC11-60	SPT2	6.85	7	0	1	1	2	5	8	8	R											R	-	-	less than 150 mm recovery
BH-BGC11-65	SPT1	0.76	1.21	1	1	2	2	2	2	2	2	3	3	2	2	3	3	2	2	1	3	28	28	36	
BH-BGC11-65	SPT2	1.52	1.97	1	1	2	1	2	1	2	3	1	2	1	2	1	1	2	1	1	2	19	19	24	
BH-BGC11-65	SPT3	2.28	2.73																			13	13	17	N=13, blow counts not recorded by 25 mm
BH-BGC11-65	SPT4	3.04	3.49	1	1	1	1	1	1	1	2	1	2	2	2	2	1	1	2	2	1	19	19	24	
BH-BGC11-65	SPT5	3.8	4.15	2	2	2	3	2	1	1	2	6	7	7	7	10	R					R	-	-	less than 150 mm recovery
BH-BGC11-65	SPT6	4.56	5.01	4	4	2	1	2	2	2	3	2	2	2	2	2	2	2	2	2	2	25	25	32	
BH-BGC11-65	SPT7	5.33	5.78	3	3	2	2	1	3	3	2	2	1	2	1	1	1	2	1	1	2	19	-	-	less than 150 mm recovery
BH-BGC11-65	SPT8	6.09	6.54	3	5	5	3	3	4	3	2	3	3	1	2	3	3	3	3	2	4	32	-	-	less than 150 mm recovery
BH-BGC11-65	SPT9	6.85	6.9	1	2	R																R	-	-	less than 150 mm recovery

2.1 SPT Energy Measurements

All SPT testing was completed using the auger rig (MARL M4CT) which was equipped with an automatic trip hammer weighing 140 lbs (63.5 kg) and having a drop height of 30 inches (760 mm).

The SPT tests for BH-BGC11-65 were monitored for hammer impact energy using an SPT Analyzer manufactured by Pile Dynamics Inc (PDI) of Cleveland, Ohio. The analyzer system consisted of a short length of instrumented sampling rod inserted in the rod string just below the jar assembly, and a field data recorder. The instrumented rods included two strain gauges permanently bonded to the rod, and two accelerometers bolted to the rod. The signals collected from the strain transducers and accelerometers were then converted by the SPT Analyzer to force and velocity records. Every SPT energy measurement was done using an AW-size instrumented rod.

Force and velocity measurements were recorded for each blow, and the SPT analyzer instantly calculated an average Energy Transfer Ratio (ETR) using the force-velocity method (ASTM D 4633-05). The ETR is given as a percent of the theoretical free fall potential energy of the standard 63.5 kg SPT hammer. Energy data was averaged for every 150 mm SPT increment and the average energy values for the two increments over 150 mm to 450 mm were also averaged to give C_E, the hammer energy correction factor, to correct the blow count value to standard 60% hammer efficiency.

C_E was calculated using the following equation:

$$C_E = \frac{ETR}{60}$$

The average energy measurement for BH-BGC11-65 was 77% of the theoretical free fall potential energy for the SPT tests. Table G.3 summarizes the values obtained.

Table G.3 Measured SPT Energy Transfer Ratios

Test	Depth (m)	Energy Transfer Ratio (ETR)%	
		Mean	Standard Deviation
SPT 1	0.76 – 1.21	78.7	3.6
SPT 2	1.52 – 1.97	79.1	2.9
SPT 4	3.04 – 3.49	77	3.6
SPT 5	3.8 – 4.15	78.4	1.5
SPT 6	4.56 – 5.01	77	1.6
SPT 7	5.33 – 5.78	75	1.5
SPT 8	6.09 – 6.54	76.8	1.6
SPT 9	6.85 – 6.9	75.6	2.2
All SPTs		77.3	2.6

Since the same hammer and equipment were used for all SPT tests, the same energy correction factor was applied to all equivalent SPT N values to calculate SPT $(N)_{60}$ values. These values are shown in figures G-11 through G-20 and in Table G.2.

4.0 DYNAMIC CONE PENETRATION TESTING (DCPT)

Cone penetration testing is conducted using a 60 mm diameter cone driven into the formation at the base of a borehole using repeated blows of a steel weight that slides on the drill rods and impacts a jar assembly or anvil to cause the cone to penetrate a standard distance, usually 300 mm, into the formation. The number of blows needed to achieve this penetration is taken as an indicator of the density or consistency of the formation material.

DCPT testing was completed with the auger rig and the same automatic trip hammer as was used for SPT testing. The DCPT tests were also monitored using SPT analyzer. Blows were counted in 150 mm increments.

A total of four DCPT tests were completed adjacent to BH-BGC11-67/69 and plate load test PT-BGC11-01. Refusal was met in these four tests at 2.5 m, 3.2 m, 0.5 m and 0.6 m.

The average energy measurement for DCPT test A was 81%. The analyzer malfunctioned for the other three DCPT tests. All raw blow counts are presented in Figure G-21 and Table G.4.

Table G.4 DCPT data

Depth		Blows per 150 mm			
From (m)	To (m)	Test A	Test B	Test C	Test D
0.00	0.15	9	11	17	21
0.15	0.30	10	14	43	38
0.30	0.46	18	19	89	75
0.46	0.61	25	30	25 (for no advancement)	131
0.61	0.76	32	36		25 (for no advancement)
0.76	0.91	35	42		
0.91	1.07	51	35		
1.07	1.22	48	32		
1.22	1.37	42	51		
1.37	1.52	29	61		
1.52	1.68	36	60		
1.68	1.83	71	56		
1.83	1.98	59	*		
1.98	2.13	50	62		
2.13	2.29	62	23		
2.29	2.44	62	12		
2.44	2.59	45	19		
2.59	2.74	27 (for no advancement)	23		
2.74	2.90		35		
2.90	3.05		26		
3.05	3.20		31		
3.20	3.35		86		
3.35	3.51		105		

*Lost count of blows.

5.0 WILDCAT PENETROMETER TESTING

Wildcat penetrometer testing is conducted using a hand operated penetration testing tool manufactured by Triggs Technologies of Willoughby Hills, Ohio, USA (Triggs Technologies 2007). The device consists of a safety hammer, rods, a sacrificial cone tip and a lubricating system. The falling portion of the hammer weighs 15.9 kgs (35 lbs) and the drop height is 0.377 m (15 inches). The rods are 1 m long and 2.8 cm (1.1 inches) in diameter. The rods are grooved every 10 cm to allow blow counts to be recorded in 10 cm increments. The sacrificial cone tip is 3.5 cm (1.4 inches) in diameter, has a 90° apex and 10 cm^2 projected area. The lubrication system allows polymer to fill the annulus between the rods and the soil, limiting the hammer energy lost to friction.

Wildcat penetration tests are completed by driving the sacrificial tip into the ground, using the safety hammer. Blows are counted for each 10 cm increment. Additional rods are added to the assembly as penetration continues. Polymer slurry is injected into the assembly or the directly into the annulus between the rods and the ground throughout testing to limit friction between the rods and the ground. Testing is completed when refusal is met (considered to be 50 blows in one 10 cm increment).

A total of 25 Wildcat penetrometer tests were completed (Table G.5). Of the 23 tests, 22 were terminated at refusal and three were terminated at the maximum length of rods available (5 m). Blow counts with depth are plotted in figures G-22 to G-38 and tabulated in Table G.6.

Table G.5 Wildcat Penetrometer Test Locations

Test Number	Test Location	Northing (m)	Easting (m)	Elevation (m)	Test Date	Tested By	Final Depth of Test (m)	Reason for End of Test	Comments
1	near TP-BGC11-90	7100513	459695	977	15/07/2011	LT	3	Refusal	
2	near BH-BGC10-24	7101012	458500	801	15/07/2011	LT/EB	5	Maximum length of rods	0.5 m of granular material present above natural ground as a result of drill pad construction
3	near BH-BGC10-13	7100942	458844	824	17/07/2011	EC	0.3	Refusal on cobbles/boulders	
4	near BH-BGC10-14	7100980	458580	808	17/07/2011	EC	1.3	Refusal	
5	near BH-BGC10-22	7101098	458391	794	17/07/2011	EC	4.9	Maximum length of rods	
6	near TP-BGC11-62	7099924	459251	972	19/07/2011	EC/EB	2.47	Refusal	removed 0.2 m of organics prior to testing
7	near TP-BGC11-69 (test A)	7099457	458915	878	19/07/2011	EC	1	Refusal	
8	near TP-BGC11-69 (test B)	7099457	458915	878	19/07/2011	EC	4.21	Refusal on cobbles/boulders	removed 0.2 m of organics prior to testing
9	Placer Tailings (PQ12-A)	7101199	459747	891	23/07/2011	EC	0.3	Refusal on cobbles/boulders	
10	Placer Tailings (PQ12-B)	7101199	459747	891	23/07/2011	EC	0.3	Refusal on cobbles/boulders	
11	Placer Tailings (PQ13)	7101284	459832	902	23/07/2011	EC	4.9	Maximum length of rods	
12	Placer Tailings (PQ7-A)	7101061	459307	860	23/07/2011	EC	0.1	Refusal on cobbles/boulders	

Test Number	Test Location	Northing (m)	Easting (m)	Elevation (m)	Test Date	Tested By	Final Depth of Test (m)	Reason for End of Test	Comments
13	Placer Tailings (PQ7-B)	7101061	459307	860	23/07/2011	EC	0.3	Refusal on cobbles/boulders	
14	Placer Tailings (PQ6-A)	7101008	459196	842	23/07/2011	EC	0.1	Refusal on cobbles/boulders	
15	Placer Tailings (PQ6-B)	7101008	459196	842	23/07/2011	EC	0.14	Refusal on cobbles/boulders	
16	near TP-BGC11-94 (test A)	7101517	459980	937	23/07/2011	EC	0.7	Refusal on cobbles/boulders	removed 0.25 m of organics prior to testing, frozen ground between 0.1 m and 2.0 m
17	near TP-BGC11-94 (test B)	7101517	459980	937	23/07/2011	EC	2.3	Refusal	removed 0.25 m of organics prior to testing, frozen ground between 0.1 m and 2.0 m
18	near BH-BGC11-53	7100984	459486	890	15/08/2011	LT	1.6	Refusal	
19	near BH-BGC11-55 (test A)	7100913	459448	889	15/08/2011	LT	1.1	Refusal	
20	near BH-BGC11-55 (test B)	7100913	459448	889	15/08/2011	LT	0.87	Refusal	
21	near TP-BGC11-103 (test A)	7101147	458821	866	15/08/2011	LT	0.35	Refusal	
22	near TP-BGC11-103 (test B)	7101148	458828	866	15/08/2011	LT	0.9	Refusal	
23	near TP-BGC11-105	7101199	458935	878	15/08/2011	LT	1	Refusal	

Test Number	Test Location	Northing (m)	Easting (m)	Elevation (m)	Test Date	Tested By	Final Depth of Test (m)	Reason for End of Test	Comments
24	PQ-14 (test A)	7100285	459722	1009	25/08/2011	PQ	0.01	Refusal	near Plate Load Test area 3 at proposed secondary crushers
25	PQ-14 (test B)	7100285	459722	1009	25/08/2011	PQ	0.01	Refusal	near Plate Load Test area 3 at proposed secondary crushers

Table G.6 Wildcat Penetrometer Blow Counts

Test #	1	2	3	4	5
Location	**Near TP-BGC11-90**	**Near BH-BGC10-24**	**Near BH-BGC10-13**	**Near BH-BGC10-14**	**Near BH-BGC10-22**
Material Tested	0.15 m to 1.15 m SAND (SP), 1.15 m to 4 m SILT (MH)	Placer Tailings	Placer Tailings, GRAVEL and SAND (GW/SW)	Placer Tailings, 0 m to 2 m GRAVEL and SAND (GW/SW), 2 m to 9.5 m SILT and SAND	Placer Tailings, 0 m to 4.7 m SAND and SILT (SM/ML)
Depth (m)	Blows per 100 mm				
0.1	4	1	3	7	2
0.2	5	7	20	8	4
0.3	4	9	50	13	6
0.4	4	10		15	6
0.5	9	9		22	7
0.6	9	9		16	5
0.7	9	7		21	5
0.8	11	4		20	6
0.9	8	3		20	5
1	9	3		19	4
1.1	10	2		30	3
1.2	7	2		50	2
1.3	8	2		50	4
1.4	11	2			3
1.5	10	2			4
1.6	9	2			3
1.7	6	1			3
1.8	8	2			4
1.9	8	3			3
2	7	3			3
2.1	11	2			4
2.2	13	3			3
2.3	13	4			4
2.4	10	2			6
2.5	9	2			4
2.6	10	3			4
2.7	9	3			5
2.8	6	3			5
2.9	11	3			5
3	25	2			5
3.1		1			5
3.2		4			4
3.3		4			5
3.4		4			4
3.5		4			5
3.6		5			5
3.7		4			5
3.8		4			6
3.9		4			5
4		2			6
4.1		5			4
4.2		4			5
4.3		4			5
4.4		4			5
4.5		5			5
4.6		4			4
4.7		5			4
4.8		6			4
4.9		8			4
5		12			

Test #	6	7	8	9	10
Location	**Near TP-BGC11-62**	**Near TP-BGC11-69 (test A)**	**Near TP-BGC11-69 (test B)**	**Placer Tailings PQ-12 (test A)**	**Placer Tailings PQ-12 (test B)**
Material Tested	0.2 m to 1 m Cobbly Silt, 1 m to 6.2 m Sandy Silt,	0.2 m to 2.6 m Silt, 2.6 m to 3.2 m Gravelly silt, 3.2 m to 4 m disintegrated bedrock, 4 m t0 6.5 m very blocky bedrock		Placer Tailings	
Depth (m)	Blows per 100 mm				
0.1	1	1	1	11	16
0.2	1	1 blow for 20 cm	1	12	8
0.3	2	2	1	17	Refusal
0.4	3	1	1		
0.5	6	2	1		
0.6	5	3	4		
0.7	6	7	2		
0.8	7	14	12		
0.9	11	12	10		
1	15	45	11		
1.1	14		8		
1.2	27		9		
1.3	20		7		
1.4	24		5		
1.5	25		8		
1.6	15		15		
1.7	11		12		
1.8	14		15		
1.9	12		27		
2	17		15		
2.1	18		14		
2.2	15		8		
2.3	25		8		
2.4	42		8		
2.5	51		9		
2.6			9		
2.7			13		
2.8			23		
2.9			22		
3			23		
3.1			20		
3.2			23		
3.3			23		
3.4			20		
3.5			20		
3.6			22		
3.7			25		
3.8			26		
3.9			19		
4			21		
4.1			35		
4.2			25		
4.3			40		

Test #	11	12	13	14	15
Location	**Placer Tailings PQ-13**	**Placer Tailings PQ-7 (test A)**	**Placer Tailings PQ-7 (test B)**	**Placer Tailings PQ-6 (test A)**	**Placer Tailings PQ-6 (test B)**
Material Tested	0.15 m to 1.15 m SAND (SP), 1.15 m to 4 m SILT (MH)	Placer Tailings		Placer Tailings	
Depth (m)	Blows per 100 mm				
0.1	1	5	12	50	37
0.2	2		15		35
0.3	2		20		
0.4	1				
0.5	1				
0.6	2				
0.7	2				
0.8	2				
0.9	5				
1	2				
1.1	3				
1.2	1				
1.3	3				
1.4	4				
1.5	3				
1.6	3				
1.7	7				
1.8	9				
1.9	4				
2	2				
2.1	4				
2.2	3				
2.3	4				
2.4	3				
2.5	4				
2.6	2				
2.7	4				
2.8	4				
2.9	3				
3	3				
3.1	7				
3.2	4				
3.3	6				
3.4	4				
3.5	5				
3.6	8				
3.7	10				
3.8	6				
3.9	6				
4	9				
4.1	10				
4.2	8				
4.3	8				
4.4	10				
4.5	10				
4.6	10				
4.7	15				
4.8	13				
4.9	14				

Test #	**16**	**17**	**18**	**19**	**20**
Location	**Near TP-BGC11-94 (test A)**	**Near TP – BGC11-94 (test B)**	**Near BH-BGC11-53**	**Near BH-BGC11-55 (test A)**	**Near BH-BGC11-55 (test B)**
Material Tested	0.2 m to 2.0 m Silt, 2.0 m to 5.0 m fine Sand		0 m to 3.8 m Silt	0 m to 8.8 m Silt	
Depth (m)	Blows per 100 mm				
0.1	16	5	1	1	0
0.2	25	21	3	3	0
0.3	22	43	1	2	0
0.4	23	54	4	2	2
0.5	19	70	8	3	4
0.6	66	50	5	3	13
0.7	48	69	5	6	10
0.8		67	4	6	36
0.9		34	6	5	50
1		24	5	29	
1.1		35	22	45+	
1.2		8	18		
1.3		8	24		
1.4		7	19		
1.5		10	16		
1.6		15	50		
1.7		18			
1.8		30			
1.9		22			
2		18			
2.1		21			
2.2		25			
2.3		22			
2.4		14			
2.5		12			
2.6		90			

Test #	**21**	**22**	**23**	**24**	**25**
Location	**Near TP-BGC11-103 (test A)**	**Near TP – BGC11-103 (test B)**	**Near TP-BGC11-105**	**PQ14 (test A)**	**PQ14 (test B)**
Material Tested	0.2 m to 3.5 m Silt		0.2 m to 2.5 m Sand	Metasedimentary Rock	
Depth (m)	Blows per 100 mm				
0.1	13	50	7	50	50
0.2	18		15		
0.3	20		29		
0.4	50		30		
0.5			30		
0.6			36		
0.7			28		
0.8			28		
0.9			25		
1			50		

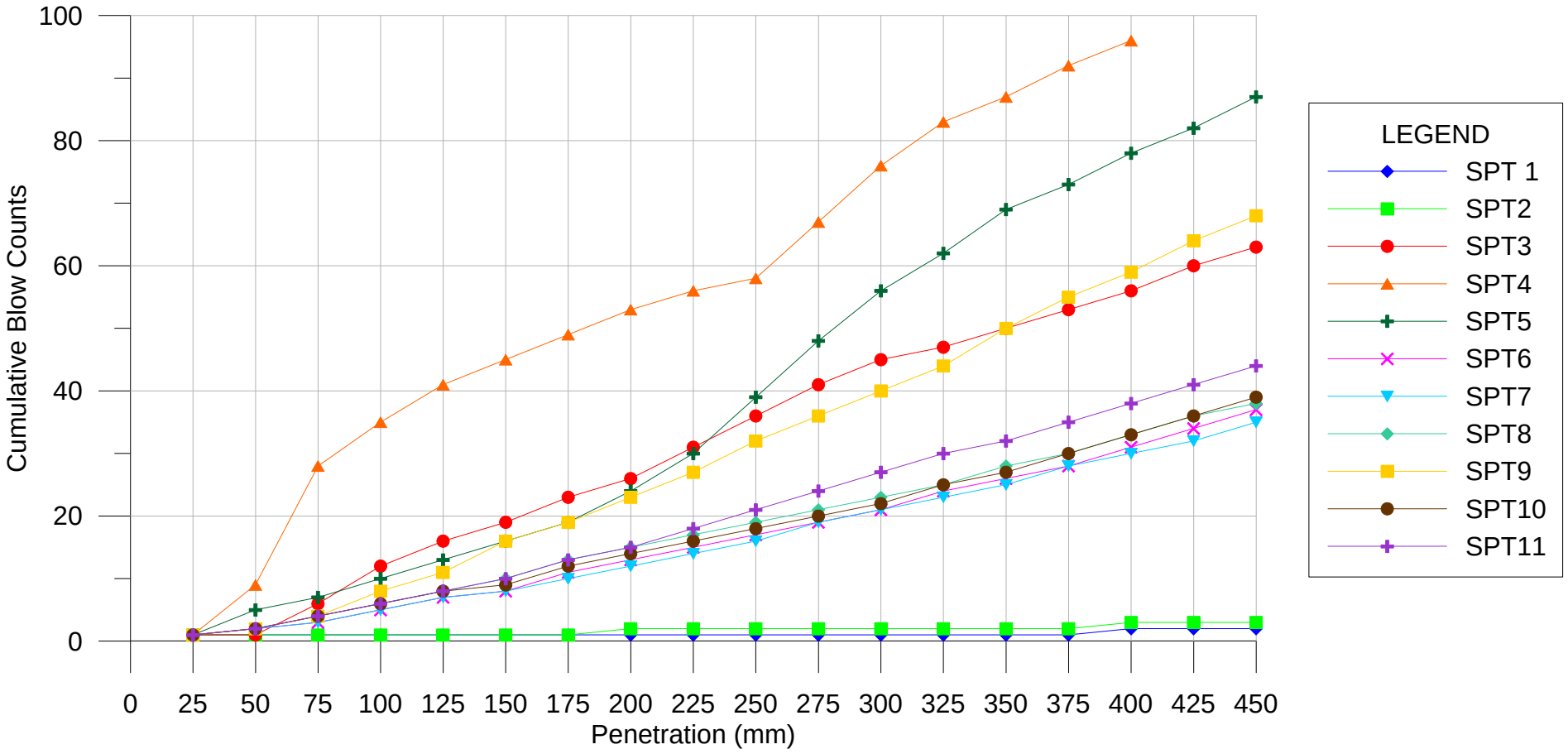
6.0 REFERENCES

ASTM D 4633-05. Standard Test Method for Energy Measurement for Dynamic Penetrometers.

Triggs Technologies Inc. Manual 14 for the Wildcat Dynamic Cone Penetrometer. May 4, 2007.

FIGURES

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPT\Cumulative blow count plots



Note: Cumulative blow counts greater than 100 are not plotted.

SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	KH	KH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-39

CLIENT: VICTORIA GOLD CORP.

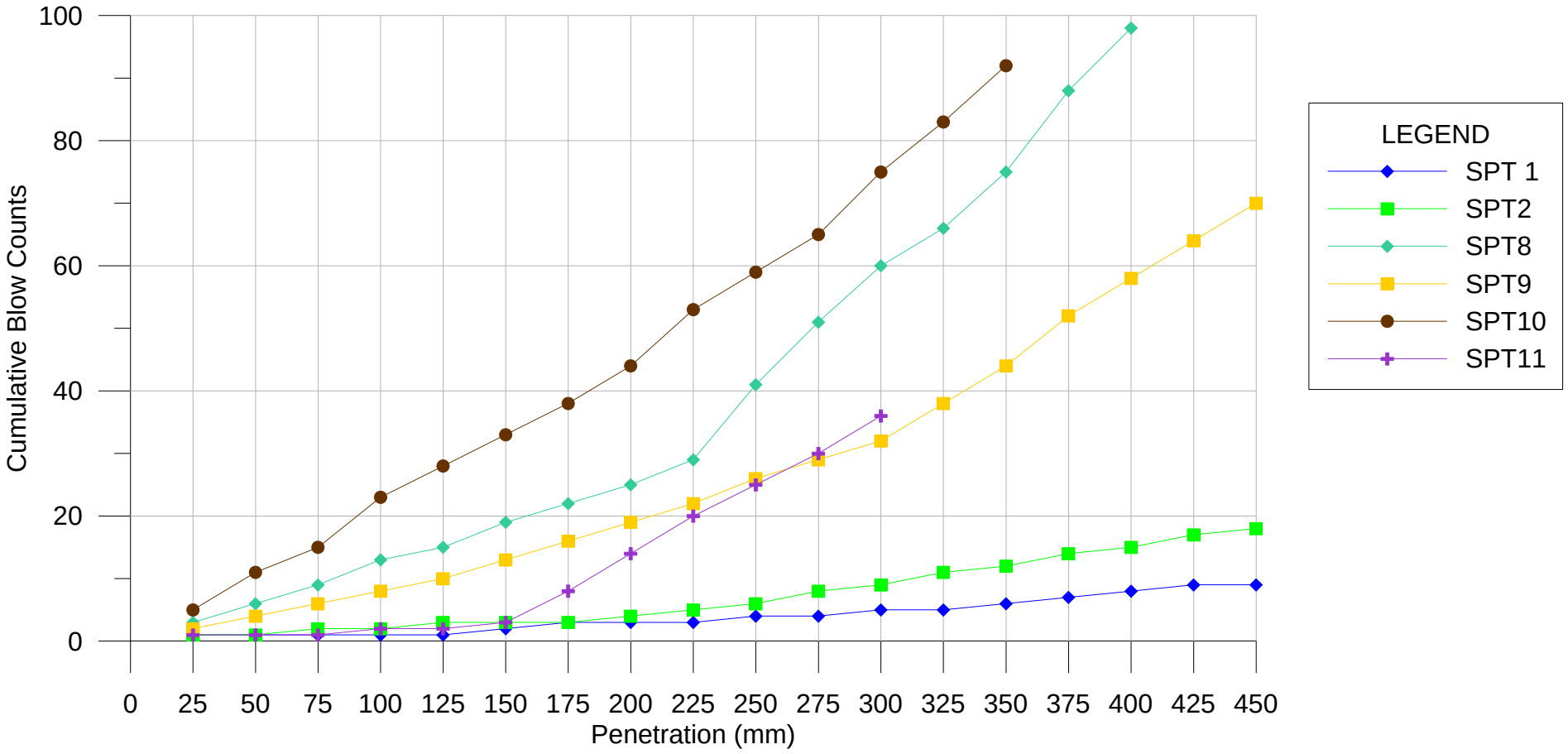
PROJECT No. 0792-006

FIG No. G-01

REV. 0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPT\Cumulative blow count plots



NOTE: SPT 3, 4, 6 and 7 had less than six inches of recovery and are not considered.
NOTE: SPT 5 was frozen and is not considered.
NOTE: Cumulative blow counts greater than 100 are not plotted.

SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	KH	KH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

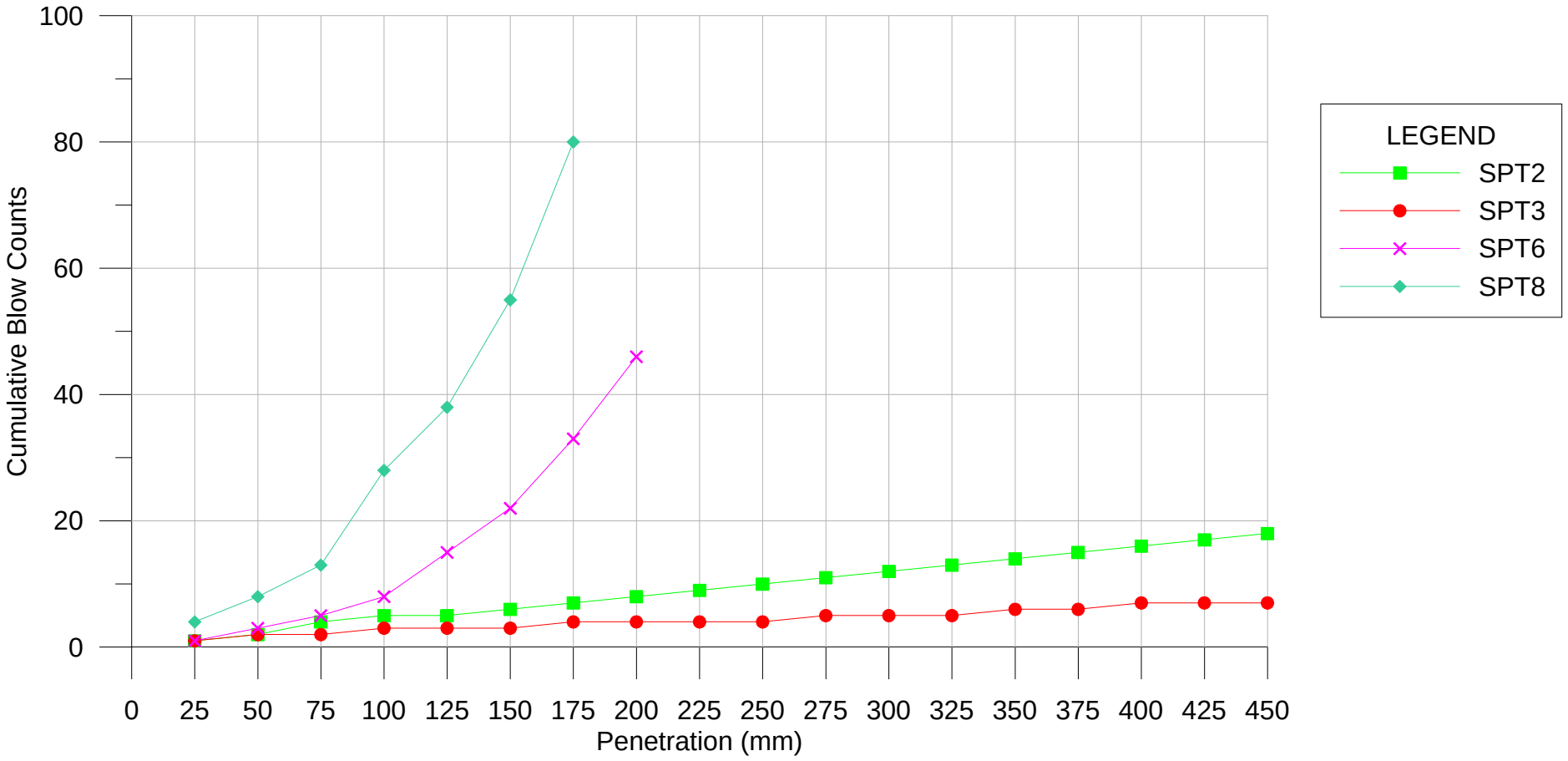
PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-44

CLIENT:	PROJECT No.	FIG No.	REV.
VICTORIA GOLD CORP.	0792-006	G-02	0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPT\Cumulative blow count plots



Note: SPT 1, 4 and 5 were frozen and are not considered.
Note: SPT 7 had less than six inches of recovery and is not considered.

SCALE: NTS	DATE: JAN 2012	DRAWN: KH	DESIGNED: KH	CHECKED: DW	APPROVED: PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

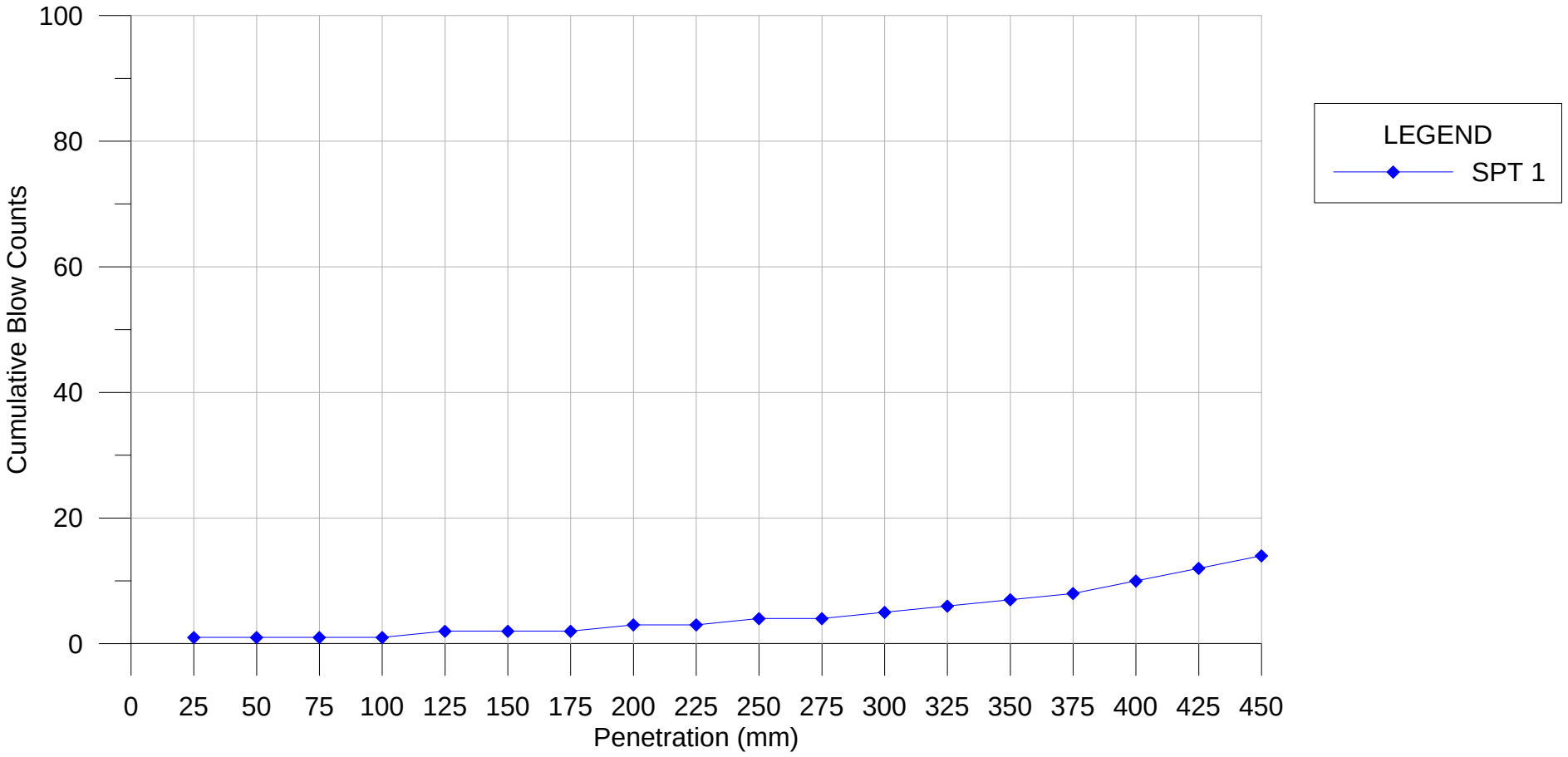
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-47

CLIENT:	PROJECT No.	FIG No.	REV.
VICTORIA GOLD CORP.	0792-006	G-03	0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



Note: SPT 2 was frozen and is not considered.

SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	KH	KH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-49

CLIENT: VICTORIA GOLD CORP.

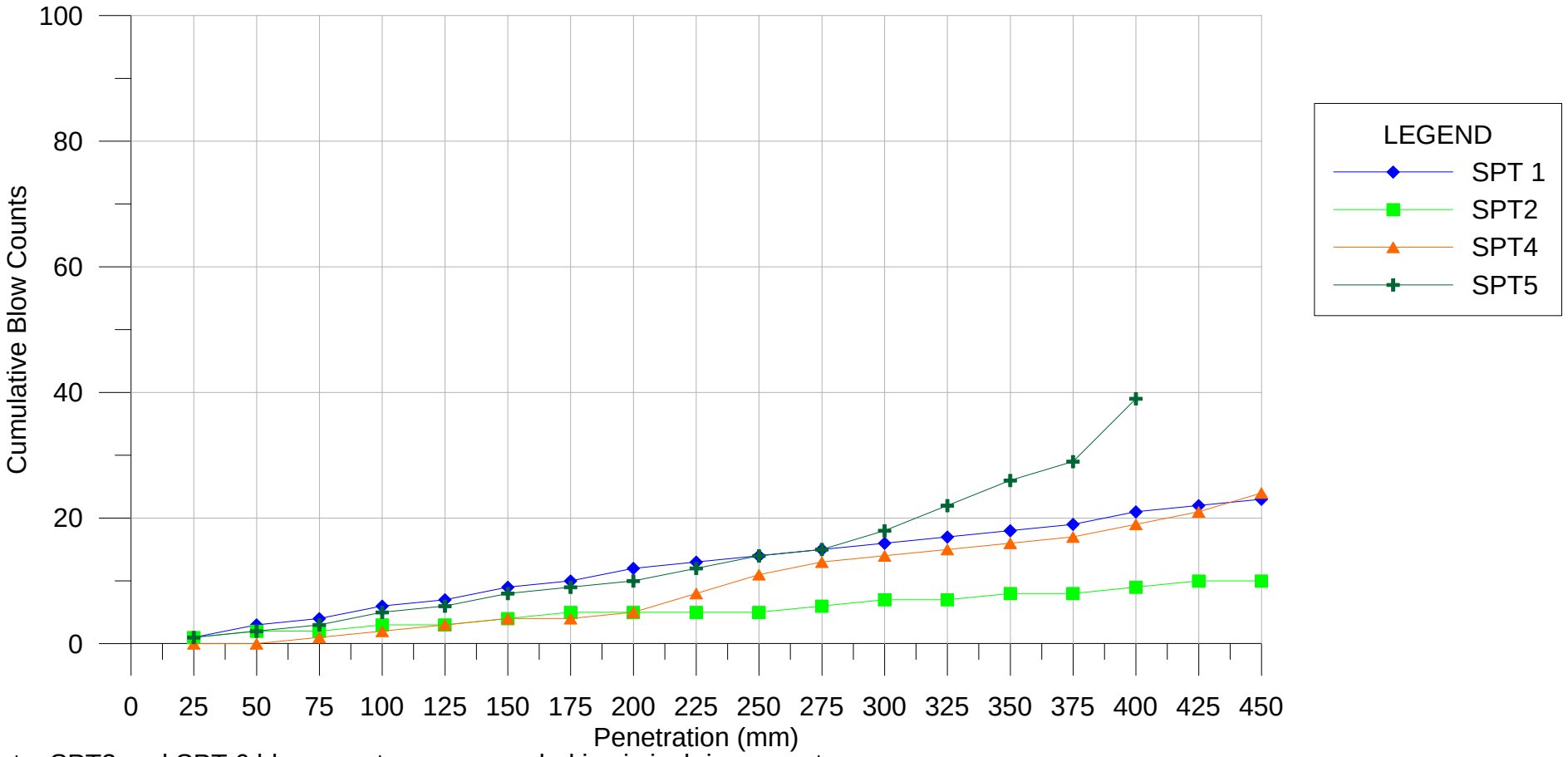
PROJECT No. 0792-006

FIG No. G-04

REV. 0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPT\Cumulative blow count plots



Note: SPT3 and SPT 6 blow counts were recorded in six inch increments.
Note: SPT7 had less than six inches of recovery and is not considered.
Note: SPT8 was completed in frozen material and is not considered.

SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	KH	KH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-51

CLIENT: VICTORIA GOLD CORP.

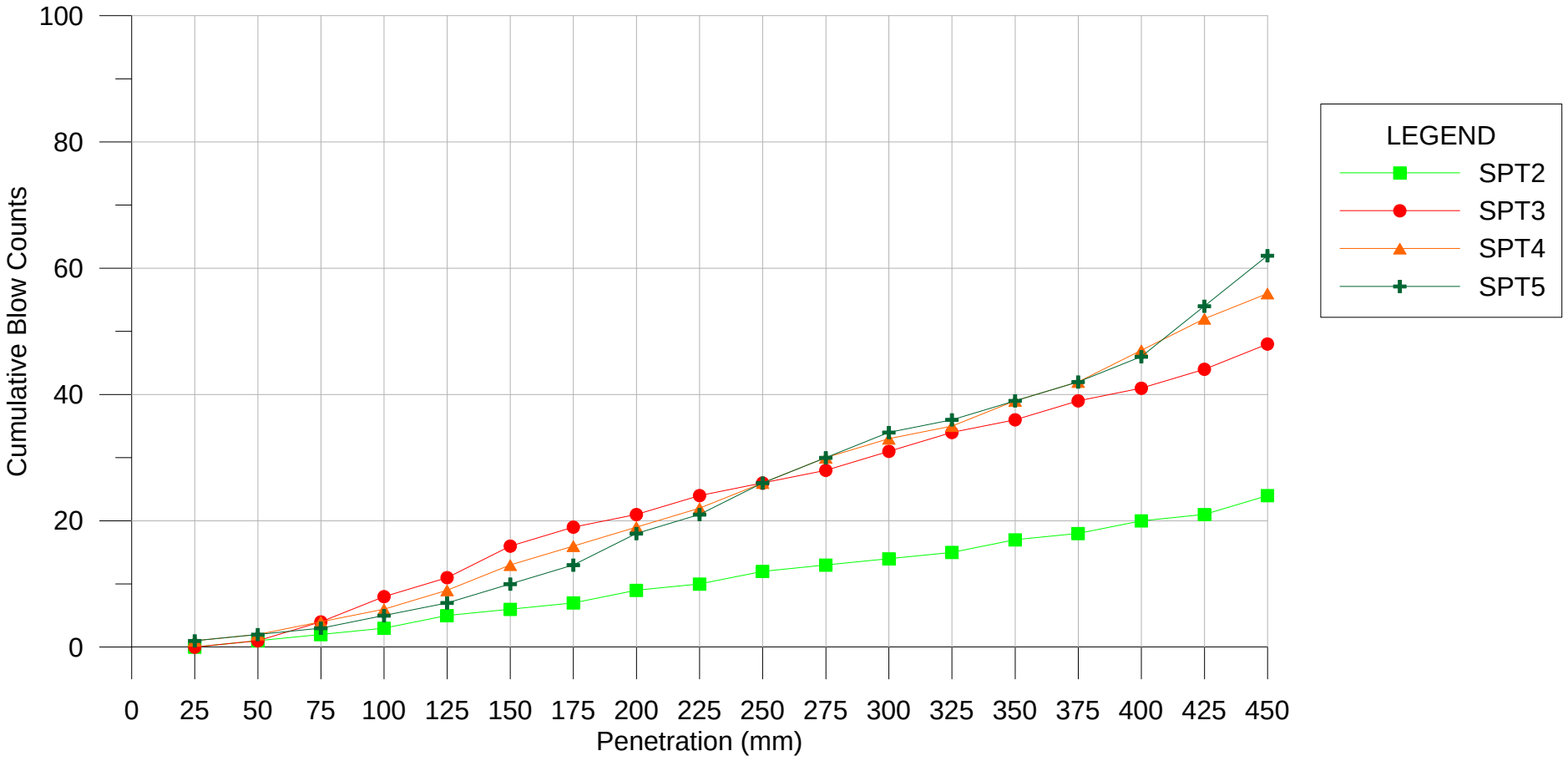
PROJECT No. 0792-006

FIG No. G-05

REV. 0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPT\Cumulative blow count plots



Note: SPT 1 had less than six inches of recovery and is not considered.

SCALE: NTS	DATE: JAN 2012	DRAWN: KH	DESIGNED: KH	CHECKED: DW	APPROVED: PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

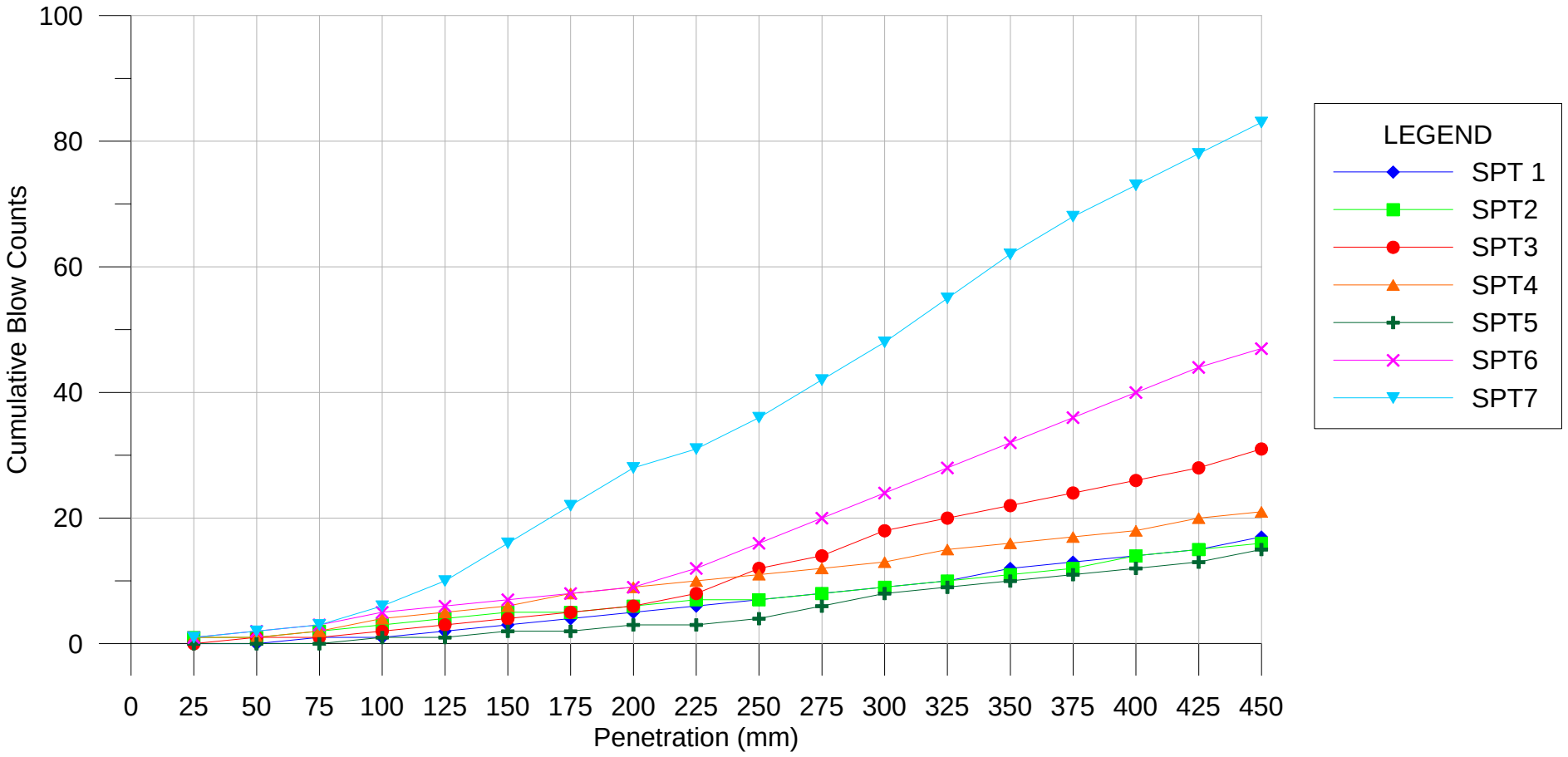
PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-53

CLIENT:	PROJECT No.	FIG No.	REV.
VICTORIA GOLD CORP.	0792-006	G-06	0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPT\Cumulative blow count plots



SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	KH	KH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-55

CLIENT: VICTORIA GOLD CORP.

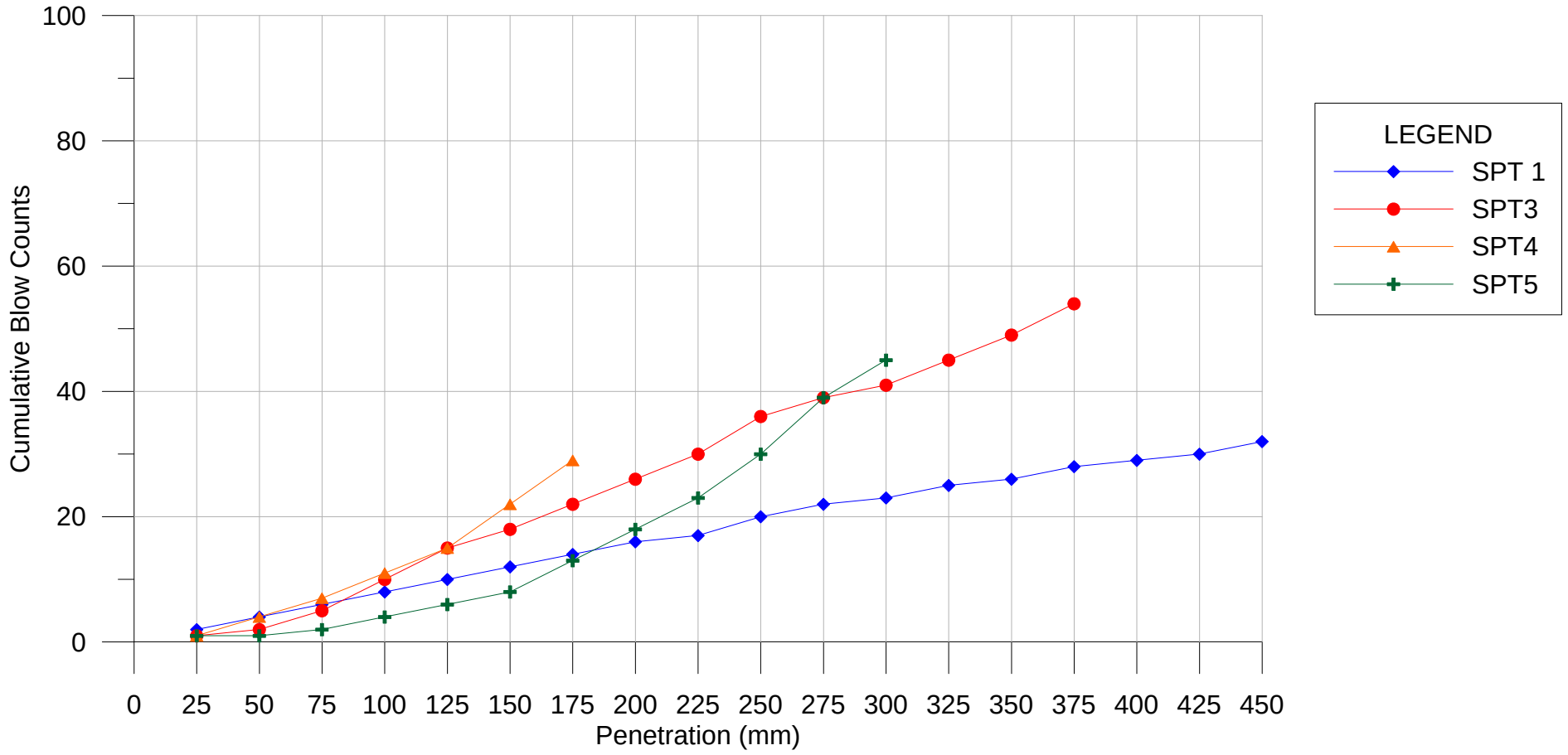
PROJECT No. 0792-006

FIG No. G-07

REV. 0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPT\Cumulative blow count plots



Note: SPT2 had no recovery and is not considered.
Note: SPT6 had less than six inches of recovery and is not considered.

SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	KH	KH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

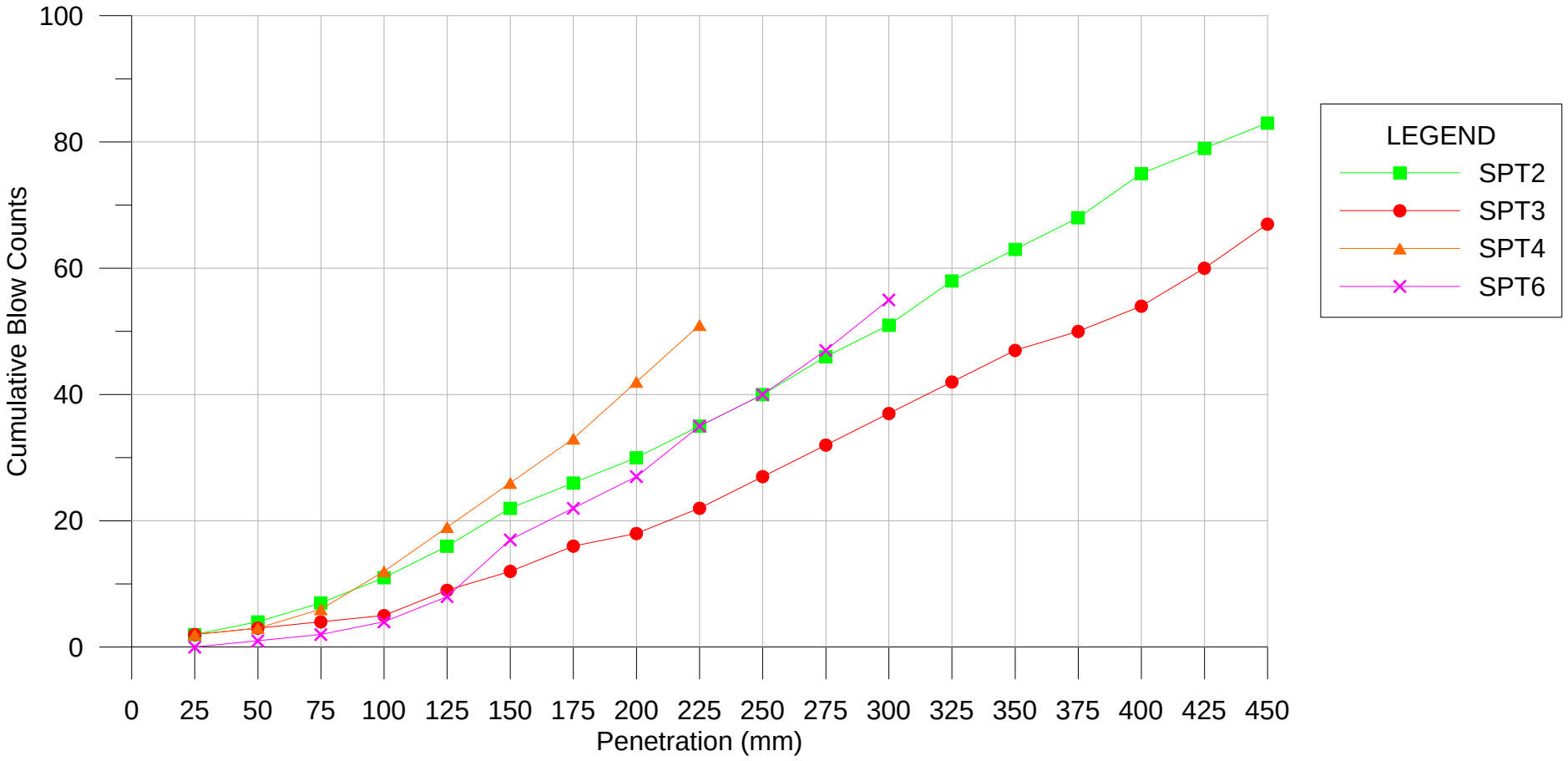
PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-56

CLIENT: VICTORIA GOLD CORP.

PROJECT No.	FIG No.	REV.
0792-006	G-08	0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



Note: SPT1 was frozen and is not considered.
Note: SPT5 had less than six inches of penetration so is not considered.

SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	KH	KH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-57

CLIENT: VICTORIA GOLD CORP.

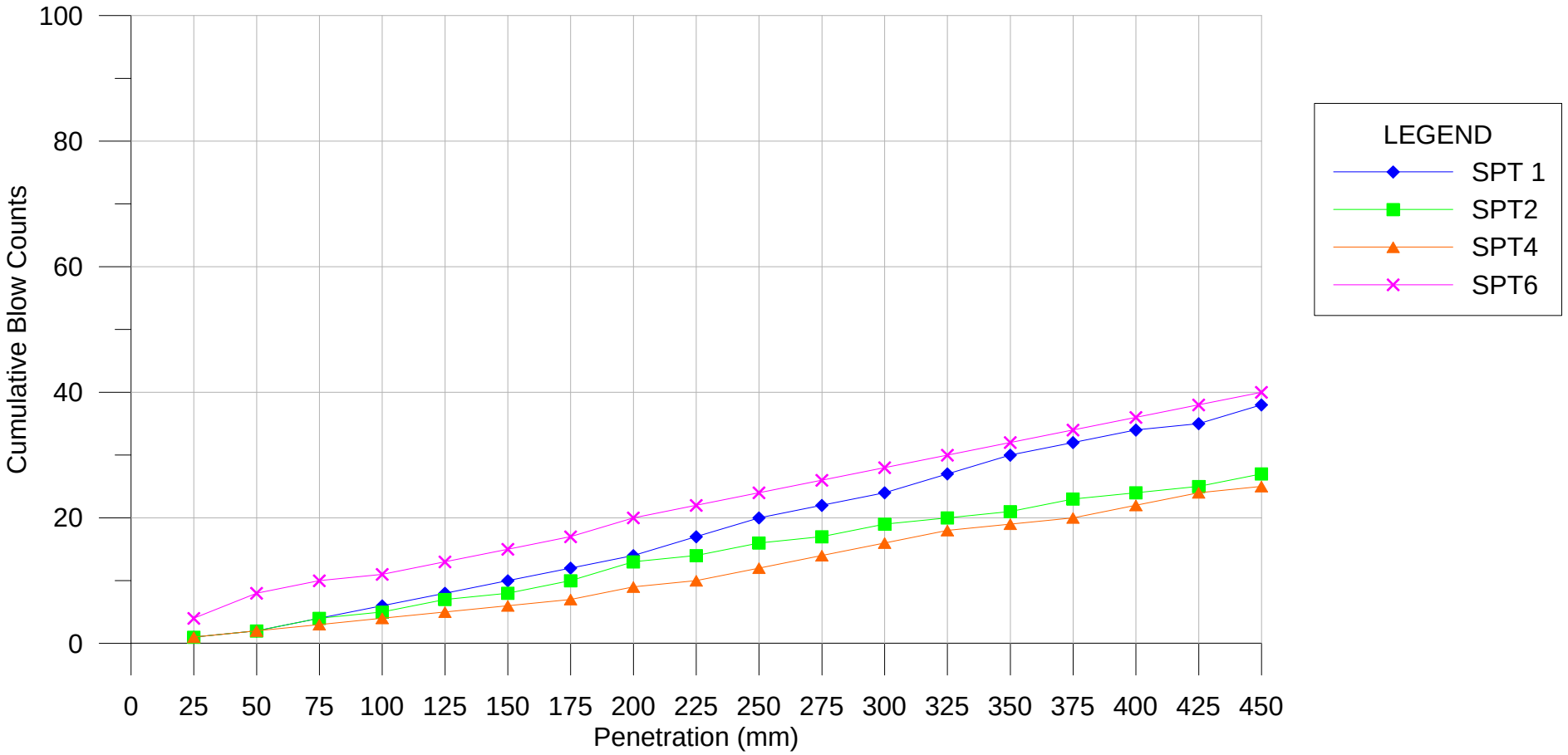
PROJECT No. 0792-006

FIG No. G-09

REV. 0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPT\Cumulative blow count plots



Note: SPT3 blow counts were recorded in six inch increments are not included in this plot.
Note SPT 5, 7, 8 and 9 had less than six inches of recovery and are not considered.

SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	KH	KH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

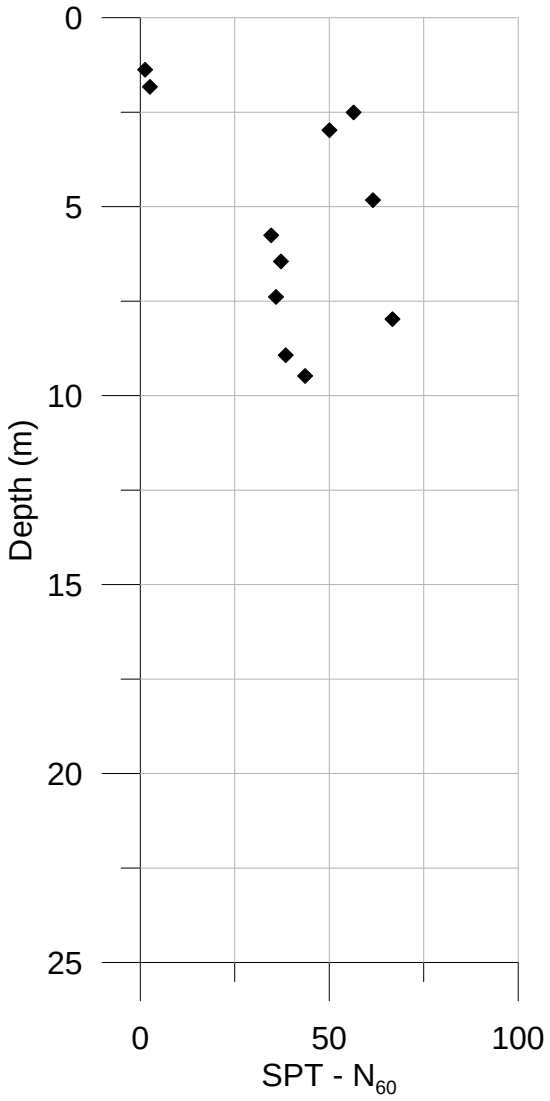
PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: CUMULATIVE SPT BLOW COUNTS BH-BGC11-65

CLIENT: VICTORIA GOLD CORP.

PROJECT No.	FIG No.	REV.
0792-006	G-10	0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

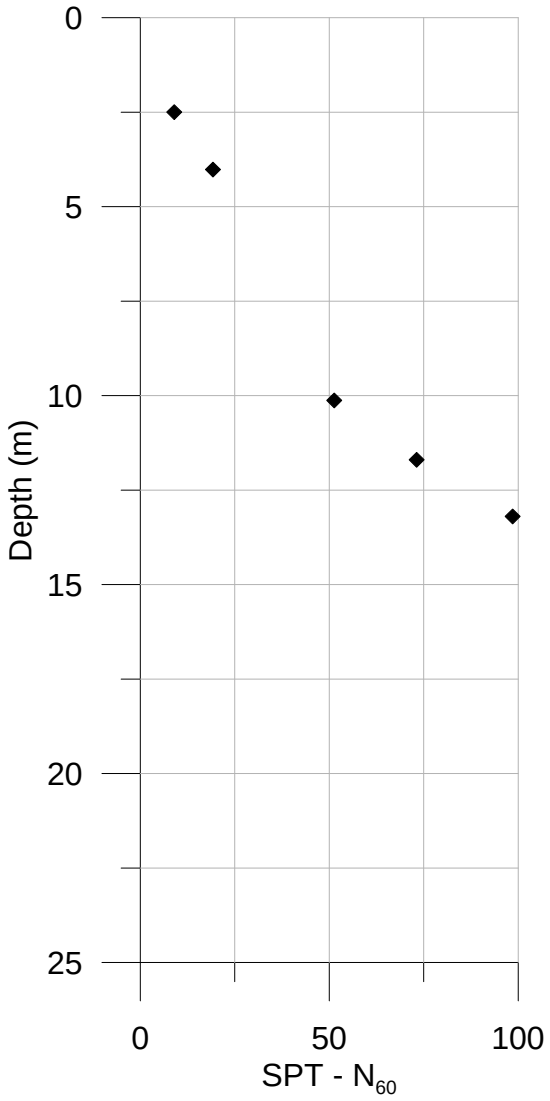
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-39

PROJECT No.	FIG No.	REV.
0792-006	G-11	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTNN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

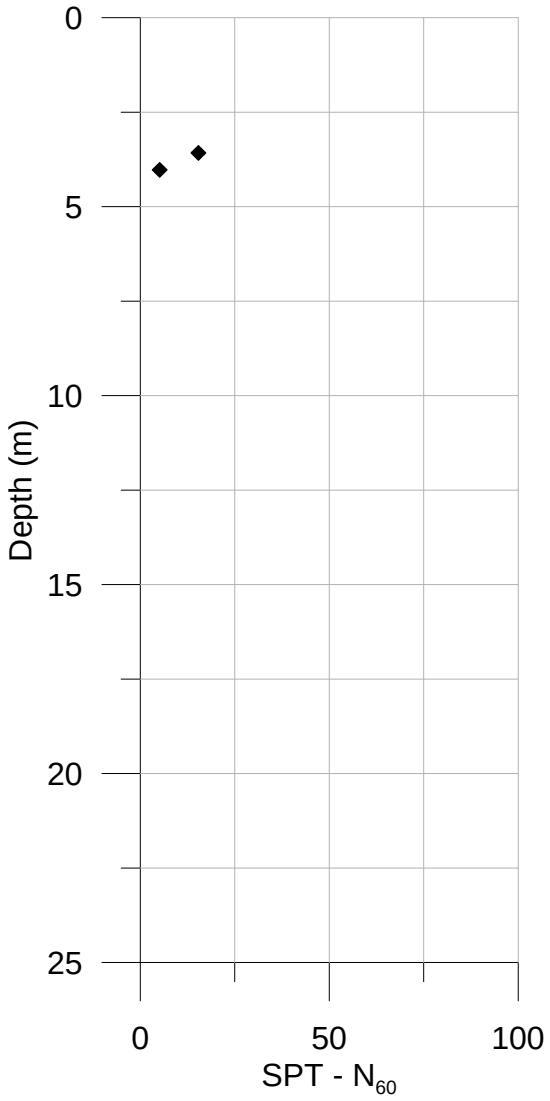
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-44

PROJECT No.	FIG No.	REV.
0792-006	G-12	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTNN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

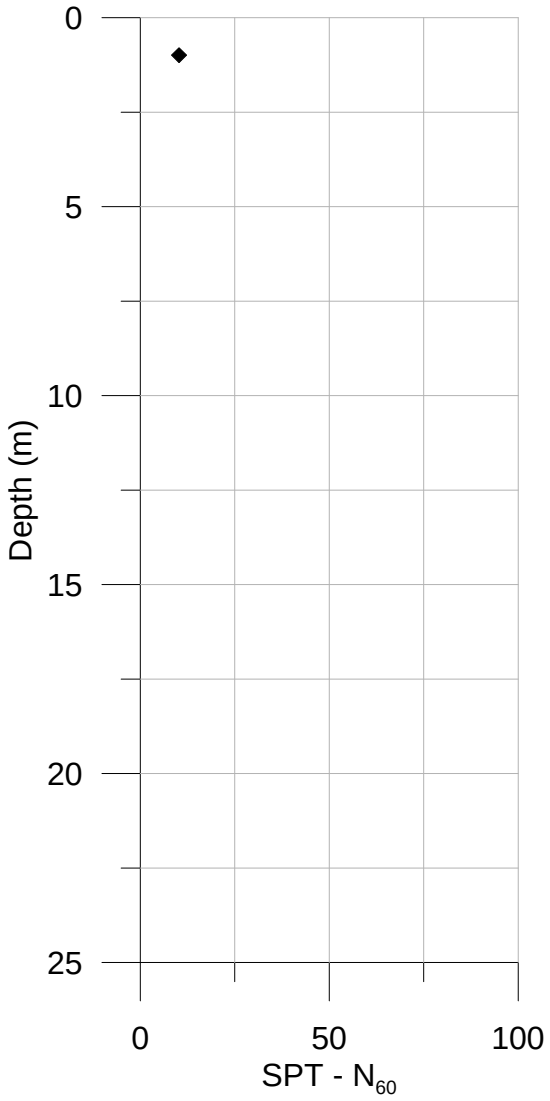
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-47

PROJECT No.	FIG No.	REV.
0792-006	G-13	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTNN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

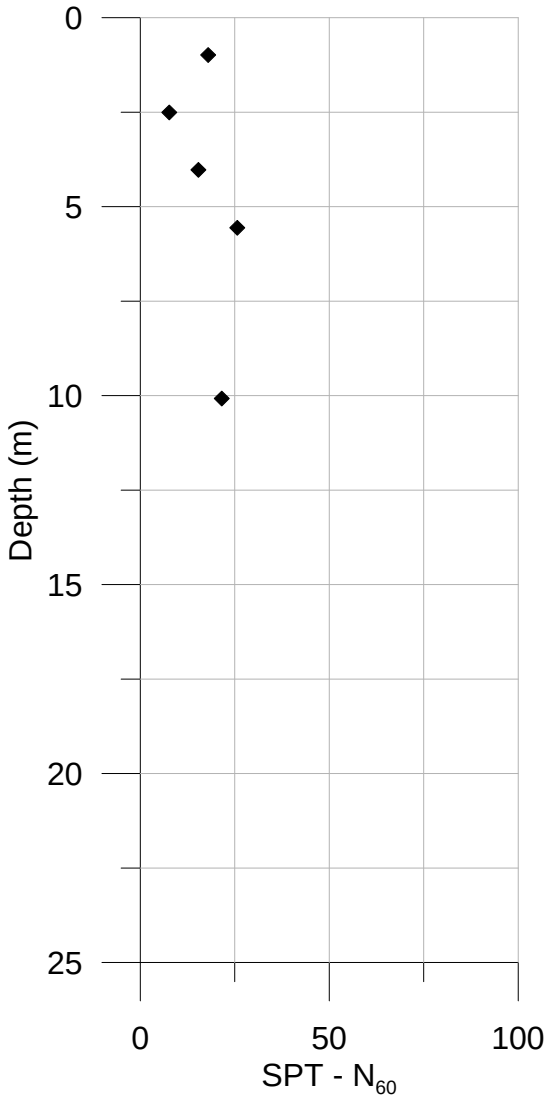
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-49

PROJECT No.	FIG No.	REV.
0792-006	G-14	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

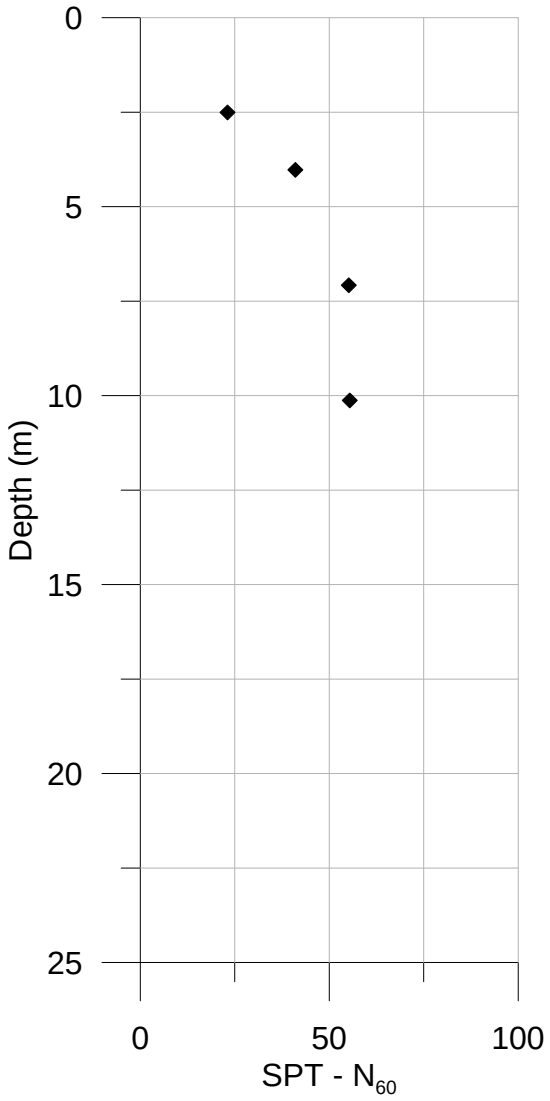
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-51

PROJECT No.	FIG No.	REV.
0792-006	G-15	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

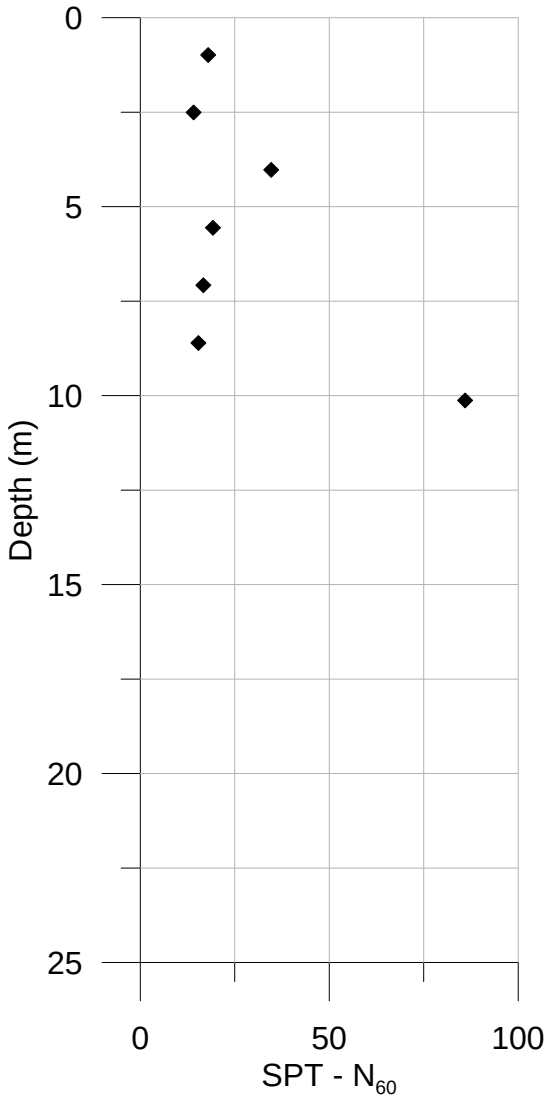
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-53

PROJECT No.	FIG No.	REV.
0792-006	G-16	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTNN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

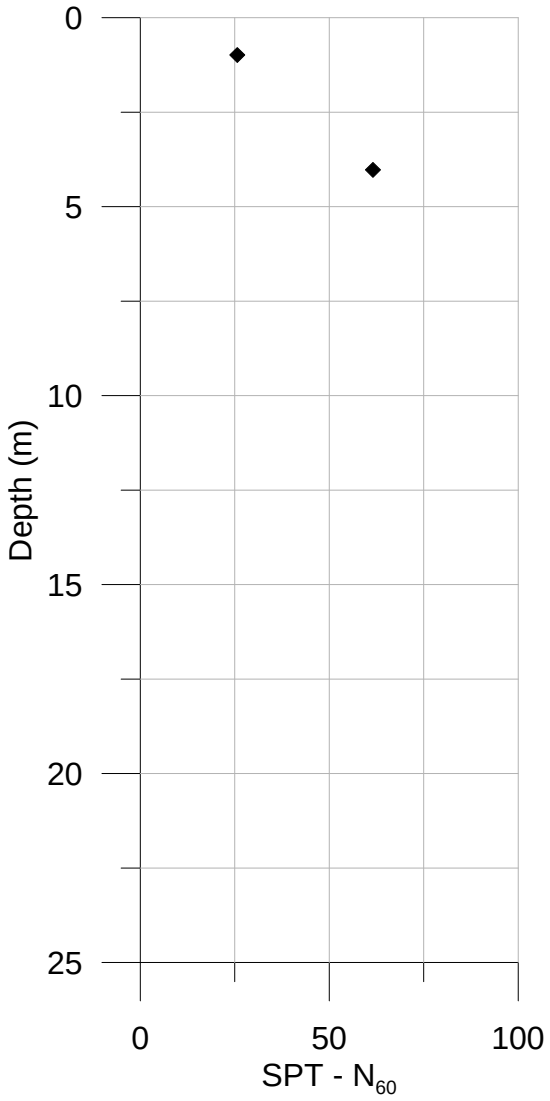
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-55

PROJECT No.	FIG No.	REV.
0792-006	G-17	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

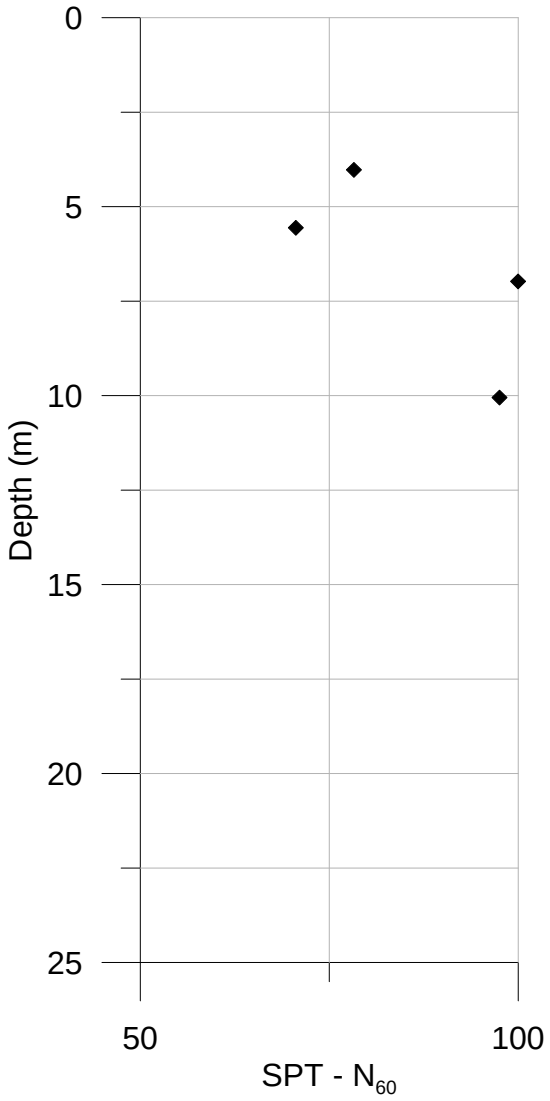
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-56

PROJECT No.	FIG No.	REV.
0792-006	G-18	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



Note: Calculated N_{60} values exceeding 100 are truncated to 100.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

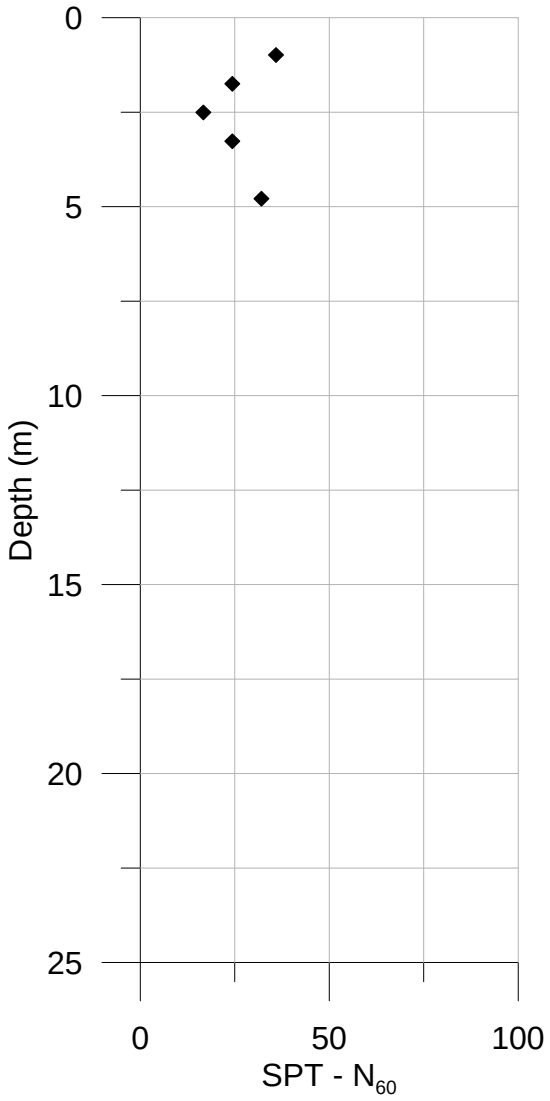
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-57

PROJECT No.	FIG No.	REV.
0792-006	G-19	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTNN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

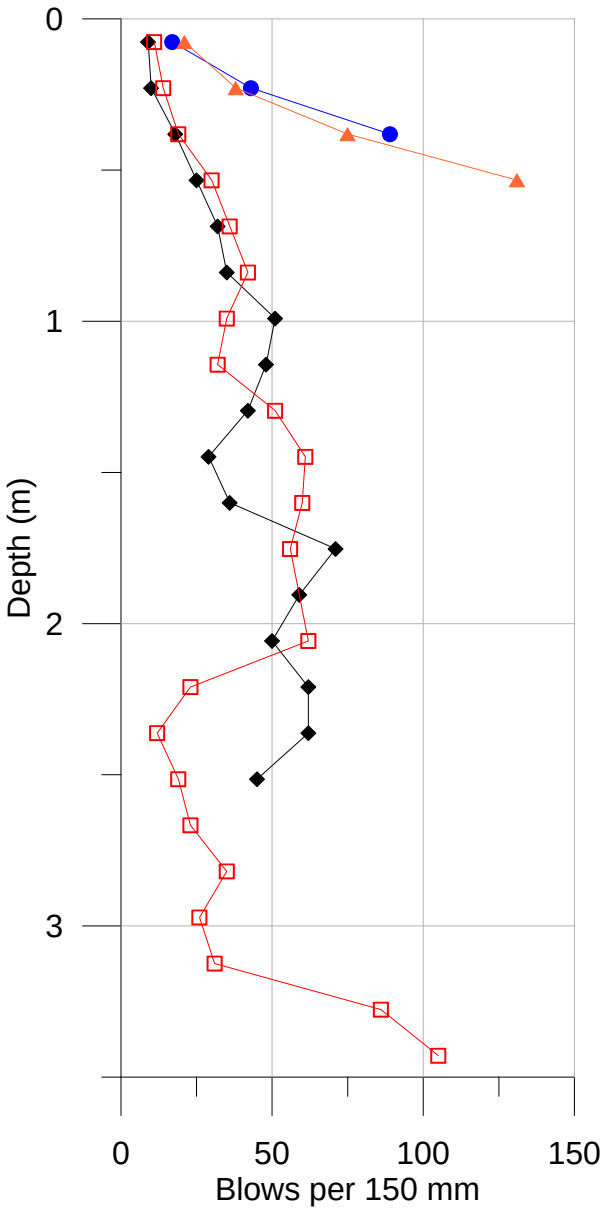
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: SPT N_{60} BH-BGC11-65

PROJECT No.	FIG No.	REV.
0792-006	G-20	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\SPTN60 plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:
1. Tests conducted within 3 m of each other adjacent to BH-BGC11-67.
2. Located adjacent to plate load test PT-BGC11-01 and BH-BGC11-69.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

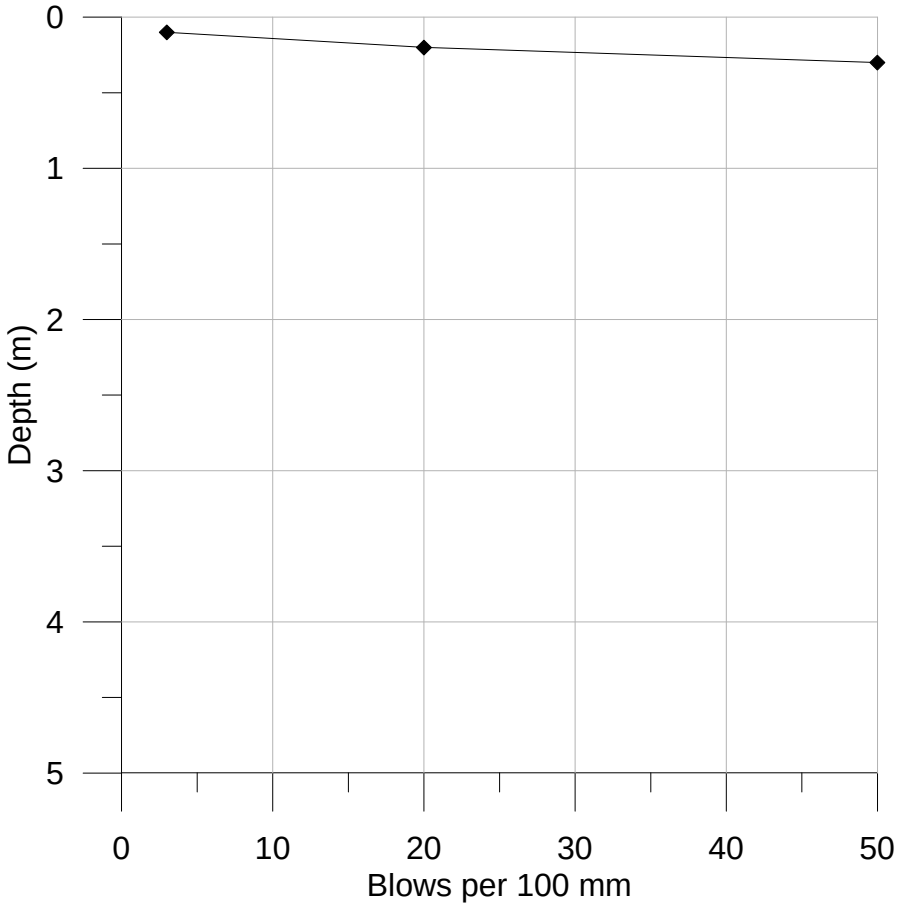
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: DCPT TESTING AT BH-BGC11-67

PROJECT No.	FIG No.	REV.
0792-006	G-21	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\DCPT

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT:
VICTORIA GOLD CORP.

PROJECT:
2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

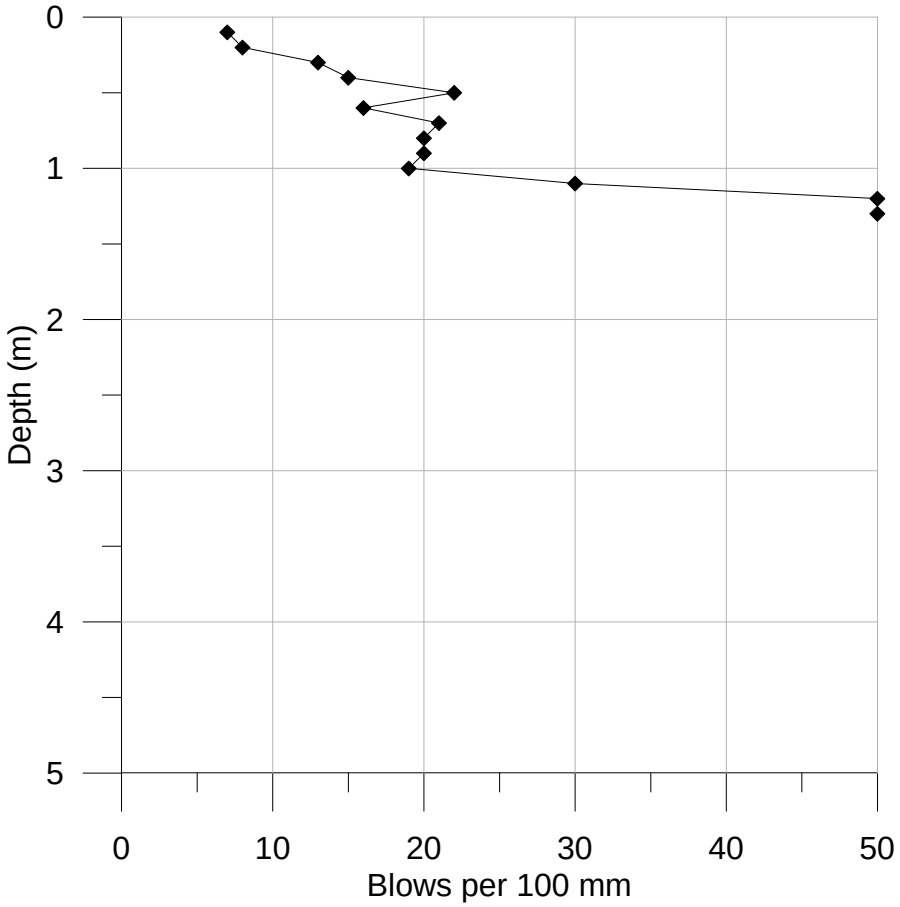
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE:
Wildcat Penetrometer Testing
near BH-BGC10-13

PROJECT No.	FIG No.	REV.
0792-006	G-22	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

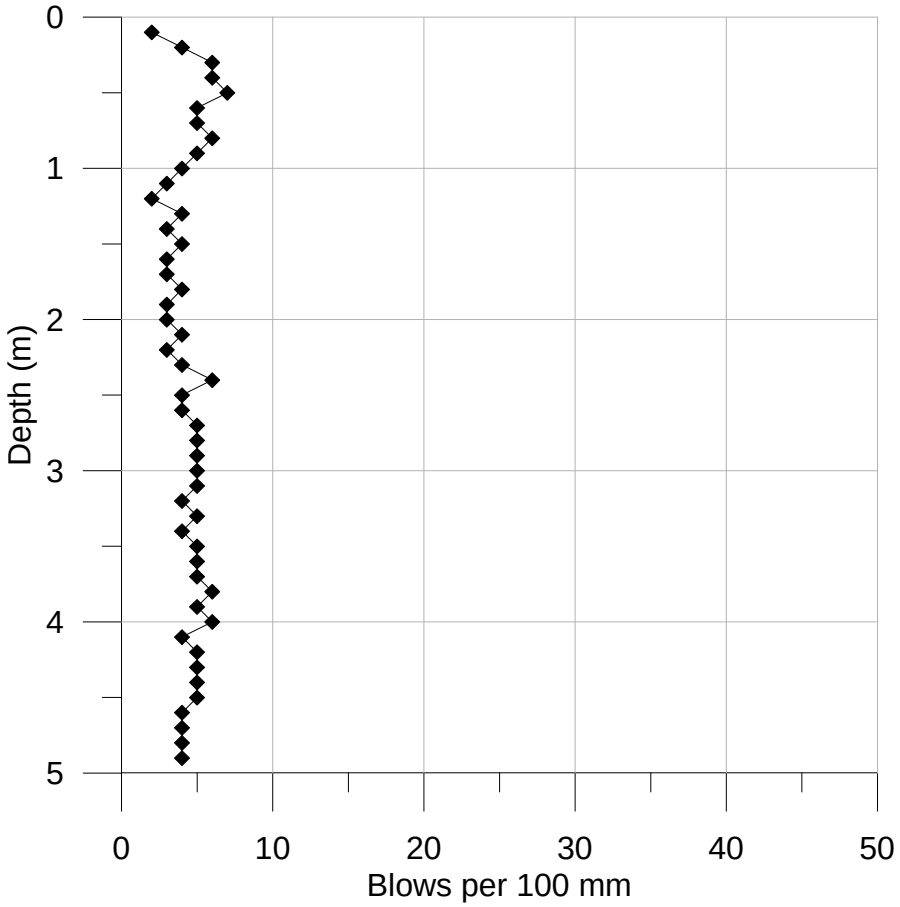
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near BH-BGC10-14

PROJECT No.	FIG No.	REV.
0792-006	G-23	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT:
VICTORIA GOLD CORP.

PROJECT:
2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

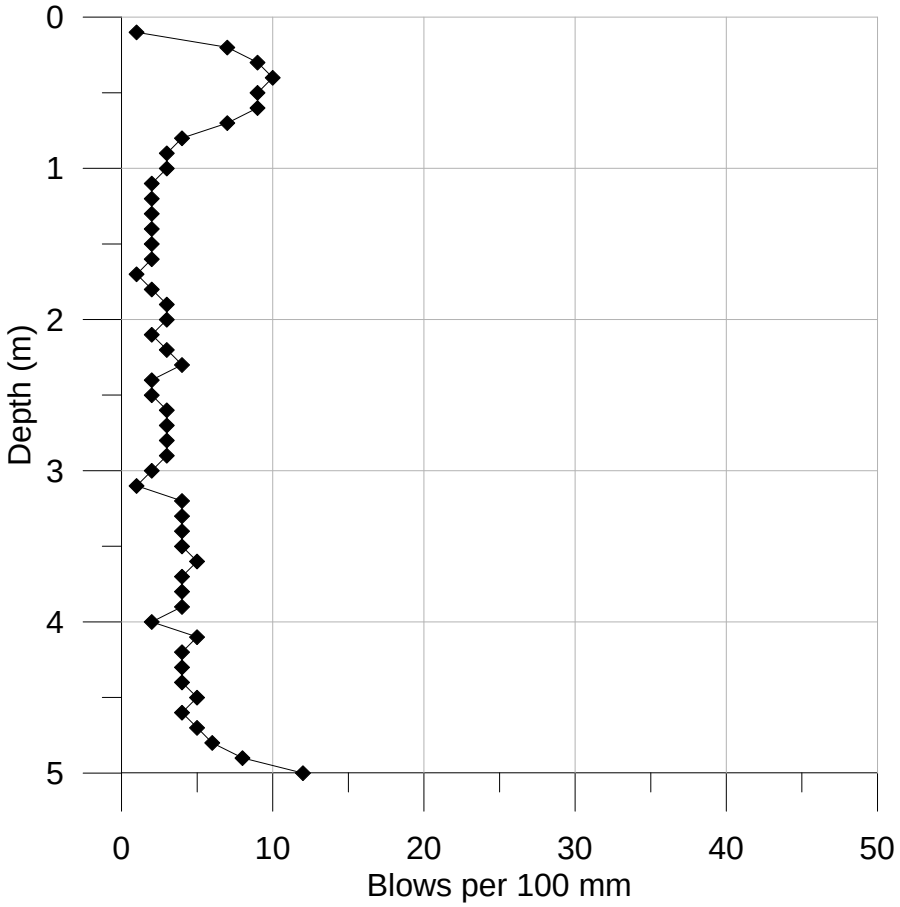
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE:
Wildcat Penetrometer Testing
near BH-BGC10-22

PROJECT No.	FIG No.	REV.
0792-006	G-24	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

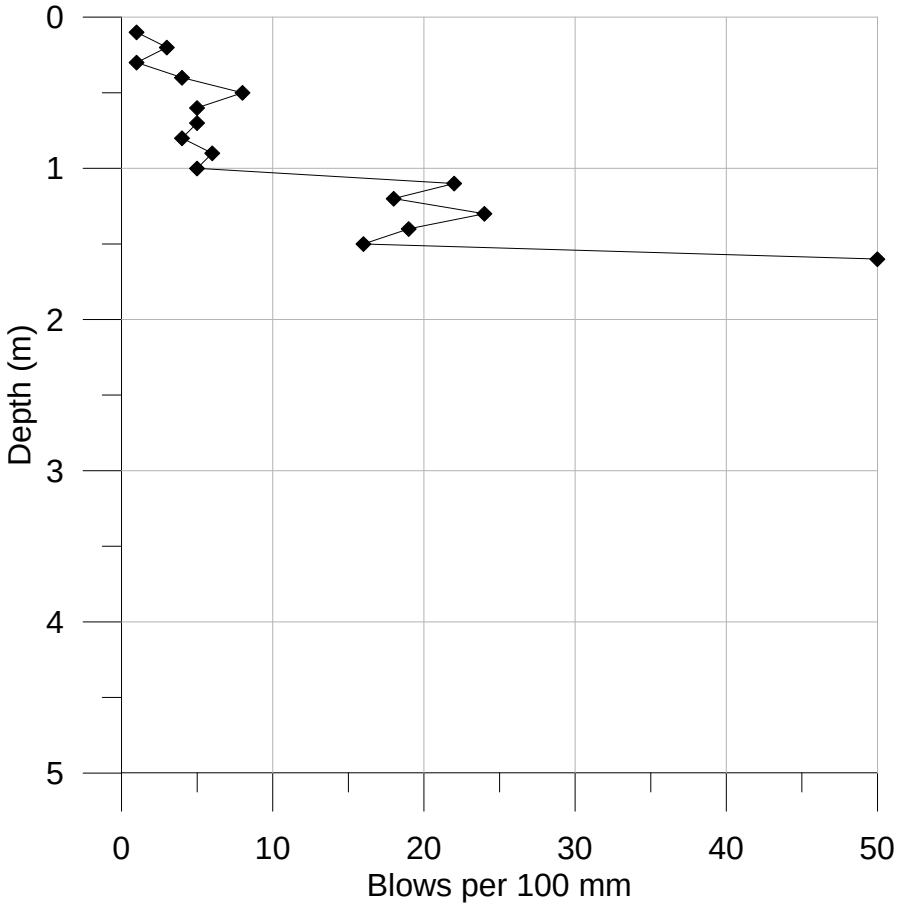
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near BH-BGC10-24

PROJECT No.	FIG No.	REV.
0792-006	G-25	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

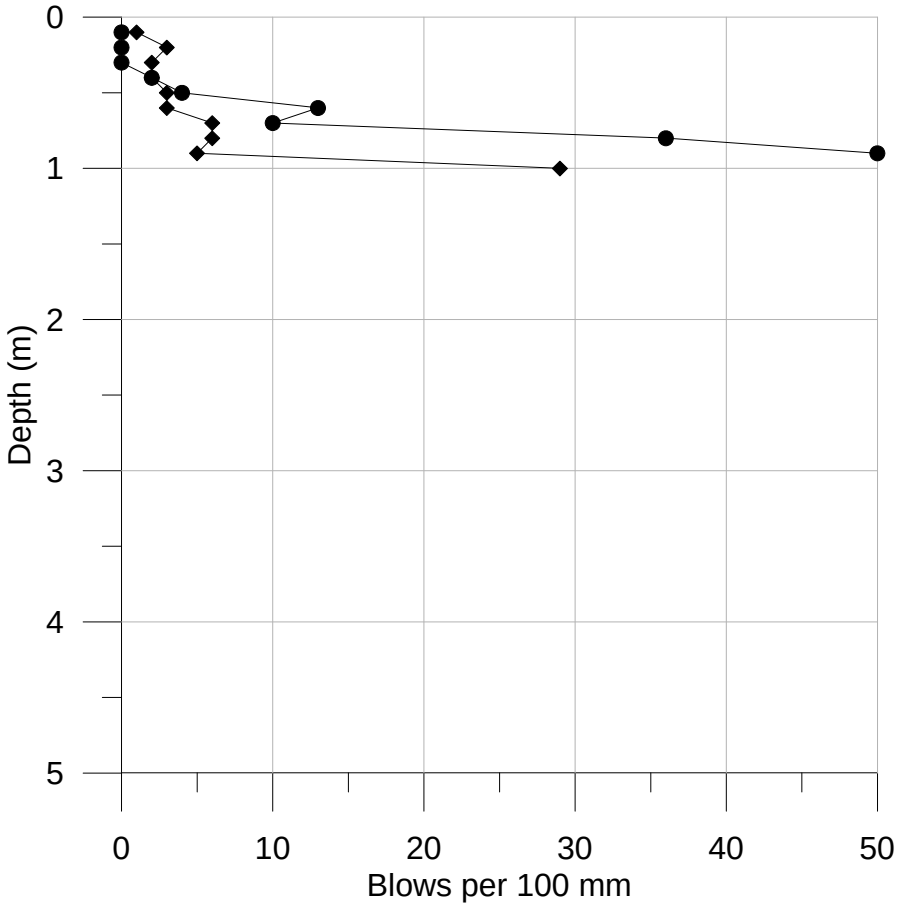
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near BH-BGC11-53

PROJECT No.	FIG No.	REV.
0792-006	G-26	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



LEGEND

BH-BGC11-55 (TEST A)

BH-BGC11-55 (TEST B)

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

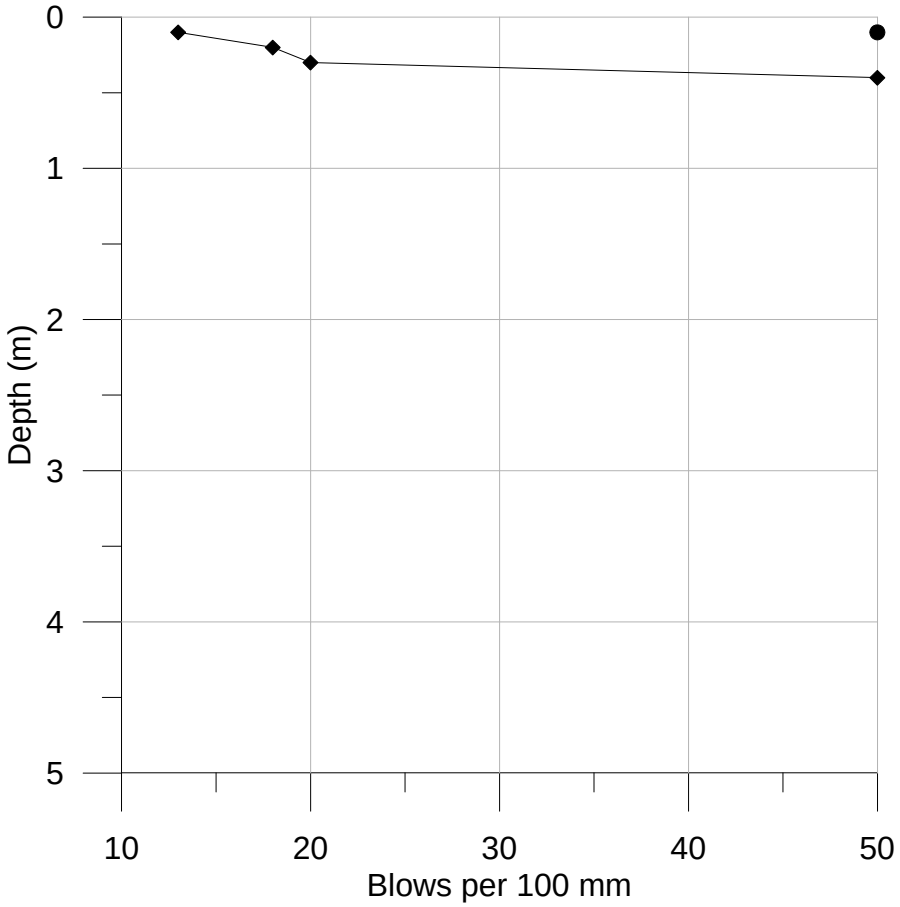
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near BH-BGC11-55

PROJECT No.	FIG No.	REV.
0792-006	G-27	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



LEGEND

TP-BGC11-103 (TEST A)

TP-BGC11-103 (TEST B)

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

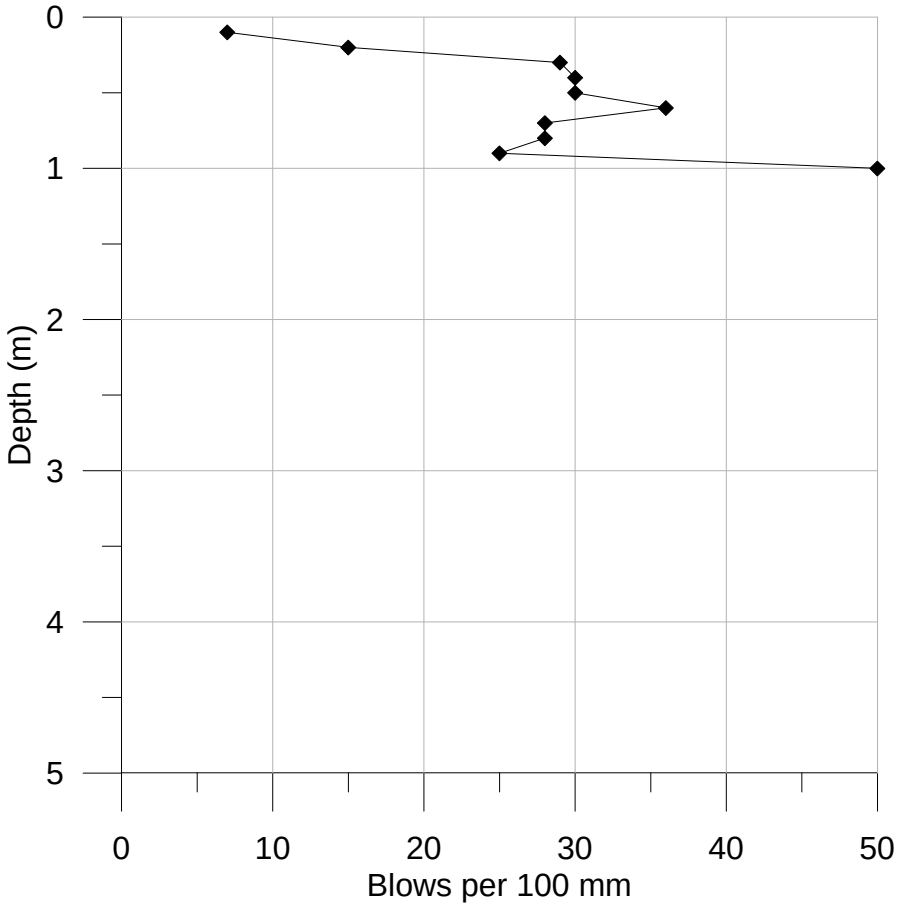
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near TP-BGC11-103

PROJECT No.	FIG No.	REV.
0792-006	G-32	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

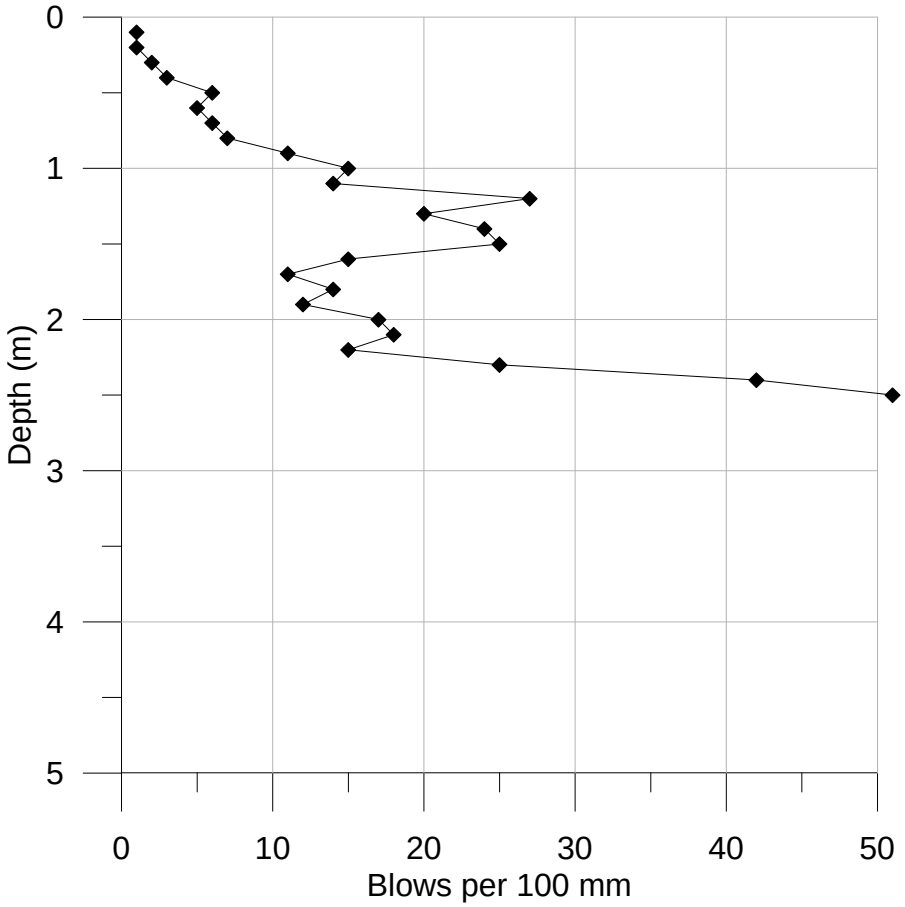
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near TP-BGC11-105

PROJECT No.	FIG No.	REV.
0792-006	G-33	0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

J:\0863 Cerro Casale\0863-003 Plantsite\05 Reporting\REV A Plant Site Report\3_Appendices\J_Settlement Calcs\Figures\Settlement-scenarios.pdf



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

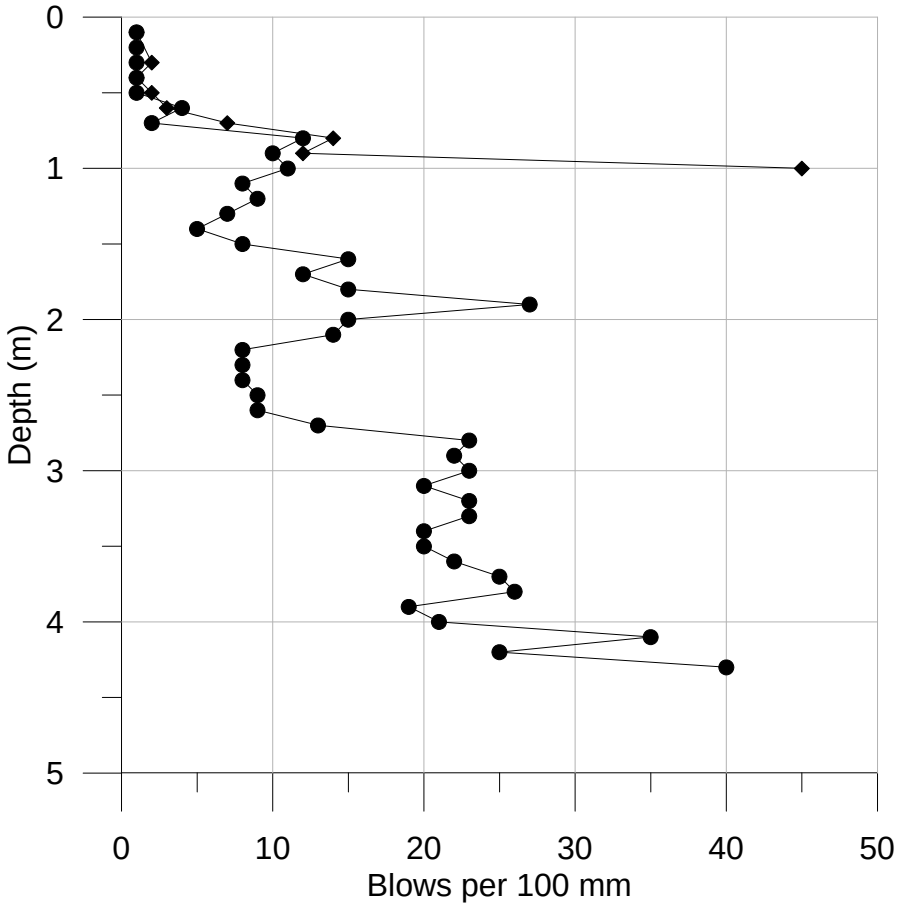
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near TP-BGC11-62

PROJECT No.	FIG No.	REV.
0792-006	G-28	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



LEGEND

TP-BGC11-69 (TEST A)

TP-BGC11-69 (TEST B)

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

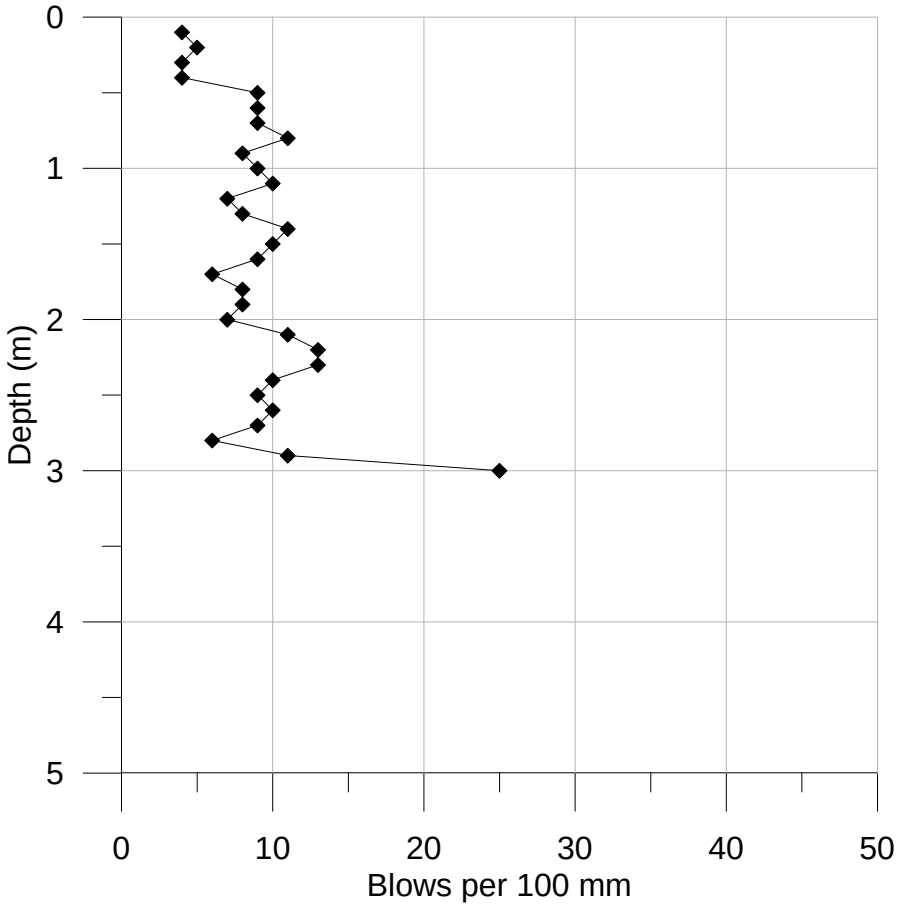
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near TP-BGC11-69

PROJECT No.	FIG No.	REV.
0792-006	G-29	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

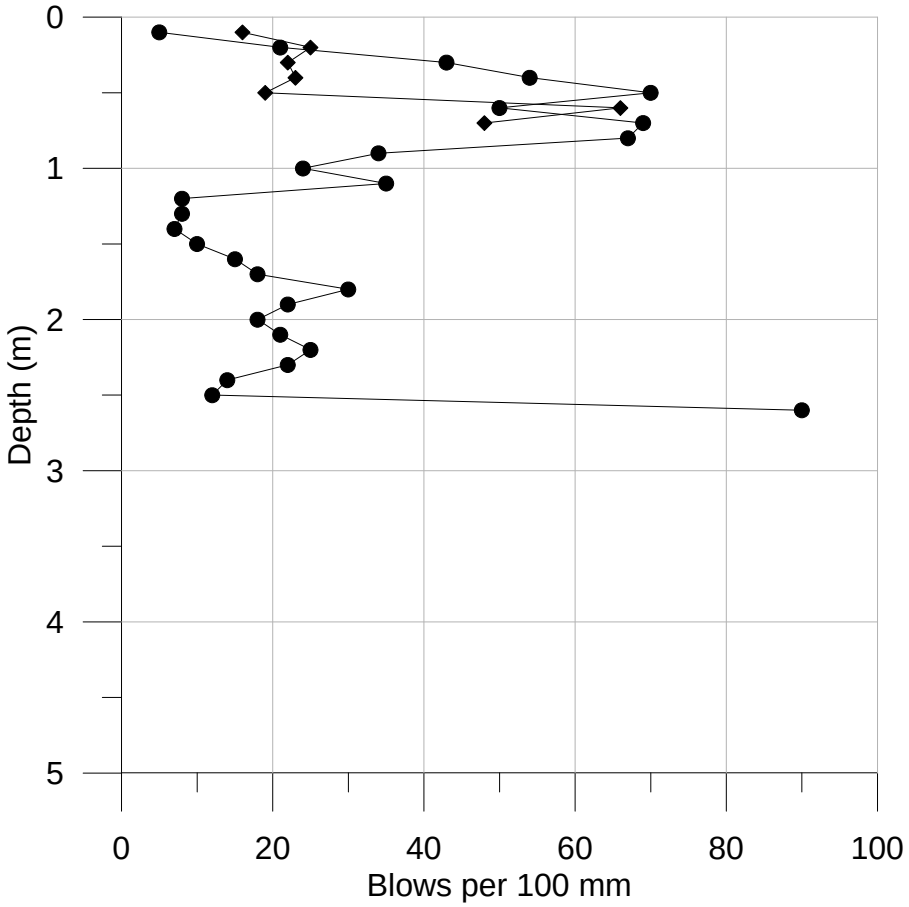
TITLE: Wildcat Penetrometer Testing near TP-BGC11-90

PROJECT No.	FIG No.	REV.
0792-006	G-30	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

Note:
Frozen ground present between 0.1 m to 2.0 m.



LEGEND
TP-BGC11-94 (TEST A)
TP-BGC11-94 (TEST B)

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

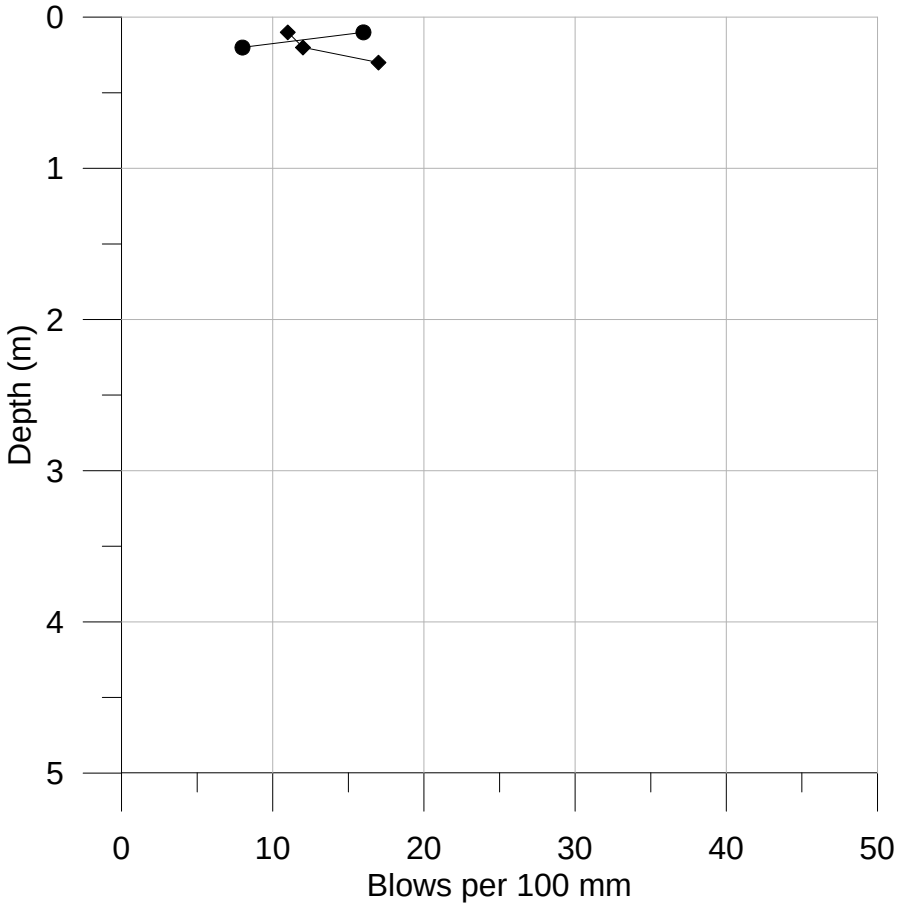
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near TP-BGC11-94

PROJECT No.	FIG No.	REV.
0792-006	G-31	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



LEGEND

Placer Tailings (PQ12-A)

Placer Tailings (PQ12-B)

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

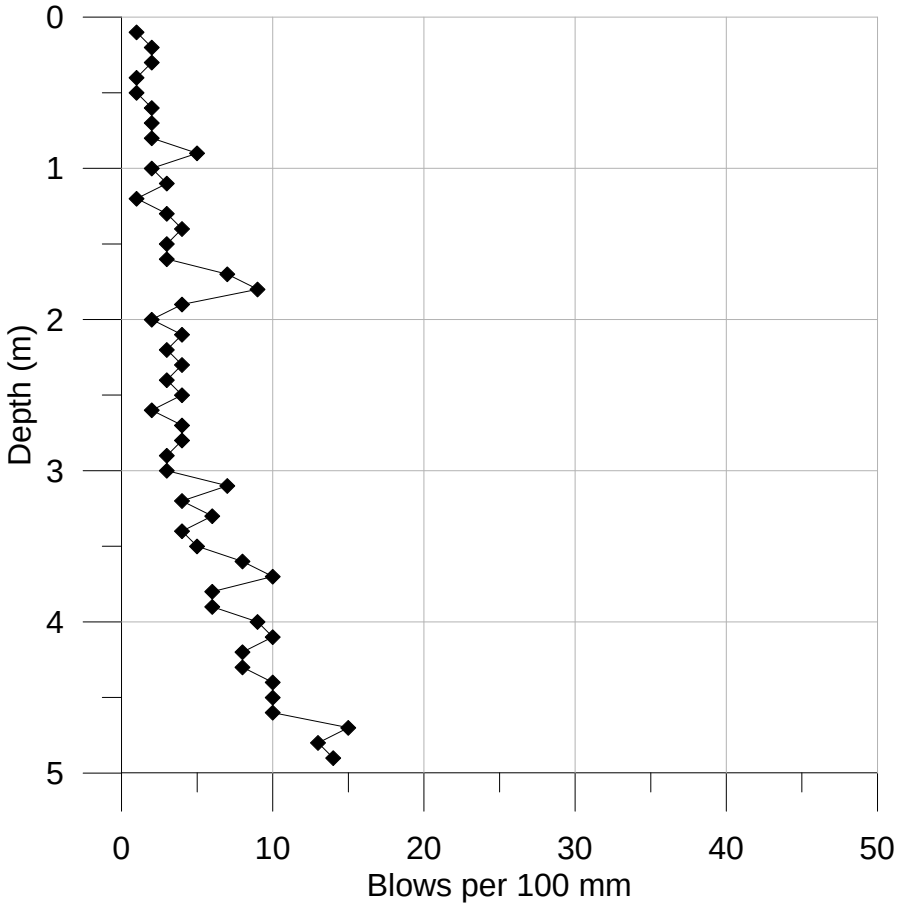
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing
Placer Tailings (PQ12)

PROJECT No.	FIG No.	REV.
0792-006	G-36	0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

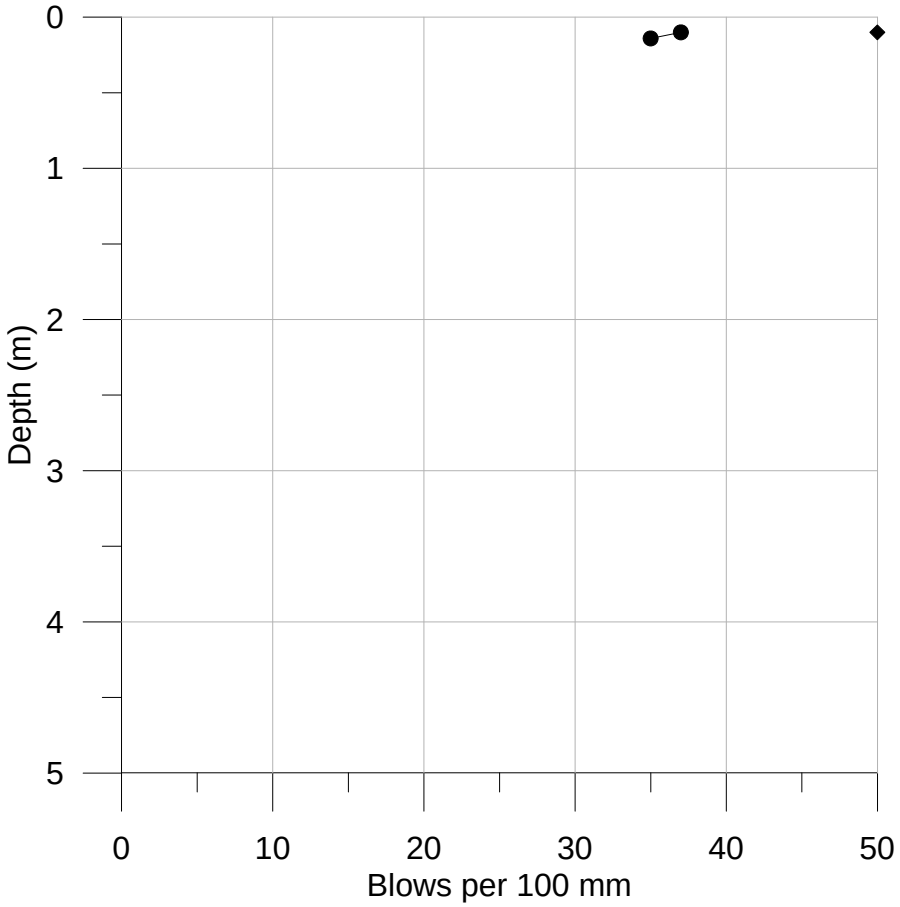
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing near Placer Tailings (PQ13)

PROJECT No.	FIG No.	REV.
0792-006	G-37	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



LEGEND

Placer Tailings (PQ6-A)

Placer Tailings (PQ6-B)

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

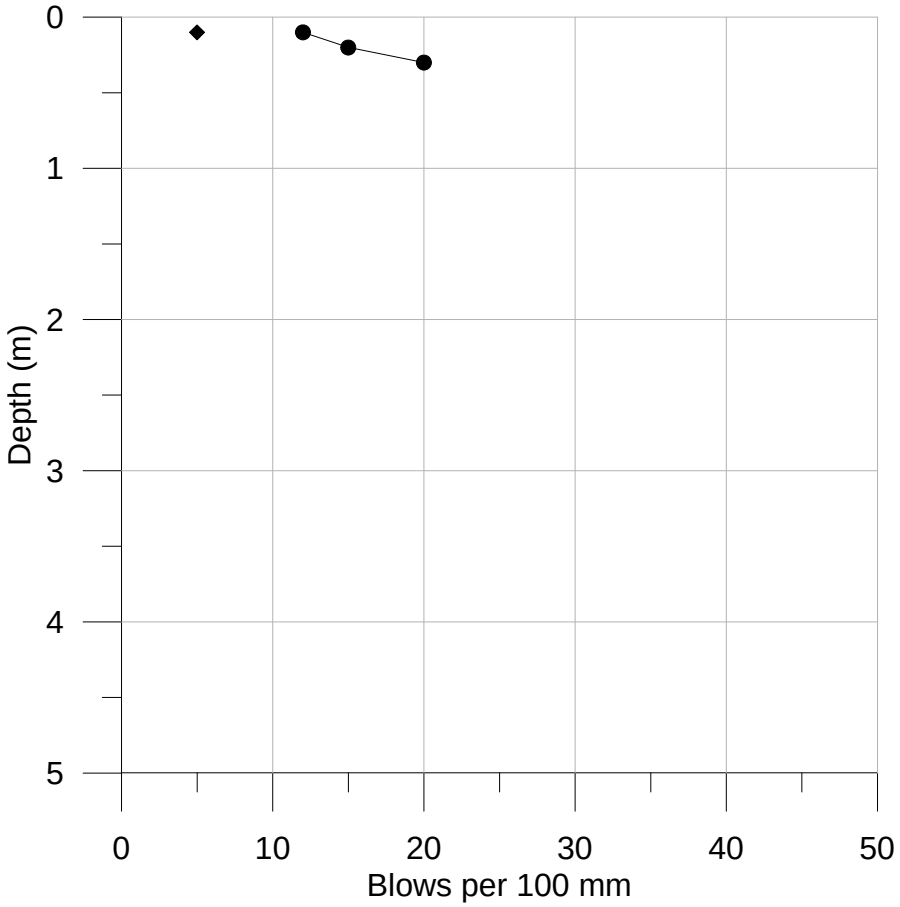
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing
Placer Tailings (PQ6)

PROJECT No.	FIG No.	REV.
0792-006	G-34	0

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots



LEGEND

Placer Tailings (PQ7-A)

Placer Tailings (PQ7-B)

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

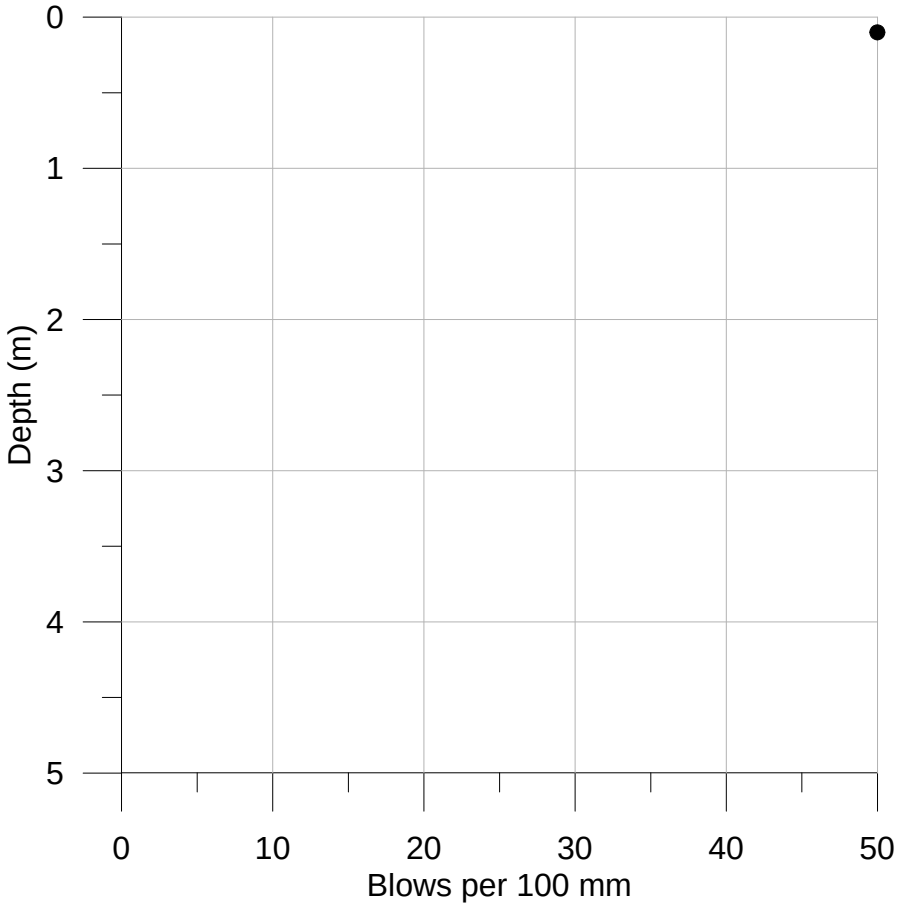
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing
Placer Tailings (PQ7)

PROJECT No.	FIG No.	REV.
0792-006	G-35	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.



LEGEND

PQ14 (TEST B)

PQ14 (TEST B)

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	KH
DATE:	JAN 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: Wildcat Penetrometer Testing
PQ14

PROJECT No.	FIG No.	REV.
0792-006	G-38	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix G Penetration Testing\WildCat\grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", DATED JAN 2012.

APPENDIX H
GEOPHYSICS

BGC ENGINEERING INC.

REPORT ON

SEISMIC REFRACTION AND

DOWNHOLE SEISMIC INVESTIGATION

PROPOSED MINE SITE FACILITIES

EAGLE GOLD PROJECT

YUKON

by

Alex Smith, M.Sc.

Russell Hillman, P.Eng.

September, 2011 **PROJECT FGI-1216**

Frontier Geosciences Inc. 237 St. Georges Avenue, North Vancouver, B.C., Canada V7L 4T4
Tel: 604.987.3037 Fax: 604.984.3074

CONTENTS

	page
1. INTRODUCTION	1
2. THE SEISMIC REFRACTION SURVEY METHOD	3
2.1 Equipment	3
2.2 Survey Procedure	3
2.3 Interpretive Method	3
3. THE DOWNHOLE SEISMIC SURVEY	4
3.1 Equipment	4
3.2 Survey Procedure	4
3.3 Post-Processing Data Reduction	5
4. GEOPHYSICAL RESULTS	6
4.1 General	6
4.2 Discussion	6
4.2.1 Heap Leach Embankment and Placer Tailings	6
4.2.2 Crusher Site Boreholes	11
4.2.3 Supplementary MASW profiles	11
5. LIMITATIONS	12

ILLUSTRATIONS

		location
Figure 1	Survey Location Plan	Page 2
Figure 2	Contact Water Dam - Site Plan	Appendix
Figure 3	Interpreted Depth Section SL-1	Appendix
Figure 4	Interpreted Depth Section SL-2A	Appendix
Figure 5	Interpreted Depth Section SL-2B	Appendix
Figure 6	Interpreted Depth Section SL-3	Appendix
Figure 7	Interpreted Depth Section SL-5A	Appendix
Figure 8	Interpreted Depth Section SL-5B	Appendix
Figure 9	Interpreted Depth Section SL-5C	Appendix
Figure 10	Interpreted Depth Section SL-7	Appendix
Figure 11	Interpreted Depth Section SL-8A	Appendix

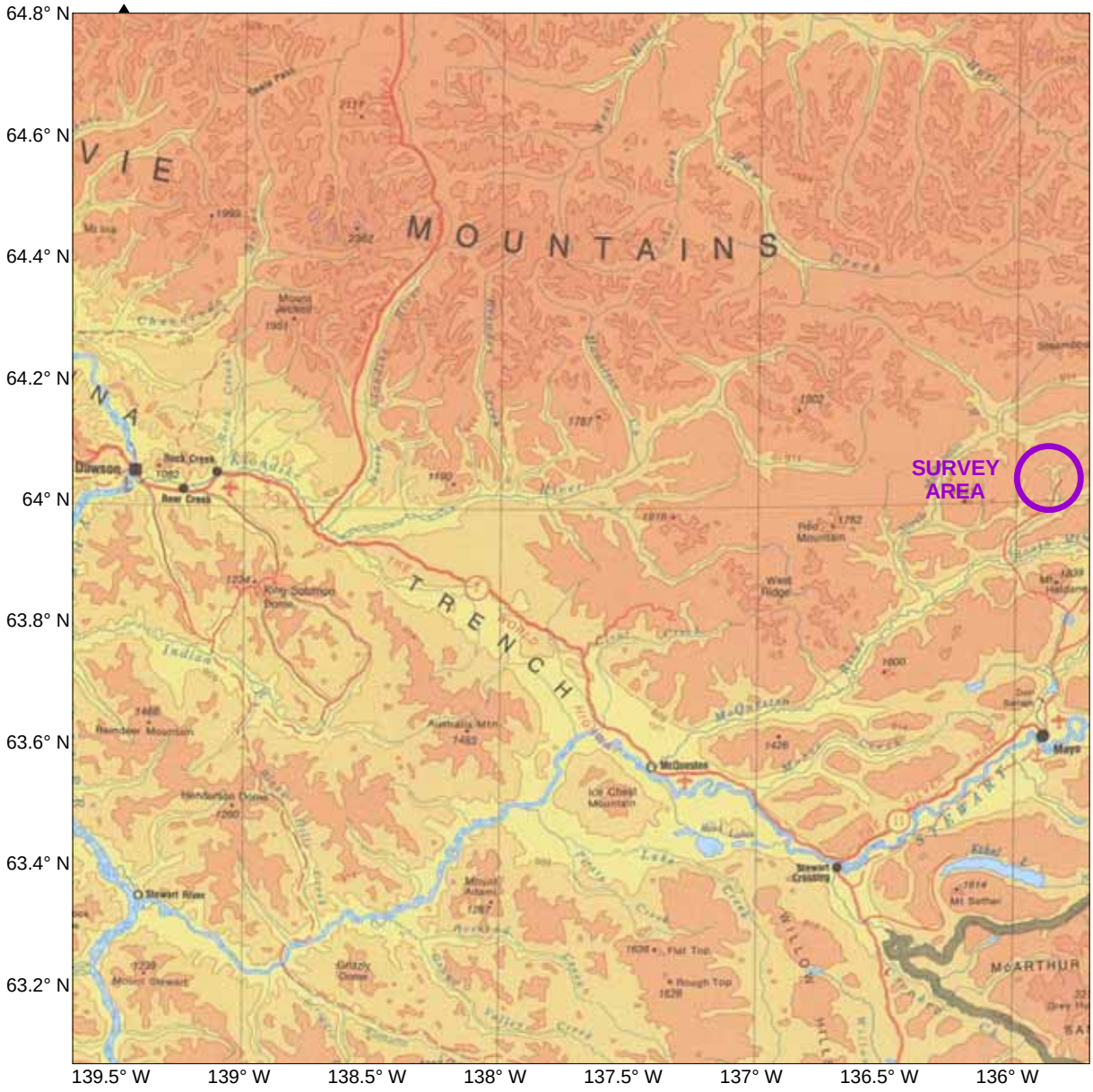
Figure 12	Interpreted Depth Section SL-8B	Appendix
Figure 13	Interpreted Depth Section SL-8C	Appendix
Figure 14	Interpreted Depth Section SL-10A	Appendix
Figure 15	Interpreted Depth Section SL-10B	Appendix
Figure 16	Interpreted Depth Section SL-10C	Appendix
Figure 17	Interpreted Depth Section SL-12	Appendix
Figure 18	Interpreted Depth Section SL-33A	Appendix
Figure 19	Interpreted Depth Section SL-33B	Appendix
Figure 20	Interpreted Depth Section SL-33C	Appendix
Figure 21	Borehole BH11-28 P and S wave Velocities	Appendix
Figure 22	Borehole BH11-32 P and S wave Velocities	Appendix
Figure 23	Borehole BH11-33 P and S wave Velocities	Appendix
Figure 24	Borehole BH11-34 P and S wave Velocities	Appendix
Figure 25	Borehole BH11-36 P and S wave Velocities	Appendix
Figure 26	Borehole BH11-39 P and S wave Velocities	Appendix
Figure 27	Borehole BH11-40B P and S wave Velocities	Appendix
Figure 28	Borehole BH11-52 P and S wave Velocities	Appendix
Figure 29	Borehole BH11-59 P and S wave Velocities	Appendix
Figure 30	Borehole BH11-62 P and S wave Velocities	Appendix
Figure 31	Borehole BH11-69 P and S wave Velocities	Appendix
Figure 32	MASW Profile SL-2, Station 300M	Appendix
Figure 33	MASW Profile SL-7, Station 155M	Appendix
Figure 34	MASW Profile SL-7, Station 185M	Appendix
Figure 35	MASW Profile SL-33, Station 165M	Appendix
Figure 36	MASW Profile SL-33, Station 360M	Appendix
Figure 37	MASW Profile SL-33, Station 380M	Appendix

1. INTRODUCTION

During the period August 24 to September 8, 2011, Frontier Geosciences Inc. carried out a seismic refraction and downhole compressional and shear wave investigation for BGC Engineering Inc. at Victoria Gold Corporation's Eagle Gold Project in the Tintina Gold Belt, central Yukon. The site is located approximately 50 kilometres north of the town of Mayo, at the intersection of Dublin Gulch and Haggart Creek. A Survey Location Plan of the area is shown at a scale of 1:1,250,000 in Figure 1.

The purpose of the seismic refraction and downhole surveys was to determine geological conditions at the proposed Heap Leach Embankment, Events Ponds and Plant Site Area. In addition, shear and compressional downhole surveys were conducted in three boreholes in the vicinity of the proposed Crusher site. A Site Plan of the survey area is presented at 1:10,000 scale in Figure 2 in the Appendix.

In all, 10 separate seismic traverses and 11 downhole compressional and shear wave surveys were completed at the proposed mine site. A total of approximately 5335 metres of detailed seismic refraction surveying was carried out in the investigation on 51 separate seismic spreads.



0 12.5 25 37.5 50

KILOMETRES

BGC ENGINEERING INC. EAGLE GOLD PROJECT		
GEOPHYSICAL SURVEY		
SURVEY LOCATION PLAN		
FRONTIER GEOSCIENCES INC.		
DATE: SEPT. 2011	SCALE 1:1,250,000	FIG. 1

2. THE SEISMIC REFRACTION SURVEY METHOD

2.1 Equipment

The seismic refraction investigation was carried out using a Geometrics, Geode, 24 channel, signal enhancement seismograph and Mark Products Ltd., 48 Hz geophones. Geophone intervals along the multi-cored seismic cables were maintained at 5 metres in order to produce high resolution data on subsurface layering as well as to ensure adequate coverage of the basal layer. The zero delay or instantaneous blasting caps in the small explosive charges used for energy input, were detonated electrically with a Geometrics, HVB-1, high voltage, capacitor type blaster.

2.2 Survey Procedure

For each spread, the seismic cable was stretched out in a straight line and the geophones implanted. Six separate 'shots' were then initiated: one at either end of the geophone array, two at intermediate locations along the seismic cable, and one off each end of the line to ensure adequate coverage of the basal layer. The shots were detonated individually and arrival times for each geophone were recorded digitally in the seismograph. Data recorded during field surveying operations was generally of good to excellent quality.

Throughout the survey, notes were recorded regarding seismic line positions in relation to topographic and geological features, and survey stations in the area. Relative elevations on the seismic lines were recorded by chain and inclinometer with absolute elevations taken from a digital elevation model provided by BGC Engineering Inc.

2.3 Interpretive Method

The final interpretation of the seismic data was arrived at using the method of differences technique. This method utilises the time taken to travel to a geophone from shotpoints located to either side of the geophone. Using the total time, a small vertical time is computed which represents the time taken to travel from the refractor up to the ground surface. This time is then multiplied by the velocity of each overburden layer to obtain the thickness of each layer at that point.

3. THE DOWNHOLE SEISMIC SURVEY

3.1 Equipment

The downhole seismic survey was carried out with the Geometrics, Geode, 24 channel, signal enhancement seismograph which was also used for digital storage of the data. The receiver package employed was a Sercel GS14-L3 triaxial, downhole geophone package. The two horizontal geophones in the package are optimal for recording the down-going, horizontally polarised, shear wave generated at the ground surface. The package was held against the casing wall by a spring steel carrier which was acoustically decoupled from the suspending cable and the weight that draws the carrier down the drillhole.

The shear wave source was a large wooden beam approximately 2 metres in length which was secured against the ground for good shear wave transmission. Force was applied to both ends of the beam with a sledge hammer to provide both positive and negative wave directions. The compressional wave source was produced by applying the sledge hammer to a steel impact plate on the ground surface. In both the shear wave and the compressional wave surveys, an electric circuit was switched-closed with the impact of the sledgehammer, to trigger the record and provide accurate zero times.

3.2 Survey Procedure

Field procedure consisted of lowering the geophone package to the measuring point in the hole and ensuring firm coupling of the geophones to the drillhole wall. The holes were tested every 0.5 metres. The secured wood beam was then struck horizontally from one end with the sledge hammer to produce a shock wave rich in shear wave energy. The horizontal geophones in the downhole triaxial package are sensitive to horizontally polarised shear wave arrivals. After recording of the first impact, the source beam was struck horizontally from the opposite end. The shear wave recorded downhole from the second impact produced an opposite polarity to the initial impact. By recording impacts from each end at every depth location, the oppositely polarised shear waves were plotted to optimise the arrival times of the horizontal shear waves.

A compressional wave was also produced by striking the steel impact plate with the hammer. This produced a well defined compressional wave from the point of impact that penetrated the depth of the holes. This compressional wave was recorded by the vertical geophone in the triaxial package

3.3 Post-Processing Data Reduction

Initial analysis of the shear wave downhole data was conducted on site directly after data acquisition. Observations were made to ensure data quality and validity. Following data acquisition, the overlapping opposite direction blows for each depth station were plotted on a single baseline. This enabled recognition of the phase of the arrival from one depth station to the next.

Initial monitoring and analysis of the compressional wave downhole data was also conducted on site to confirm data quality and validity.

The picking of the first arrival times involved identification of the shear wave break on the basis of polarity, increase in amplitude and abrupt change in frequency. An evaluation of the location of the first break was made on the location of the departure from the baseline of oppositely polarised data. This was also facilitated by comparison with data recorded both above and below the data point and by knowledge that arrival times must increase with depth. The same procedure was followed for the picking of the first arrivals of the compressional wave with the exception of polarity change.

4. GEOPHYSICAL RESULTS

4.1 General

The majority of the 10 seismic profiles were conducted along the placer deposits in Dublin Gulch and across the Gulch at the proposed location of the Heap Leach Embankment. The results of the seismic interpretations for these lines are presented at 1:500 scale in Figures 3 through 20 of the Appendix. Compressional and shear wave velocity profiles for the surveyed boreholes within the proposed Plant site, Event Ponds, Heap Leach Facility and Crusher site are shown in Figures 21 through 31 in the Appendix.

4.2 Discussion

4.2.1 Heap Leach Embankment and Placer Tailings

A primary focus of the survey was to determine depths to bedrock and geological conditions within the previously deposited placer tailings and the proposed location of the Heap Leach Embankment.

Seismic lines SL-12, SL-2 and SL-33 were surveyed from west to east along the placer tailings deposits within Dublin Gulch. The seismic refraction data indicate the area is underlain by three or four velocity layers. In many areas, the deeper intermediate velocity layer is associated with a layer of highly weathered bedrock.

The surficial layer with compressional (P) wave velocities ranging from 305 m/s to 650 m/s, averages approximately 3.5 metres in thickness across the three traverses. This layer correlates to shallow shothole and drillhole intersections of cobbles, gravel, sand, silt and clay.

The surficial layer is underlain by one or two intermediate layers exhibiting significant variations in compressional wave velocities. Line SL-12 contains two intermediate layers with the shallower intermediate layer displaying (P-wave) velocities of 675 m/s to 1000 m/s. This narrow range in velocities is consistent with more compact silt, sand and silty sand. This shallow intermediate layer is underlain by a second intermediate layer with velocities varying from 1400 m/s to 1750 m/s. With an average thickness of 19.5 metres, the velocities suggest this layer is composed of very compact, saturated placer tailings. There exists however, the possibility that the base of this layer may be highly weathered bedrock.

The majority of line SL-2 is interpreted to be underlain by three velocity layers with the onset of a fourth layer at approximate station 420E. This intermediate layer with velocities from 700 m/s to 1700 m/s, correlates with drill log intersections of silt, sand, gravel, cobbles and boulders. Higher velocities are likely associated with localized zones of coarser or denser material. The deeper intermediate layer from 420E to the east end of the line, has a compressional wave velocity of approximately 1900 m/s. Borehole intersections of bedrock at a depth of 11.6 metres in DH-BGC09-DG-3, indicate this layer is highly weathered bedrock. Intersections of granodiorite boulders intermixed with gravel and cobbles immediately above the bedrock may account for the two metre discrepancy between the interpreted bedrock surface and the borehole intersection.

There is good agreement between the interpreted bedrock surface and the intersection of bedrock in borehole BH-BGC11-32. Downhole shear wave velocities for BH-BGC11-32 indicate the surficial materials have a shear wave velocity of 120 m/s. Velocities vary from 265 m/s to 480 m/s throughout the thick sequence of cobbles and boulders and increase to a value of 670 m/s at the onset of the highly weathered bedrock. Compressional wave velocities determined from the downhole survey are elevated when compared with values from seismic refraction analysis. This discrepancy may be associated with the downhole pressure wave preferentially travelling through the grout column.

Seismic line SL-33 was located between borehole DH-BGC09-DG-3 and a point north and east of borehole BH-BGC11-52. This traverse is underlain by four layers to station 560ENE, where the interpreted weathered bedrock layer pinches out against the basal, competent bedrock. The shallow intermediate layer exhibits compressional wave velocities ranging from 500 m/s to 1600 m/s. With an average thickness of 6.9 metres, the velocities generally increase to the east along the traverse. This correlates well with an increase in coarse materials observed in geotechnical investigations in the site area. The deeper intermediate layer is likely associated with the onset of weathered bedrock as observed in boreholes DH-BGC09-DG-3 and BH-BGC11-33. In the approximate station interval 300ENE to 440ENE, this layer may be associated with lower compressional wave sands and gravels. Black dashed lines on the sections indicate possible transitions from weathered bedrock to tailings material within this velocity layer. Basal layer velocities from 3075 m/s to 4240 m/s, denote the competent metasedimentary bedrock surface.

Shear wave velocity surveying of BH-BGC11-33 yielded values from 205 m/s to 510 m/s in the initial 8.5 metres of the borehole. There is a noticeable increase to 800 m/s at the onset of the weathered bedrock. Similarly, borehole BH-BGC11-34 exhibits shear wave velocities of

205 m/s to 510 m/s in the initial 15 metres of the hole. Below 15 metres, the shear wave velocity increases to 800 m/s. This velocity increase correlates reasonably well with the onset of weathered bedrock at a depth of 16.3 metres.

Seismic line SL-8 was situated between borehole BH-BGC11-34 to a point roughly 125 metres northeast of BH-BGC11-28. This traverse, with the exception of a segment from 290NE to 390NE, is believed to be underlain by four velocity layers. The surficial layer averages only 2.2 metres in thickness and exhibits compressional wave velocities of 305 m/s to 375 m/s. Consistent with loose soils, sands and gravels, this layer is underlain by a more compact layer of sands and gravels with velocities of 550 m/s to 1375 m/s. Borehole BH-BGC11-28 located approximately 11 metres off the line, indicates this layer may in places, be comprised of highly weathered bedrock. This shallower intermediate layer is underlain by a weathered bedrock layer with velocities ranging from 1350 m/s to 2450 m/s. The interpreted thicknesses of the weathered bedrock layer vary from 2 m to 28.7 metres, and average 14.6 metres. The basal layer with velocities from 3100 m/s to 4350 m/s is the interpreted competent bedrock surface.

Borehole BH-BGC11-28 has a calculated shear wave velocity of 210 m/s for the surficial 3.5 metres of moderately weathered bedrock. The velocity increases significantly to 880 m/s in the depth interval, 3.5 m to 17 metres. Velocities vary from 650 m/s to 1130 m/s below 17 metres depth, consistent with slightly to moderately weathered bedrock.

Seismic lines SL-1 and SL-3 cut across the placer tailings deposits in the western part of the survey area. Seismic line SL-1 has surficial layer velocities of 300 m/s to 445 m/s, which coincide with borehole intersections of silts and sands. This surficial layer is underlain by a thicker section of sands, gravels, cobbles and boulders exhibiting compressional wave velocities of 500 m/s to 1000 m/s. A deeper intermediate layer with velocities of 1500 to 1600 m/s coincides with the borehole intersection of sands, silts and gravels. This layer and the corresponding higher velocities is in good agreement with saturated conditions and the expected water table. The basal layer is interpreted to be competent bedrock, although there are two zones with abnormally low compressional wave velocities. From 45NNE to 110NNE and from 215NNE to 255NNE, compressional wave velocities varying from 2050 m/s to 2300 m/s were computed for the basal refractor These velocities likely reflect either highly weathered bedrock or significant shear zones in the bedrock.

Borehole BH-BGC11-39 located approximately 2 metres off line SL-1 shows good agreement with the interpreted seismic section. Saturated overburden velocities are observed

at approximately 10 metres depth. Shear wave velocities obtained from the borehole survey are approximatley 130 m/s in the surficial 3 metres of loose silts and sands. Velocities increase significantly to 325 m/s, at the onset of a layer of gravel, cobbles and boulders.

Seismic line SL-3 is interpreted to consist of three distinct layers, with compressional wave velocities for the surficial layer varying from 375 m/s to 420 m/s. Surficial layer thicknesses range from 0.1 metres to 8.1 metres, with the thinnest section located near the middle of the traverse. The surficial layer is underlain by a thick intermediate layer with P-wave velocities of 950 m/s to 1500 m/s. Higher velocities indicate the presence of coarser materials and possibly, increased water content. Basal velocities vary from 2125 m/s to 3630 m/s and are interpreted to be metasedimentary bedrock with varying degrees of weathering. The 2125 m/s velocity zone at the north end of the line may be indicative of either highly weathered bedrock or a shear zone in the bedrock

Parallel seismic lines SL-10 and SL-5 were oriented southeast to northwest, with line SL-5 located on the proposed heap embankment and line SL-10 running along the edge of the embankment up to the proposed Plant Site. Both lines are interpreted to be underlain by 3 or 4 velocity layers. Typically, the surficial layer is associated with loose sands and gravels with compressional wave velocities varying from 290 m/s to 550 m/s.

A thin layer of surficial material overlying weathered bedrock with compressional wave velocities of 2700 m/s to 2900 m/s, is present on the southern end of both traverses. The weathered bedrock in turn overlies more competent bedrock. The weathered bedrock layer is no longer discernible at approximately 100NW on lines SL-5 and SL-10, as indicated by the dashed black lines on the sections.

From station 110NW on line SL-10 and station 145NW on line SL-5, the interpreted sections consist of four layers. The shallow intermediate layer exhibits velocities ranging from 600 m/s to 1900 m/s. This layer is correlated in boreholes with gravel, and gravel with sand. This layer is underlain by a thicker intermediate layer with velocities of 1050 m/s to 2100 m/s. This intermediate layer is consistent with denser sands, gravels, cobbles and boulders as observed in BH-BGC11-34 on line SL-5, and highly weathered bedrock intersected in borehole BH-BGC11-33 on line SL-10. The deeper intermediate layer pinches out at the elevation low associated with the creek at 460NW on line SL-10B and 400NW on line SL-5B. Northwest of the creek, line SL-5 consists of 3 layers, with the intermediate layer varying in velocity from 750 m/s to 1900 m/s. Seismic line SL-10 has a thick intermediate layer with velocities ranging from 715 m/s to 1250 m/s from 460NW to the end of the

traverse. From station 635NW, this layer is underlain by a deeper intermediate layer with a velocity of 2050 m/s. This deeper layer is likely consistent with highly weathered bedrock.

Basal layer velocities on both lines vary from 1635 m/s to 4800 m/s, with low velocity zones observed at 495NW to 525NW and 665NW to 700NW on line SL-5, and 110NW to 120NW on line SL-10. The higher velocities are interpreted as competent metasedimentary bedrock. The three low velocity zones with values of 1635 m/s to 1900 m/s are believed to be indicative of highly weathered rock or shear zones.

Located approximately 5 metres off SL-5, borehole BH-BGC11-59 exhibits good agreement between the interpreted basal layer and the intersection of weathered bedrock. Shear wave velocities also show a noticeable increase from 290 m/s to 570 m/s at the onset of the bedrock. Inconsistent with some boreholes, the compressional wave velocities for BH-BGC11-59 compare reasonably well with the refraction results, with velocities of 2045 m/s in the frozen overburden and 3085 m/s in the slightly to moderately weathered bedrock.

The final section SL-7, is located at the eastern end of the survey area. Line SL-7 was oriented south to north and consists of 3 distinct velocity layers. The surficial layer varies in thickness from 0.3 to 4.5 metres, with an average thickness of 2.2 metres. Velocities ranging from 300 m/s to 380 m/s are consistent with loose, surficial, sands and gravels. The surficial layer is underlain by a thick layer of more compact sands, gravels and cobbles. Compressional wave velocities for this layer range from 650 m/s to 1150 m/s.

The interpreted basal layer is in good agreement with moderately weathered metasedimentary bedrock observed in borehole BH-BGC11-52. Depths to bedrock vary from 6.1 to 24.4 metres, with an average depth of 13.2 metres. Calculated basal layer velocities range from 2445 m/s to 4670 m/s. The lower velocity zone of 2445 m/s at the southern end of the line likely indicates highly to moderately weathered bedrock.

Downhole shear and compressional wave testing in borehole BH-BGC11-52 shows similar results to other boreholes, with low shear wave velocity of 115 m/s to 210 m/s in the shallow overburden materials. An increase in shear wave velocities at 4.5 metres depth to 475 m/s, coincides well with an increase in compressional wave velocities apparent on seismic line SL-7 at approximately 4 metres depth. Shear wave velocities increase again to 665 m/s at the onset of the metasedimentary rock..

4.2.2 Crusher Site Boreholes

Boreholes BH-BGC11-36, BH-BGC11-40B and BH-BGC11-62 are all located within the proposed crusher site. The boreholes all contain a thin section of overburden material overlying relatively shallow bedrock. Bedrock ranges from slightly to moderately weathered. Shear wave velocities typically exceed 800 m/s at or near, the surface of the bedrock. Shear wave testing in borehole BH-BGC11-36 resulted in one of the thickest, continuous shear wave zones in bedrock. The 1290 m/s zone is approximately 30 m thick and is underlain at a depth of about 40 m, by a 1745 m/s velocity zone that extends to the bottom of the hole.

4.2.3 Supplementary MASW Profiles.

The Multichannel analysis of surface wave (MASW) method was applied to surface seismic data within the vicinity of boreholes BH-BGC11-32, BH-BGC11-33, BH-BGC11-34 and BH-BGC11-52. The MASW profiles are presented at a vertical scale of 1:250 in Figures 32 to 37 of the Appendix. Each profile indicates the seismic line number and the distance along the traverse. Also shown at the lower left hand corner of the plots is the closest geotechnical borehole. The MASW results show general agreement with the downhole shear wave velocities calculated from borehole seismic logging.

5. LIMITATIONS

The depths to subsurface boundaries derived from seismic refraction surveys are generally accepted as accurate to within ten percent of the true depths to the boundaries. In some cases, unusual geological conditions may produce false or misleading data points with the result that computed depths to subsurface boundaries may be less accurate. In seismic refraction surveying difficulties with a 'hidden layer' or a velocity inversion may produce erroneous depths. The first condition is caused by the inability to detect the existence of a layer because of insufficient velocity contrasts or layer thicknesses. A velocity inversion exists when an underlying layer has a lower velocity than the layer directly above it. The interpreted depths shown on drawings are to the closest interface location, which may not be vertically below the measurement point if the refractor dip direction departs significantly from the survey line location.

In downhole seismic surveys, individual values taken at discrete depth points may precede or lag the anticipated arrival due to 'zero time', timing errors in the circuitry. These errors are generally quite small and average velocities taken over a broader zone are good representations of in situ shear wave and compressional wave velocities in a layer.

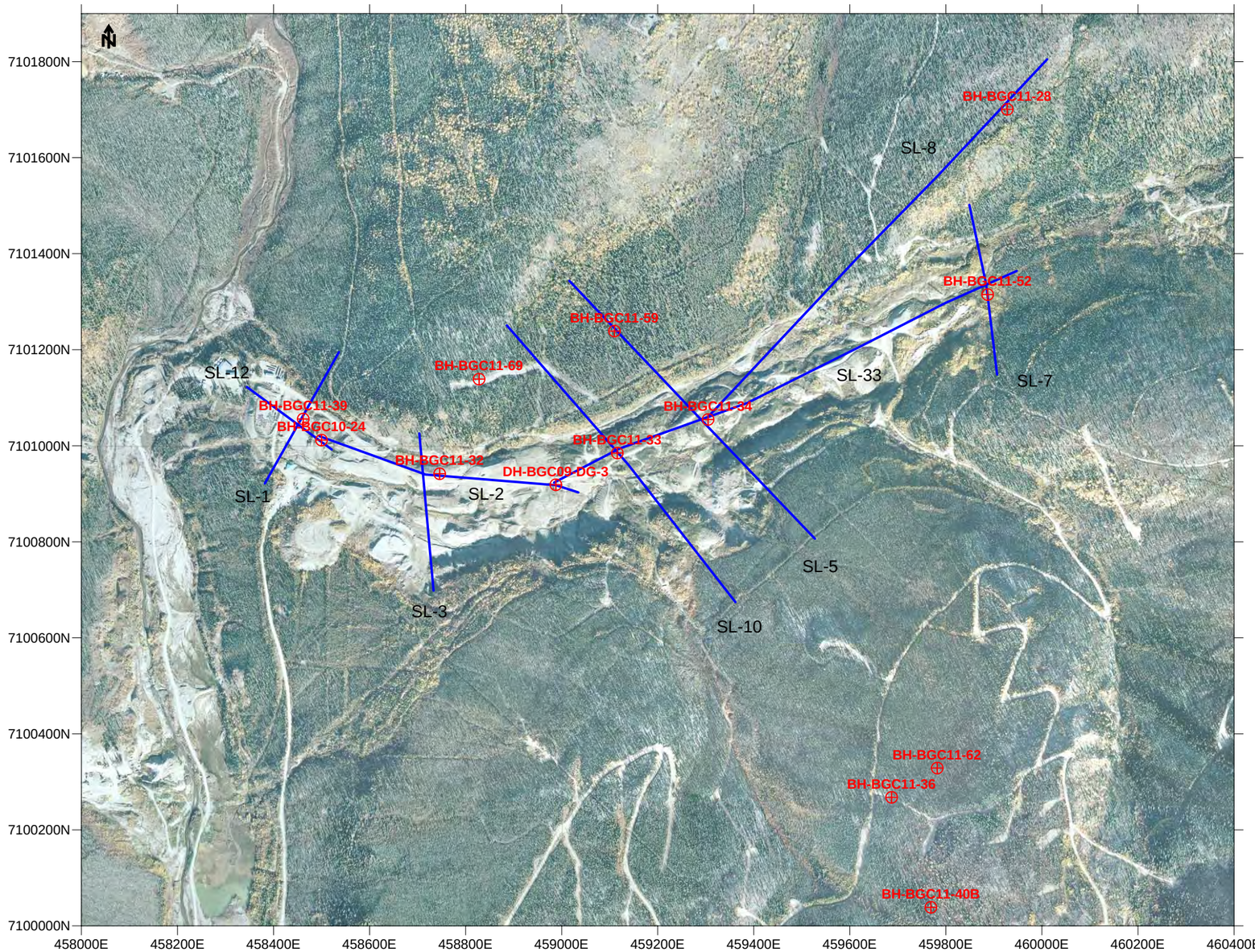
In this survey, some difficulty was encountered in downhole logging due to seismic energy travelling in the grout surrounding the plastic casing. This difficulty was generally overcome by careful picking of later seismic arrivals subsequent to the arrival of the grout wave.

The results are interpretive in nature and are considered to be a reasonably accurate representation of existing subsurface conditions within the limitations of the seismic refraction and downhole seismic methods.

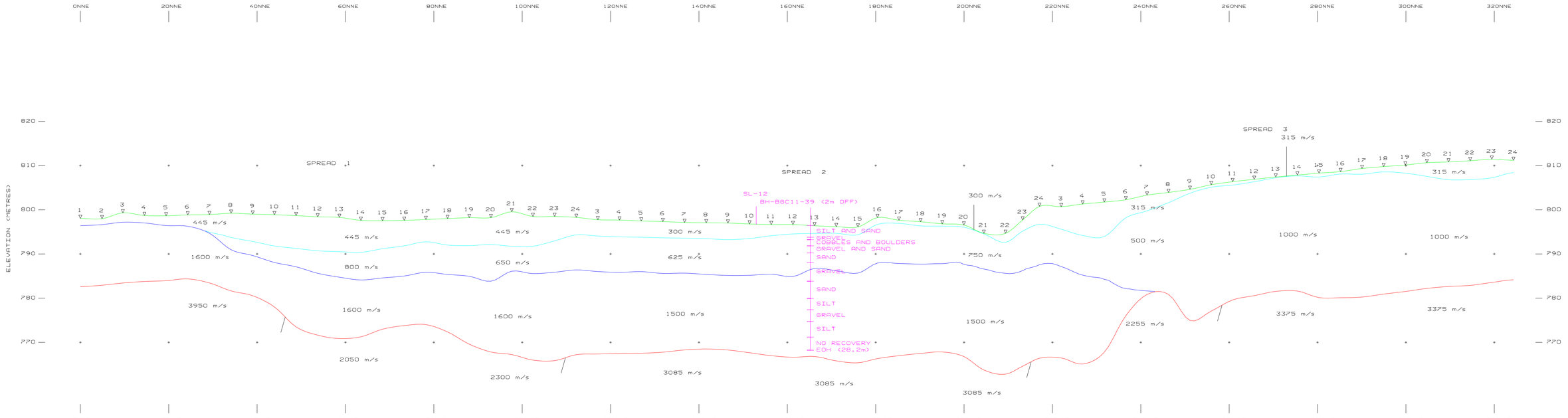
For: Frontier Geosciences Inc.

Alex Smith, M.Sc.

Russell Hillman, P.Eng.



BGC ENGINEERING INC. EAGLE GOLD PROJECT		
GEOPHYSICAL SURVEY		
SITE PLAN		
FRONTIER GEOSCIENCES INC.		
DATE: SEPT 2011	SCALE 1:10,000	FIG. 2



SEISMIC LINE SL-1

INSTRUMENT: GEOMETRICS GEODE

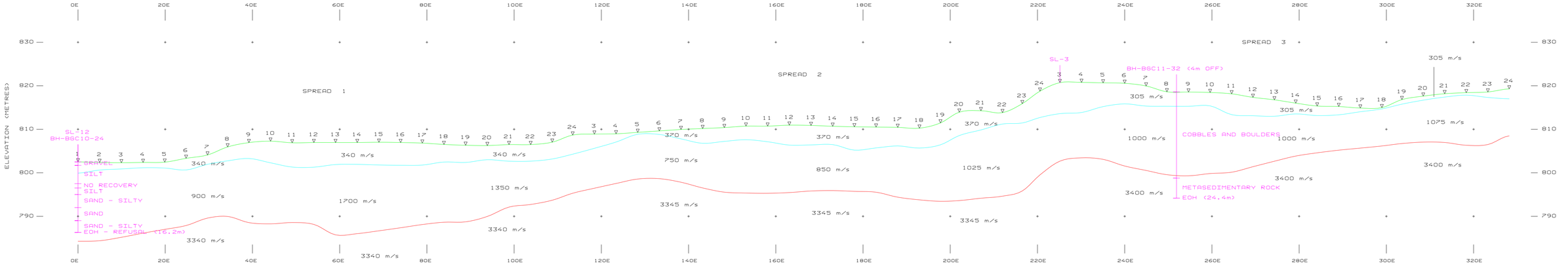
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-1

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 3



SEISMIC LINE SL-2A

INSTRUMENT: GEOMETRICS GEODE

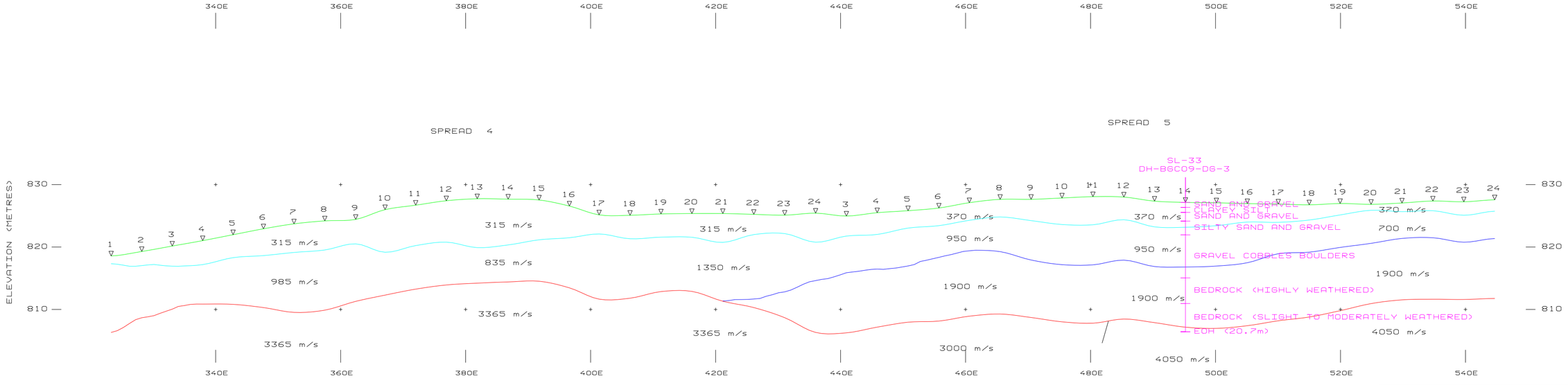
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-2A

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011 | SCALE 1:500 | FIG. 4



SEISMIC LINE SL-2B

INSTRUMENT: GEOMETRICS GEODE

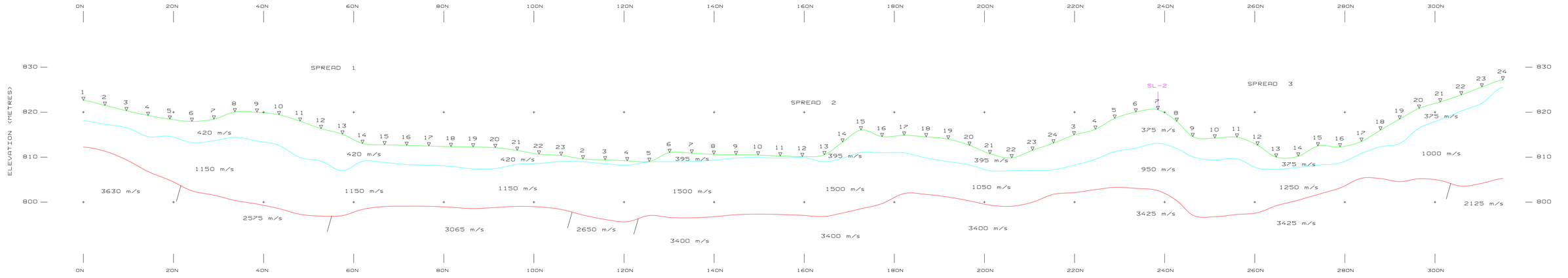
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-2B

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011 | SCALE 1:500 | FIG. 5



SEISMIC LINE SL-3

INSTRUMENT: GEOMETRICS GEODE

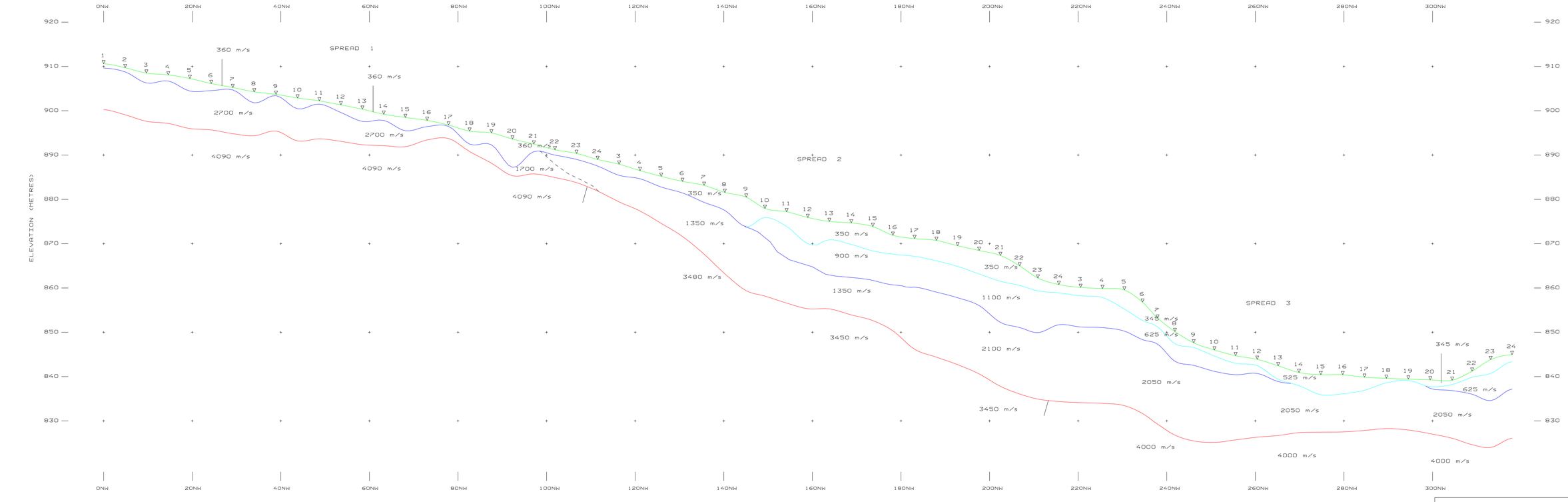
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-3

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011 | SCALE 1:500 | FIG. 6



SEISMIC LINE SL-5A

INSTRUMENT: GEOMETRICS GEODE

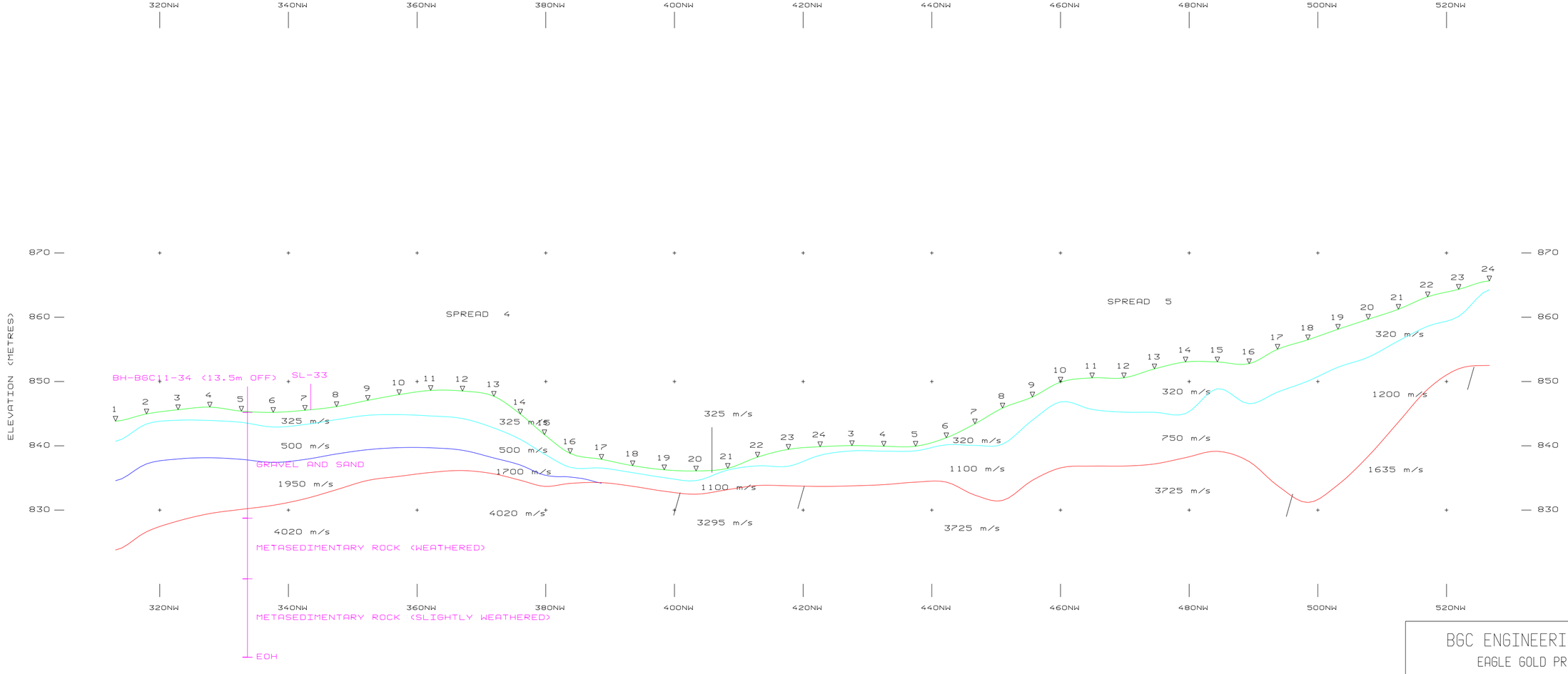
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-5A

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 7



SEISMIC LINE SL-5B

INSTRUMENT: GEOMETRICS GEODE

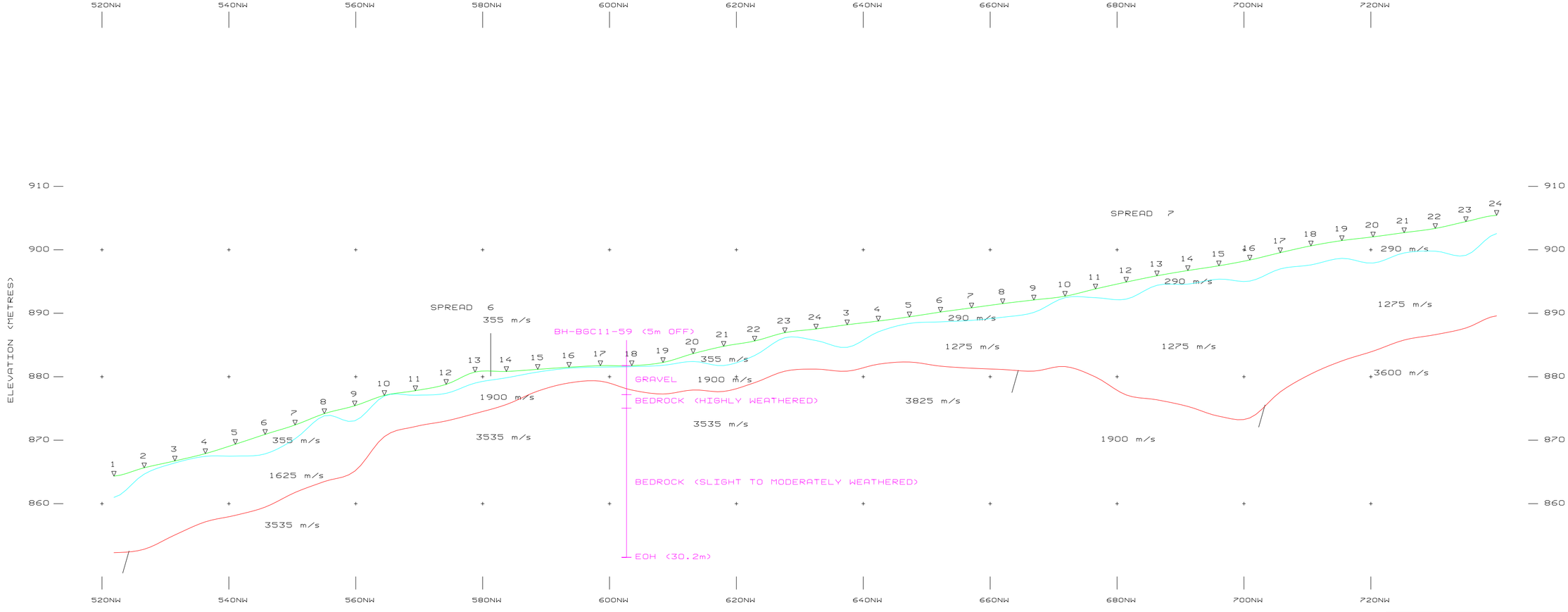
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-5B

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 8



SEISMIC LINE SL-5C

INSTRUMENT: GEOMETRICS GEODE

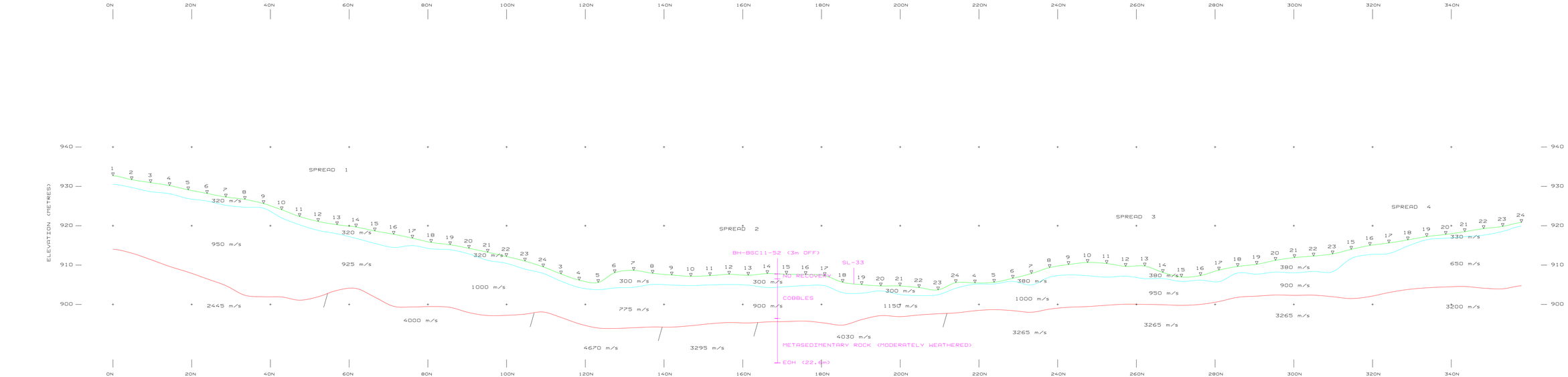
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-5C

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 9



SEISMIC LINE SL-7

INSTRUMENT: GEOMETRICS GEODE

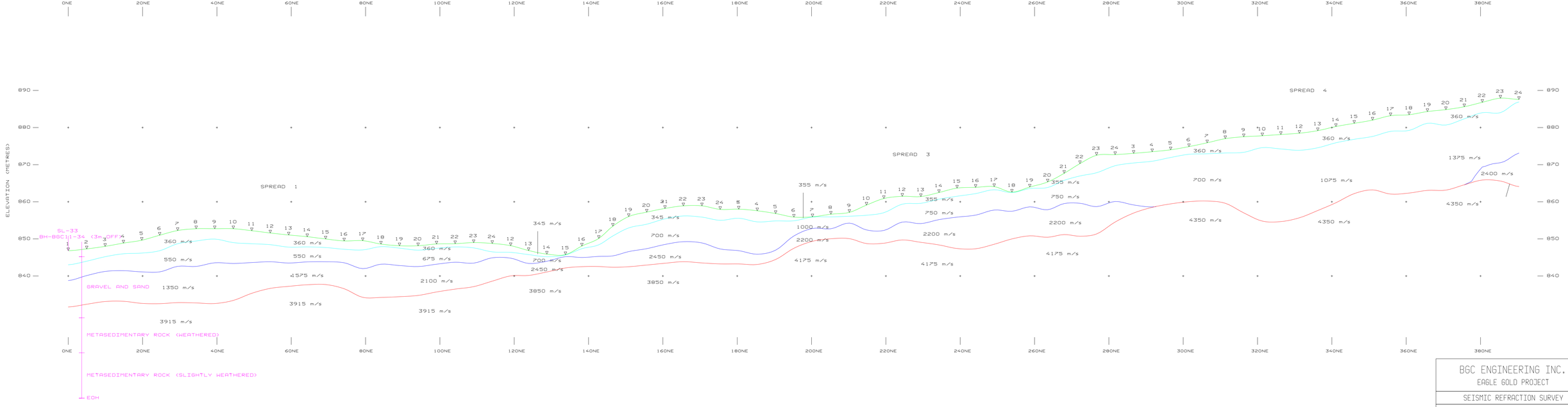
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-7

FRONTIER GEOSCIENCES INC.

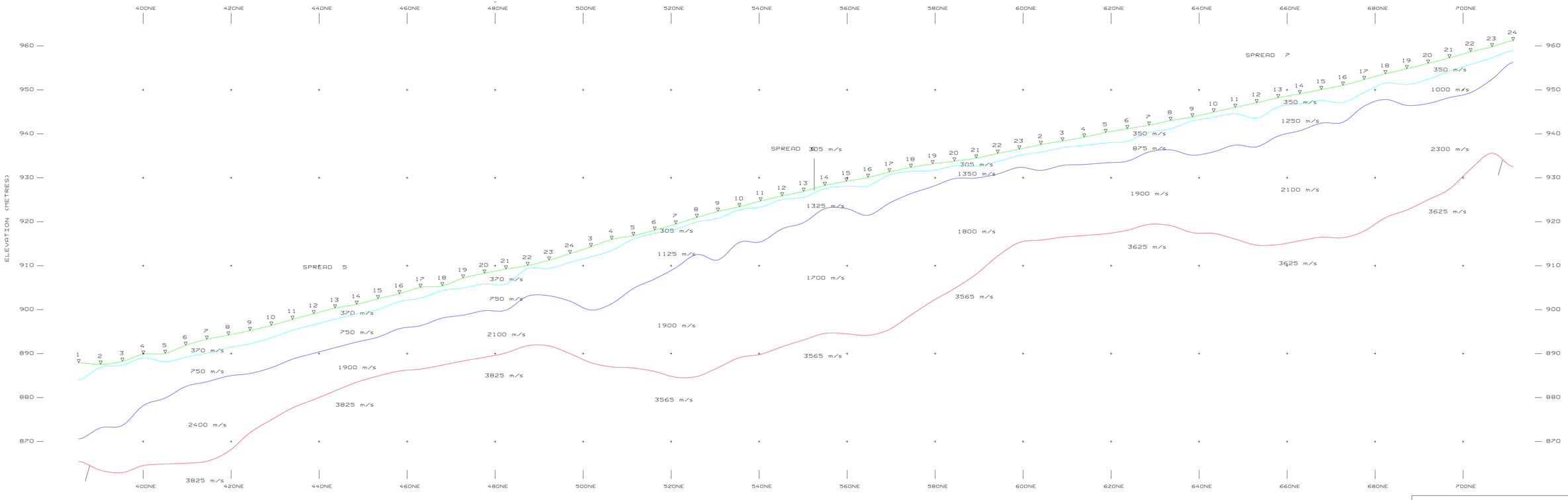
DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 10



SEISMIC LINE SL-8A

INSTRUMENT: GEOMETRICS GEODE

BGC ENGINEERING INC.
EAGLE GOLD PROJECT
SEISMIC REFRACTION SURVEY
INTERPRETED DEPTH SECTION SL-8A
FRONTIER GEOSCIENCES INC.
DATE: SEPTEMBER 2011 | SCALE 1:500 | FIG. 11



SEISMIC LINE SL-8B

INSTRUMENT: GEOMETRICS GEODE

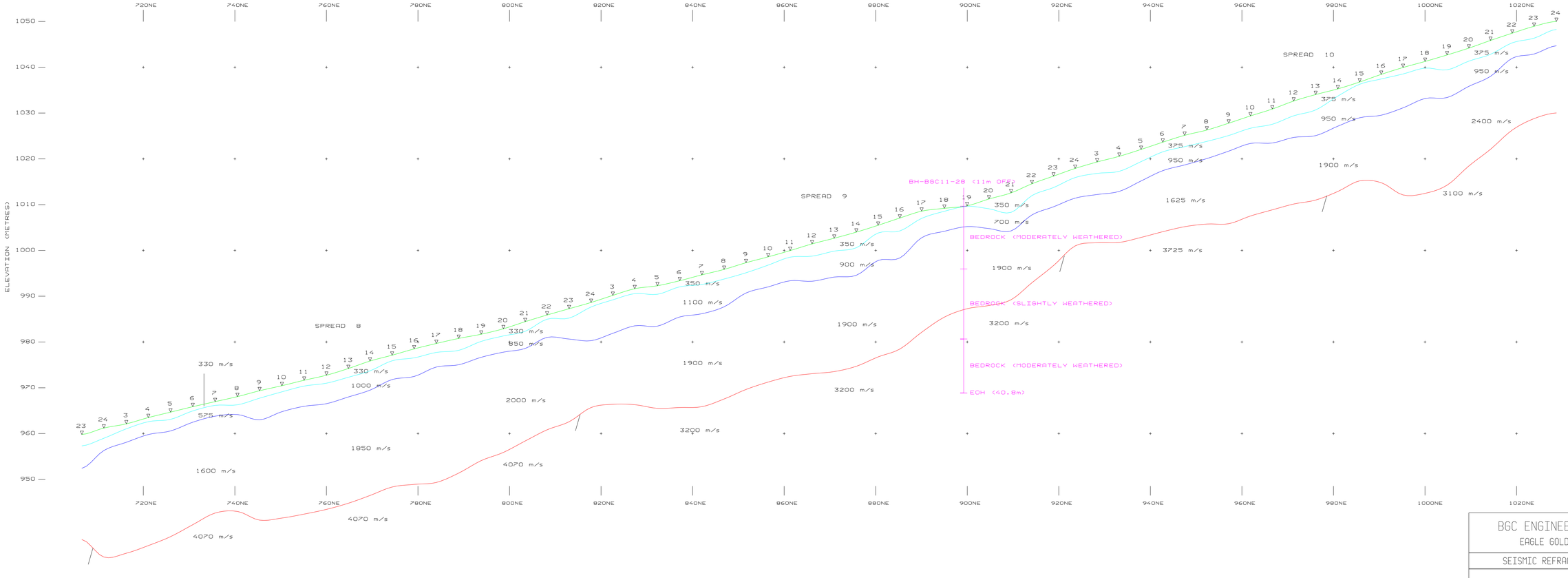
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-8B

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 12



SEISMIC LINE SL-8C

INSTRUMENT: GEOMETRICS GEODE

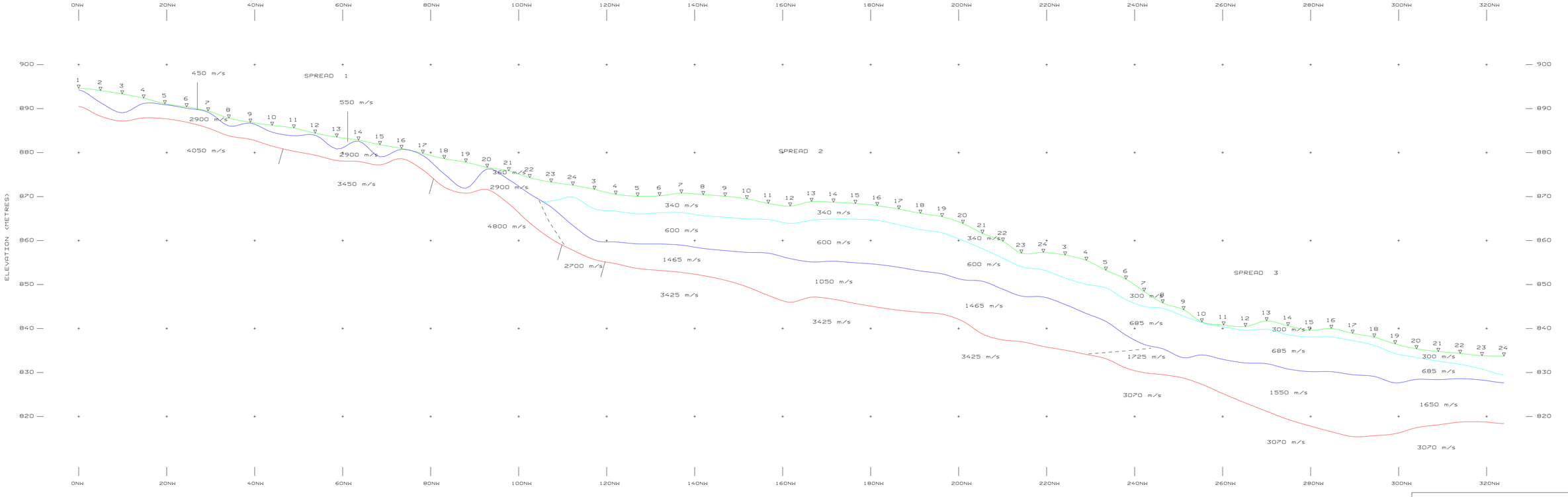
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-8C

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011 | SCALE 1:500 | FIG. 13



SEISMIC LINE SL-10A

INSTRUMENT: GEOMETRICS GEODE

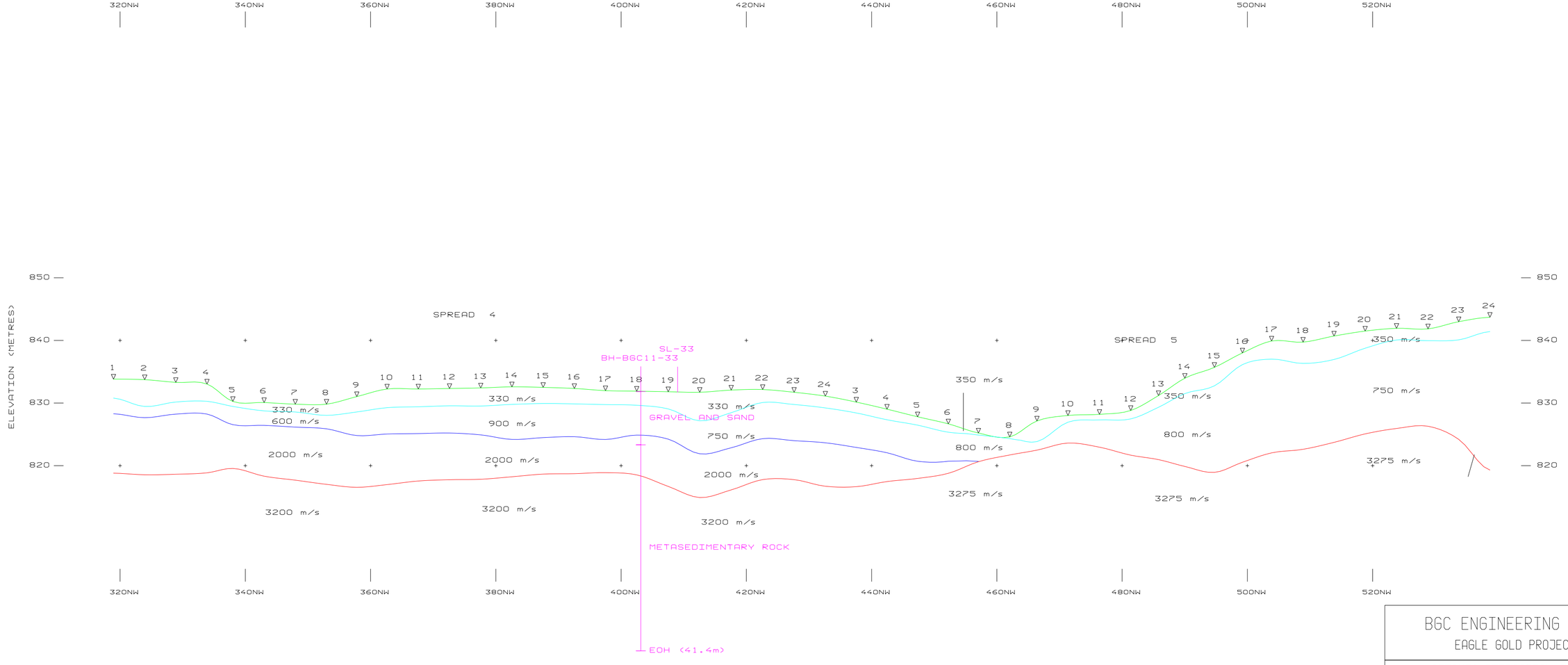
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-10A

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 14



SEISMIC LINE SL-10B

INSTRUMENT: GEOMETRICS GEODE

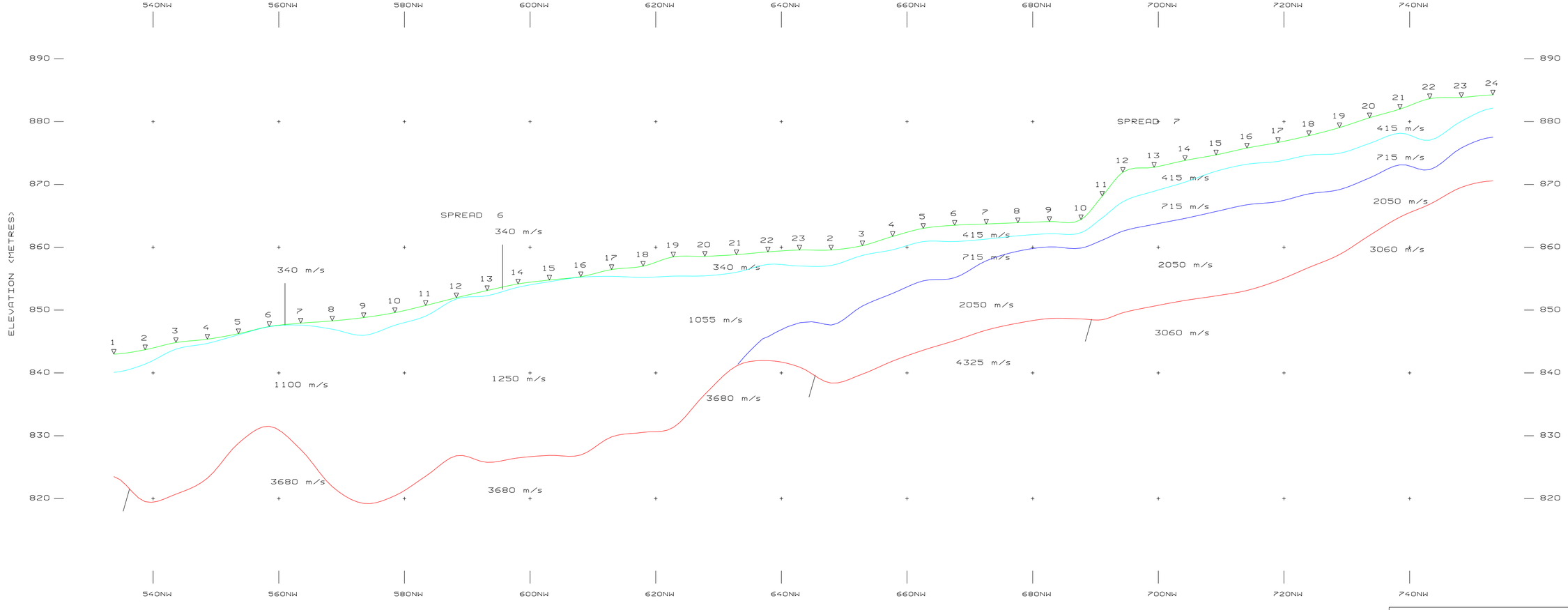
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-10B

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 15



SEISMIC LINE SL-10C

INSTRUMENT: GEOMETRICS GEODE

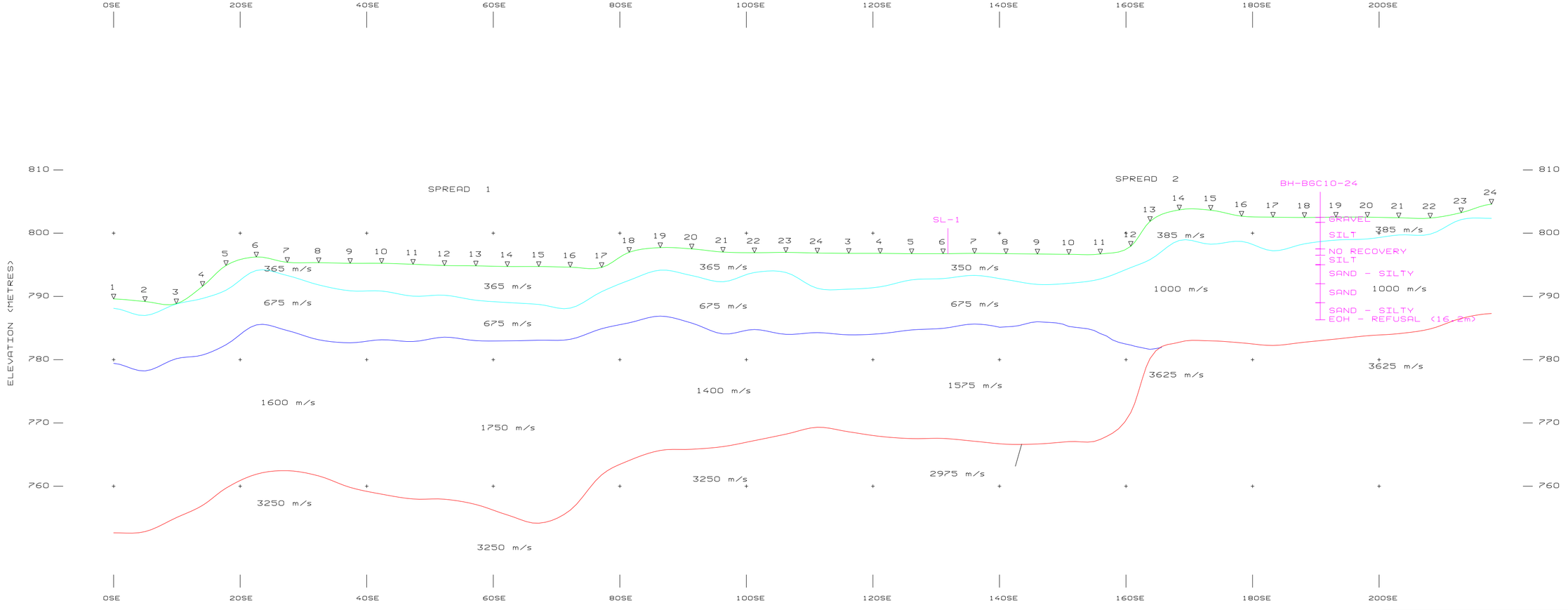
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-10C

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 16



SEISMIC LINE SL-12

INSTRUMENT: GEOMETRICS GEODE

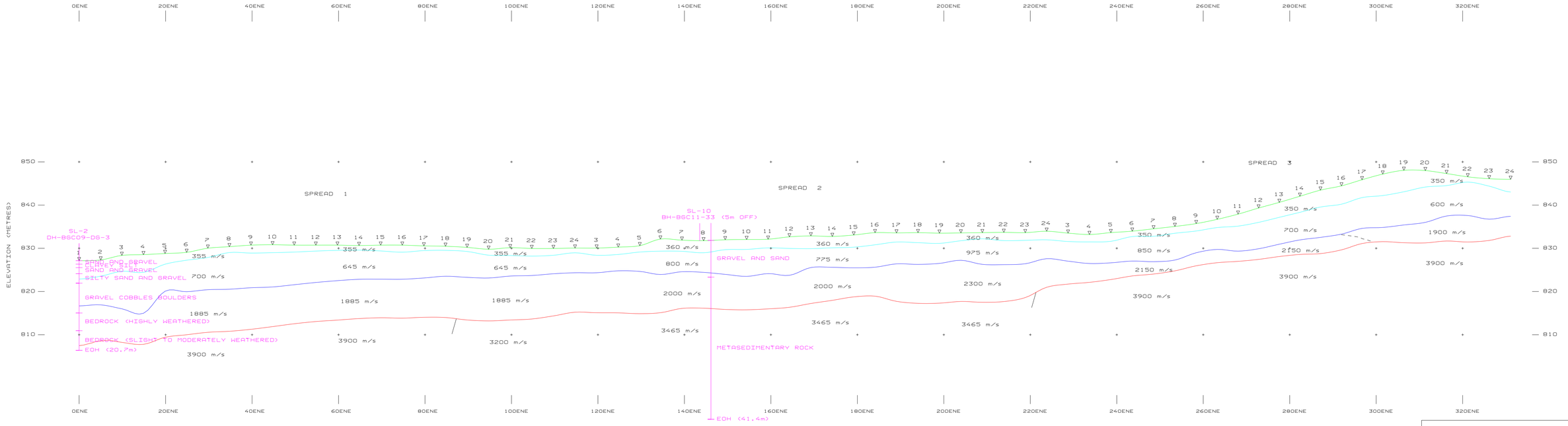
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-12

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011	SCALE 1:500	FIG. 17



SEISMIC LINE SL-33A

INSTRUMENT: GEOMETRICS GEODE

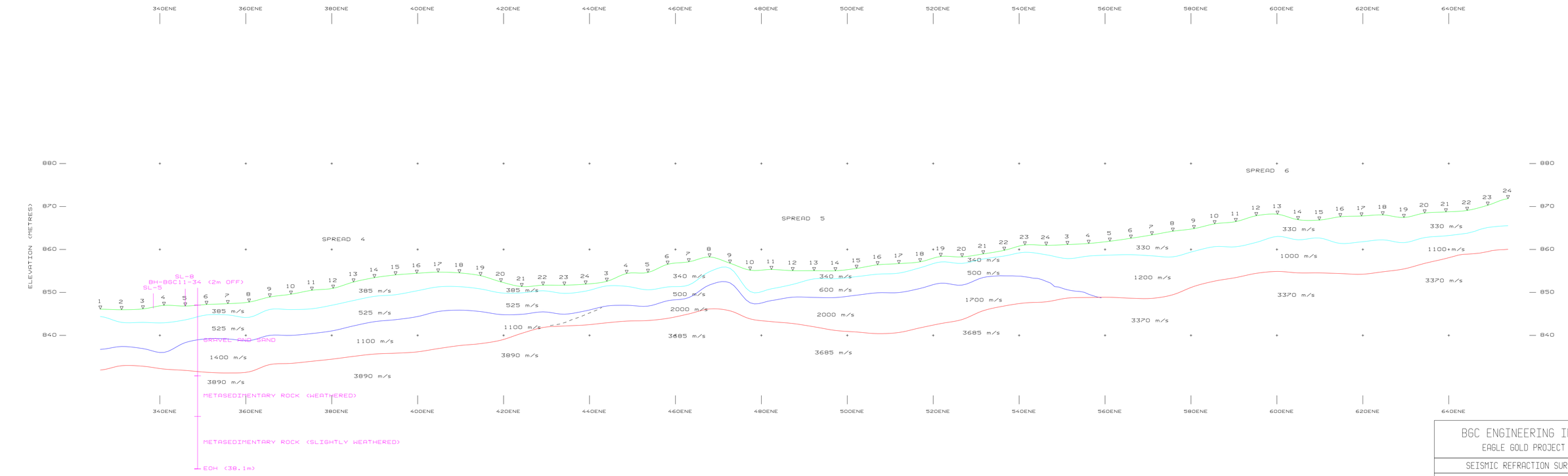
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-33A

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011 | SCALE 1:500 | FIG. 18



SEISMIC LINE SL-33B

INSTRUMENT: GEOMETRICS GEODE

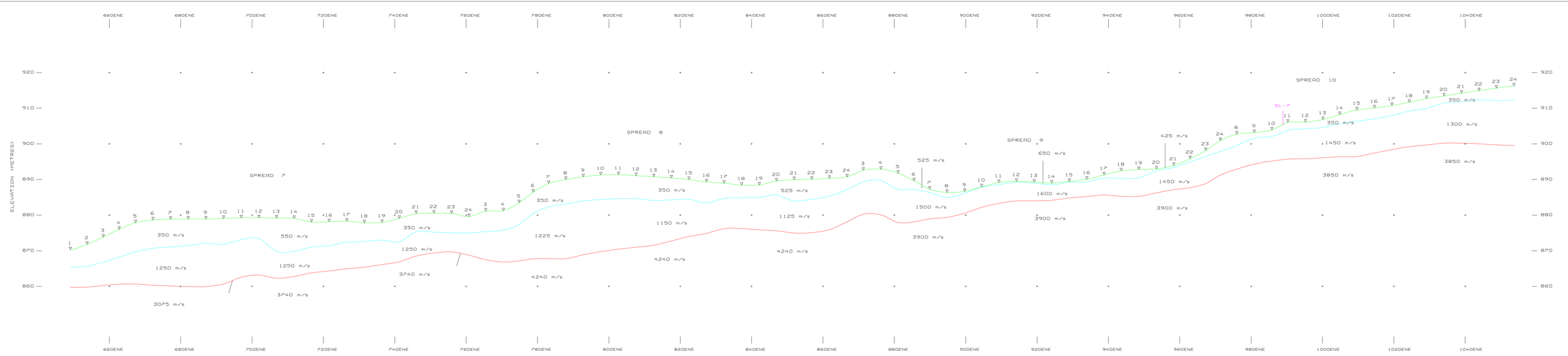
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-33B

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011 | SCALE 1:500 | FIG. 19



SEISMIC LINE SL-33C

INSTRUMENT: GEOMETRICS GEODE

BGC ENGINEERING INC.

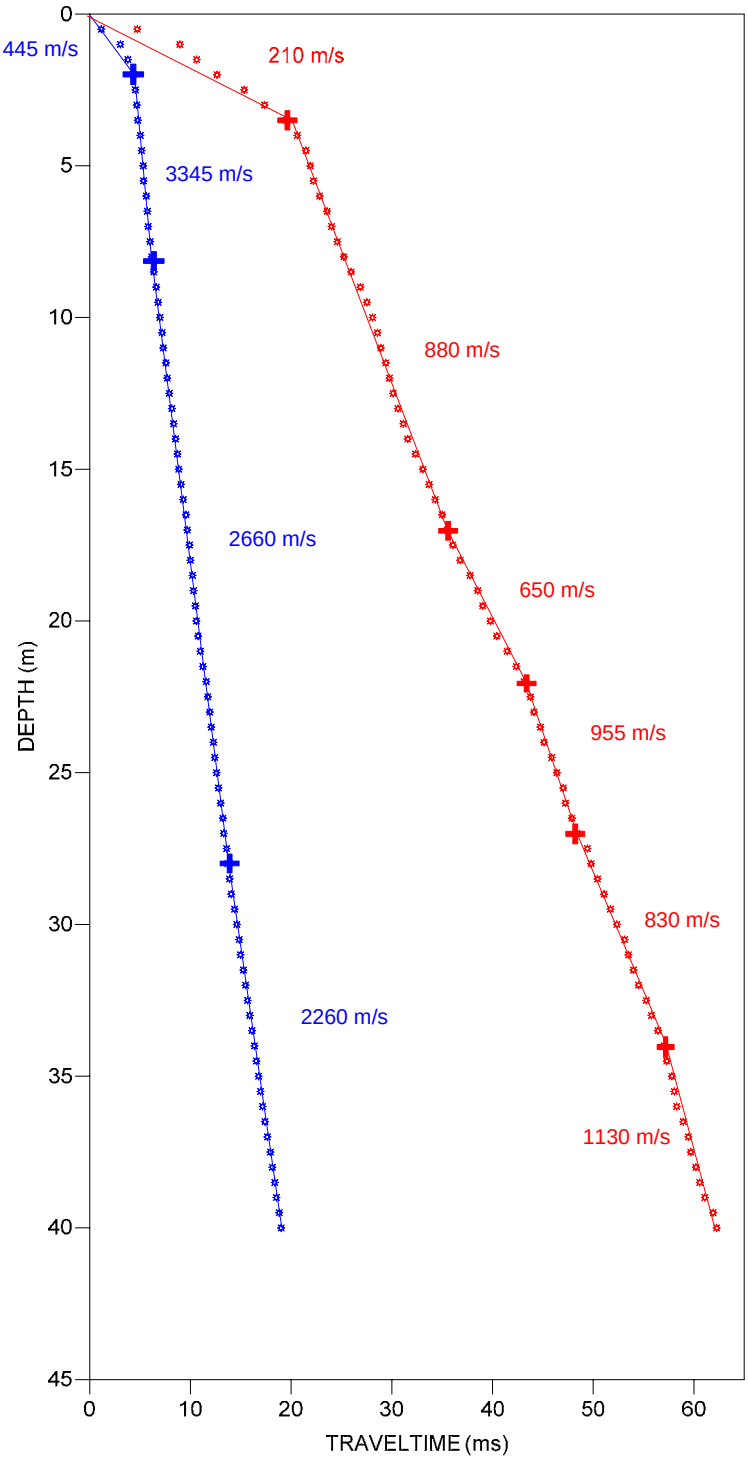
EAGLE GOLD PROJECT

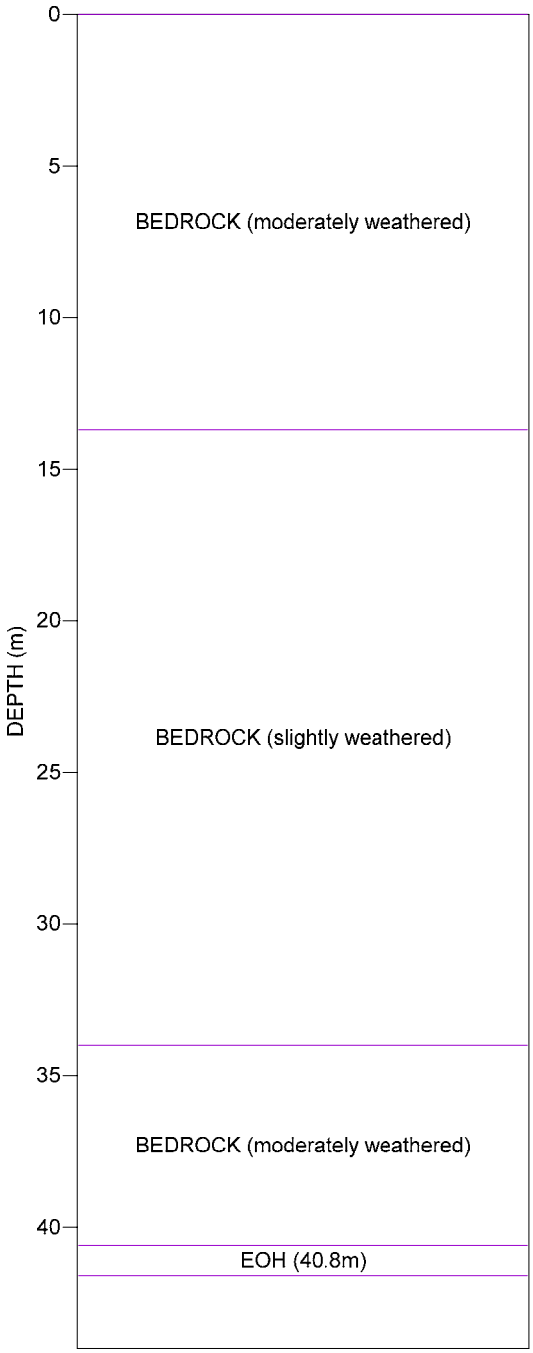
SEISMIC REFRACTION SURVEY

INTERPRETED DEPTH SECTION SL-33C

FRONTIER GEOSCIENCES INC.

DATE: SEPTEMBER 2011 | SCALE 1:500 | FIG. 20





LEGEND

DATA POINTS

VELOCITY CHANGE

P WAVE

S WAVE

LAYER BOUNDARIES

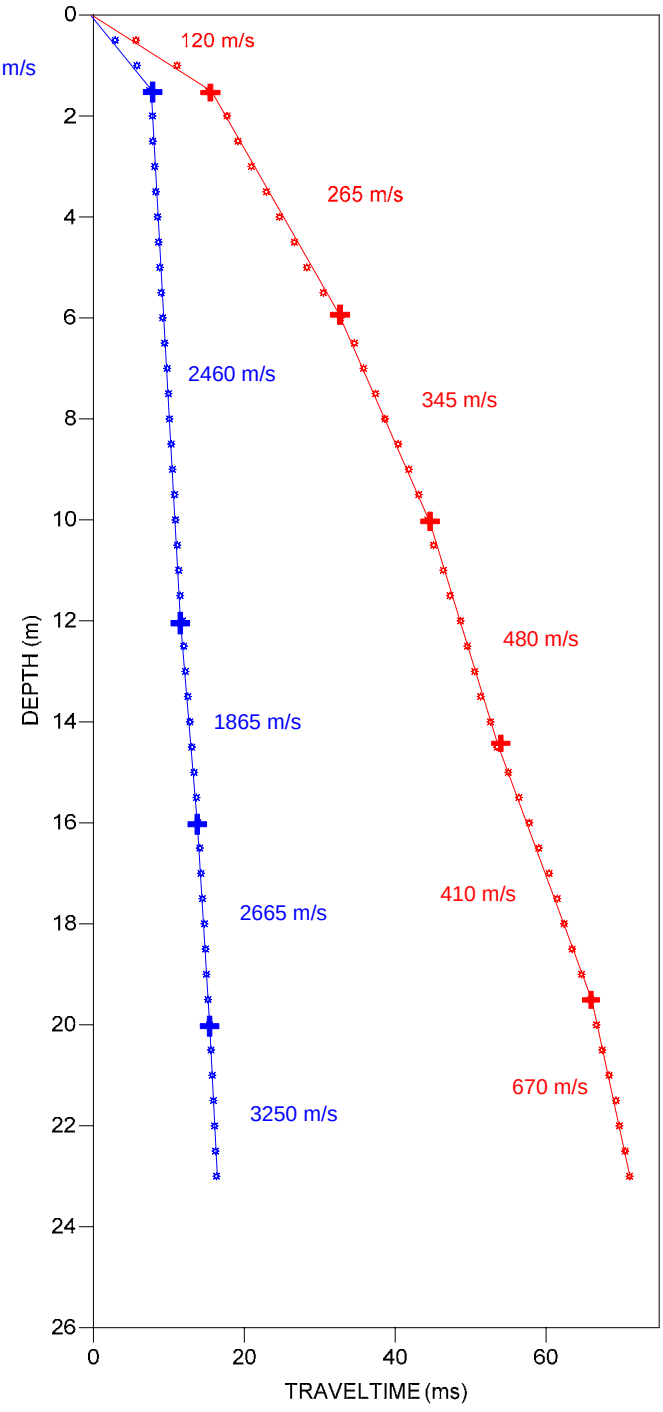
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

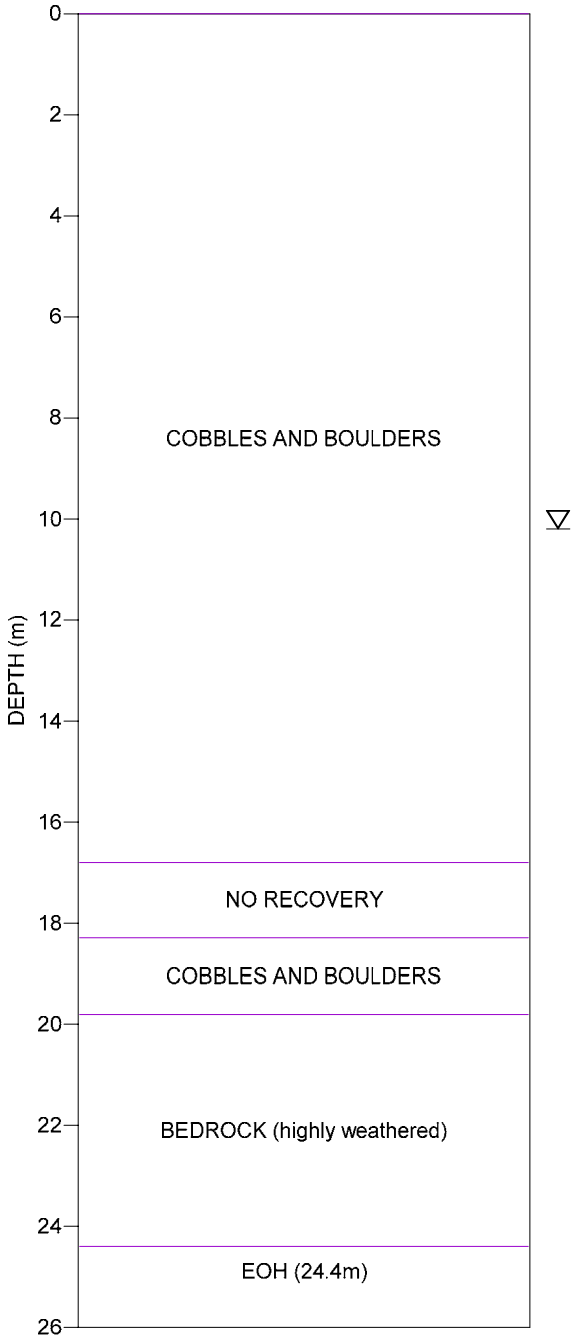
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-28
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:250	FIG. 21





LEGEND

DATA POINTS

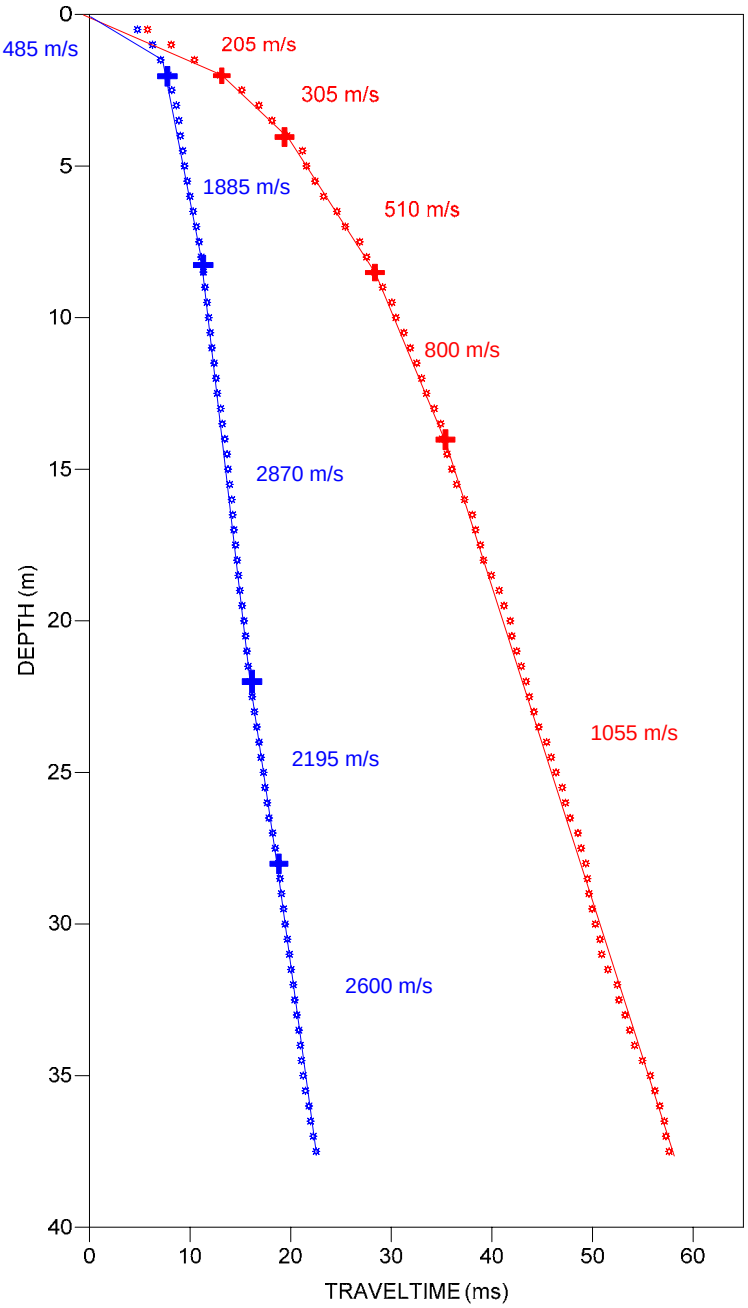
VELOCITY CHANGE

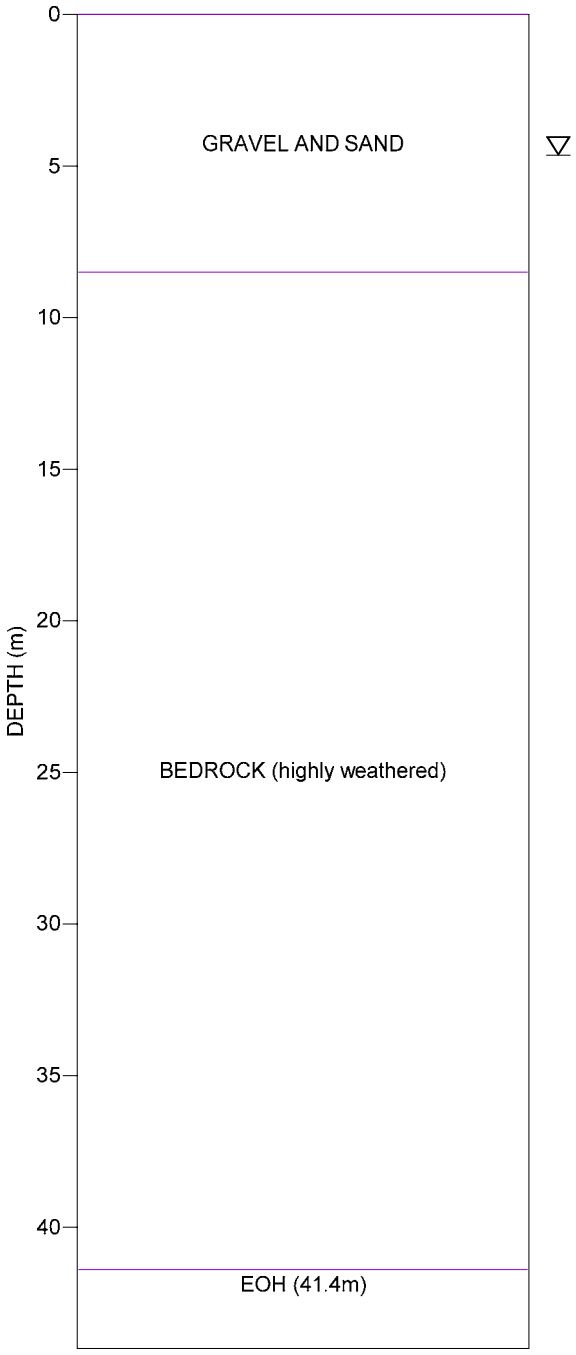
P WAVE

S WAVE

LAYER BOUNDARIES

BGC ENGINEERING INC. EAGLE GOLD PROJECT		
DOWNHOLE SEISMIC SURVEY		
BOREHOLE BH11-32 P AND S WAVE VELOCITIES		
FRONTIER GEOSCIENCES INC.		
DATE: SEPT. 2011	VSCALE 1:150	FIG. 22





LEGEND

DATA POINTS

VELOCITY CHANGE

P WAVE

S WAVE

LAYER BOUNDARIES

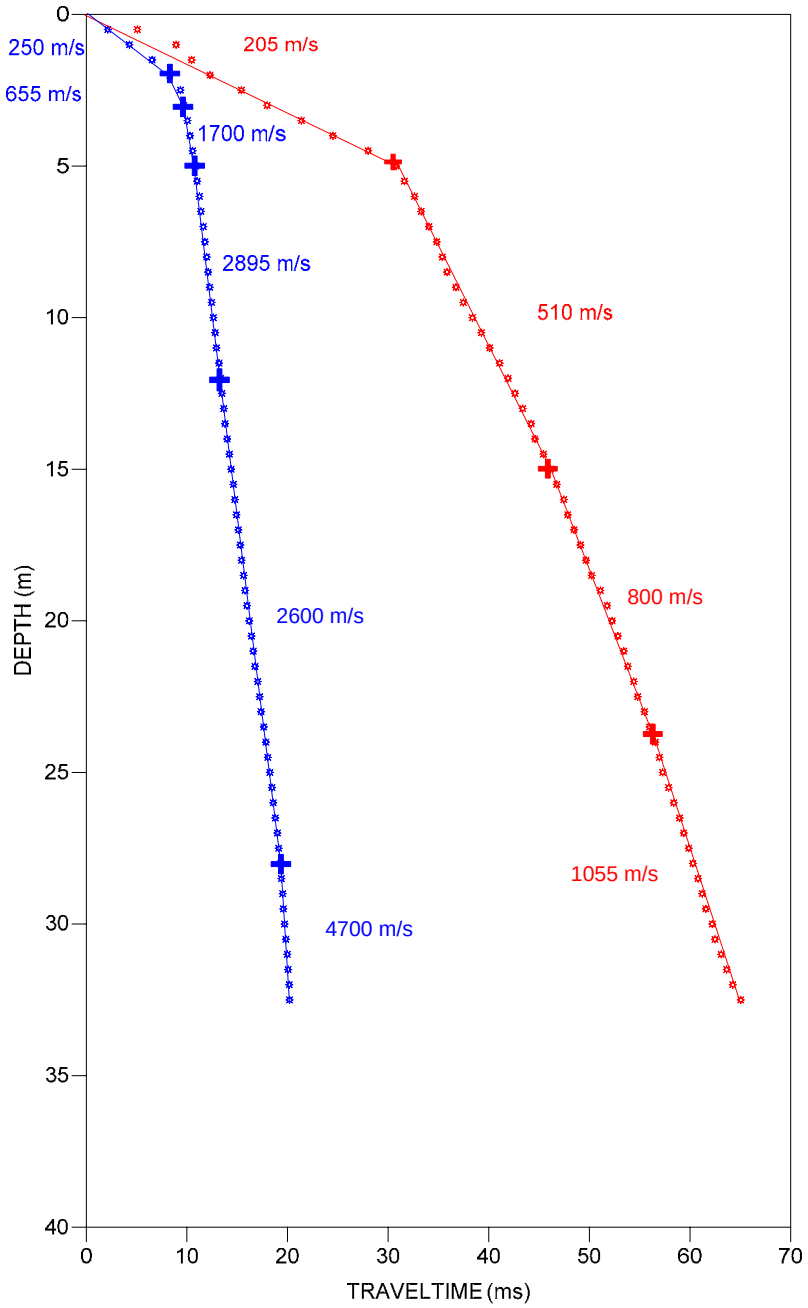
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

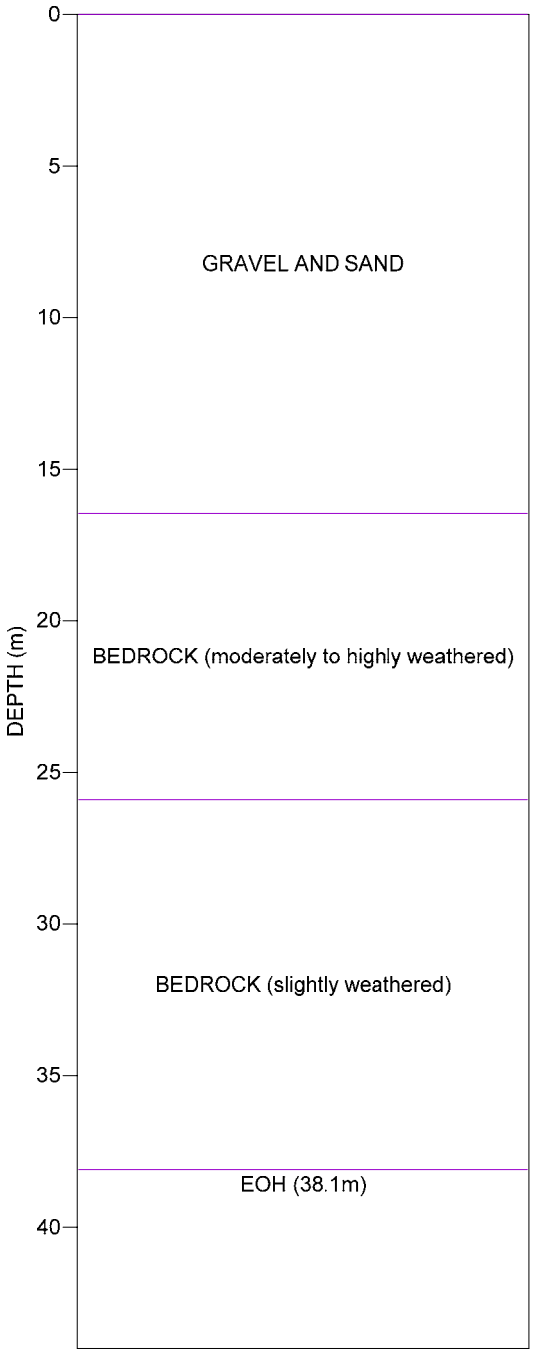
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-33
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:250	FIG. 23





LEGEND

DATA POINTS

VELOCITY CHANGE

P WAVE

S WAVE

LAYER BOUNDARIES

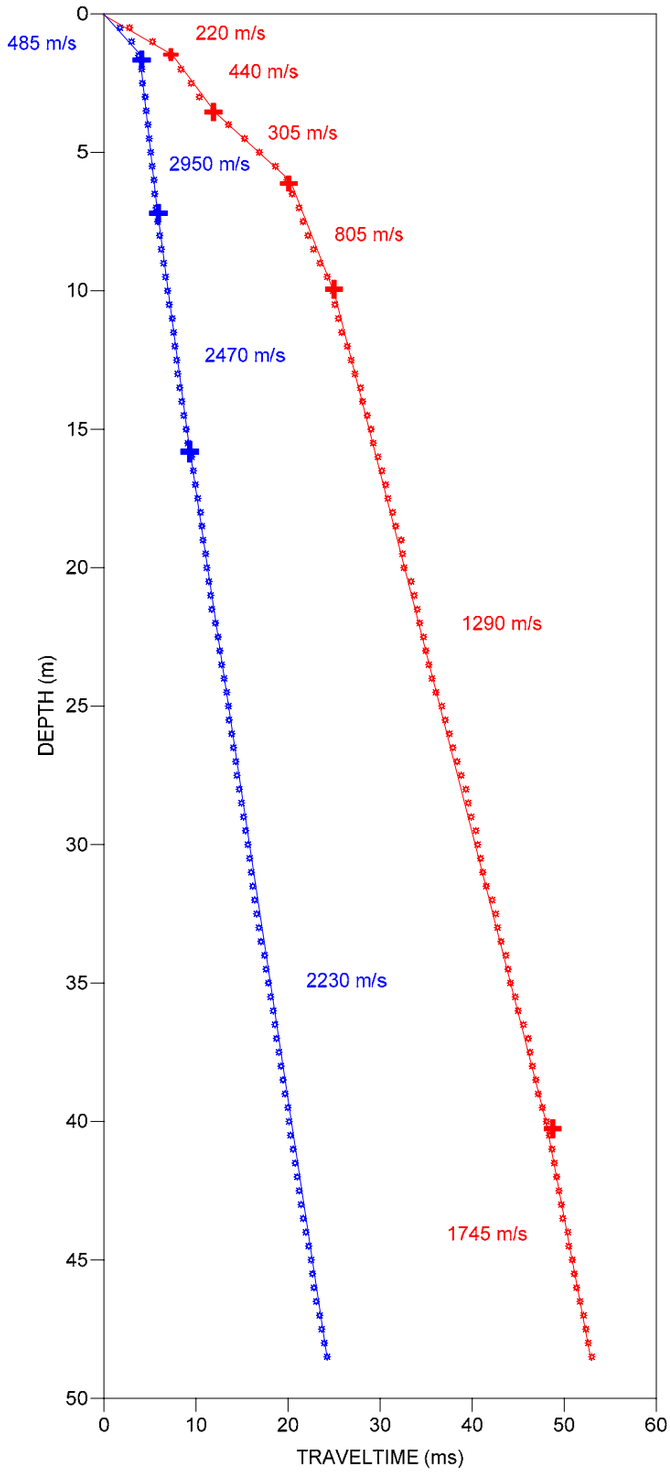
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

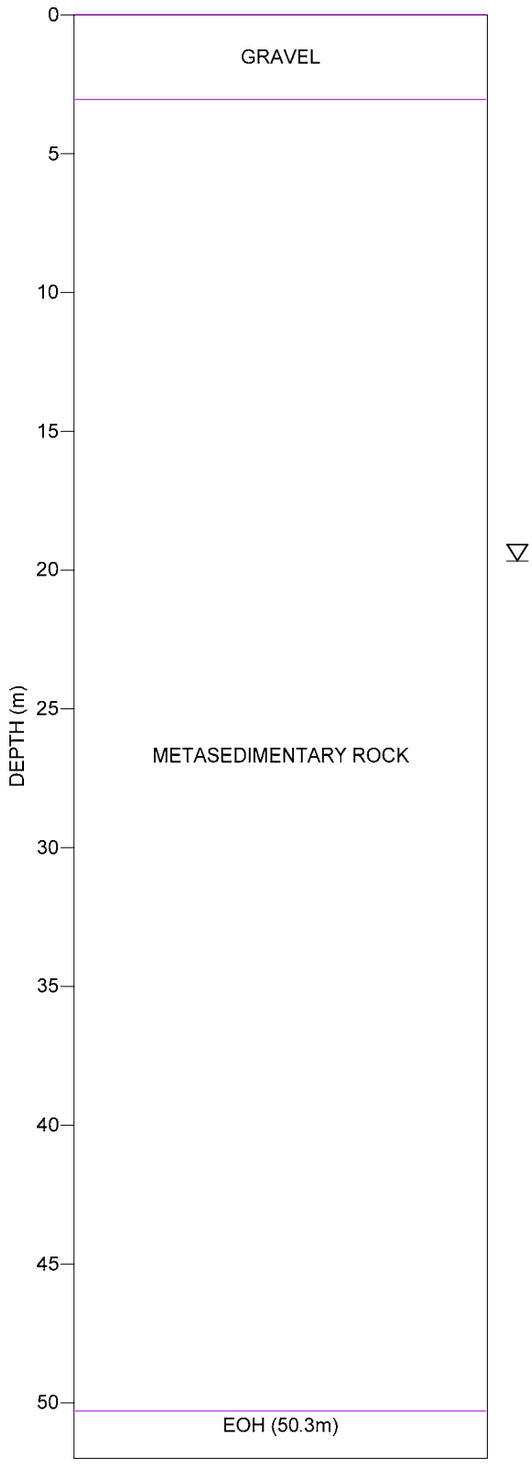
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-34
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:250	FIG. 24





LEGEND

DATA POINTS

VELOCITY CHANGE

P WAVE

S WAVE

LAYER BOUNDARIES

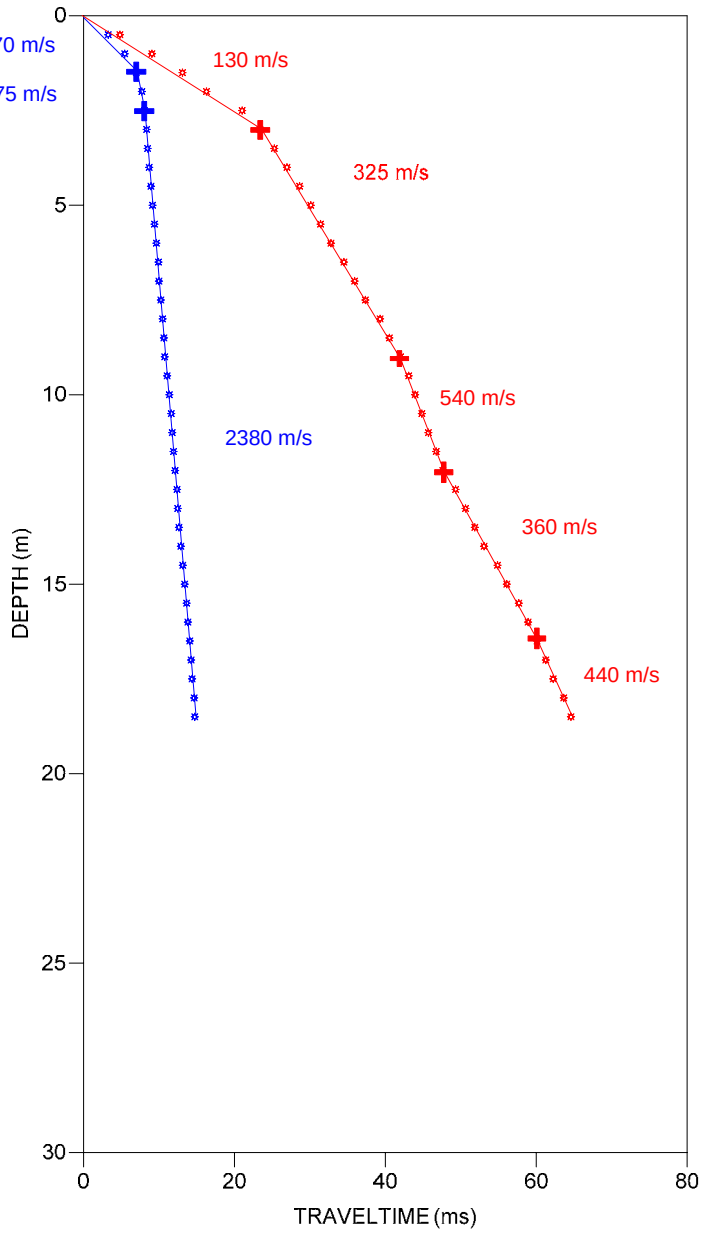
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

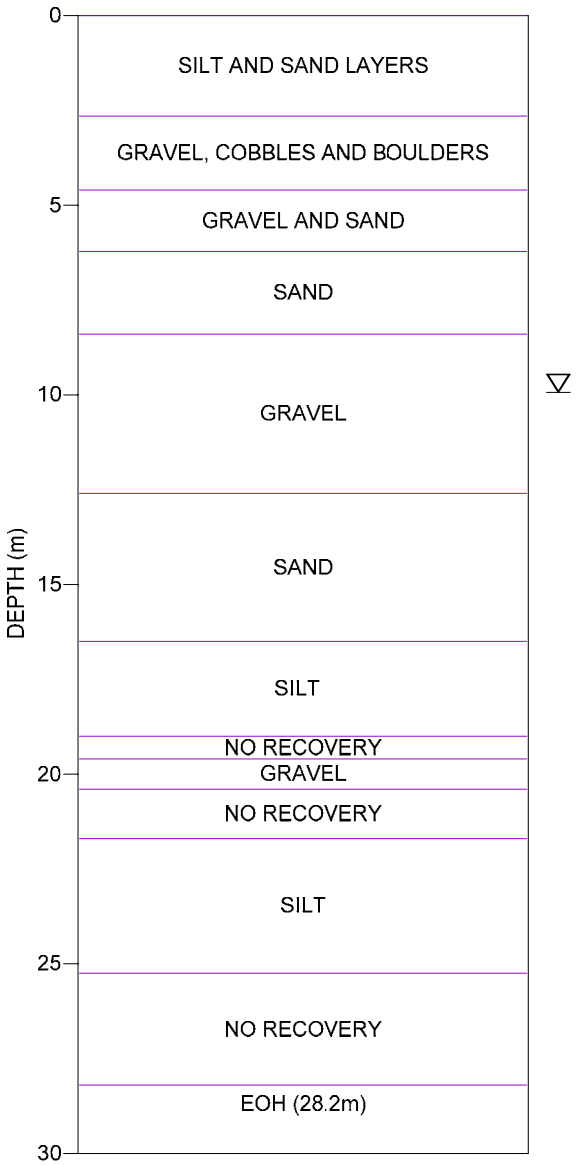
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-36
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:250	FIG. 25





LEGEND

- DATA POINTS
- VELOCITY CHANGE
- P WAVE
- S WAVE
- LAYER BOUNDARIES

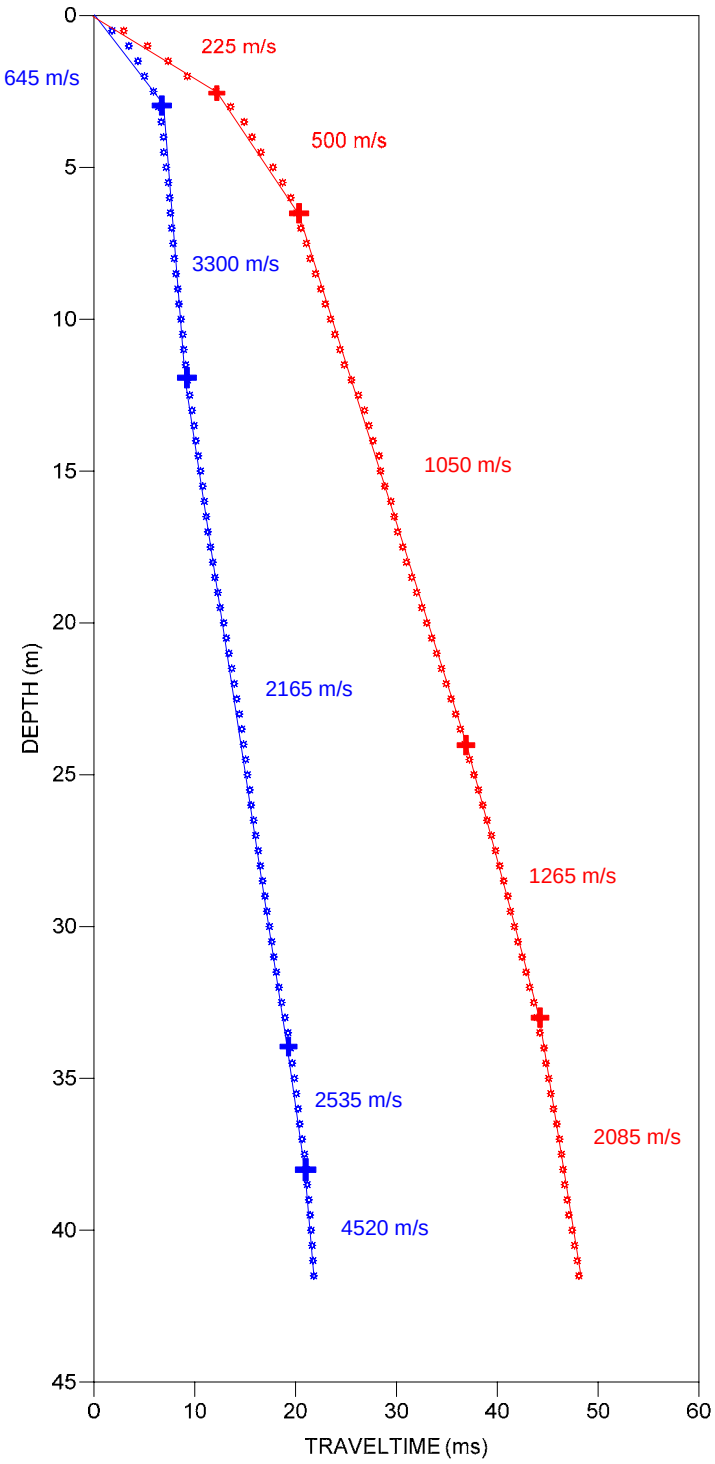
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

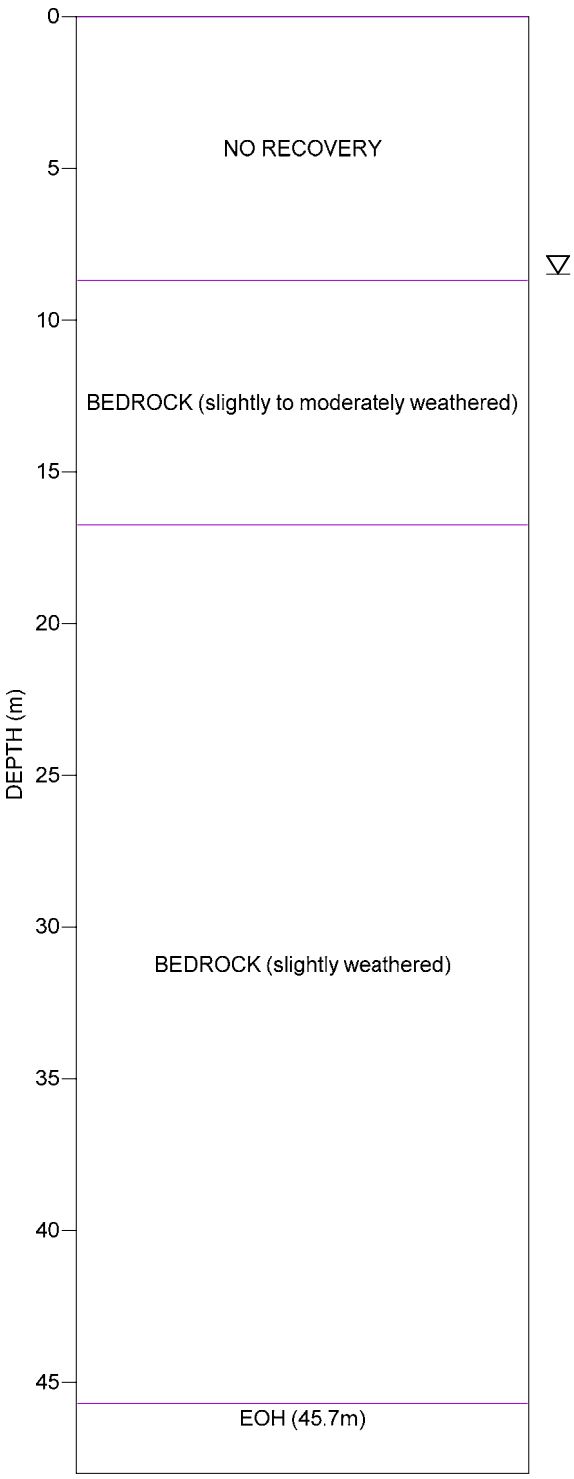
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-39
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:200	FIG. 26





LEGEND

DATA POINTS

VELOCITY CHANGE

P WAVE

S WAVE

LAYER BOUNDARIES

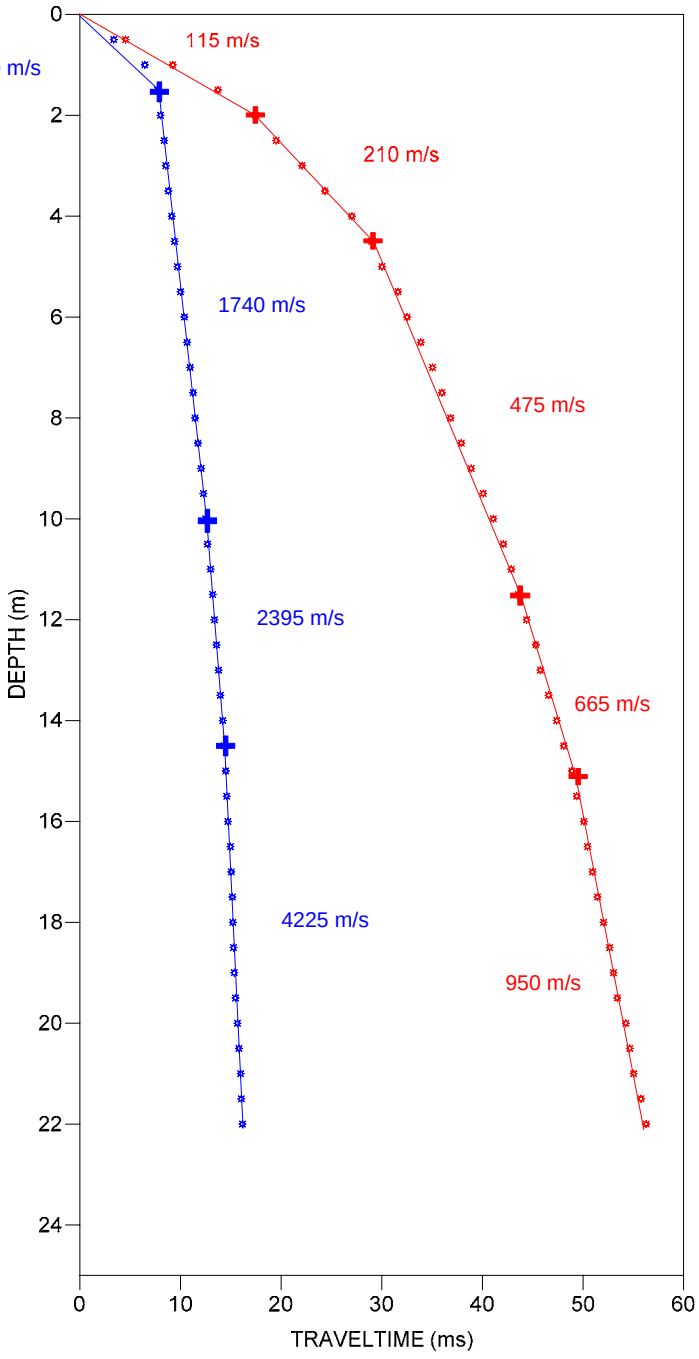
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

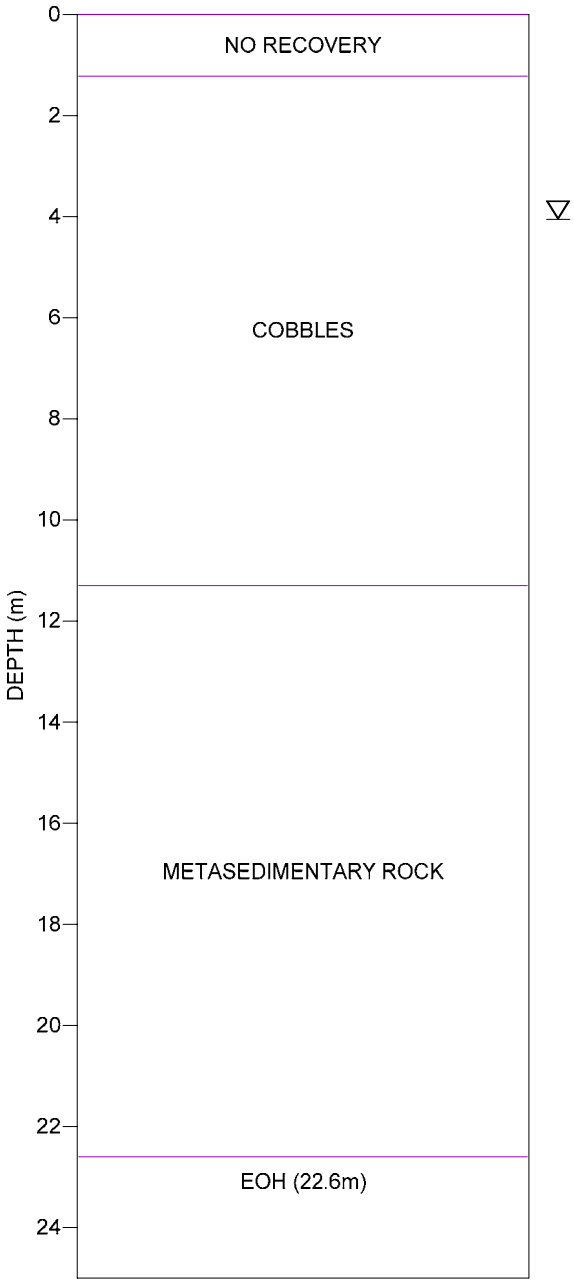
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-40B
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:250	FIG. 27





LEGEND

DATA POINTS

VELOCITY CHANGE

P WAVE

S WAVE

LAYER BOUNDARIES

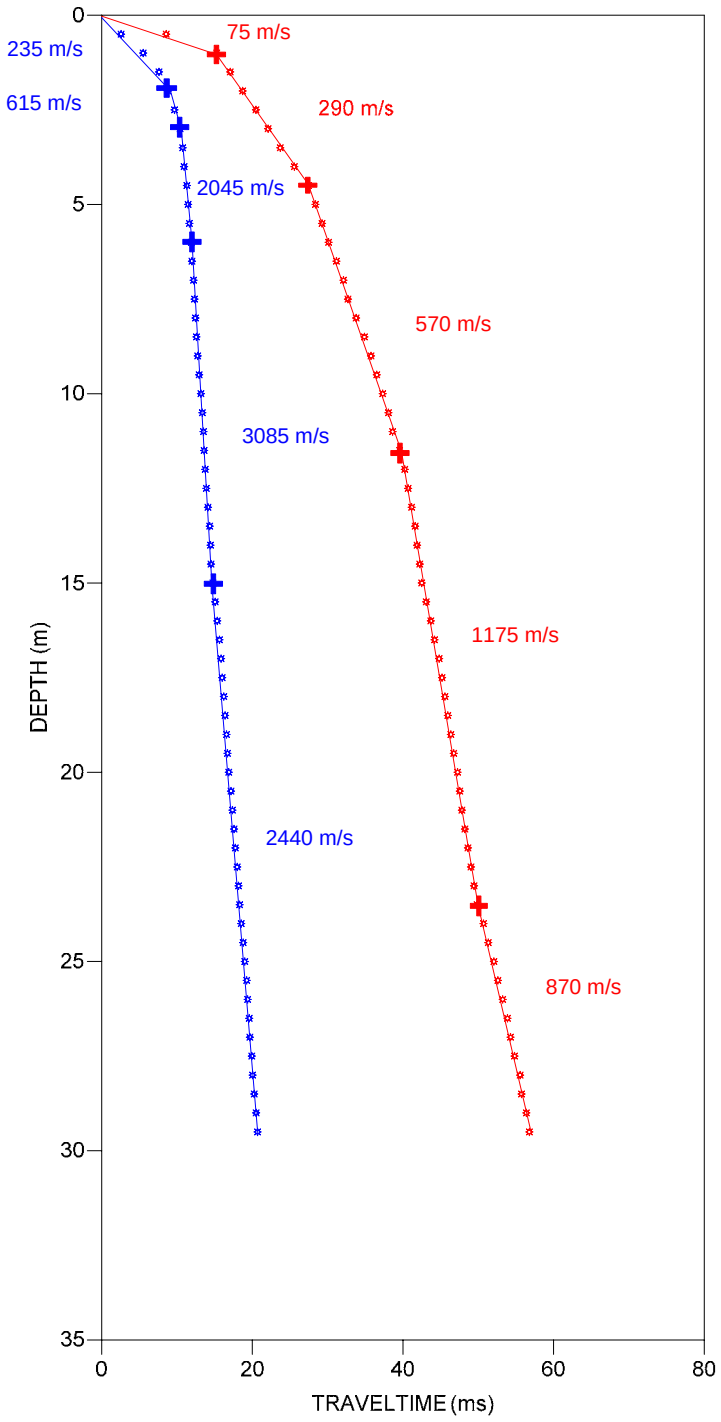
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

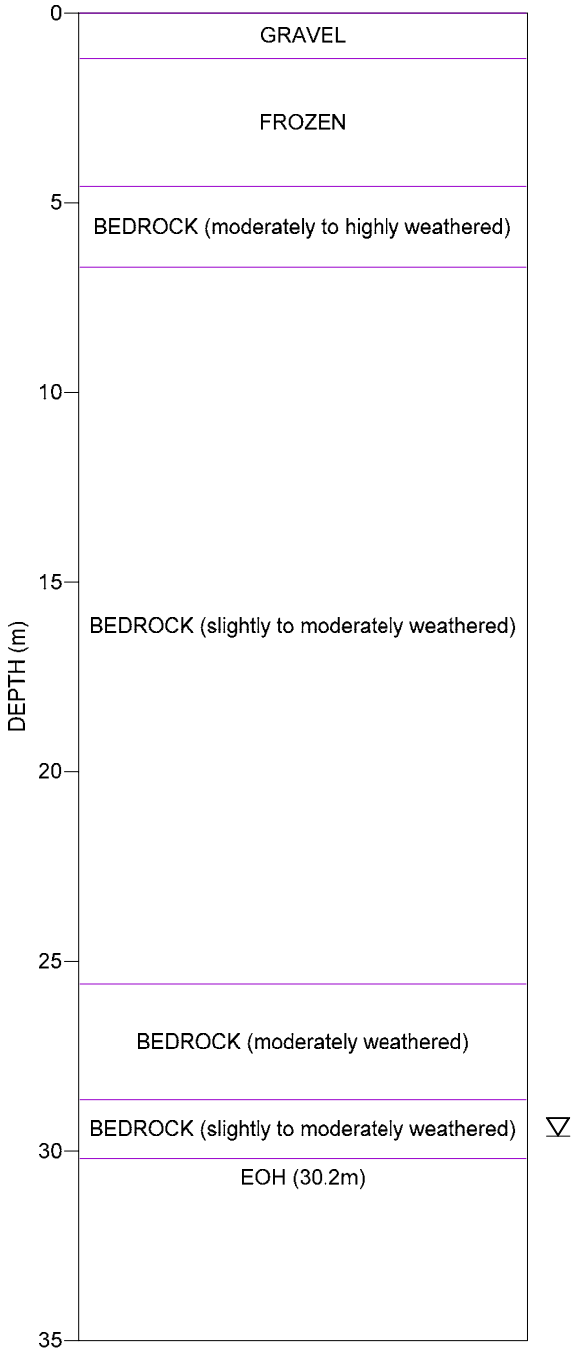
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-52
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:150	FIG. 28





LEGEND

DATA POINTS

VELOCITY CHANGE

P WAVE

S WAVE

LAYER BOUNDARIES

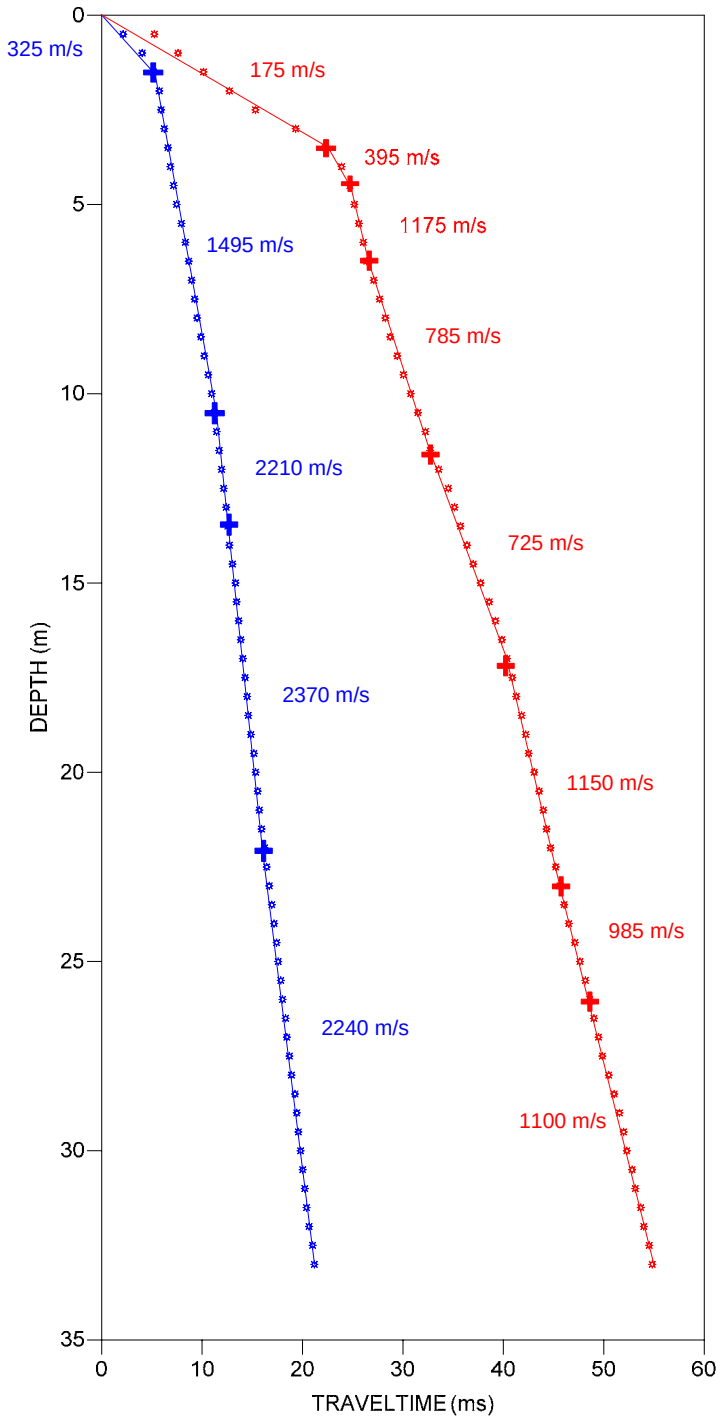
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

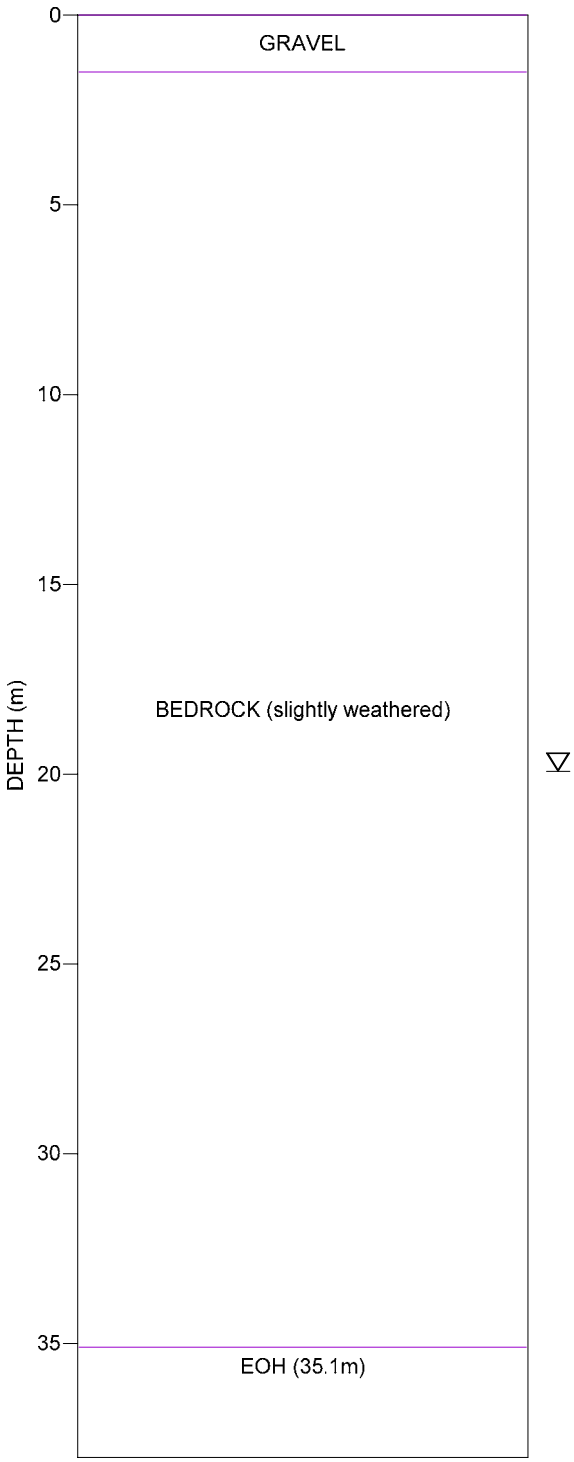
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-59
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:200	FIG. 29





LEGEND

DATA POINTS

VELOCITY CHANGE

P WAVE

S WAVE

LAYER BOUNDARIES

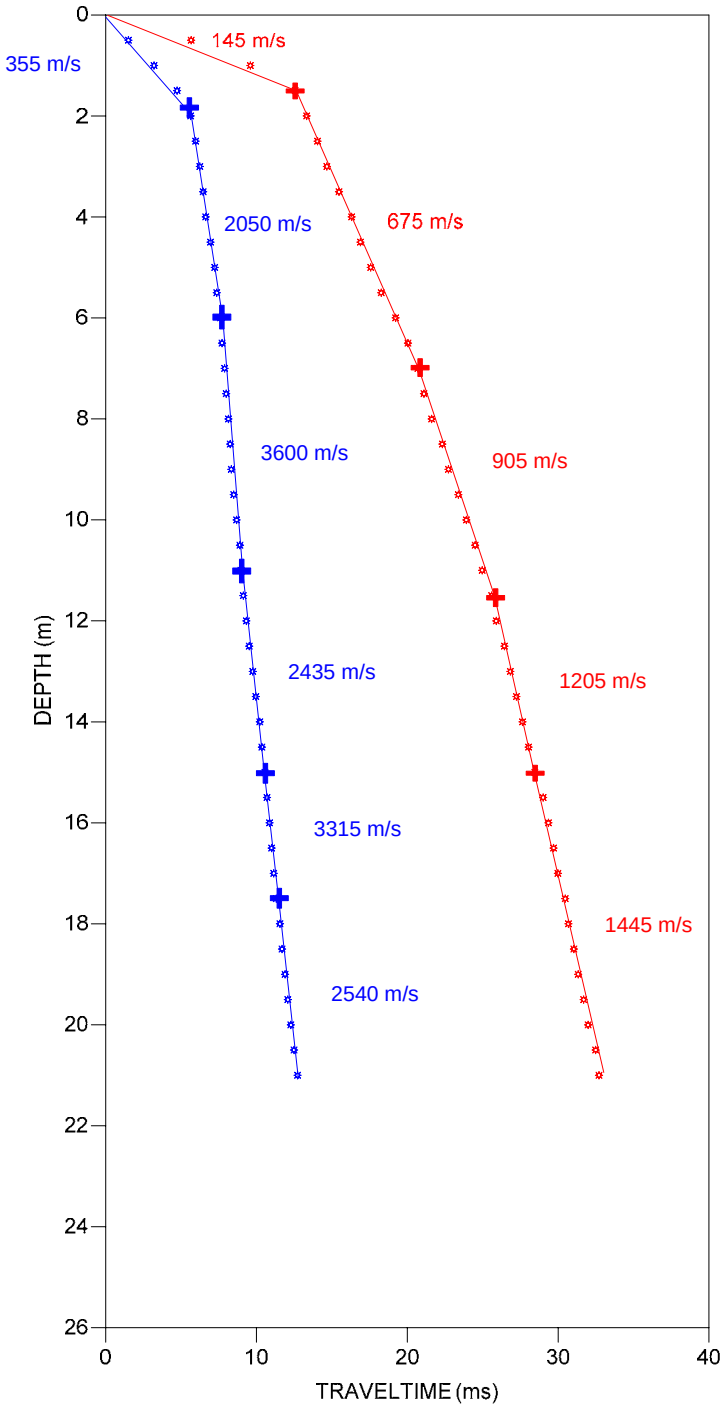
BGC ENGINEERING INC.
EAGLE GOLD PROJECT

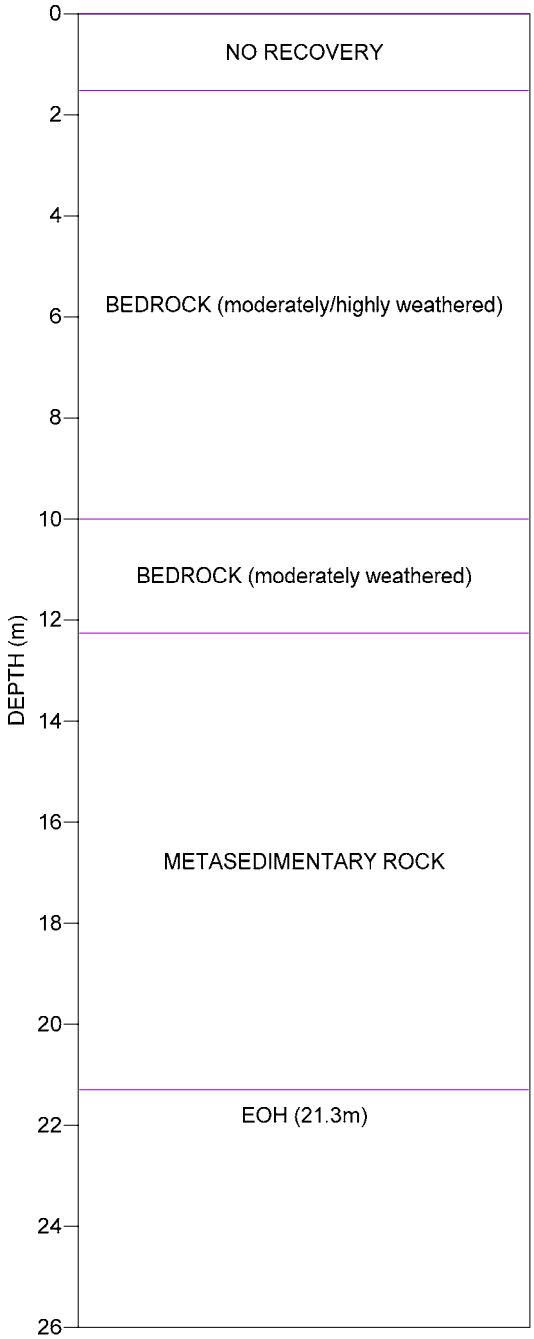
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-62
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:200	FIG. 30





LEGEND

DATA POINTS

VELOCITY CHANGE

P WAVE

S WAVE

LAYER BOUNDARIES

BGC ENGINEERING INC.
EAGLE GOLD PROJECT

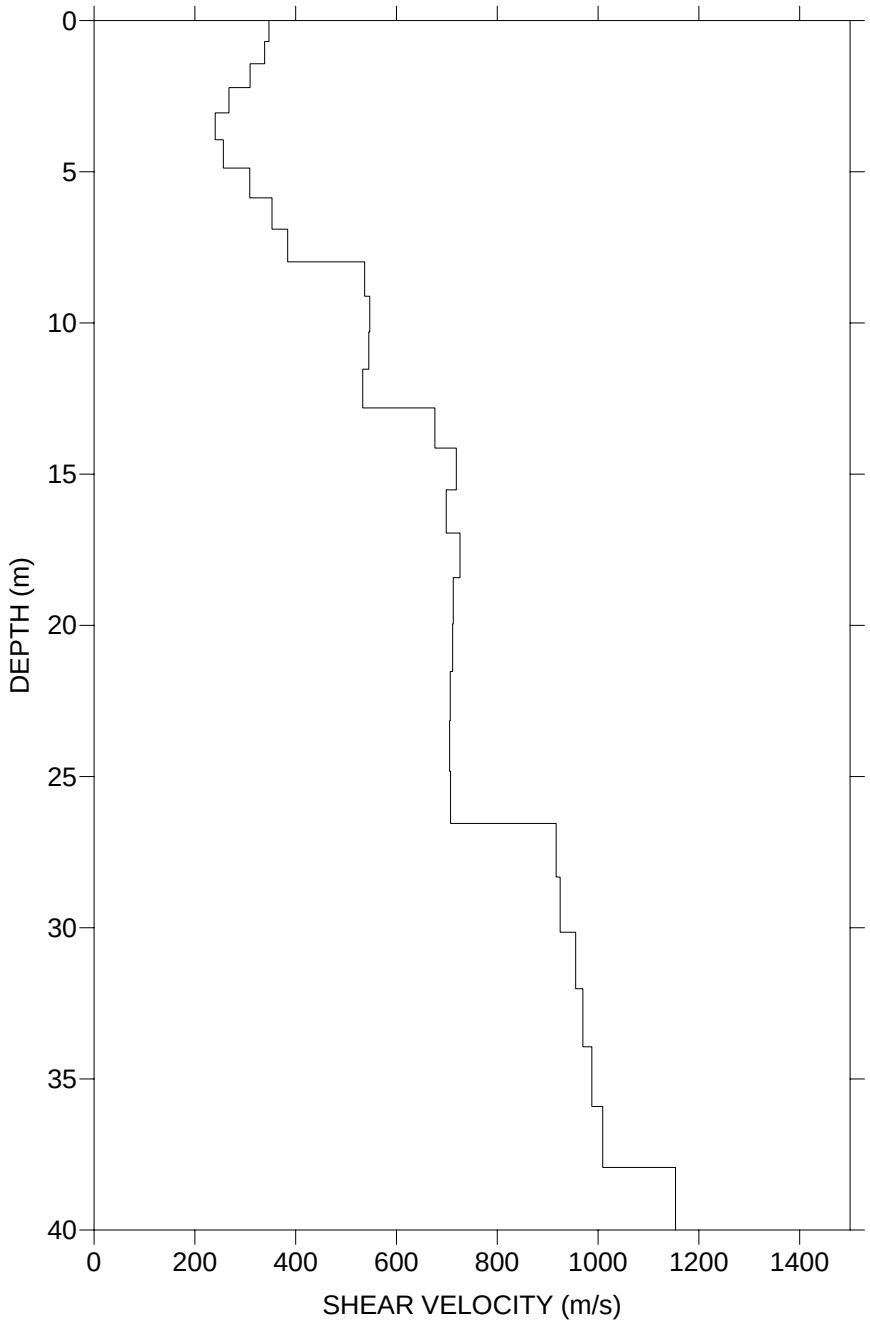
DOWNHOLE SEISMIC SURVEY

BOREHOLE BH11-69
P AND S WAVE VELOCITIES

FRONTIER GEOSCIENCES INC.

DATE: SEPT. 2011	VSCALE 1:150	FIG. 31

MASW PROFILE SL-2 STATION 300m

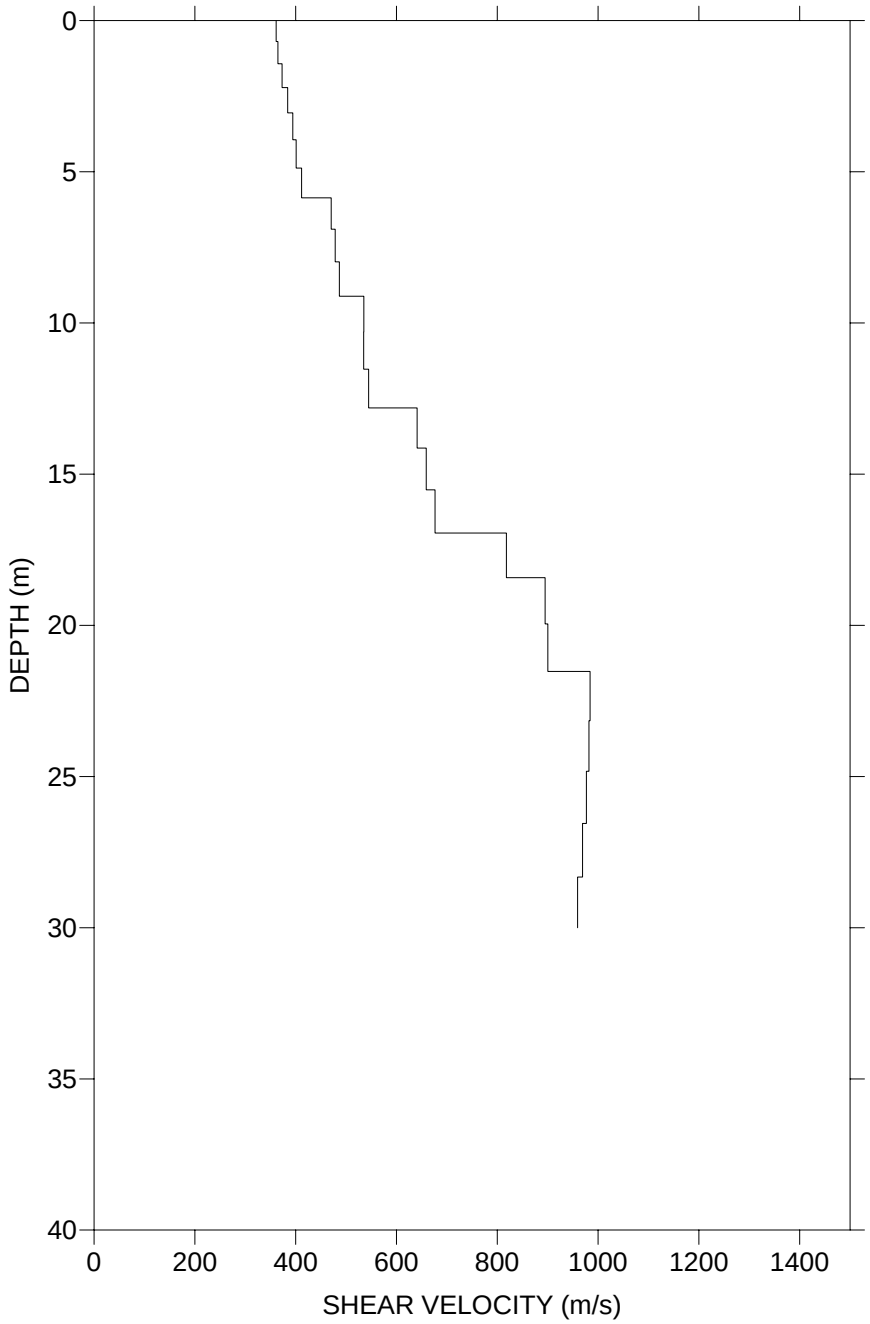


BH-BGC11-32

BGC ENGINEERING INC. EAGLE GOLD PROJECT
GEOPHYSICAL SURVEY
MASW PROFILE SL-2 STATION 300M
FRONTIER GEOSCIENCES INC.

DATE: SEPT 2011	SCALE 1:250	FIG. 32

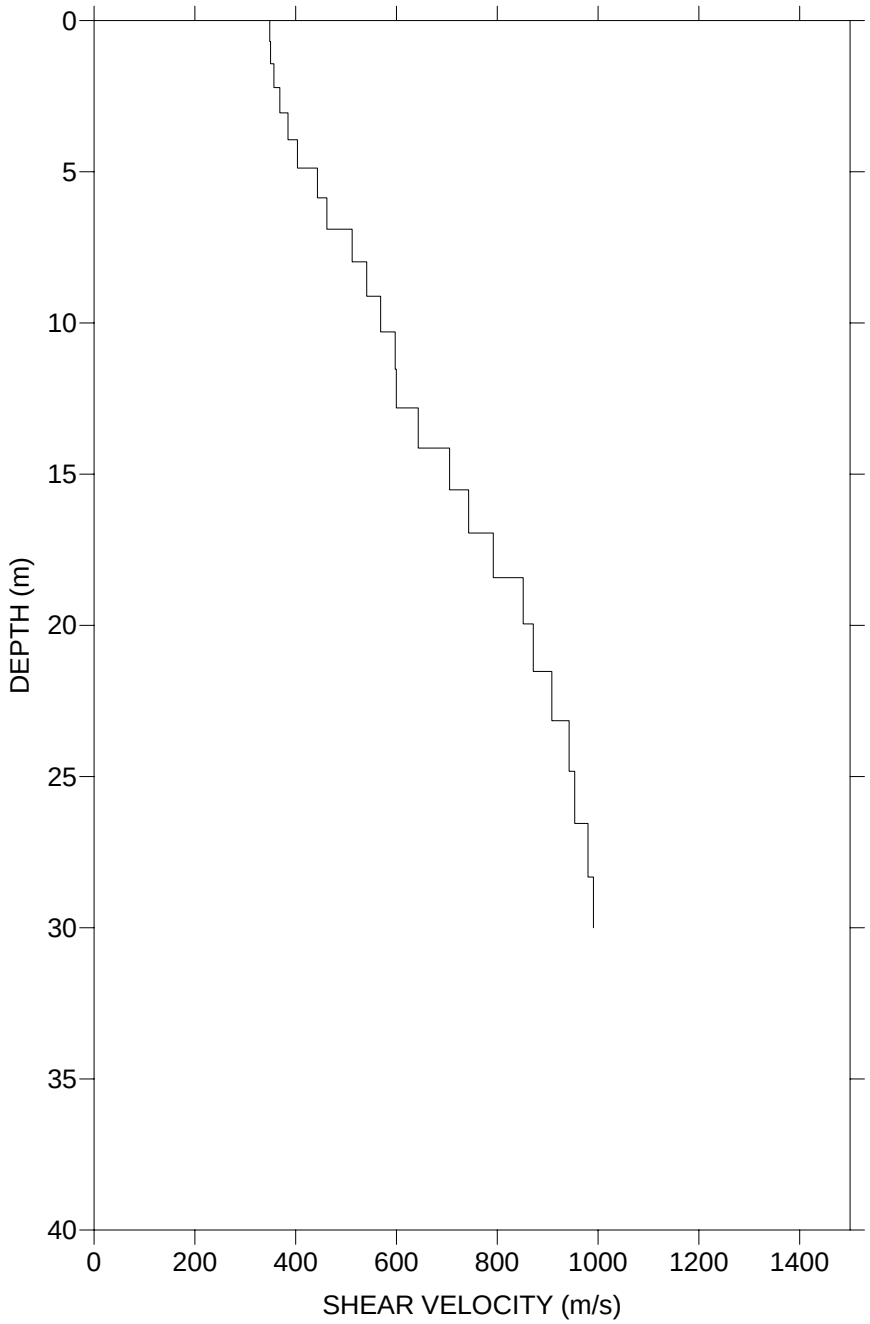
MASW PROFILE SL-7 STATION 155m



BH-BGC11-52

BGC ENGINEERING INC. EAGLE GOLD PROJECT		
GEOPHYSICAL SURVEY		
MASW PROFILE SL-7 STATION 155M		
FRONTIER GEOSCIENCES INC.		
DATE: SEPT 2011	SCALE 1:250	FIG. 33

MASW PROFILE SL-7 STATION 185m

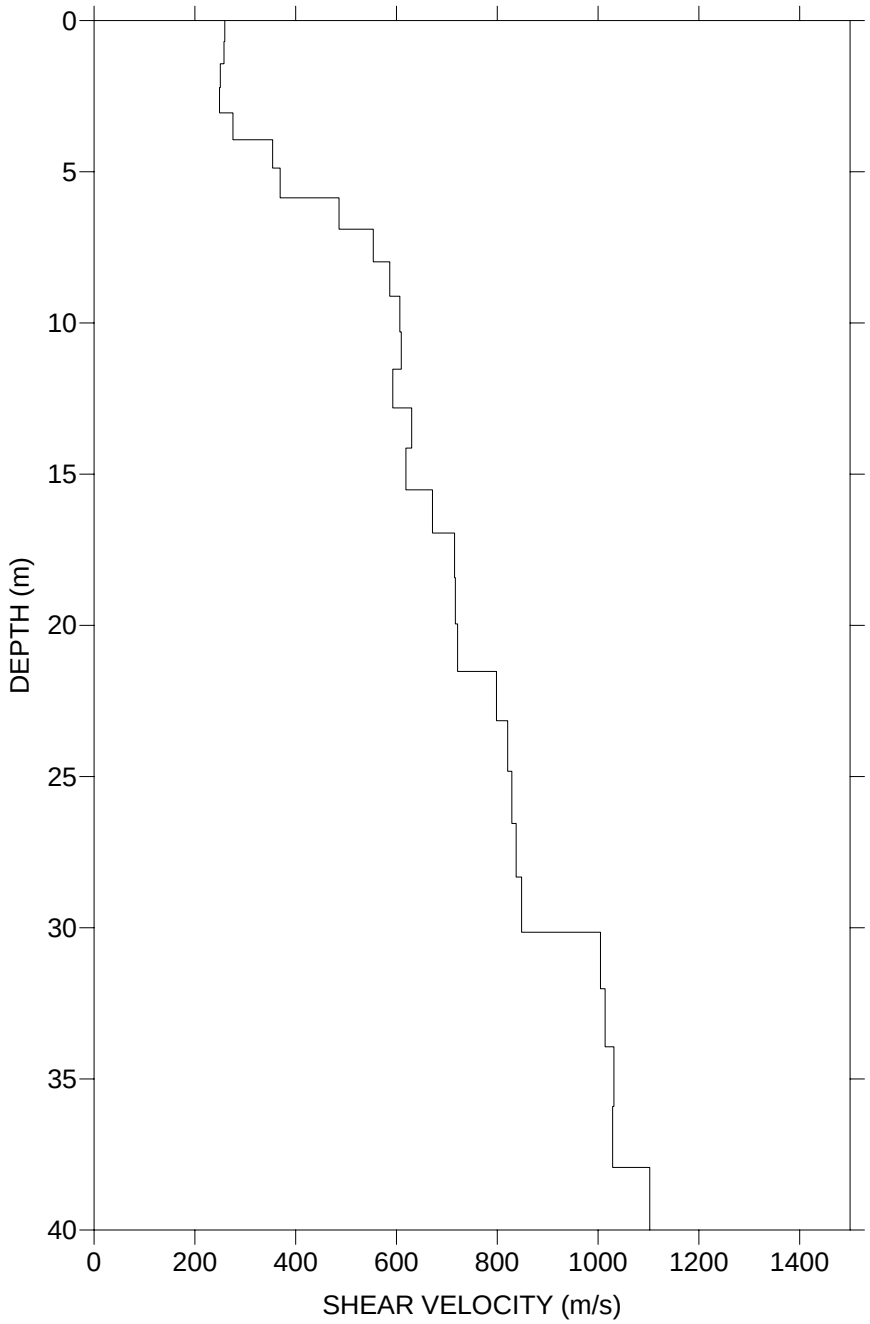


BH-BGC11-52

BGC ENGINEERING INC. EAGLE GOLD PROJECT
GEOPHYSICAL SURVEY
MASW PROFILE SL-7 STATION 185M
FRONTIER GEOSCIENCES INC.

DATE: SEPT 2011	SCALE 1:250	FIG. 34

MASW PROFILE SL-33 STATION 165m

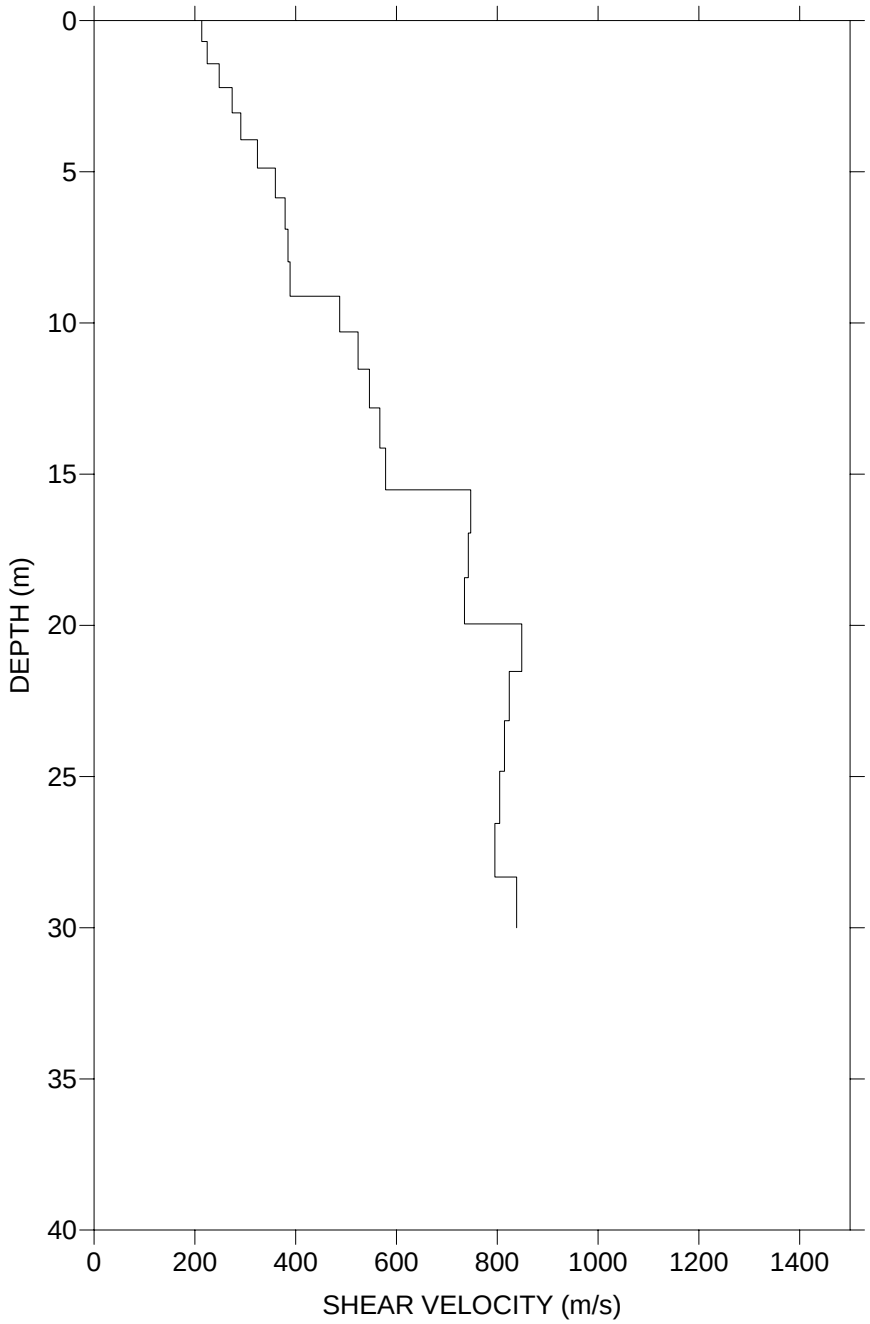


BH-BGC11-33

BGC ENGINEERING INC. EAGLE GOLD PROJECT
GEOPHYSICAL SURVEY
MASW PROFILE SL-33 STATION 165M
FRONTIER GEOSCIENCES INC.

DATE: SEPT 2011	SCALE 1:250	FIG. 35

MASW PROFILE SL-33 STATION 360m

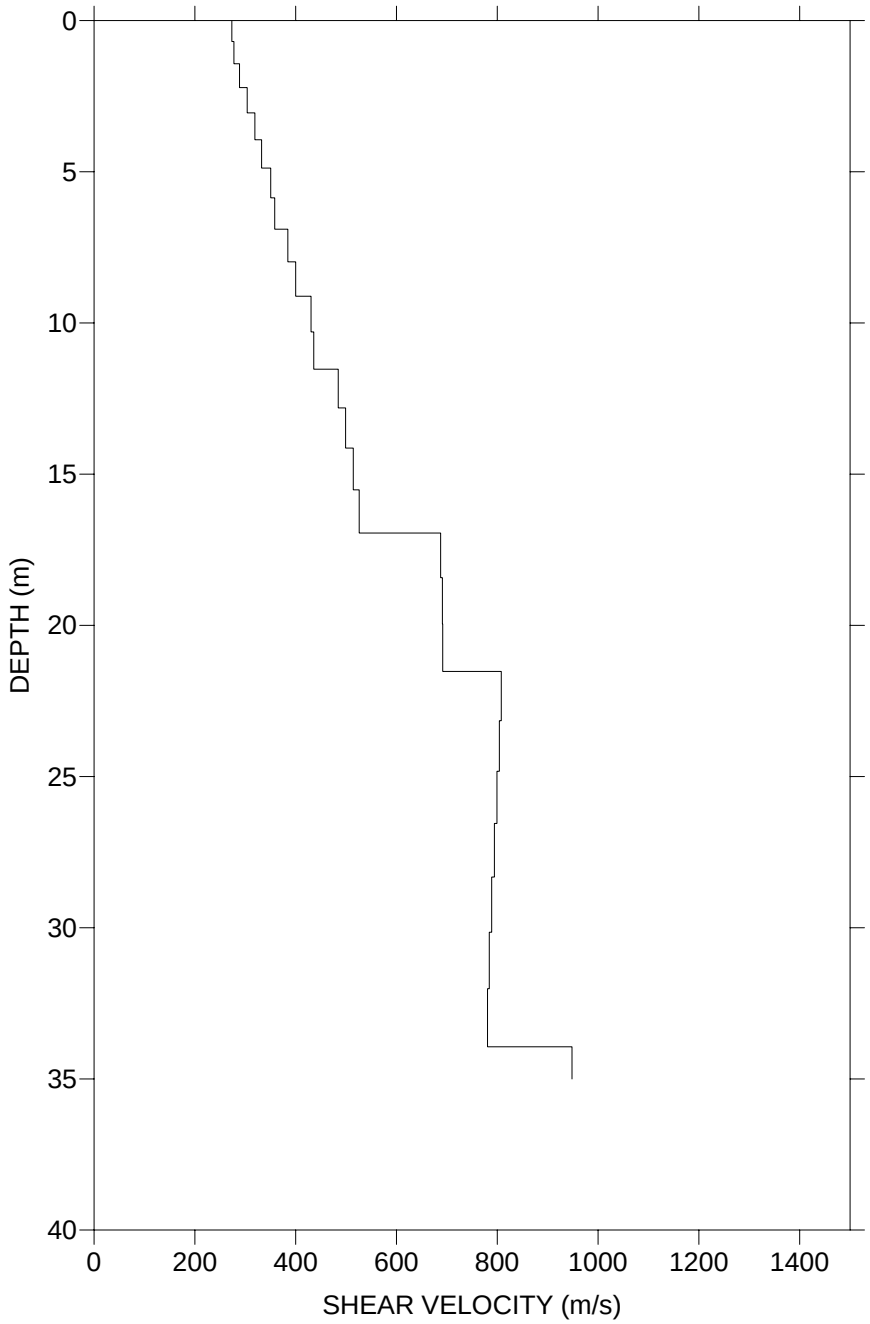


BH-BGC11-34

BGC ENGINEERING INC. EAGLE GOLD PROJECT
GEOPHYSICAL SURVEY
MASW PROFILE SL-33 STATION 360M
FRONTIER GEOSCIENCES INC.

DATE: SEPT 2011	SCALE 1:250	FIG. 36

MASW PROFILE SL-33 STATION 380m



BH-BGC11-34

BGC ENGINEERING INC. EAGLE GOLD PROJECT
GEOPHYSICAL SURVEY
MASW PROFILE SL-33 STATION 380M
FRONTIER GEOSCIENCES INC.

DATE: SEPT 2011	SCALE 1:250	FIG. 37

APPENDIX I
PLATE LOAD TESTS

1.0 INTRODUCTION

This Appendix documents the methods and results of plate load testing undertaken during the summer 2011 geotechnical investigations for mine site infrastructure.

Plate load tests were carried out by BGC personnel in August 2011 to assess the stiffness of exposed subgrade materials at or near selected proposed building pads. The aims of this testing program were to:

- Estimate the modulus of subgrade reaction of exposed subgrade materials.
- Estimate the yield stress pressure when possible.
- Test various diameters of plate to estimate the variation of material stiffness with bearing pressure and investigate the influence of plate size for extrapolation of results to full size footings.

2.0 PLATE LOAD TEST PROCESS DESCRIPTION

2.1. Test Locations

The tests were conducted in three excavated pits: two located within the proposed Plant Site footprint and one in the proximity of the proposed Secondary Crusher. The test areas were chosen for their proximity to the footprint of high bearing load structures and for their expected shallow occurrence of targeted rock formation. The pads were cautiously cut into undisturbed ground with an excavator under the supervision of BGC staff.

Tables I-1 and I-2 summarize the locations and characteristics of the tests performed. Refer to Drawing 07 for details of the layout of the plate load tests.

2.2. Installation

Specific test locations where identified in undisturbed representative subgrade and their surfaces were smoothed manually. For each location, the surface was cleaned of loose materials and a transition layer of clean coarse silica sand was placed at the test area to create a continuous and even contact between the base and the plates.

The plates where positioned parallel to the base of the rear differential of a D9H bulldozer that provided the approximately 48t reaction force for the test. A 25t hydraulic jack powered by a hand pump was used to apply the load to the ground and a 10,000 psi gauge was used to set and monitor the pressure increments. Refer to Photo 1 for a general arrangement of the test set up.

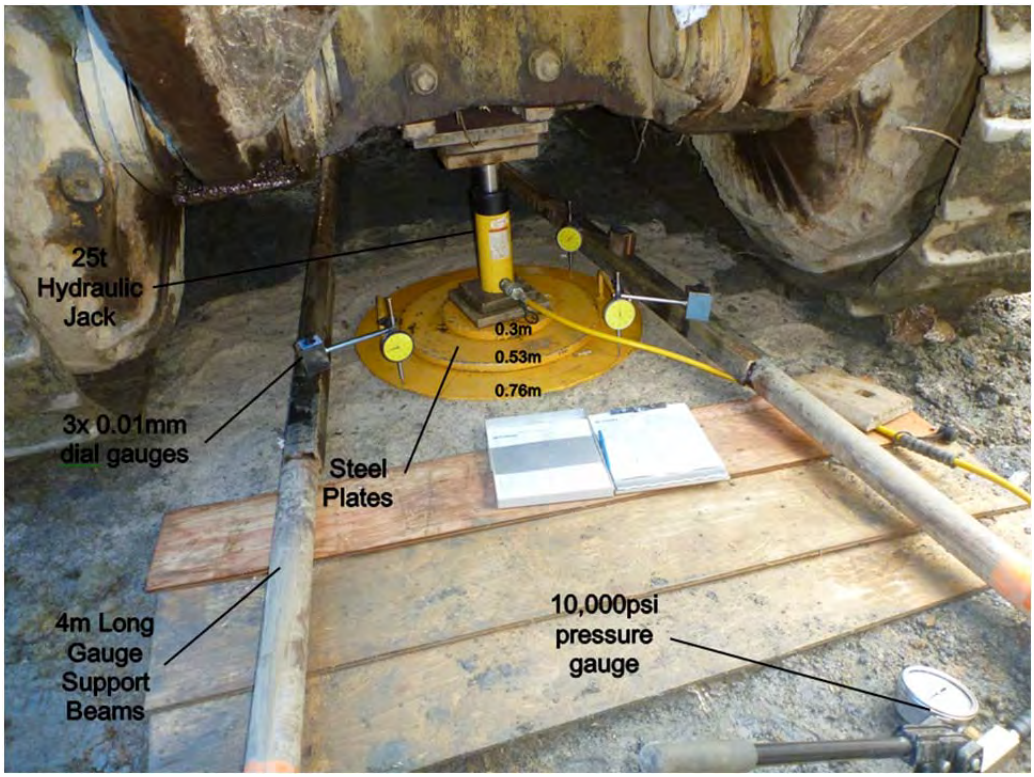


Photo 1. Details of the Instrumentation Set Up

2.3. Settlement monitoring and load increments

Vertical plate movements were measured to 0.01 mm resolution using three dial gauges positioned as shown in Photo 1.

The dial gauges were mounted on two 4m horizontal reference beams with supporting legs resting on the ground beyond the area of influence of the test. The load pattern was selected to obtain roughly 10 to 20 increments between the start and the maximum available pressure. The maximum pressure was limited by the capacity of the jack to 10,000 psi. After an intermediate load was reached, pressure was incrementally decreased and then re-increased, inducing an unload-reload cycle. Each load increment was maintained until the measured movements dropped to less than 0.01 mm/5 min.

2.4. Plate Sizes

Different plate sizes were tested at different locations to estimate variation of material stiffness with bearing pressure, and to investigate the influence of the load applied to different surface areas (plate diameters) on settlement and stiffness. Four different plate sizes were used in the plate load tests: 0.3 m, 0.53 m, 0.76 m and 1.2 m. All plates were 25mm thick and made of high grade steel.

2.5. Instruments Calibration

After completion of the field testing, the hydraulic gear was calibrated by an accredited laboratory (Acuren Group Inc, Richmond, BC). Loads estimated during testing and presented in this appendix have been corrected accordingly. The compression load calibration results are attached in the Calibration Report following the figures at the end of this appendix.

Table I-1. Summary of Plate Load Tests at the Plant Site

Location	Test #	Date	Approximate UTM Coordinates (NAD 84)		Depth (m) Below Grade	Plate Diameter (m)	Max. Pressure Applied (kPa)	Max. Gauge Deformation (mm)
			N (m)	E (m)				
TP-BGC11-103	PT-BGC11-01	10/08/11	7101124	458820	5.5	0.76	280	1.9
	PT-BGC11-02	11/08/11			5.0	0.76	390	2.8
	PT-BGC11-03	12/08/11			5.0	0.53	980	2.0
	PT-BGC11-04	13/08/11			5.0	0.3	3100	9.6
	PT-BGC11-05	14/08/11			5.5	0.53	780	4.7
TP-BGC11-105	PT-BGC11-06	15/08/11	7101190	458939	8.5	1.2	190	6.9
	PT-BGC11-07	16/08/11			8.5	0.76	480	14.4
	PT-BGC11-08	17/08/11			8.5	0.76	480	12.9
	PT-BGC11-09	22/08/11			8.5	0.53	490	14.2

Table I-2. Summary of Plate Load Test at the Secondary Crusher Area

Location	Test #	Date	UTM Coordinates (NAD 84)		Depth (m) Below Grade	Plate Diameter (m)	Max. Pressure Applied (kPa)	Max. Gauge Deformation (mm)
			N (m)	E (m)				
Between OC-BGC11-47 and BH-BGC11-36	PT-BGC11-10	23/08/11	7100285	459722	3.2	0.53	880	4.1
	PT-BGC11-11	24/08/11			3.2	0.3	2790	5.0
	PT-BGC11-12	25/08/11	7100288	459722	3.2	0.53	960	4.8
	PT-BGC11-13	26/08/11	7100291	459722	3.8	0.3	2160	14.7
	PT-BGC11-14	27/08/11	7100295	459722	4.2	0.53	980	2.1

3.0 DATA RESULTS AND ANALYSIS

The applied plate pressures and recorded movements for each dial gauge were plotted to produce plate load test curves.

The vertical subgrade reaction moduli for the virgin curve, k_v, and for the rebound curve, $k_{v(u-r)}$, were determined for every plate load test curve. From the load/settlement relationship, the vertical subgrade reaction modulus for the virgin curve is calculated as $k_v = dP/d\delta$, derivative of the tangent line that was most reflective of the ground behavior post immediate settlement (>60 KPa) and prior to occurrence of yield behavior (when applicable). The vertical subgrade reaction modulus for the rebound curve is calculated as $k_{v(u-r)} = dP_{(u-r)}/d\delta$, derivative of the tangent to the most representative section of the reload section of the unload/reload loop, before the virgin loading gradient of the load/settlement relationship is recovered. Figures I-1 to I-14 illustrates the plate load test curves for each individual test.

Results and test details are summarized in Table I-3 and Table I-4 for the plant site area and the secondary crusher area, respectively.

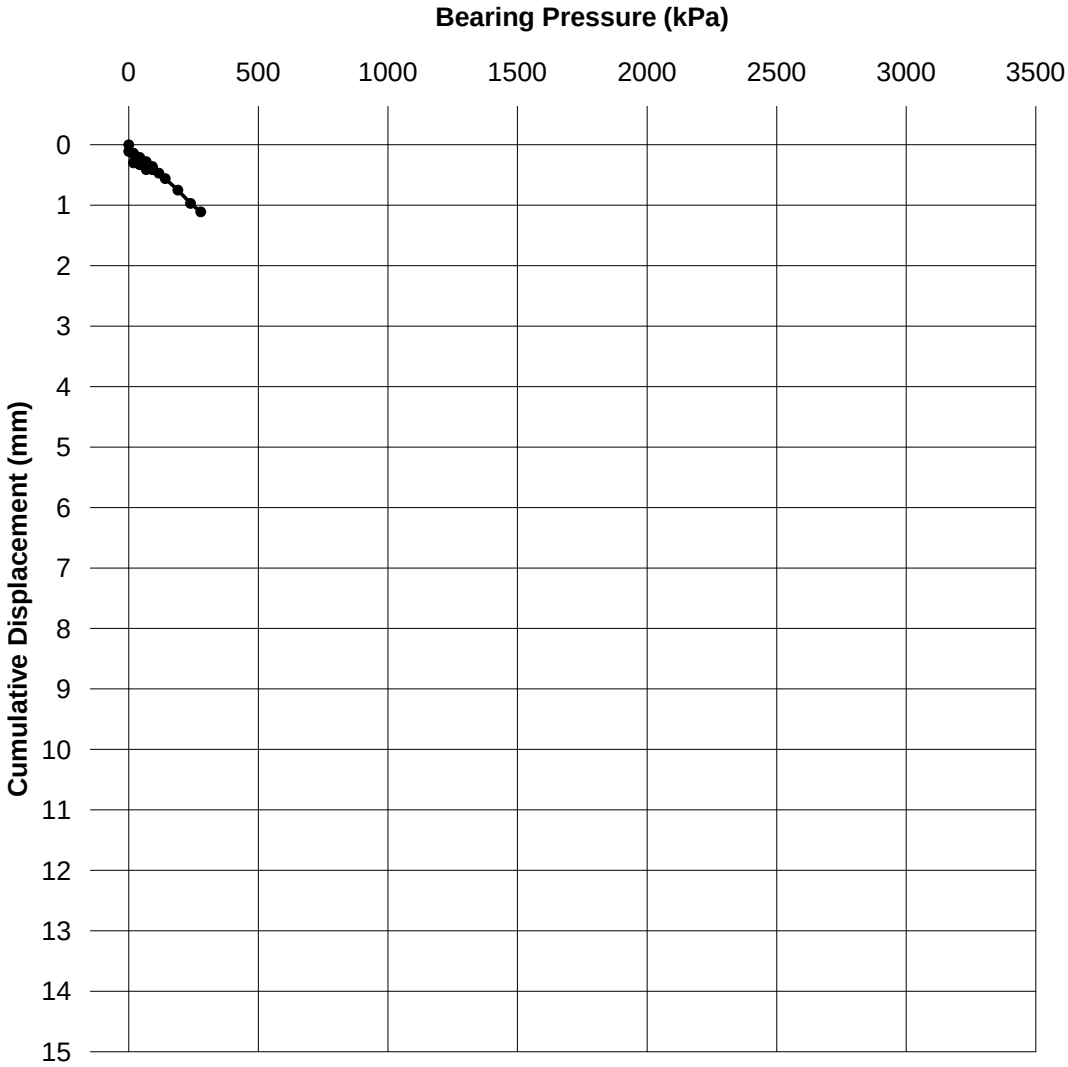
Table I-3. Summary of Subgrade Reaction Modulus from Plate Load Tests at the Plant Site

Location	Test #	Depth Below Grade (m)	Plate Diameter (m)	Vertical Subgrade Reaction Modulus (kPa/mm³)	
				Virgin Curve, kv	Rebound Curve, kv(u-r)
TP-BGC11-103	PT-BGC11-01	5.5	0.76	130	220
TP-BGC11-103	PT-BGC11-02	5	0.76	140	310
TP-BGC11-103	PT-BGC11-03	5	0.53	130	290
TP-BGC11-103	PT-BGC11-04	5	0.3	540	1170
TP-BGC11-103	PT-BGC11-05	5.5	0.53	130	250
TP-BGC11-105	PT-BGC11-06	8.52	1.2	30	60
TP-BGC11-105	PT-BGC11-07	8.52	0.76	40	80
TP-BGC11-105	PT-BGC11-08	8.52	0.76	50	120
TP-BGC11-105	PT-BGC11-09	8.52	0.53	40	120

Table I-4. Summary of Subgrade Reaction Modulus from Plate Load Tests at the Secondary Crusher

Location	Test #	Depth Below Grade (m)	Plate Diameter (m)	Vertical Subgrade Reaction Modulus (kPa/mm³)	
				Virgin Curve, kv	Rebound Curve, kv(u-r)
Between OC-BGC11-47 and BH-BGC11-36	PT-BGC11-10	3.2	0.53	190	600
	PT-BGC11-11	3.2	0.3	640	1600
	PT-BGC11-12	3.2	0.53	200	500
	PT-BGC11-13	3.8	0.3	220	1000
	PT-BGC11-14	4.2	0.53	400	1040

FIGURES



NOTES:
Test: PT-BGC11-01
Depth: 5.5 m
Plate Diameter: 0.76 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 130 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 220 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

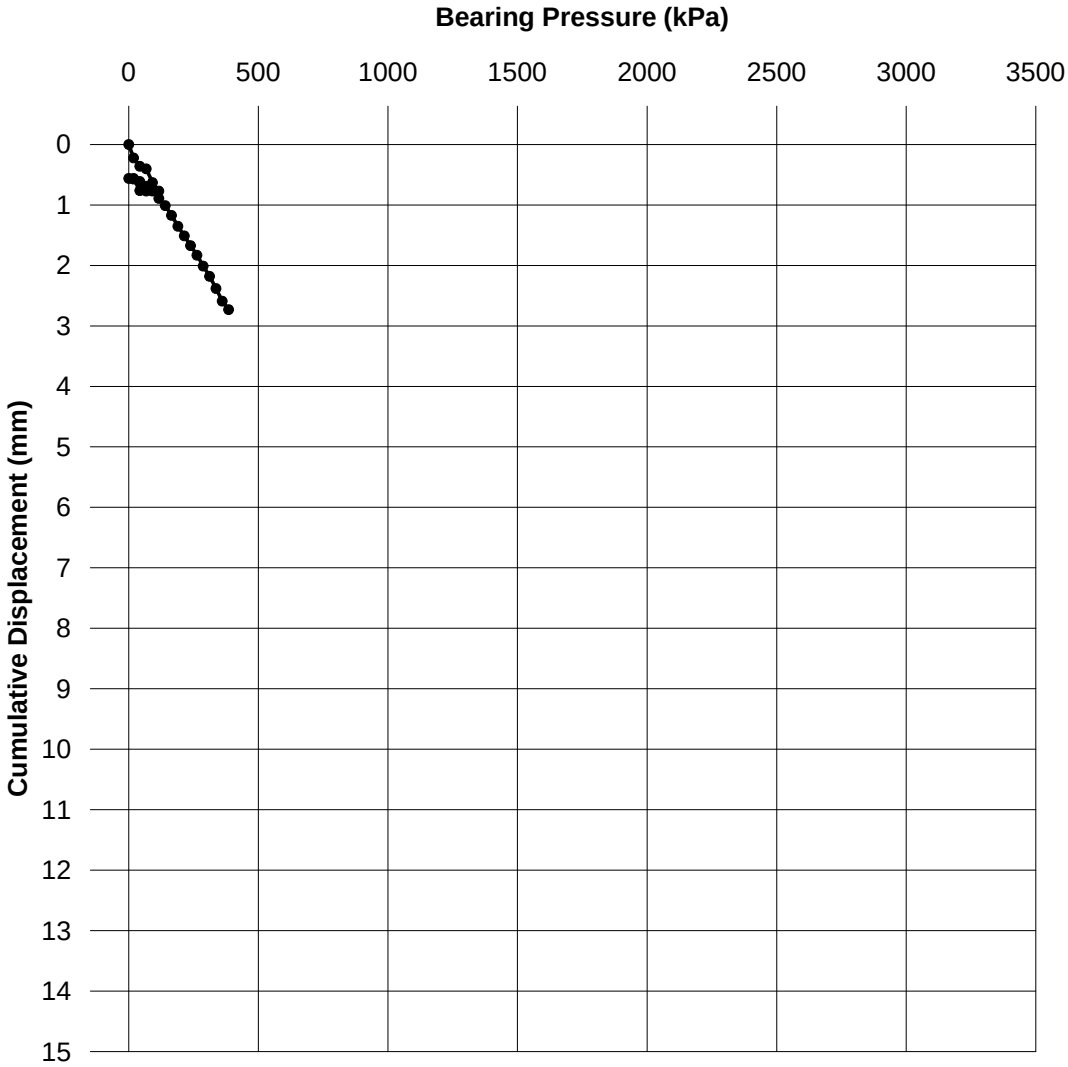
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-01

PROJECT No.	FIG No.	REV.
0792-006	I-1	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-02
Depth: 5 m
Plate Diameter: 76 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 140 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 310 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

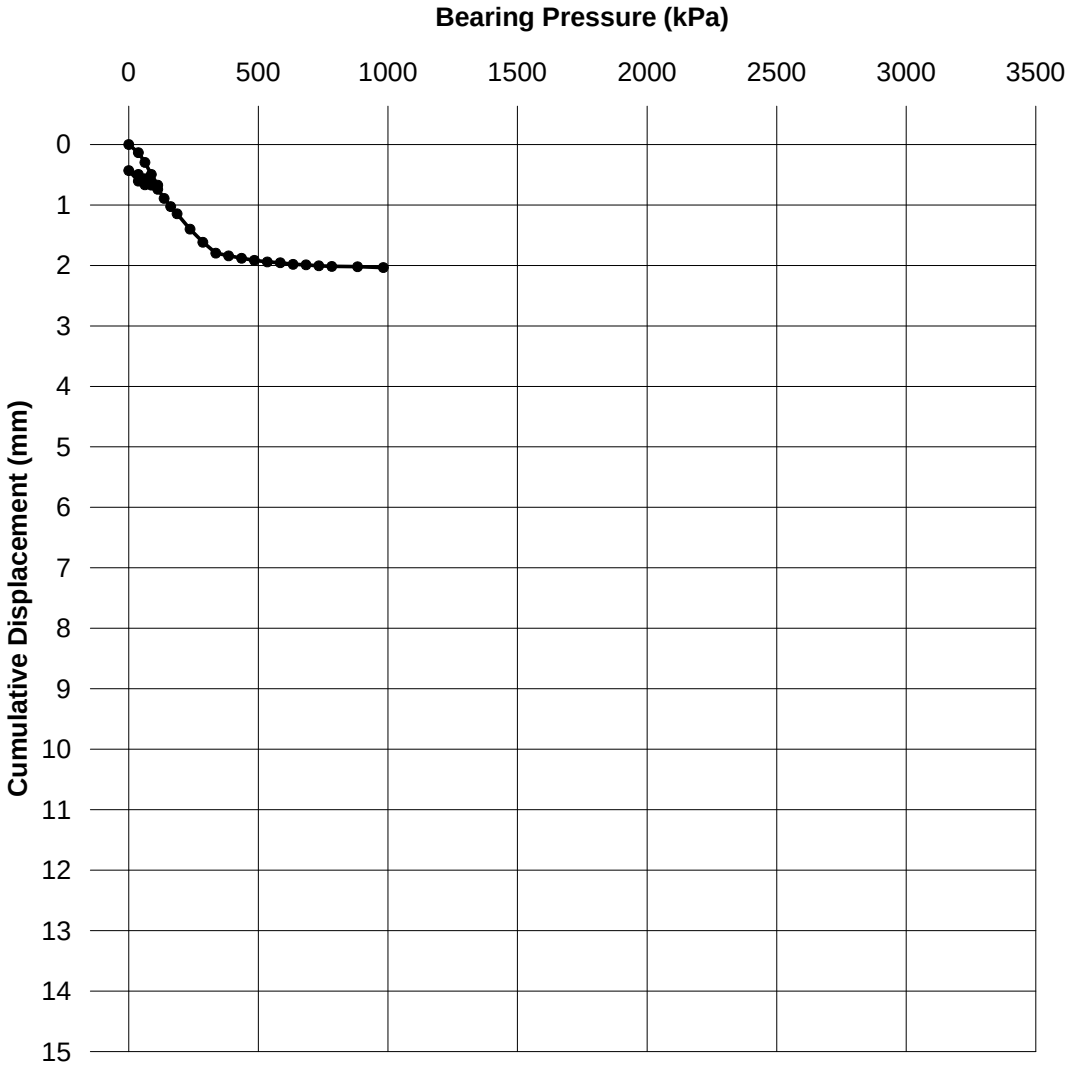
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-02

PROJECT No.	FIG No.	REV.
0792-006	I-2	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-03
Depth: 5 m
Plate Diameter: 53.3 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 130 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 290 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

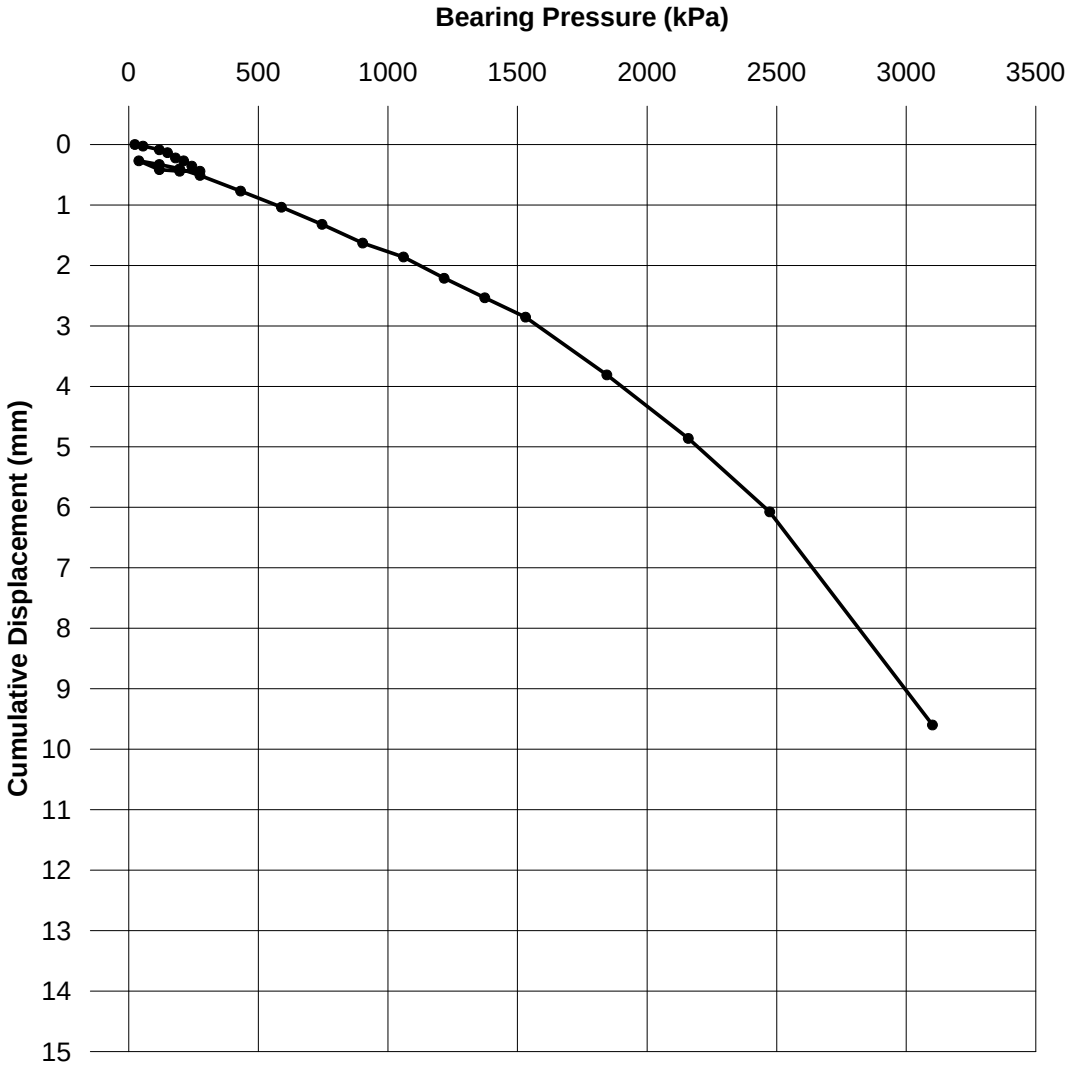
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-03

PROJECT No.	FIG No.	REV.
0792-006	I-3	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-04
Depth: 5 m
Plate Diameter: 30 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 540 kPa/mm
Reboud Curve $k_{v(u-r)}$ = 1170 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: DJANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

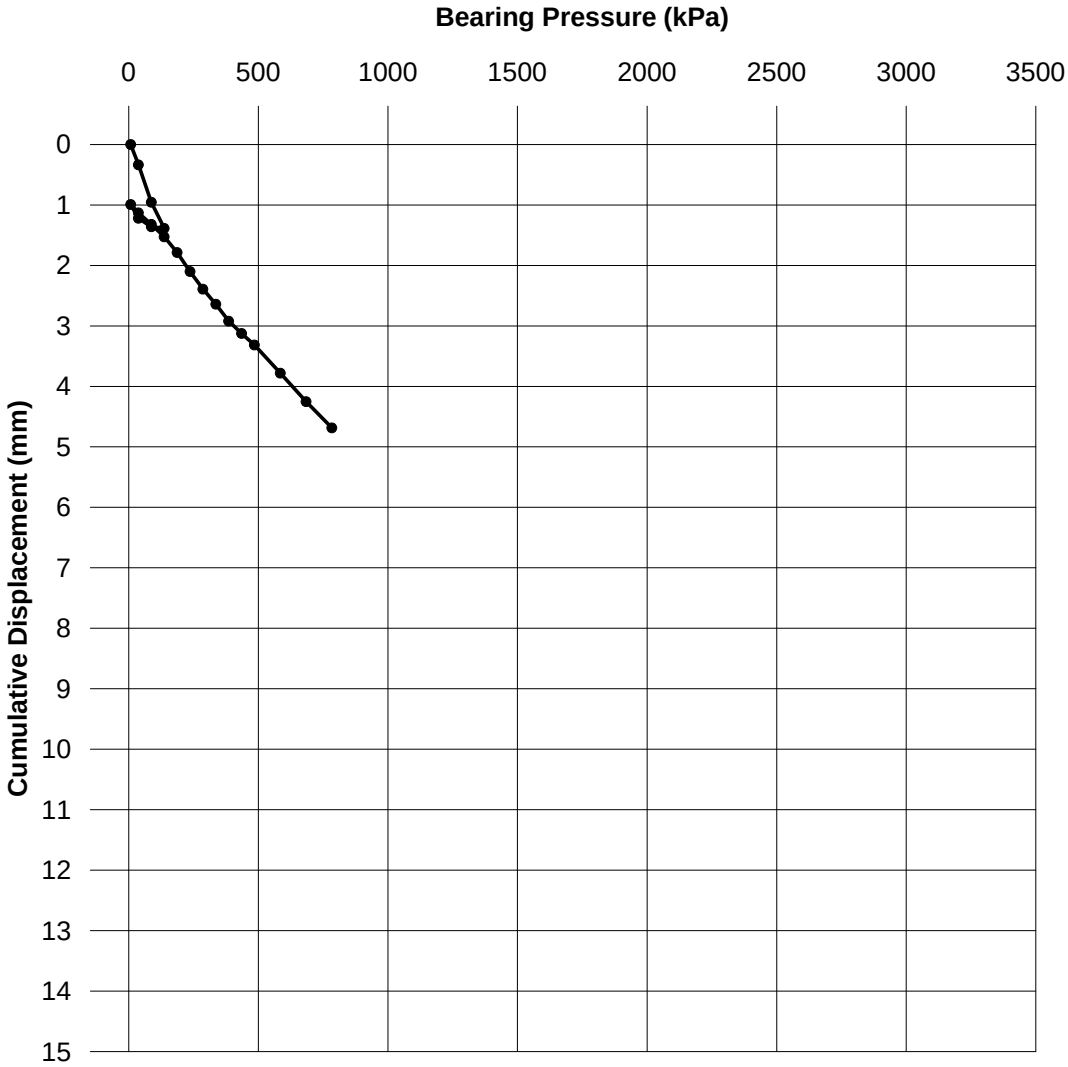
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-04

PROJECT No.	FIG No.	REV.
0792-006	I-4	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-05
Depth: 5.5 m
Plate Diameter: 53.3 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 130 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 250 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

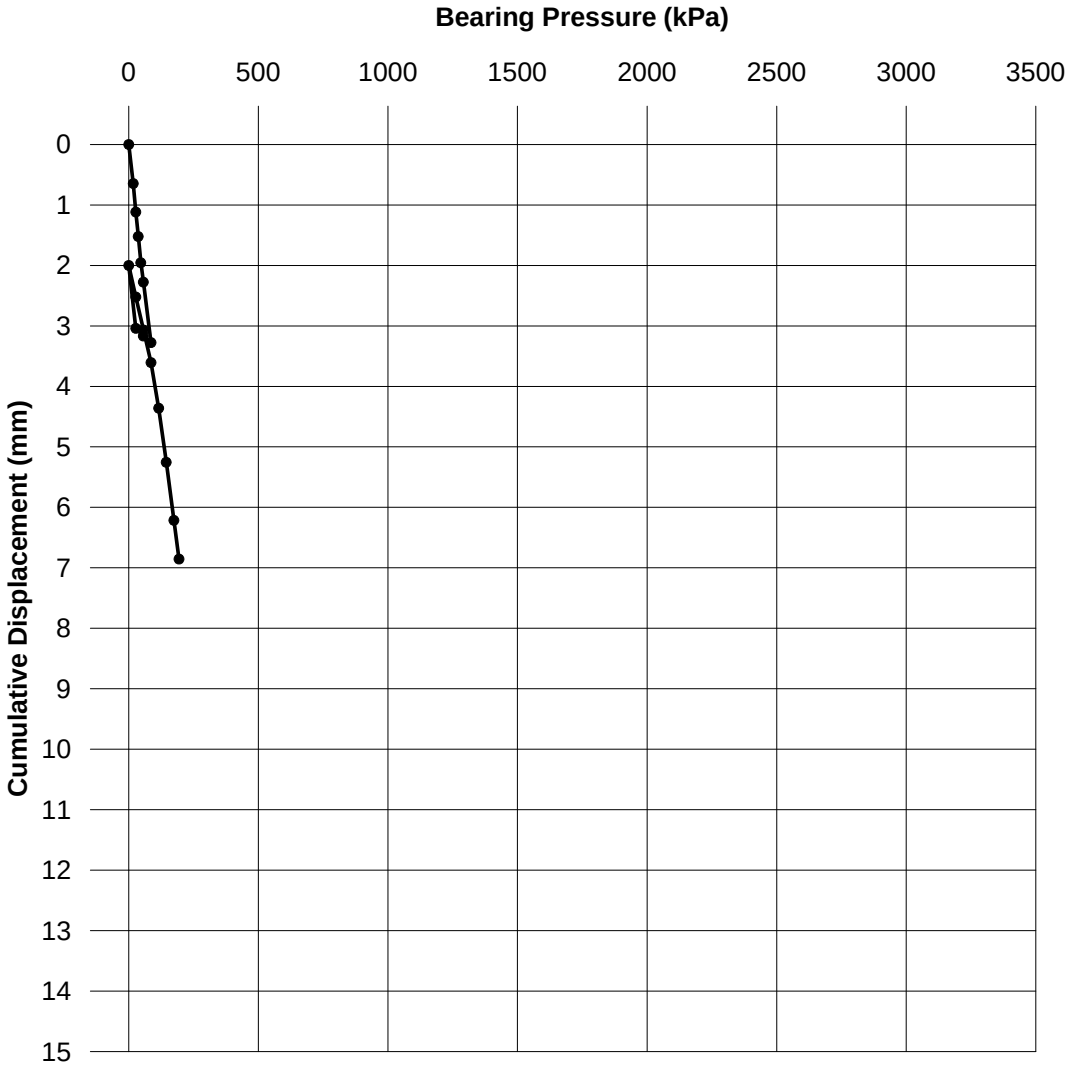
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-05

PROJECT No.	FIG No.	REV.
0792-006	I-5	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-06
Depth: 8.52 m
Plate Diameter: 120 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 30 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 60 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

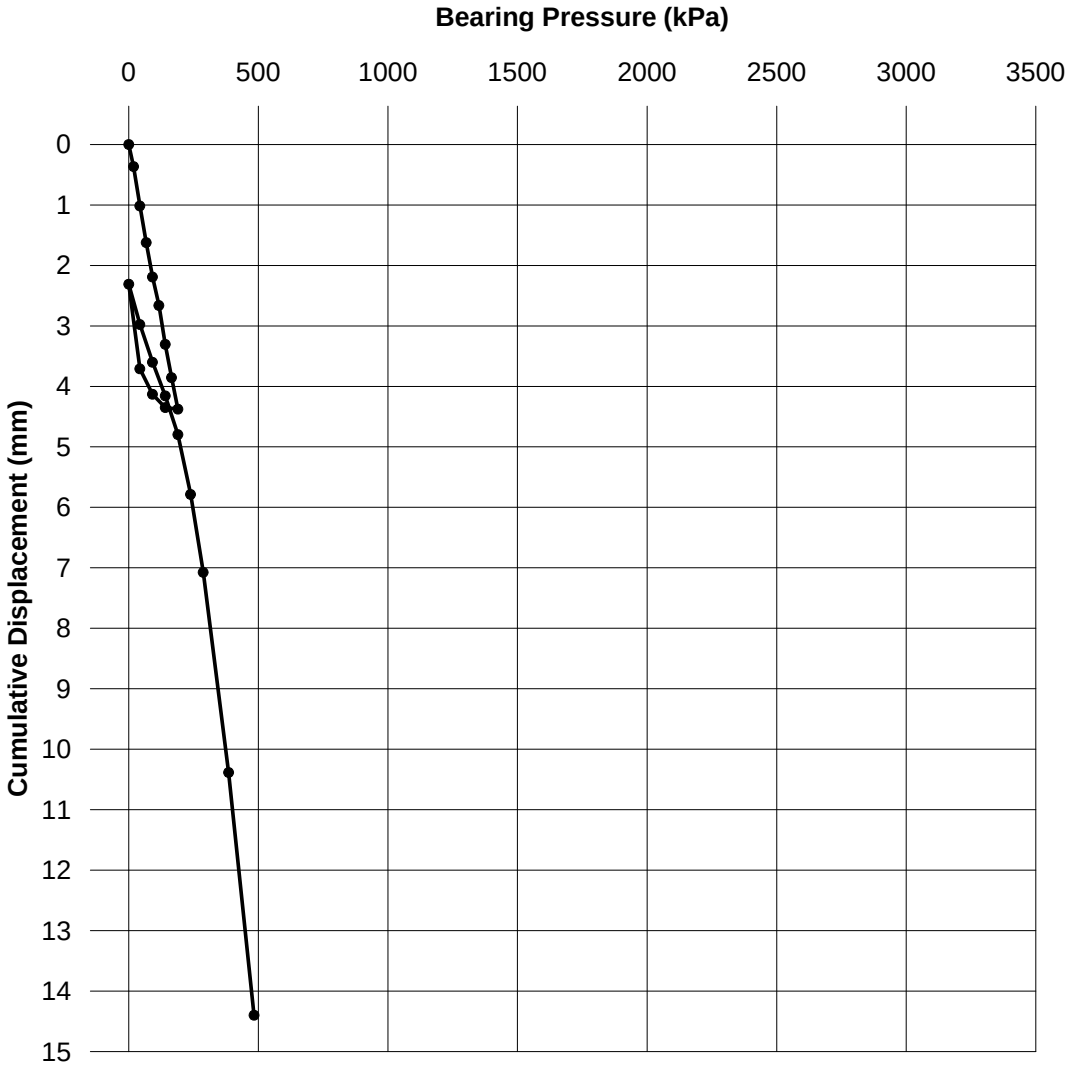
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-06

PROJECT No.	FIG No.	REV.
0792-006	I-6	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-07
Depth: 8.52 m
Plate Diameter: 76 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 40 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 80 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED:PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

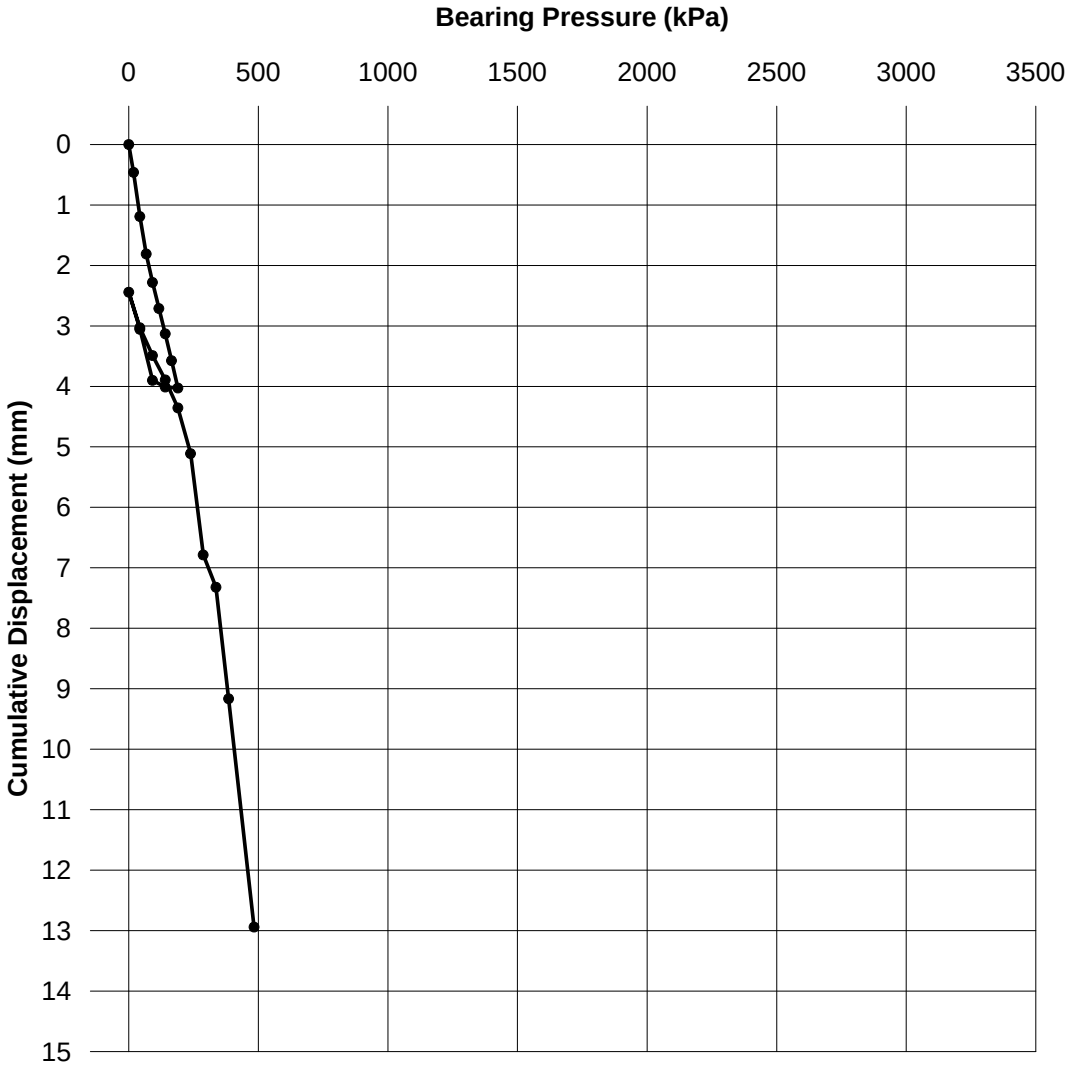
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-07

PROJECT No.	FIG No.	REV.
0792-006	I-7	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-08
Depth: 8.52 m
Plate Diameter: 76 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 50 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 120 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

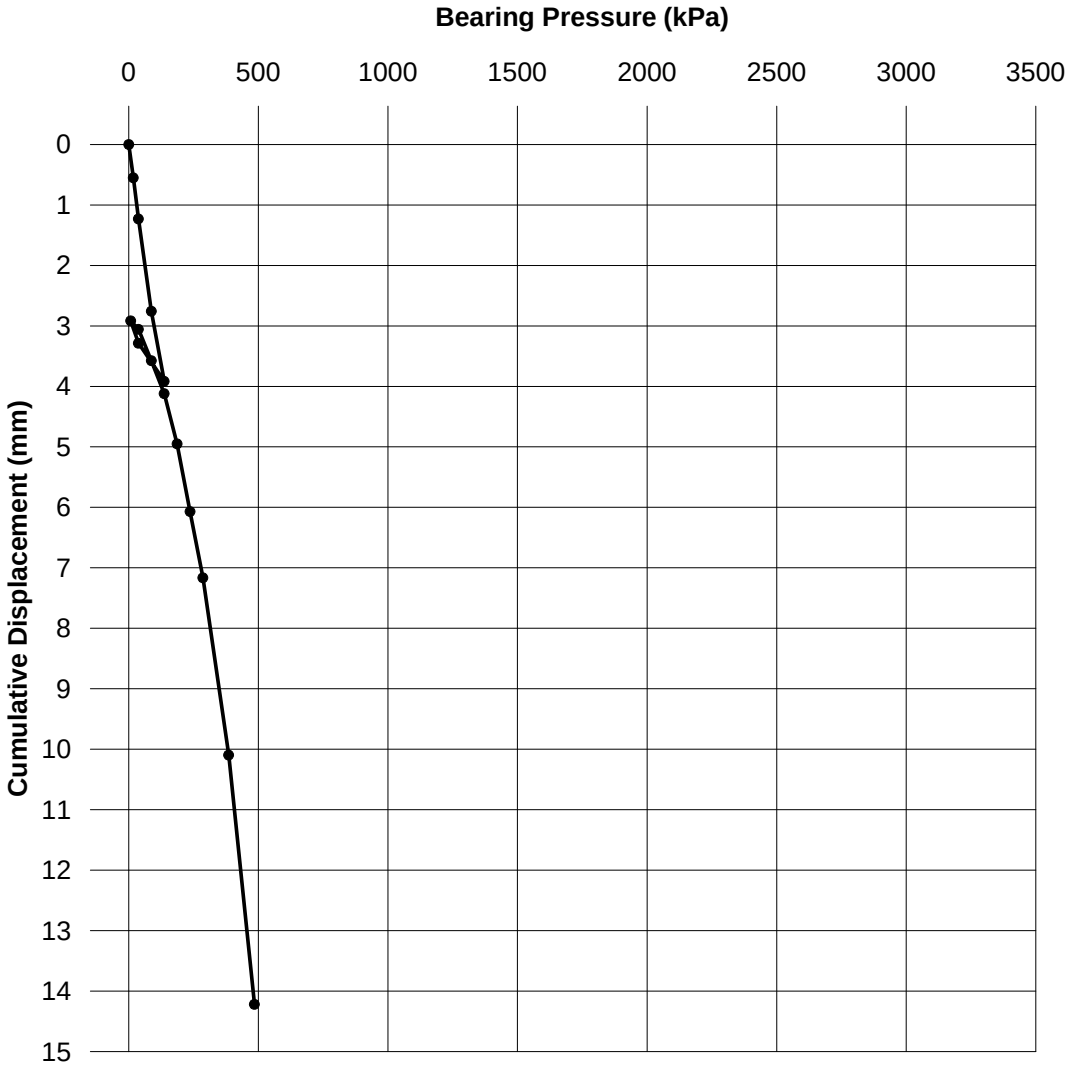
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-08

PROJECT No.	FIG No.	REV.
0792-006	I-8	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-09
Depth: 8.52 m
Plate Diameter: 53.3 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 40 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 120 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

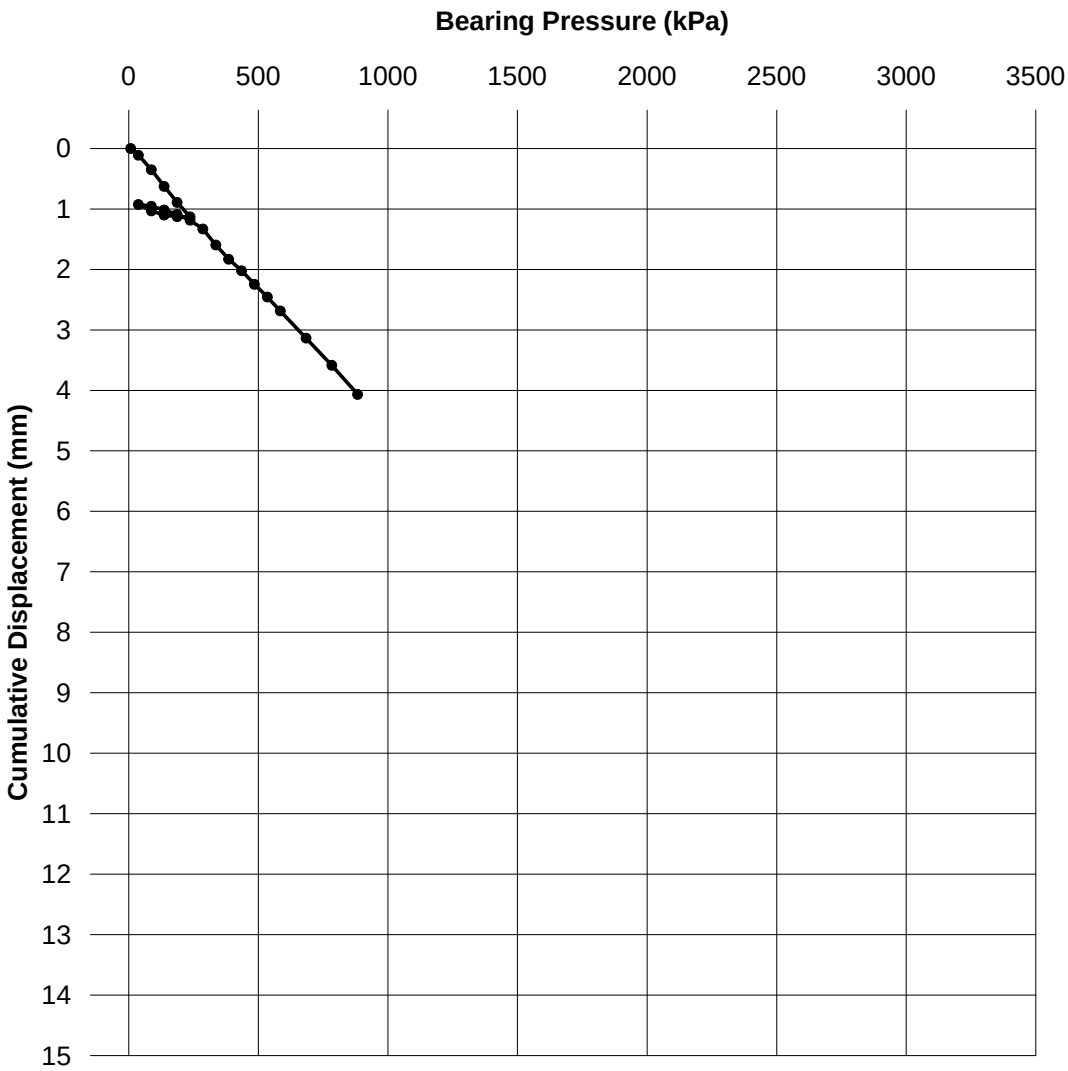
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-09

PROJECT No.	FIG No.	REV.
0792-006	I-9	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-10
Depth: 3.2 m
Plate Diameter: 53.3 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 190 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 600 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

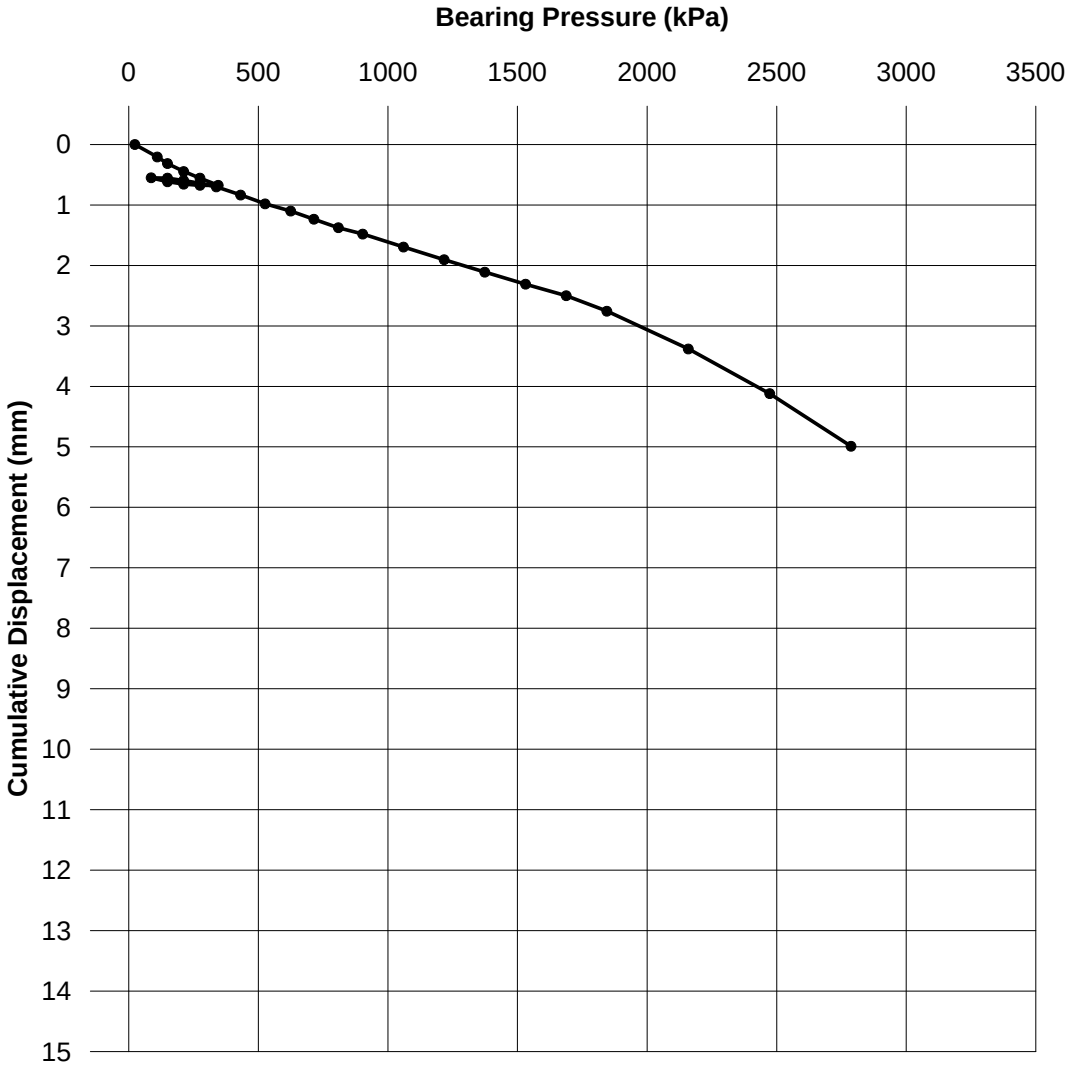
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-10

PROJECT No.	FIG No.	REV.
0792-006	I-10	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-11
Depth: 3.2 m
Plate Diameter: 30 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 642 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 1600 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

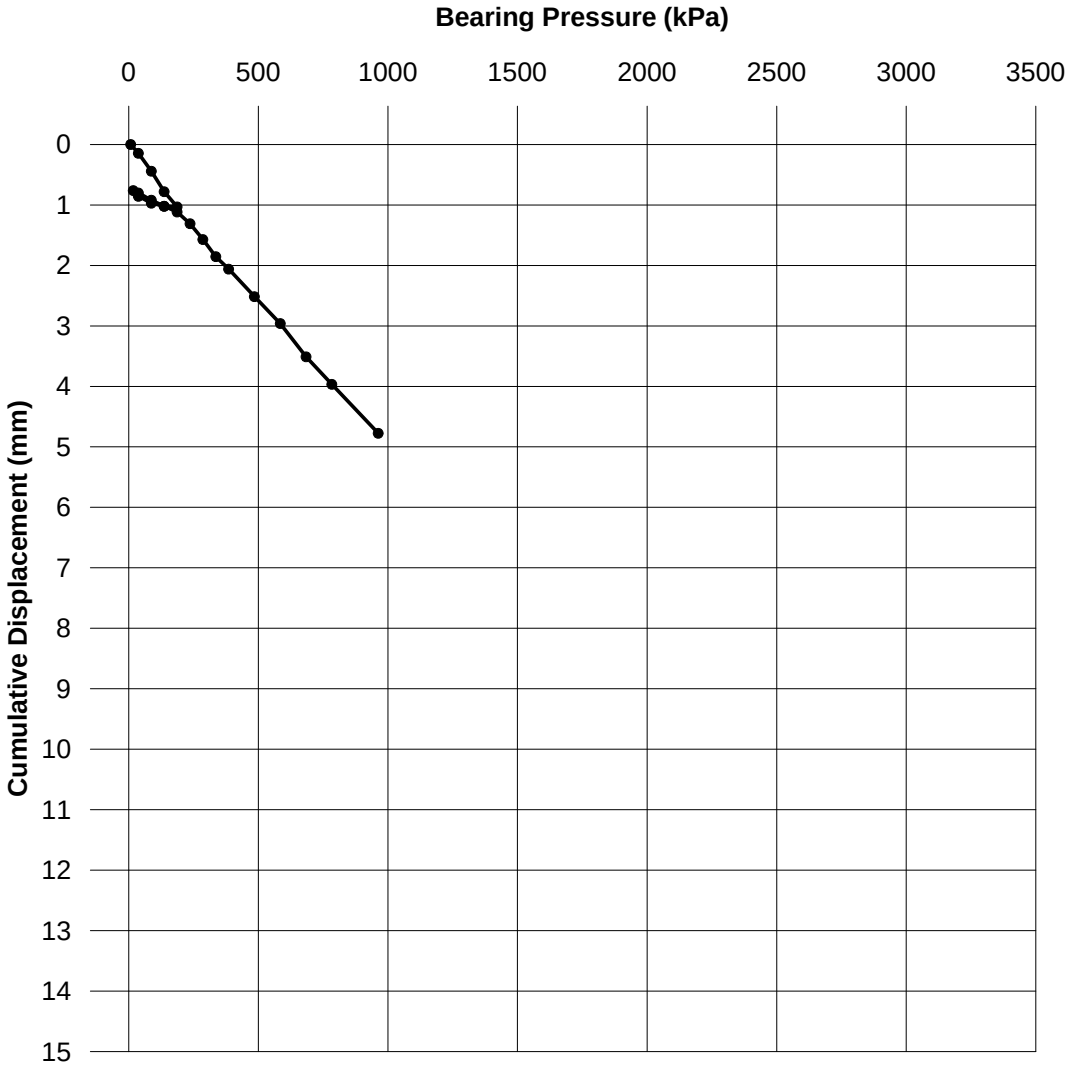
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-11

PROJECT No.	FIG No.	REV.
0792-006	I-11	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-12
Depth: 3.2 m
Plate Diameter: 53.3 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 200 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 500 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN:LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

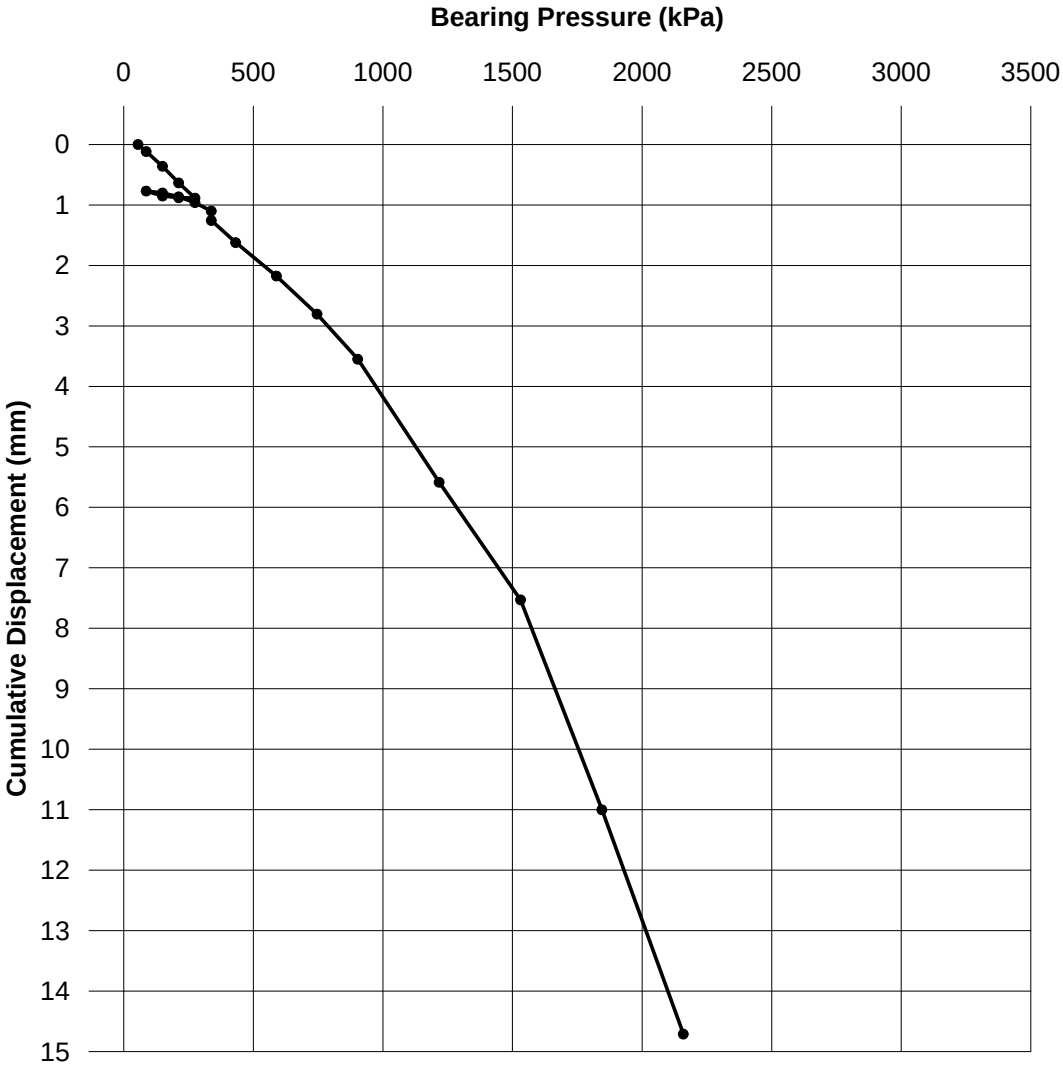
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-12

PROJECT No.	FIG No.	REV.
0792-006	I-12	0

N:\BGC\Projects\0792 Victoria Gold\0006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-13
Depth: 3.8 m
Plate Diameter: 30 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 220 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 1000 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

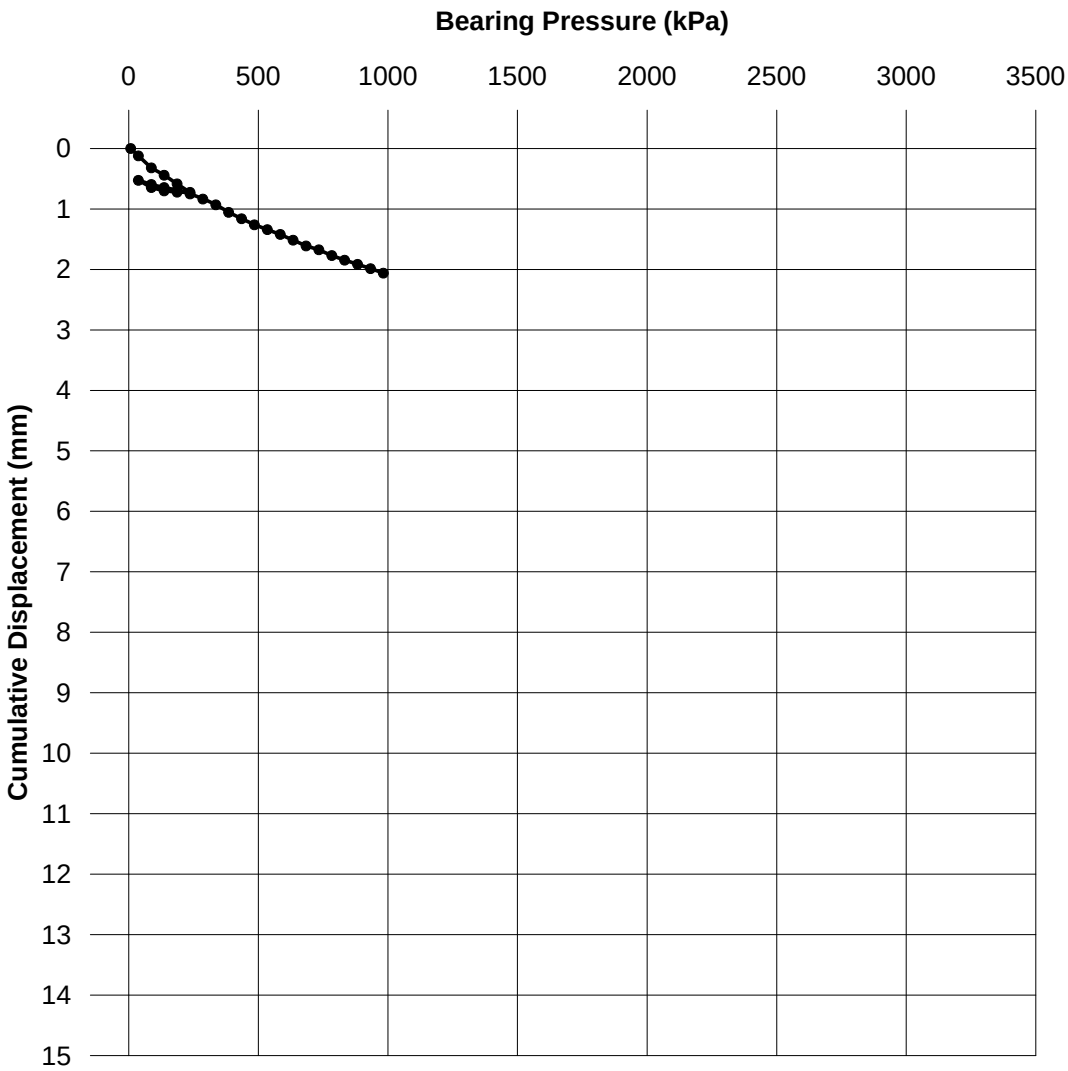
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-13

PROJECT No.	FIG No.	REV.
0792-006	I-13	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



NOTES:
Test: PT-BGC11-14
Depth: 4.2 m
Plate Diameter: 53.3 cm

Subgrade Reaction Modulus Summary:

Virgin Curve: k_v = 400 kPa/mm
Rebound Curve $k_{v(u-r)}$ = 1040 kPa/mm

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE: NTS	DESIGN: LGT
DATE: JANUARY 2012	CHECKED: PQ
DRAWN: JND	APPROVED: PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: PLATE TEST RESULTS PT-BGC11-14

PROJECT No.	FIG No.	REV.
0792-006	I-14	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix I Plate Load Testing\Figures\Grapher plots for report

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.

CALIBRATION REPORT

Acuren Group Inc.
12271 Horseshoe Way
Richmond, BC, Canada V7A 4V4
www.acuren.com

Phone: 604.275.3800
Fax: 604.274.7235

NDT, Inspection and Materials Engineering
a Rockwood Company

CALIBRATION REPORT

BGC ENGINEERING INC.
SUITE 500 - 1045 HOWE STREET
VANCOUVER BC
V6Z 2A9

Attention: LUC TOUSSAINT

Date: September 21, 2011
File No.: 6057329
P.O. No.: VISA
Report No.: 1

Description: 25 Ton ENERPAC Ram for Compression Load Calibration
Model: RC256

Calibration Date: September 21, 2011

Testing Machine ID: SATEC Universal Testing Machine, Serial 120HVL-1164

Calibration Data

Gauge Reading (psi)	Run #1 (lbf)	Run #2 (lbf)	Test Machine Reading (Average Load) (lbf)
100	0	0	0
1000	4393	4426	4410
2000	9489	9459	9474
3000	14246	14220	14233
4000	19262	19015	19139
5000	24160	24213	24187
6000	29126	29045	29086
7000	34284	34172	34228
8000	39274	39348	39311
9000	44477	44418	44448

* Test machine calibrated to ASTM E4 and CSA A23.2-9C specifications

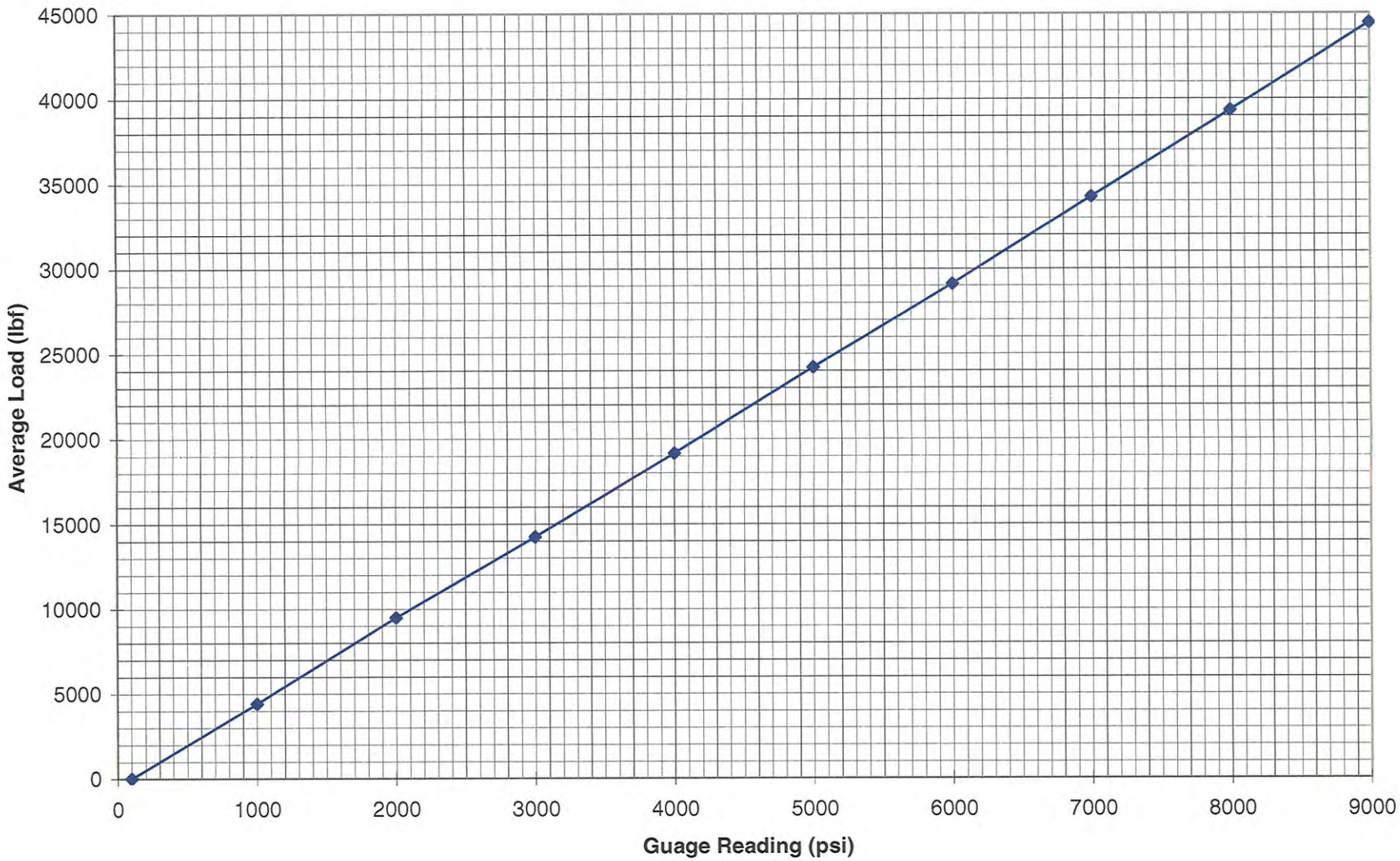
Reviewed by: _____
Alex Wong, AScT

Reviewed by: _____
Bill Johnson, AScT

SCOPE OF SERVICES: The agreement of Acuren to perform services extends only to those services specifically provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested inspection of specific equipment provided for in writing and the preparation of reports or similar documents. Any descriptions, statements, comments or expressions made reflect the opinion or observations of the Acuren examiner based solely upon data available at the time, and are not intended, nor can they be construed, as representations or warranties as to the actual circumstances. Acuren does not assume any responsibilities of the owner/operator, and the owner/operator retains complete responsibility for all engineering, repair and use decisions.
STANDARD OF CARE: In performing the services provided, Acuren shall use the degree of care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren, and all other warranties are expressly disclaimed. In the event of any breach of this warranty, Acuren's sole and exclusive obligation will be to correct or re-perform the deficient service or, at Acuren's option, to refund the amount paid for the deficient service.
LIMITATIONS OF LIABILITY: Nothing in this agreement shall be construed to mean that Acuren assumes any liability on account of injury to persons or property, including death, except and only to the extent those directly caused by the willful or negligent misconduct of Acuren in the context of performing the requested services. In no event shall Acuren's aggregate liability for any reason, in connection with any claim asserted, exceed the amount paid for the services in question. Acuren shall not be held responsible or liable for any loss, damage or delay caused by accidents, strikes, fires, floods, or other circumstances or causes beyond Acuren's control, including actions taken or not taken by the owner/operator or other third parties. In no event shall Acuren be liable for indirect, incidental, special, punitive, or consequential damages including, without limitation, damages relating to reputation, lost profits, goodwill, downtime, loss of use, business interruption or other economic loss.

ACUREN

ENERPAC RC256 COMPRESSION LOAD CALIBRATION GRAPH- 6057329
BGC ENGINEERING INC.



APPENDIX J
THERMISTORS

THERMISTORS

1.0 INTRODUCTION

Thermistors were installed in eight new boreholes to measure ground temperatures and determine the presence of frozen ground and thickness of the active layer. In addition, four thermistors had been previously installed in boreholes in 2009 and 2010. This appendix describes the thermistor work and presents initial temperature data obtained from these instruments in summer 2011.

2.0 THERMISTOR INSTALLATIONS

Thermistors installed in 2011 were manufactured by M-squared Instruments of Cochrane, Alberta. Thermistors were installed in 2" diameter schedule 80 PVC pipe. The annulus between the thermistor and the PVC was not backfilled, but the top of the pipe was sealed to prevent air circulation. The annulus between the PVC pipe and the borehole wall was backfilled with grout in diamond drill holes and with bentonite chips in auger holes. Selected installed thermistors were subsequently moved to different holes to balance the distribution of subsurface temperature measurements at appropriate areas of the site where the data are expected to be of most interest. Three 25 m long thermistors with eight thermocouple beads and four 10 m long thermistors with eight thermocouple beads were installed in 2011. Thermistors installed in 2009 and 2010 were manufactured by EBA Engineering Consultants Ltd. The thermistor installations are summarized in Table J.1.

Table J.1 Thermistor Installation Details

Hole	Facility/Area	Lithology	Date Installed	Hole Depth (m)	Length of Thermistor (m)	Installation details	Thermistor Cable ID #	Number of sensors	Manufacturer	Model	Comments
DH-BGC09-STU-3	Lower Stuttle Gulch	Sand and gravel to 6.1, then silt with, clay sand and gravel	24/08/2009	31.09	10 (plus 2m lead)		EBA#2194	6	EBA Engineering Consultants Ltd		
DH-BGC09-STU-4	Lower Stuttle Gulch	Silty sand and gravel to 7.5m, then gravelly clay (till) to 18.29m	24/08/2009	18.29m	10 (plus 2m lead)		EBA#2193	6	EBA Engineering Consultants Ltd		
DH-BGC09-AG3	Lower Ann Gulch	Sand and gravel to 2.8, silty sand to 7.6m, slightly to moderately weathered quartzite to 13.7	25/08/2009	13.7	10 (plus 2m lead)		EBA#2192	1	EBA Engineering Consultants Ltd		One bead working at 10m
BH-BGC10-07	Previously proposed location of tertiary crusher, south side of Dublin Gulch between Stuttle Gulch and Eagle Pup	Sand Gravel, low recovery to 18.0 (colluvium? Completely weathered rock?)	17/08/2010	29.95	10 (plus 2m lead)	50mm diameter sched 80 PVC casing to 10.1m backfilled with sand, bentonite plug at the top.	EBA#2256	6	EBA Engineering Consultants Ltd	W12101148	
BH-BGC11-42	In ice-rich colluvium located in the Eagle Pup WRSA area	Sand (SW), some silt, some gravel, frozen Vx with 1.3m thick pure ice encountered	25/08/2011	28.19	25 (plus 1.5m lead)	26.9m long 2" threaded sched 40 PVC casing, outer backfilled with bentonite chips, no infill of casing around cable. Steel monument at collar	26.5-2	8	M-Squared Instruments, Cochrane, AB	Termination: MS3106E20-29P Thermistor Type: YSI44007	
BH-BGC11-63	In ice-rich colluvium in the Eagle Pup WRSA area	Silt (ML), frozen Vx (assumed Colluvium)	25/08/2011	26.7	25 (plus 1.5m lead)	26.7m long 2" threaded sched 40 PVC casing, outer backfilled with bentonite chips, no infill of casing around cable. Steel monument at collar	26.5-3	8	M-Squared Instruments, Cochrane, AB	Termination: MS3106E20-29P Thermistor Type: YSI44007	Vibrating wire piezometer also installed in the hole
BH-BGC11-47	Silt borrow area	Silt (ML) with occasional sand bed, trace fine gravel	10/08/2011	16	10 (plus 1.5m lead)	14.6m long 2" threaded sched 40 PVC casing, outer backfilled with bentonite chips, no infill of casing around cable. Steel monument at collar	11.5-1	8	M-Squared Instruments, Cochrane, AB	Termination: MS3106E20-29P Thermistor Type: YSI44007	Thermistor was moved from this hole to BH-BGC11-58 on Aug 28th
BH-BGC11-44	Silt borrow area	Silt (ML and MH) with occasional silt and gravel layer, potentially frozen to bottom of hole	10/08/2011	14.68	10 (plus 1.5m lead)	12.4m long 2" threaded sched 40 PVC casing, outer backfilled with bentonite chips, no infill of casing around cable. Steel monument at collar	11.5-3	8	M-Squared Instruments, Cochrane, AB	Termination: MS3106E20-29P Thermistor Type: YSI44007	Thermistor got damaged on Aug 28 2011
BH-BGC11-49	Silt borrow area	Silt (ML) with occasional sand bed, trace fine gravel	10/08/2011	16	10 (plus 1.5m lead)	14.95m long 2" threaded sched 40 PVC casing, outer backfilled with bentonite chips, no infill of casing around cable. Steel monument at collar	11.5-4	8	M-Squared Instruments, Cochrane, AB	Termination: MS3106E20-29P Thermistor Type: YSI44007	

Hole	Facility/Area	Lithology	Date Installed	Hole Depth (m)	Length of Thermistor (m)	Installation details	Thermistor Cable ID #	Number of sensors	Manufacturer	Model	Comments
BH-BGC11-57	Truck shop area	Silt (ML), some sand, trace to some gravel, frozen to 6.5-7.0m?	26/08/2011	12.1	10 (plus 1.5m lead)	Standpipe piezo 2" casing screening from 6.6 to 9.9m	11.5-2	8	M-Squared Instruments, Cochrane, AB	Termination: MS3106E20-29P Thermistor Type: YSI44007	Thermistor relocated to this hole from BH-BGC11-51
BH-BGC11-58	Truck shop area	Silt (ML), some sand, trace to some gravel, frozen to Nbn and Vx to 4.9m?	29/08/2011	10.8	10 (plus 1.5m lead)	10.8m long 2" threaded sched 40 PVC casing, outer backfilled with bentonite chips, no infill of casing around cable. Steel monument at collar	11.5-1	8	M-Squared Instruments, Cochrane, AB	Termination: MS3106E20-29P Thermistor Type: YSI44007	Thermistor relocated to this hole from BH-BGC11-47
BH-BGC11-51	Silt borrow area	Interbedded silts and sand, frozen from approx 6.0 to 17.0m	25/08/2011	25.15	25 (plus 1.5m lead)	24.39m long 2" threaded sched 40 PVC casing, outer backfilled with bentonite chips, no infill of casing around cable. Steel monument at collar	26.5-1	8	M-Squared Instruments, Cochrane, AB	Termination: MS3106E20-29P Thermistor Type: YSI44007	
BH-BGC11-51			10/08/2011	25.15	10 (plus 1.5m lead)		11.5-2	8	M-Squared Instruments, Cochrane, AB	Termination: MS3106E20-29P Thermistor Type: YSI44007	Thermistor was removed from this hole on Aug 25th and transferred to BH-BGC11-57

3.0 THERMISTOR READINGS

Thermistors were read on six different days in July and August. In July, thermistors installed in 2009 and 2010 were read. In August, the new thermistors were installed and read in new boreholes. Selected 2009 thermistors were also read in August.

Thermistor readings are taken using a handheld ohmmeter and a converter box used to control which thermistor bead is being read. Readings are recorded as resistance in kiloohms (kΩ). Resistance readings are converted to temperatures using a polynomial function for thermistors manufactured by EBA and a table of conversions for thermistors manufactured by M-squared instruments.

Thermistor readings are tabulated in Table J.2 and shown graphically in Figures J-1 through J-13.

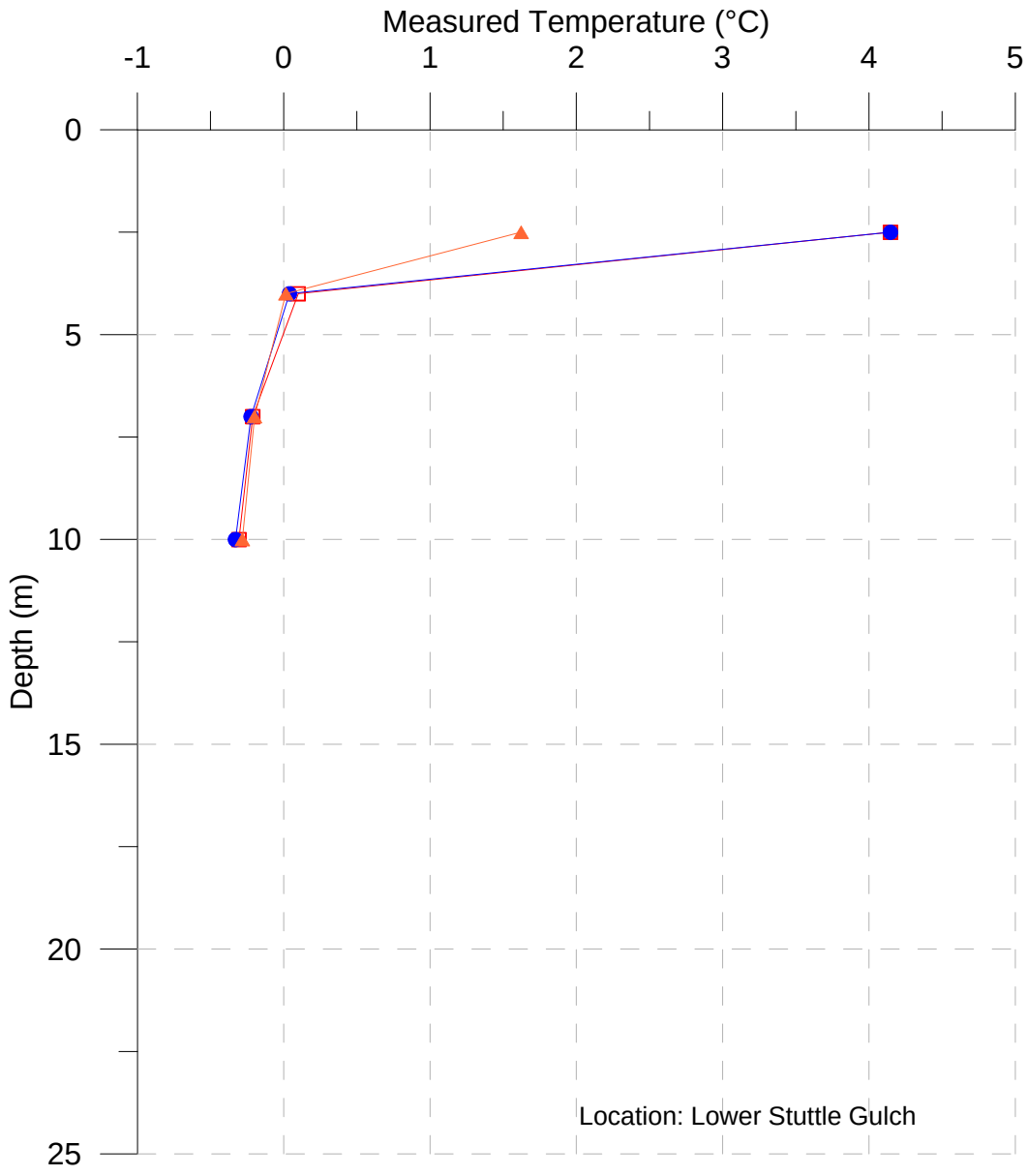
Table J.2 Thermistor Readings

Hole (Cable ID#)	Bead number	Depth of Bead BGL (m)	Date installed	07/11/2011		08/11/2011		08/25/2011		08/26/2011		08/29/2011		08/30/2011	
				Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)
DH-BGC09-STU-3 (EBA#2194)	1	0.5	2009	9.21	11.6			10.12	9.6			10.62	8.6		
	2	1.5		11.71	6.6			11.42	7.1			11.5	7.0		
	3	2.5		15.03	1.6			13.24	4.1			13.24	4.1		
	4	4		16.31	0.0			16.29	0.0			16.24	0.1		
	5	7		16.49	-0.2			16.51	-0.2			16.5	-0.2		
	6	10		16.56	-0.3			16.6	-0.3			16.58	-0.3		
DH-BGC09-STU-4 (EBA#2193)	1	0.5	2009	9.5	10.9			10.5	8.9			11.02	7.9		
	2	1.5		14.1	2.9			12.64	5.1			12.92	4.6		
	3	2.5		16.2	0.1			15.12	1.5			15.15	1.5		
	4	4		16.42	-0.1			16.33	0.0			16.4	-0.1		
	5	7		16.48	-0.2			16.48	-0.2			16.48	-0.2		
	6	10		16.52	-0.2			16.51	-0.2			16.52	-0.2		
DH-BGC09-AG-3 (EBA#2192)	1	10	2009	15.8	0.6										
BH-BGC10-07 (EBA#2256)	1	0.5	17/08/2010	8.89	12.3							9.86	10.2	9.98	9.9
	2	1.5		10.89	8.1							10.15	9.6	10.18	9.5
	3	2.5		12.83	4.8							10.78	8.3	10.78	8.3
	4	4		15.09	1.5							12.26	5.7	12.28	5.7
	5	7		16.18	0.2							15.27	1.3	15.26	1.3
	6	10		16.32	0.0							16.3	0.0	16.29	0.0
BH-BGC11-42 (26.5-2)	1	0.30	25/08/2011									11.02	7.9	11.13	7.7
	2	0.60										12.34	5.6	12.42	5.4
	3	1.20										13.55	3.7	13.63	3.6
	4	2.00										15.47	1.1	15.41	1.1
	5	5.00										16.55	-0.3	16.47	-0.2
	6	10.00										16.56	-0.3	16.46	-0.2
	7	15.00										16.67	-0.4	16.56	-0.3
	8	25.00										16.58	-0.3	16.45	-0.1

Hole	Bead number	Depth of Bead BGL (m)	Date installed	07/11/2011		08/11/2011		08/25/2011		08/26/2011		08/29/2011		08/30/2011	
				Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)
BH-BGC11-63 (26.5-3)	1	0.30	25/08/2011									12.48	5.4	12.98	4.6
	2	0.60										14.76	2.0	14.92	1.8
	3	1.20										16.5	-0.2	16.5	-0.2
	4	2.00										16.53	-0.2	16.52	-0.2
	5	5.00										16.46	-0.2	16.46	-0.2
	6	10.00										16.54	-0.2	16.54	-0.2
	7	15.00										16.56	-0.3	16.56	-0.3
	8	25.00										16.35	0.0	16.35	0.0
BH-BGC11-47 (11.5-1)	1	0.15	10/08/2011			10.71	8.5					12.06	6.0	Removed	
	2	0.50				12.2	5.8					12.54	5.3		
	3	1.00				15.19	1.4					14.61	2.2		
	4	1.50				16.12	0.3					16.21	0.1		
	5	2.50				15.95	0.5					16.08	0.3		
	6	4.00				16.19	0.2					16.26	0.1		
	7	7.00				16.27	0.1					16.36	0.0		
	8	10.00				16.31	0.0					16.42	-0.1		
BH-BGC11-44 (11.5-3)	1	0.15	10/08/2011			9.08	11.9					11.44	7.1	10.76	8.4
	2	0.50				10.51	8.9					11.24	7.5	11.49	7.0
	3	1.00				11.36	7.3					11.56	6.9	11.63	6.8
	4	1.50				12.73	5.0					12.54	5.3	12.53	5.3
	5	2.50				14.64	2.2					14.12	2.9	14.09	2.9
	6	4.00				15.87	0.6					15.54	1.0	15.54	1.0
	7	7.00				16.32	0.0					16.35	0.0	16.35	0.0
	8	10.00				16.37	0.0					16.41	-0.1	16.41	-0.1
BH-BGC11-49 (11.5-4)	1	0.15	10/08/2011			8.62	13.0			Thermistor Damaged					
	2	0.50				11.1	7.7								
	3	1.00				13.34	4.0								
	4	1.50				15.5	1.0								
	5	2.50				16.26	0.1								
	6	4.00				16.34	0.0								
	7	7.00				16.29	0.0								
	8	10.00				16.31	0.0								

Hole	Bead number	Depth of Bead BGL (m)	Date installed	07/11/2011		08/11/2011		08/25/2011		08/26/2011		08/29/2011		08/30/2011	
				Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)	Field reading (KΩ)	Corrected Temperature (°C)
BH-BGC11-57 (11.5-2)	1	0.15	26/08/2011									10.14	9.6	11.43	7.1
	2	0.50										13.15	4.3	13.48	3.8
	3	1.00										15.16	1.5	15.29	1.3
	4	1.50										16.42	-0.1	16.44	-0.1
	5	2.50										16.44	-0.1	16.45	-0.1
	6	4.00										16.5	-0.2	16.52	-0.2
	7	7.00										16.48	-0.2	16.48	-0.2
	8	10.00										16.41	-0.1	16.41	-0.1
BH-BGC11-58 (11.5-1)	1	0.15	29/08/2011											12.46	5.4
	2	0.50												15.14	1.5
	3	1.00												16.42	-0.1
	4	1.50												16.61	-0.3
	5	2.50												16.75	-0.5
	6	4.00												16.91	-0.7
	7	7.00												16.91	-0.7
	8	10.00												16.84	-0.6
BH-BGC11-51 (26.5-1)	1	0.30	25/08/2011							7.4	16.3	6.35	19.6	7.37	16.4
	2	0.60								8.78	12.6	9.4	11.2	9.39	11.2
	3	1.20								9.4	11.2	9.57	10.8	9.73	10.5
	4	2.00								9.8	10.3	9.87	10.2	9.9	10.1
	5	5.00								14.3	2.6	14.26	2.7	14.24	2.7
	6	10.00								16.26	0.1	16.25	0.1	16.26	0.1
	7	15.00								16.39	-0.1	16.39	-0.1	16.4	-0.1
	8	25.00								16.45	-0.1	16.45	-0.1	16.45	-0.1
BH-BGC11-51 (11.5-2)	1	0.15	10/08/2011			7.91	14.8	8.24	14.0	Removed					
	2	0.50				8.58	13.1	9.31	11.4						
	3	1.00				8.82	12.5	9.54	10.9						
	4	1.50				9.28	11.5	9.77	10.4						
	5	2.50				11.07	7.8	11.03	7.9						
	6	4.00				13.74	3.4	13.62	3.6						
	7	7.00				16.63	-0.4	15.8	0.6						
	8	10.00				16.18	0.2	16.31	0.0						

FIGURES



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 19/08/09
3) Thermistor brand: EBA, ID#: EBA#2194, installed on 24/08/09

DH-BGC09-STU-3

- 29/08/2011
- 25/08/2011
- 07/07/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

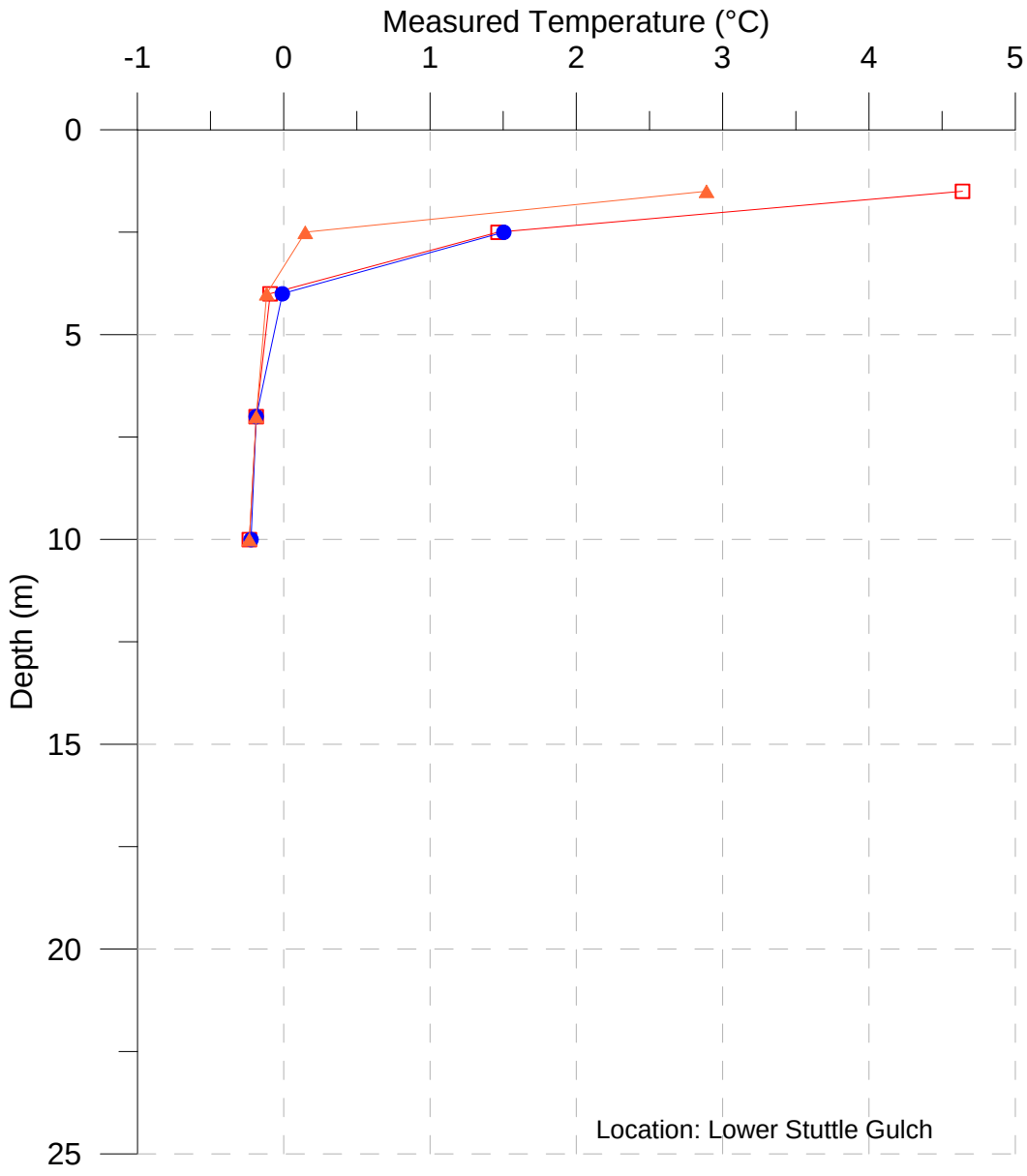
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, DH-BGC09-STU-3

PROJECT No.	FIG No.	REV.
0792-006	J-1	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 21/08/09
3) Thermistor brand: EBA, ID#: EBA#2193, installed on 24/08/09

DH-BGC09-STU-4
- 07/07/2011
- 25/08/2011
- 29/08/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

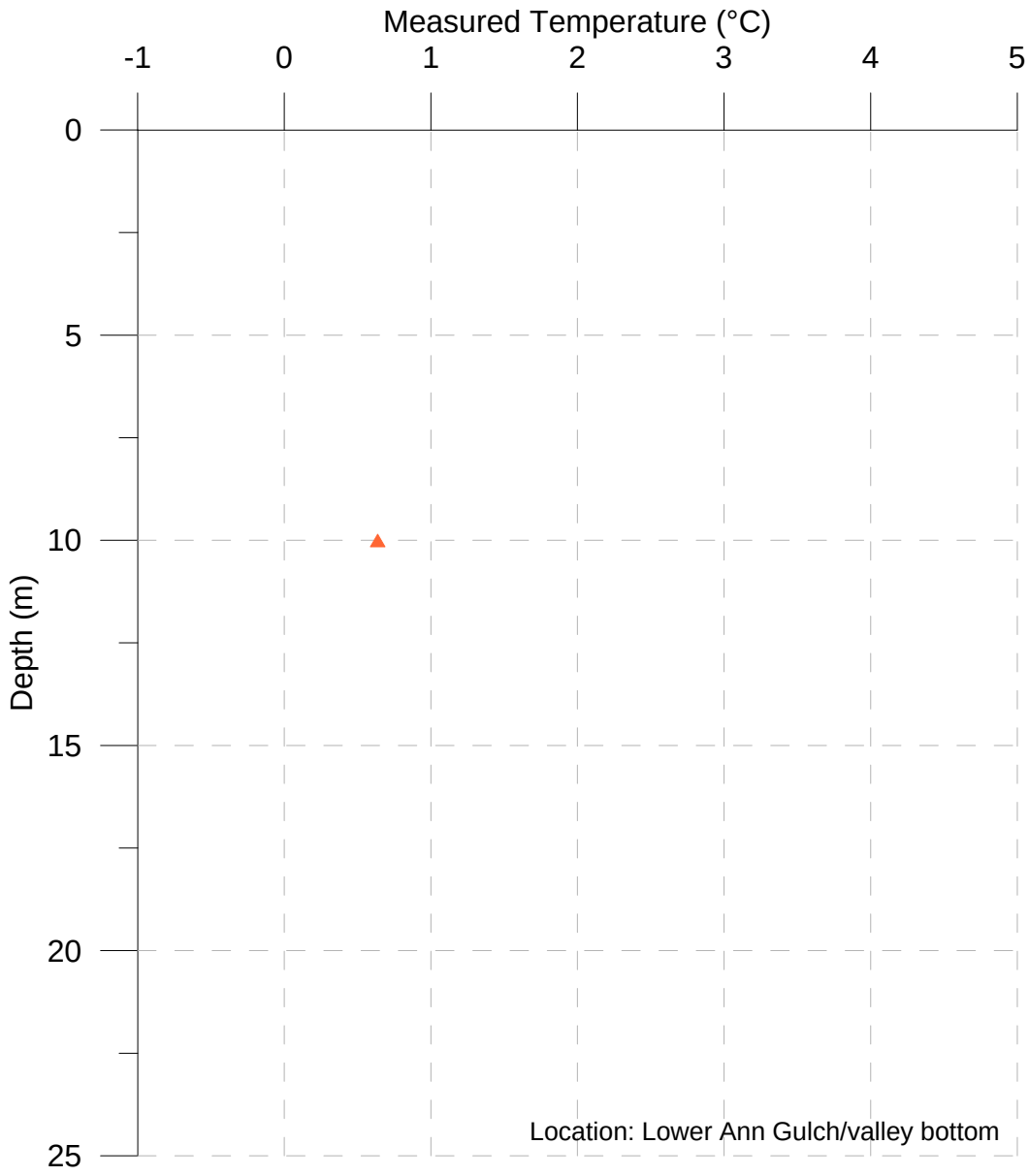
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILE, DH-BGC09-STU-4

PROJECT No.	FIG No.	REV.
0792-006	J-2	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 23/08/09
3) Thermistor brand: EBA, ID#: EBA#2192, installed on 25/08/09
4) Thermistor consisted of a single thermocouple bead at 10 m depth

DH-BGC09-AG-3
07/11/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

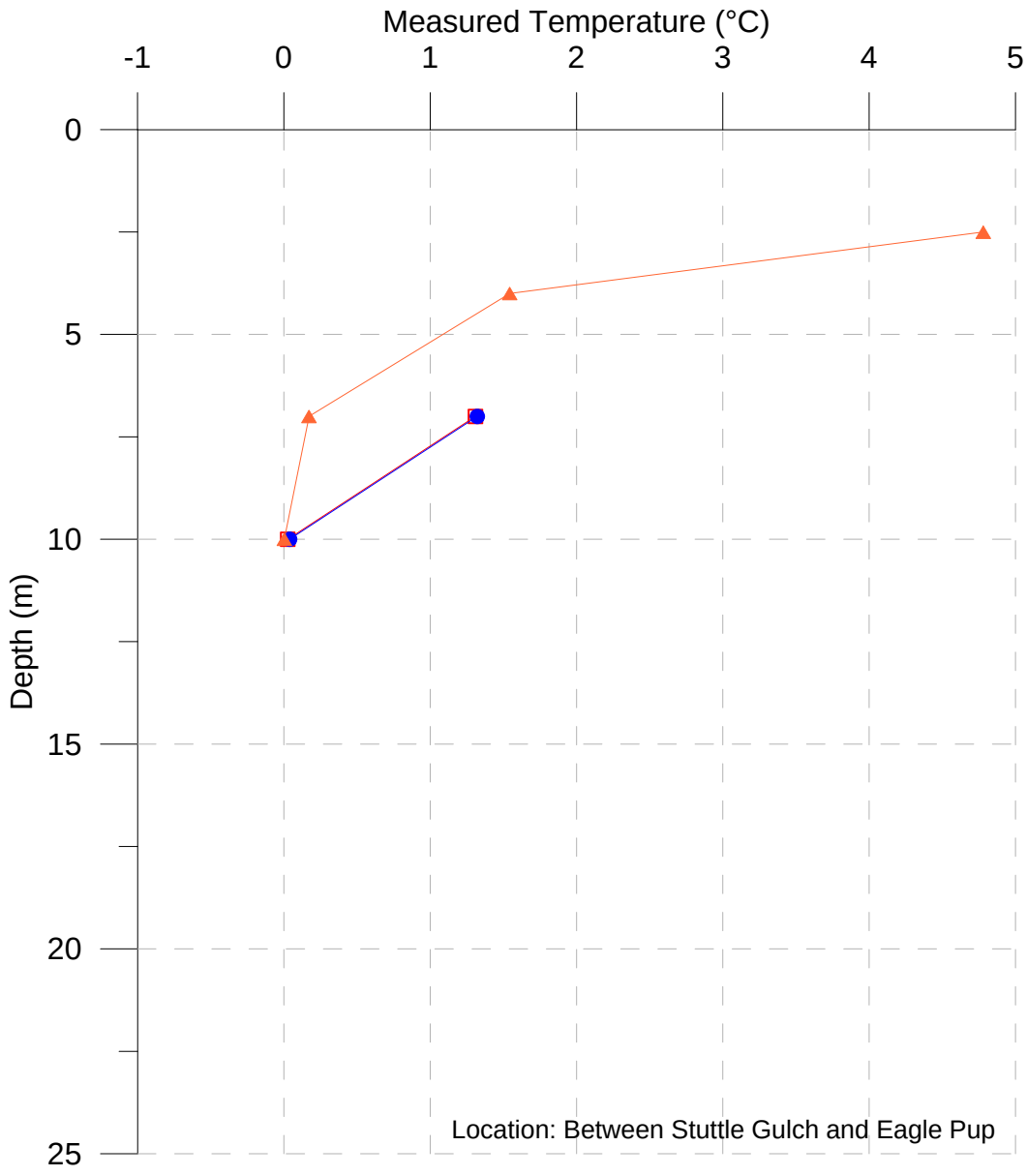
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, DH-BGC09-AG-3

PROJECT No.	FIG No.	REV.
0792-006	J-3	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 17/08/10
3) Thermistor brand: EBA, Model: W12101148, ID#:EBA#2256 installed on 17/08/10

BH-BGC10-07

- 07/11/2011
- 29/ 08/2011
- 30/08/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

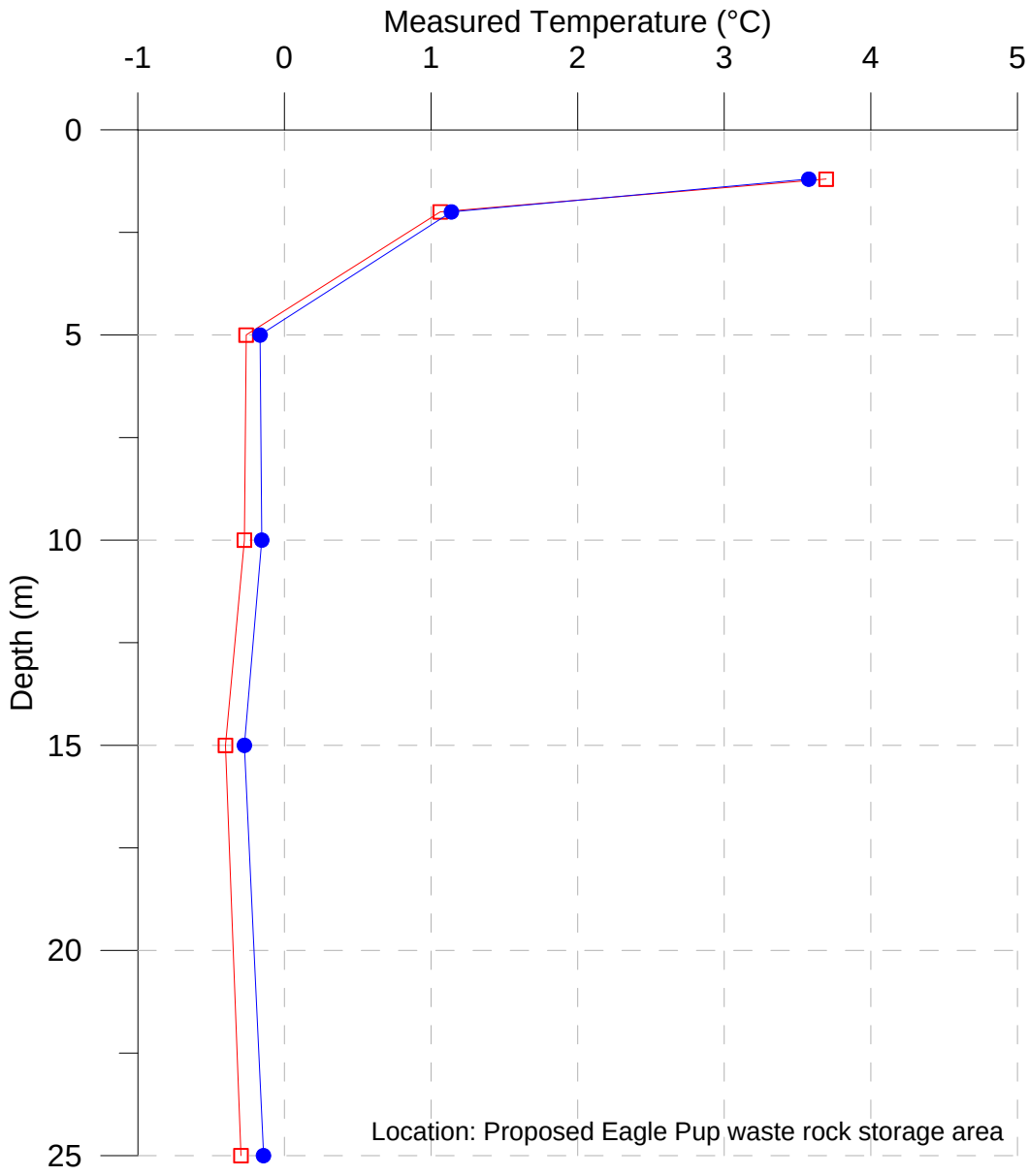
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, BH-BGC10-07

PROJECT No.	FIG No.	REV.
0792-006	J-4	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 01/08/11
3) Thermistor brand: M^2, Termination: MS3106E20-29P, Type: YSI44007, ID#: 26.5-2, installed on 25/08/11

BH-BGC11-42
29/08/2011
30/08/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

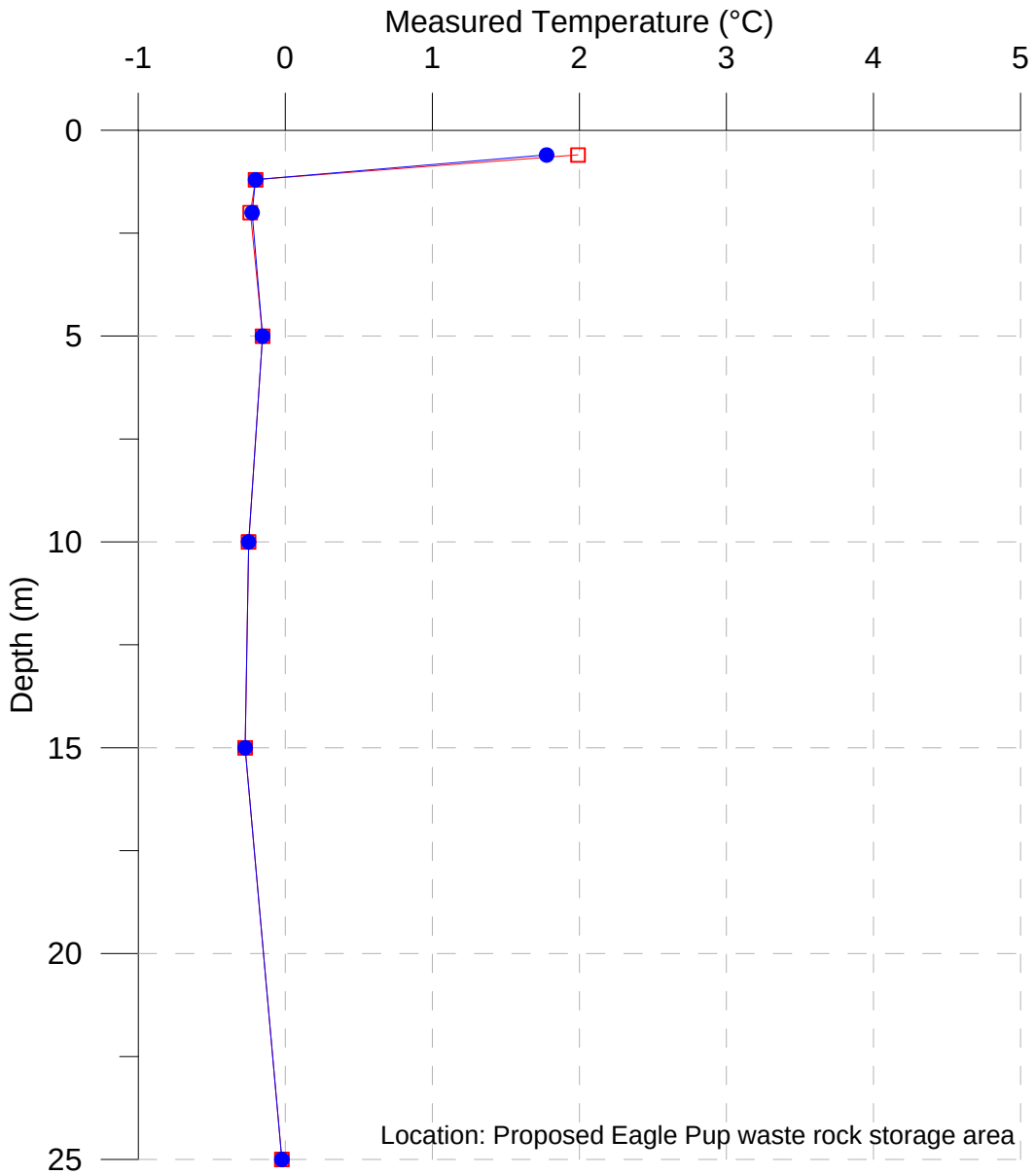
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, BH-BGC11-42

PROJECT No.	FIG No.	REV.
0792-006	J-5	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 13/08/11
3) Thermistor brand: M^2,Termination: MS3106E20-29P, Type: YSI44007, ID#: 26.5-3, installed on 25/08/11
4) Vibrating wire piezometer also installed in the drillehole casing

BH-BGC11-63

29/08/2011

30/08/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

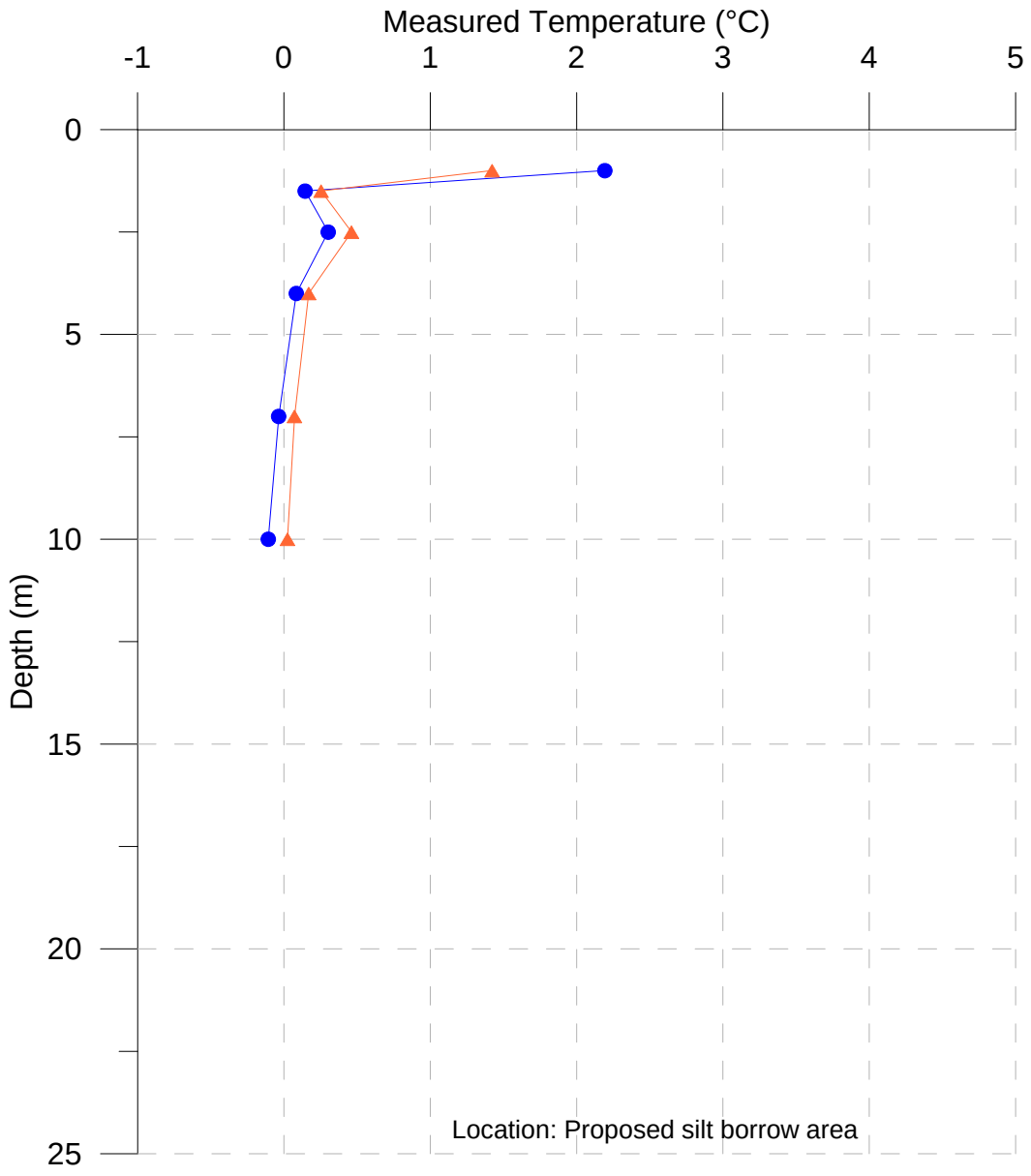
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, BH-BGC11-63

PROJECT No.	FIG No.	REV.
0792-006	J-6	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 04/08/11
3) Thermistor brand: M^2, Termination: MS3106E20-29P, Type: YSI44007, ID#: 11.5-1, installed on 10/08/11
4) Thermistor moved to BH-BGC11-58 on 28/08/11

BH-BGC11-47
11/08/2011
29/08/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

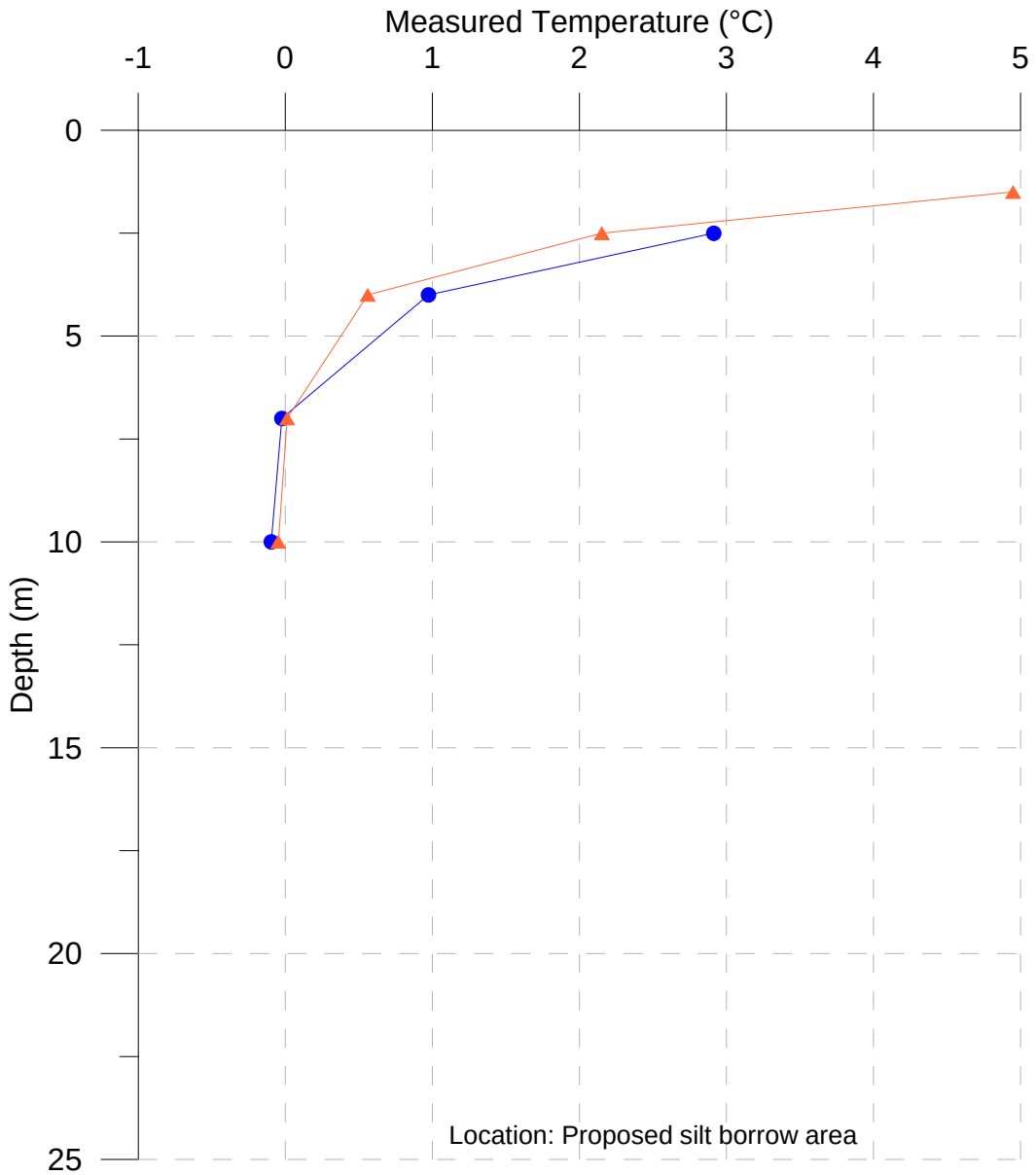
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, BH-BGC11-47

PROJECT No.	FIG No.	REV.
0792-006	J-7	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



BH-BGC11-44

- 11/08/2011
- 29/08/2011
- 30/08/2011

Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 03/08/11
3) Thermistor brand: M^2, Termination: MS3106E20-29P, Type: YSI44007, ID#:11.5-3, installed on 10/08/11
4) Instrument got damaged and removed on 28/08/11

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

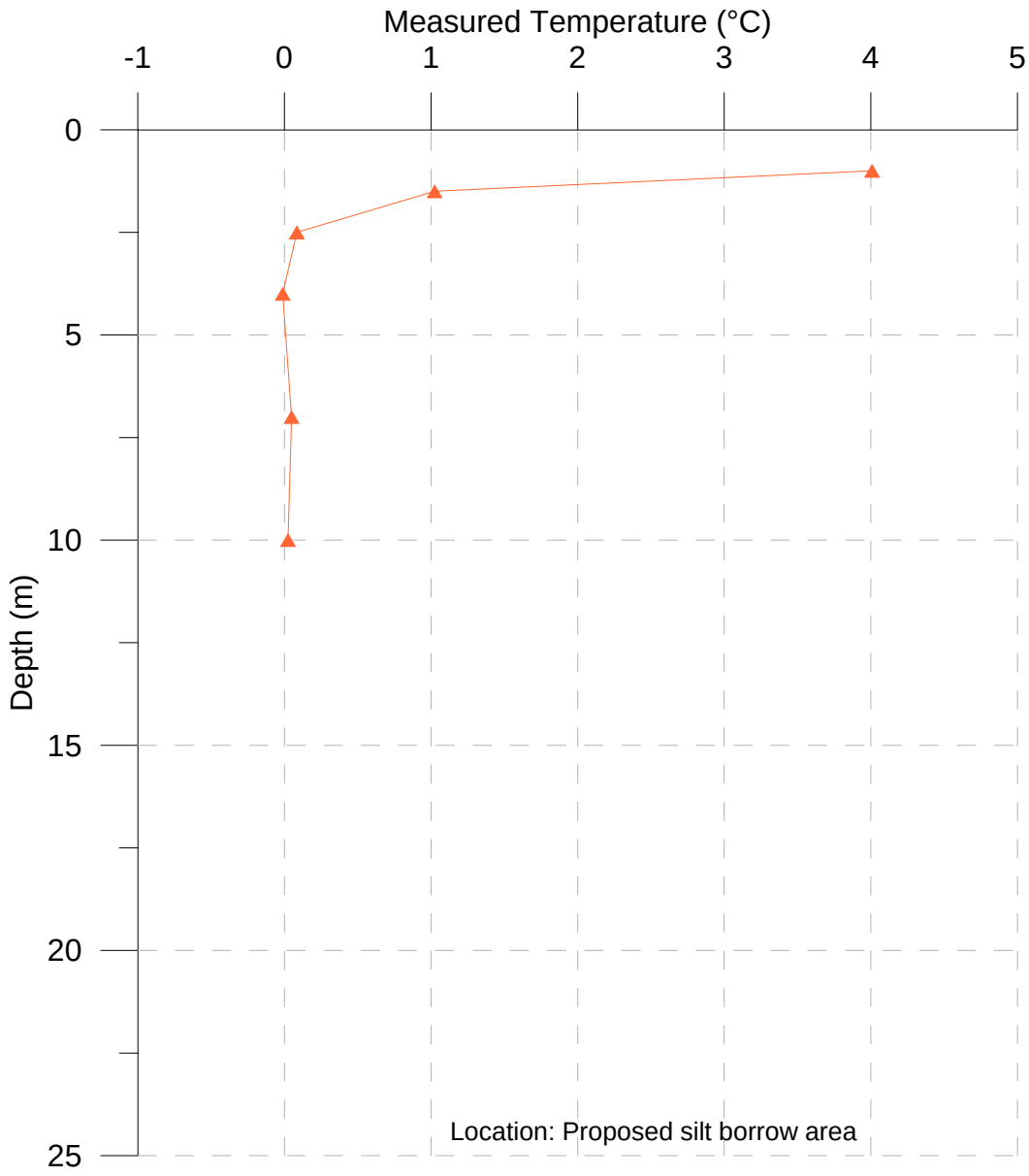
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, BH-BGC11-44

PROJECT No.	FIG No.	REV.
0792-006	J-8	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 05/08/11
3) Thermistor brand: M^2,Termination: MS3106E20-29P, Type: YSI44007, ID#:11.5-4 installed on 10/08/11

BH-BGC11-49

11/08/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

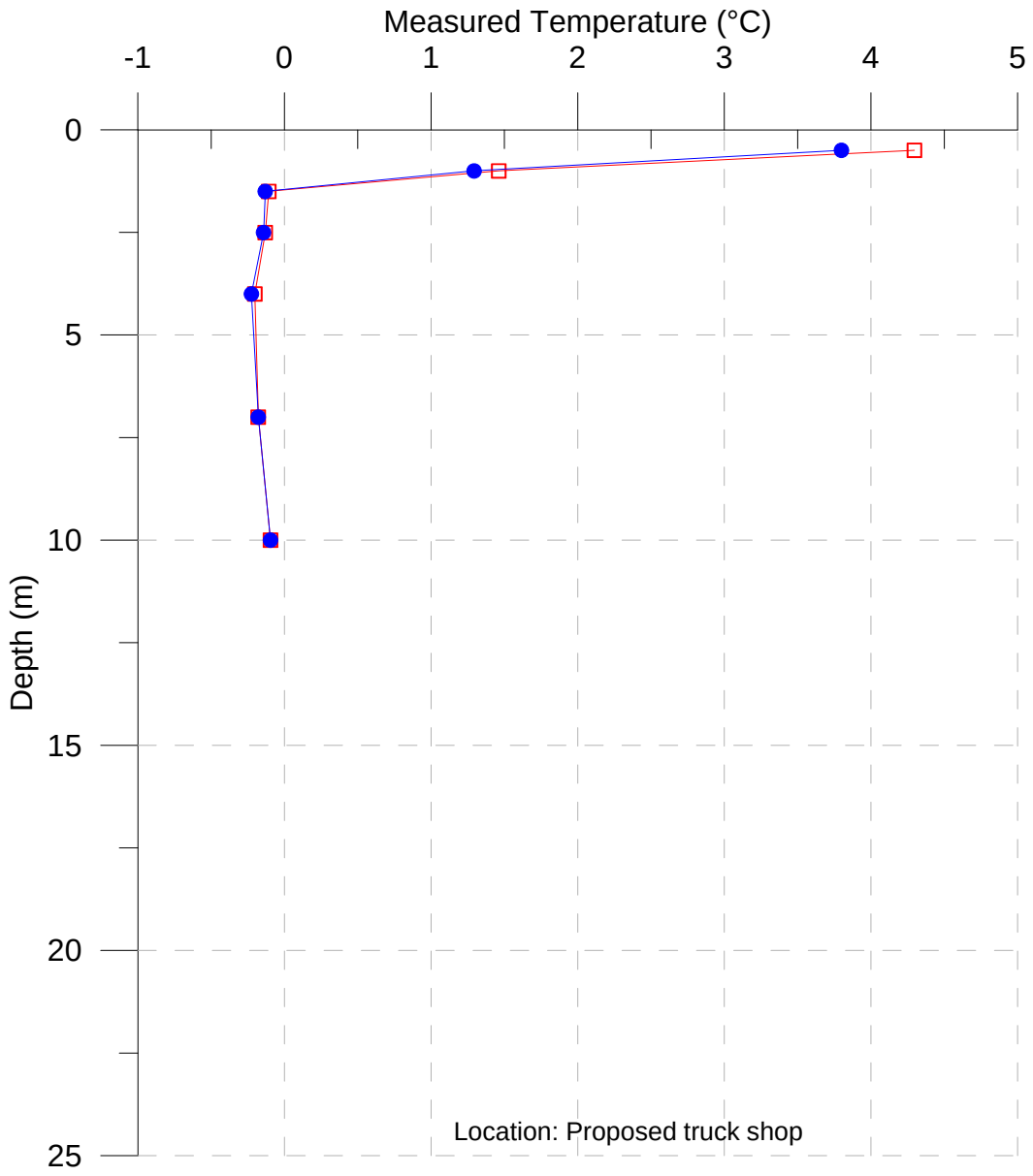
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, BH-BGC11-49

PROJECT No.	FIG No.	REV.
0792-006	J-9	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 10/08/11
3) Thermistor brand: M^2, Termination: MS3106E20-29P, Type: YSI44007, ID#:11.5-2, installed on 26/08/11

BH-BGC11-57
29/08/2011
30/08/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

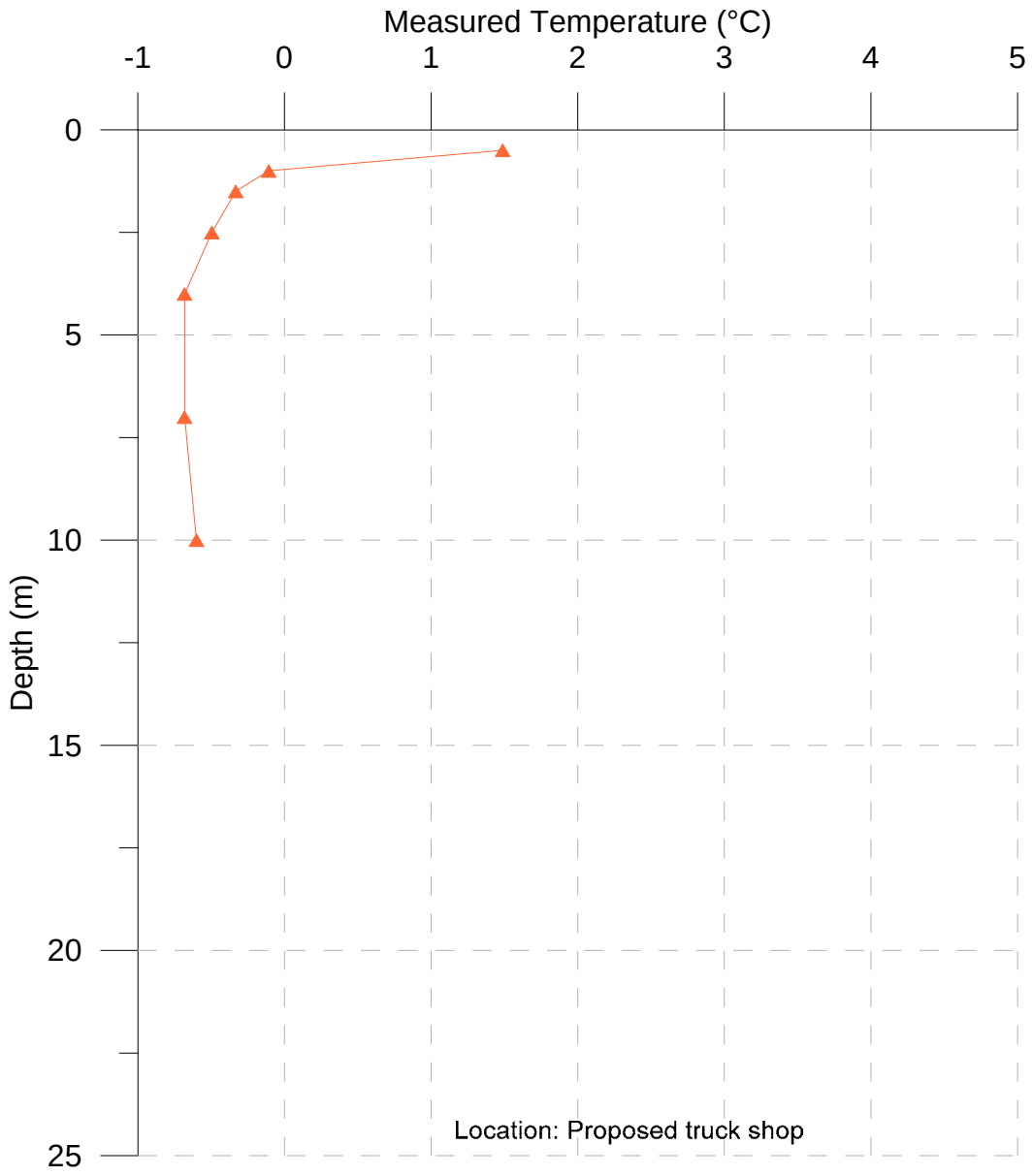
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, BH-BGC11-57

PROJECT No.	FIG No.	REV.
0792-006	J-10	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 10/08/11
3) Thermistor brand: M^2, Termination: MS3106E20-29P, Type: YSI44007, ID#:11.5-1, installed on 29/08/11

BH-BGC11-58

30/08/2011

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

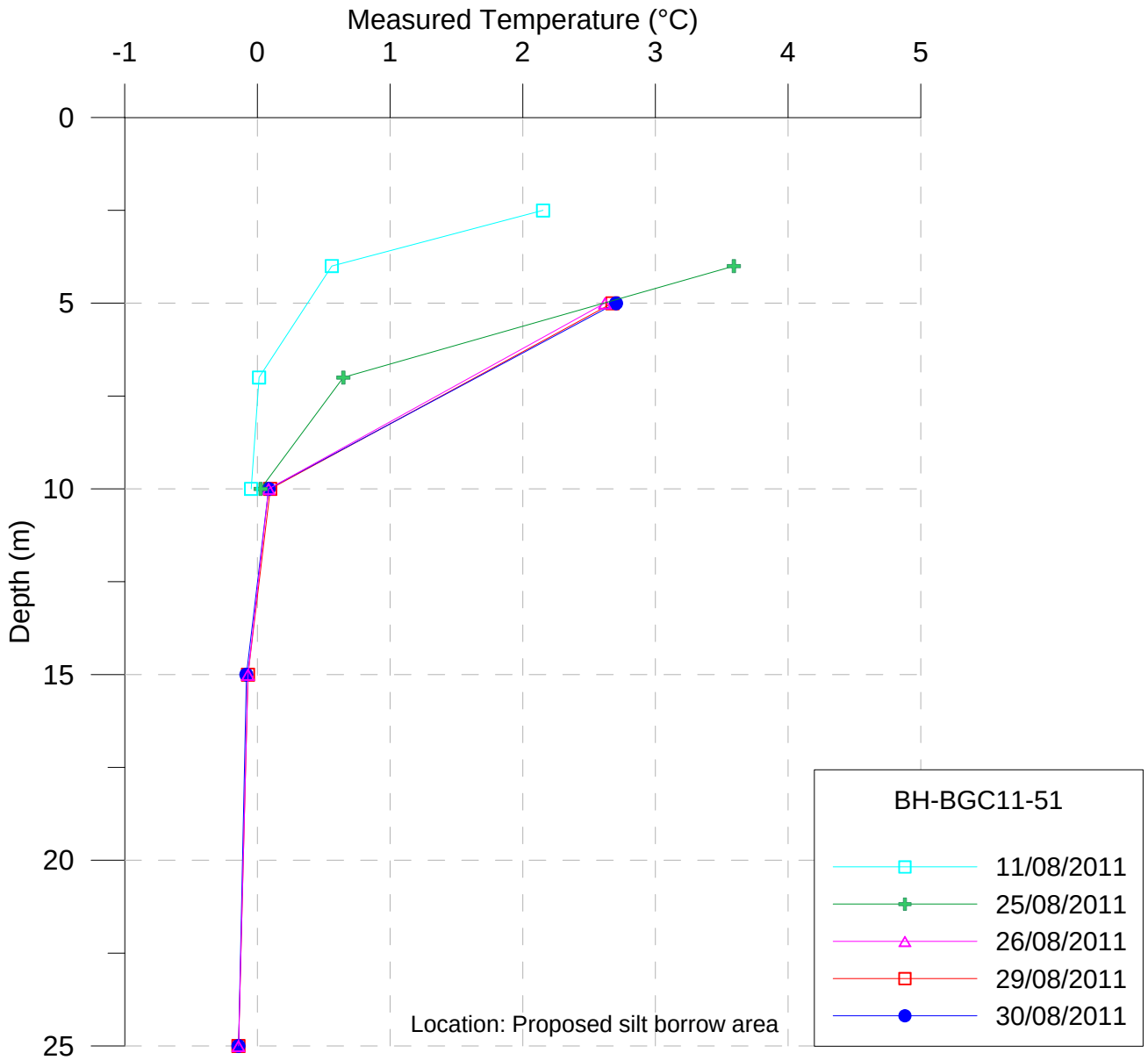
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, BH-BGC11-58

PROJECT No.	FIG No.	REV.
0792-006	J-11	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Notes:

1) Measured temperatures warmer than 5°C not shown for clarity
2) Drillhole completed on 06/08/11.
3) Thermistor brand: M^2, Termination: MS3106E20-29P, Type: YSI44007, ID#: 11.5-2, installed on 10/08/11 was removed on 25/08/11
4) Thermistor brand: M^2, Termination: MS3106E20-29P, Type: YSI44007, ID#: 26.5-2, installed on 25/08/11

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

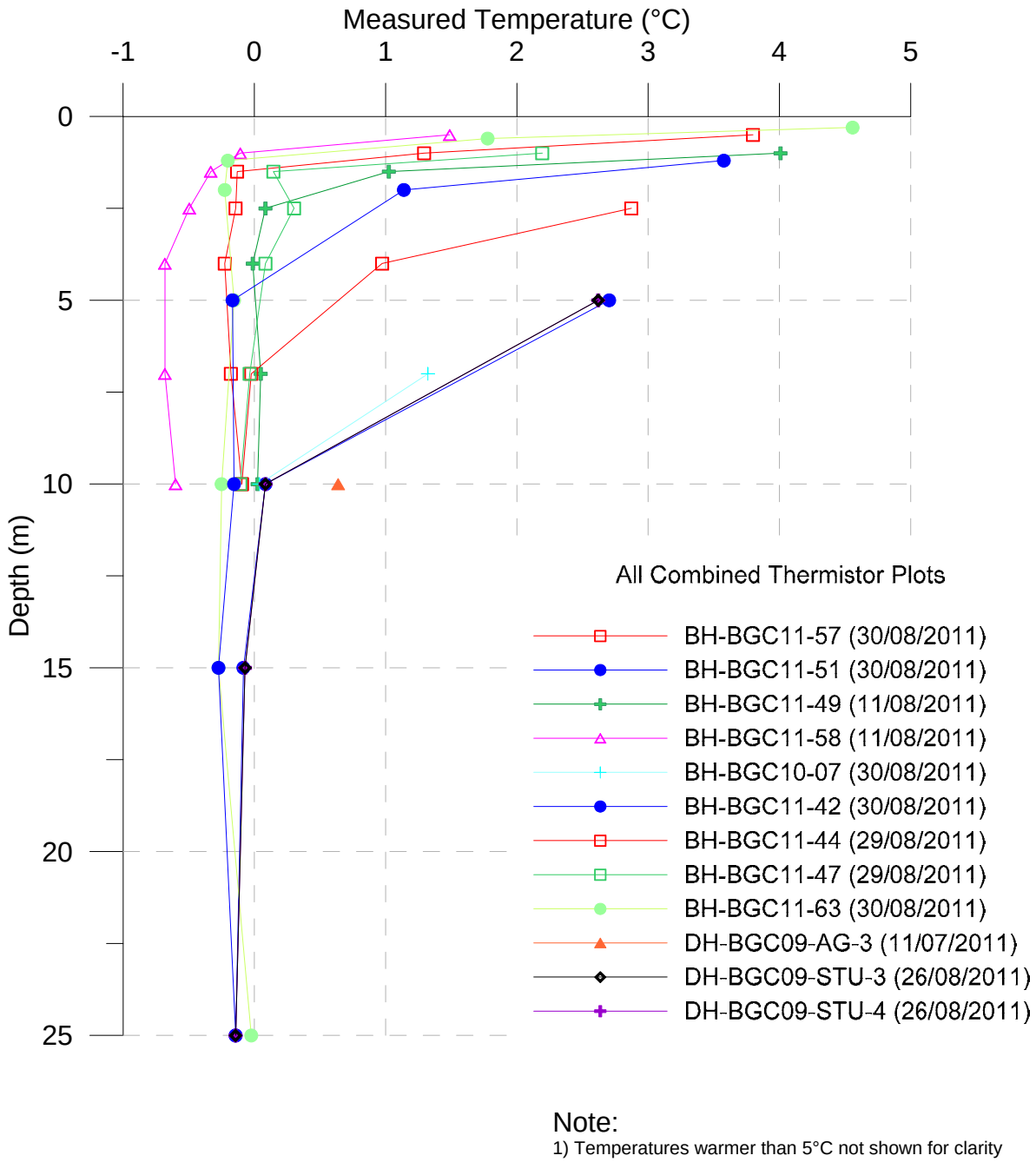
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES, BH-BGC11-51

PROJECT No.	FIG No.	REV.
0792-006	J-12	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.



Note:
1) Temperatures warmer than 5°C not shown for clarity

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGN:	LGT
DATE:	JAN 2012	CHECKED:	PQ
DRAWN:	LGT	APPROVED:	PQ

CLIENT: VICTORIA GOLD CORP.

PROJECT: 2011 GEOTECHNICAL SITE INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

TITLE: MEASURED GROUND TEMPERATURE PROFILES
ALL INSTRUMENTS END OF AUGUST 2011

PROJECT No.	FIG No.	REV.
0792-006	J-13	0

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix J Thermistors

FIGURE TO BE READ WITH BGC REPORT TITLED "2011 GEOTECHNICAL SITE INVESTIGATION FOR MINE SITE INFRASTRUCTRE FACTUAL DATA REPORT", DATED JAN 2012.

APPENDIX K
GROUNDWATER INVESTIGATIONS

GROUNDWATER

1.0 INTRODUCTION

Groundwater observations were made as one component of the 2011 site investigation program. The work consisted of measuring static water levels in standpipe piezometers and obtaining readings of piezometric head from vibrating wire piezometers. The program also included slug testing in selected 2011 BGC standpipes to estimate hydraulic conductivity of selected geological units. Finally, observations were made of surface seepage locations throughout the site as and when encountered during the summer site investigation.

BGC completed a separate program of groundwater investigation for pit depressurization, and for groundwater supply. Those programs will be reported under separate cover.

2.0 PIEZOMETER INSTALLATIONS

A total of 22 standpipe piezometers were installed in auger and diamond drill holes during the 2011 geotechnical site investigation for mine site infrastructure. Two vibrating wire piezometers were installed; one in an auger hole and the other in a diamond drill hole. Piezometer installation details are summarized in Table K-1 and Table K-2, and illustrated graphically on the borehole logs in Appendix D. Piezometer locations are shown on Drawing 09.

Standpipe piezometers typically consisted of 2 inch diameter schedule 80 PVC with 3 m (10 ft) slotted screens. One piezometer with a 6 m (20 ft) screen was installed. Piezometers were either installed at the bottom of the hole or, the hole was backfilled with bentonite to the desired elevation prior to placing the piezometer. Sand packs in the screened zone of the piezometers used medium silica sand. For piezometers installed in diamond drill holes, a bentonite seal of typically 0.5 m to 2 m thick was installed above the sand pack, and the remainder of the hole grouted to surface using a cement-bentonite grout. For piezometers installed in auger holes, the hole was backfilled with bentonite above the sand pack, with the exception of BH-BGC11-55 where a bentonite seal was installed above the sand pack and the hole was backfilled with grout to allow for downhole geophysics.

The vibrating wire piezometer installed in the diamond drill hole (BH-BGC11-54) was taped to a PVC tremmie tube, lowered down the hole and grouted to surface using the sacrificial PVC tremmie. The grout was a cement-bentonite grout mix. The vibrating wire piezometer installed in the auger hole (BH-BGC11-63) was taped to 2 inch solid PVC pipe to be used for a thermistor installation. There was running water at the bottom of BH-BGC11-63 and sandy material from above the bottom of the hole had collapsed into the bottom of the hole. The vibrating wire was pushed through the sloughed material and bentonite chips were used to backfill the hole to surface.

Table K-1 Standpipe Piezometer Installation Details

Hole	Northing (m)	Easting (m)	Elevation (masl)	PVC Diameter (mm)	Bottom of Sand Pack (mbgs)	Bottom of Screen (mbgs)	Top of Screen (mbgs)	Top of Sand Pack (mbgs)	Height of Stickup (m)
BH-BGC11-26	7102088.1	460205.8	1139.6	51	19.8	18.3	12.2	9.5	0.14
BH-BGC11-29	7101802.1	459977.8	1045.3	51	20.24	20	17	16.2	0.79
BH-BGC11-30	7101567.8	460122.0	952.0	51	32.2	30.7	27.7	27.32	0.85
BH-BGC11-32	7100934.4	458745.2	818.7	51	23.6	23.1	20.1	19.5	0.81
BH-BGC11-33	7100983.6	459115.7	833.0	51	41.4	40.01	37.01	36.3	0.56
BH-BGC11-34	7101053.5	459308.5	848.3	51	34.4	33.7	30.7	30.1	0.82
BH-BGC11-35	7100440.3	459695.7	986.3	51	49	48.3	45.3	44.9	0.97
BH-BGC11-36	7100274.7	459699.9	1002.5	51	50.29	48.8	45.8	45.2	0.93
BH-BGC11-37	7100180.5	459762.8	1034.4	51	42.6	42	39	38.5	0.21
BH-BGC11-38	7100416.0	459820.0	1013.0	51	49.1	48.6	45.6	44.3	1.35
BH-BGC11-39	7101056	458462	804	51	19.1	18.59	15.55	14.6	0.68
BH-BGC11-40B	7100038.8	459767.0	1049.8	51	45.36	43.97	40.97	40.57	0.94
BH-BGC11-45	7099109.5	460556.2	1354.4	51	20.73	19.89	16.89	16.28	0.92
BH-BGC11-46	7099004.0	460262.7	1246.1	51	20.12	17.53	14.53	13.37	1.15
BH-BGC11-48	7099118.1	459936.0	1140.0	51	32.92	32.32	29.27	28.61	0.97
BH-BGC11-52	7101316.4	459891.2	909.0	51	22.56	21.8	18.8	18.3	1
BH-BGC11-55	7100918.4	459440.6	881.0	51	13.1	12.65	9.65	8.5	0.92
BH-BGC11-57	7099978.2	458798.6	859.2	51	10	9.9	6.9	6.1	0.97
BH-BGC11-59	7101239.4	459113.1	883.7	51	30.18	29.08	26.08	25.5	0.93
BH-BGC11-60	7100041.6	458795.6	859.2	51	8.85	8.6	5.6	4.9	0.78
BH-BGC11-62	7100334.1	459785.9	1017.9	51	35.05	34.2	31.2	30.32	0.71
BH-BGC11-64	7100262.9	460182.4	1044.1	51	48.77	46.69	43.6	43.2	1.13

1. Holes surveyed by Underhill in August and September 2011 using a differential GPS, with the exception of BH-BGC11-39, which was surveyed by BGC staff using a handheld GPS.
2. Coordinates are in UTM NAD 83, Zone 8N.
3. Depths are recorded in meters below ground surface (mbgs).

Table K-2 Vibrating Wire Piezometer Installation Details

Hole	Northing (m)	Easting (m)	Elevation (masl)	Serial Number	Manufacturer	Tip Northing (m)	Tip Easting (m)	Tip Elevation (masl)	Tip Depth (mbgs)
BH-BGC11-54	7101245.6	458886.2	883.8	VW18102	RST Instruments	7101245.6	458886.2	846	39.7
BH-BGC11-63	7100114.1	460302.9	1100.7	VW18103	RST Instruments	7100114.1	460302.9	1076	26.3

1. Holes surveyed by Underhill in August and September 2011 using a differential GPS.
2. Coordinates are in UTM NAD 83, Zone 8N.
3. Depths are recorded in meters below ground surface (mbgs).

3.0 WATER LEVEL OBSERVATIONS

Water level measurements in standpipe piezometers and vibrating wire piezometers were made in two separate campaigns. Water levels in select standpipes installed by others in previous years were measured on July 3rd and July 4th, 2011. Water levels in standpipes and vibrating wires installed by BGC in 2011 along with select standpipes installed by others were read between August 25th and August 29th, 2011. Table K-3 summarizes the observed ground water depths.

Table K-3 Groundwater Level Observations

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC11-26	7102088.1	460205.8	1139.6	27-Aug-11	16.4	Standpipe
BH-BGC11-29	7101802.1	459977.8	1045.3	27-Aug-11	7.8	Standpipe
BH-BGC11-30	7101567.8	460122.0	952.0	27-Aug-11	16.3	Standpipe
BH-BGC11-32	7100934.4	458745.2	818.7	24-Aug-11	10.8	Standpipe
BH-BGC11-33	7100983.6	459115.7	833.0	26-Aug-11	4.2	Standpipe
BH-BGC11-34	7101053.5	459308.5	848.3	24-Aug-11	8.3	Standpipe
BH-BGC11-35	7100440.3	459695.7	986.3	27-Aug-11	24.6	Standpipe
BH-BGC11-36	7100274.7	459699.9	1002.5	27-Aug-11	19.9	Standpipe
BH-BGC11-38	7100416.0	459820.0	1013.0	25-Aug-11	26.3	Standpipe
BH-BGC11-39	7101056	458462	804	24-Aug-11	9.8	Standpipe
BH-BGC11-40B	7100038.8	459767.0	1049.8	25-Aug-11	8.5	Standpipe
BH-BGC11-45	7099109.5	460556.2	1354.4	27-Aug-11	8.4	Standpipe
BH-BGC11-46	7099004.0	460262.7	1246.1	27-Aug-11	15.3	Standpipe
BH-BGC11-48	7099118.1	459936.0	1140.0	27-Aug-11	31.3	Standpipe
BH-BGC11-52	7101316.4	459891.2	909.0	25-Aug-11	4.1	Standpipe
BH-BGC11-54	7101245.6	458886.2	883.8	29-Aug-11	11.8	Vibrating Wire
BH-BGC11-55	7100918.4	459440.6	881.0	27-Aug-11	dry	Standpipe
BH-BGC11-57	7099978.2	458798.6	859.2	27-Aug-11	dry	Standpipe
BH-BGC11-59	7101239.4	459113.1	883.7	27-Aug-11	29.4	Standpipe
BH-BGC11-60	7100041.6	458795.6	859.2	27-Aug-11	dry	Standpipe
BH-BGC11-62	7100334.1	459785.9	1017.9	27-Aug-11	20.2	Standpipe
BH-BGC11-63	7100114.1	460302.9	1100.7	29-Aug-11	18.1	Vibrating Wire
GT96-26	7101825	462617	n/a	3-Jul-11	30.1	Standpipe
GT96-35	7099081	460238	n/a	27-Aug-11	3.4	Standpipe
MW09-AG1	7101949	459425	1017	25-Aug-11	15.7	Standpipe
MW09-AG2	7101981	459785	1009	27-Aug-11	12.7	Standpipe
MW09-DG1	7101009	459325	840	4-Jul-11	1.8	Standpipe
MW09-DG1	7101009	459325	840	27-Aug-11	2.3	Standpipe
MW09-DG2	7100877	458992	824	4-Jul-11	0.9	Standpipe

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Date Collected	Depth (mbgs)	Piezometer Type
MW09-DG4	7101111	458284	787	4-Jul-11	5.6	Standpipe
MW09-DG5	7100607	458397	810	27-Aug-11	10.7	Standpipe
MW09-OG2	7100599	462221	1332	3-Jul-11	2.2	Standpipe
MW09-OG3	7101552	461223	1065	3-Jul-11	0.4	Standpipe
MW09-STU1	7100648	459771	967	4-Jul-11	14.3	Standpipe
MW09-STU1	7100648	459771	967	27-Aug-11	14.4	Standpipe
MW09-STU2	7100799	459212	857	4-Jul-11	2.1	Standpipe
MW10-DG06	7101120	459552	859	3-Jul-11	2.2	Standpipe
MW10-OBS1	7101100	458443	796	4-Jul-11	7.2	Standpipe
MW10-OBS2	7101116	458405	793	4-Jul-11	5.3	Standpipe
MW96-01	7100965	463763	1398	3-Jul-11	23.1	Standpipe
MW96-02	7101047	463679	1394	3-Jul-11	8.1	Standpipe
MW96-03a	7101135	463597	1384	3-Jul-11	1.9	Standpipe
MW96-04	7101229	463508	1373	3-Jul-11	4.6	Standpipe
MW96-05	7101301	463429	1363	3-Jul-11	2.7	Standpipe
MW96-06a	7101636	463913	1405	3-Jul-11	2.6	Standpipe
MW96-07b	7101670	463596	n/a	3-Jul-11	0.0	Standpipe
MW96-08	7101458	463252	1339	3-Jul-11	4.9	Standpipe
MW96-09a	7101244	463076	1361	3-Jul-11	4.5	Standpipe
MW96-09b	7101252	463073	1361	3-Jul-11	6.7	Standpipe
MW96-10a	7101121	462939	1367	3-Jul-11	2.2	Standpipe
MW96-10b	7101132	462936	1368	3-Jul-11	2.0	Standpipe
MW96-13a	7100925	460003	984	3-Jul-11	5.3	Standpipe
MW96-13b	7100925	460003	984	3-Jul-11	14.9	Standpipe
MW96-14a	7100609	460145	976	3-Jul-11	dry	Standpipe
MW96-14a	7100609	460145	976	27-Aug-11	dry	Standpipe
MW96-14b	7100609	460145	976	27-Aug-11	3.6	Standpipe
MW96-14b	7100609	460145	976	3-Jul-11	3.6	Standpipe
MW96-15a	7101037	459679	943	4-Jul-11	0.8	Standpipe
MW96-15a	7101037	459679	943	27-Aug-11	1.5	Standpipe
MW96-26	7101516	462873	1316	3-Jul-11	6.5	Standpipe
MW96-27	7101562	462876	1308	3-Jul-11	9.3	Standpipe

1. Holes surveyed in August and September 2011 using a differential GPS, with the exception of BH-BGC11-39, which was surveyed by BGC staff using a handheld GPS.
2. Coordinates in UTM NAD 83, Zone 8N.
3. Depths are recorded in meters below ground surface (mbgs).
4. Linear calibration used for vibrating wire piezometers.

4.0 SLUG TESTS

Five single well response tests (slug tests) were conducted in the holes BH-BGC11-32, -33, -34, -39 and -52, all of which are located in the Dublin Gulch valley bottom. Three iterations of a 0.9 L rising head slug test were performed for each well, however in one of the iterations in borehole BH-BGC11-39 problems occurred with the data logger and the results were not analyzed. The water level response was induced by removing a single bailer (0.9 L) full of water. The water level response was recorded with Solinist's 3001 Levelogger Gold submersible pressure transducers and data loggers, as well as manually, for an in-field QA/QC. The data loggers were set to record water level recovery versus time on a reading per second or reading per half-second interval.

The testing results were reviewed and interpreted using the Hvorslev method of analysis as implemented in AQTESOLVE Pro Version 4.50.002 to calculate hydraulic conductivity. Hvorslev (1951) developed a semi-analytical method for the analysis of an overdamped slug test in a fully or partially penetrating well in a homogeneous, anisotropic confined aquifer. The Hvorslev method employs a quasi-steady-state model that ignores elastic storage in the aquifer. Well response data and calculated hydraulic conductivity results are summarized in Table K-4. Detailed calculation results are provided in the figures at the end of this Appendix.

5.0 SURFACE SEEPAGE OBSERVATIONS

When observed, locations of surface seepage were recorded. The location was noted and approximate seepage rate was estimated where possible. The list of surface seepage locations in Table K-5 is not an exhaustive list of surface seepage locations at the site, but rather a list of surface seepage locations observed by BGC staff on an opportunity basis throughout the course of the site investigation program. Seeps were typically observed while marking bore hole or test pit locations, investigating access to bore hole or test pit locations or while completing test pits and mapping outcrops. Photos of selected surface seepage observations are included below.

Table K-4 Summary of hydraulic conductivities

Hole ID	Elevation (masl)	Formation/Unit	Top and Bottom of sand pack (mbgs)	Average conductivity, k (m/sec)
BH-BGC11-32	819	Placer Tailings and Weathered Bedrock[1]	19.5 – 23.6	2.5×10^{-6}
BH-BGC11-33	833	Weathered Bedrock	36.3 – 41.4	1.1×10^{-7}
BH-BGC11-34	848	Weathered Bedrock	30.1 – 34.4	2.6×10^{-6}
BH-BGC11-39	804	Placer Tailings	14.6 – 18.6	8.1×10^{-5}
BH-BGC11-52	909	Weathered Bedrock	18.3 – 22.6	9.7×10^{-6}

Note:
1) Screened pipe was installed over two units, therefore the conductivity (k) cannot be representative of any one unit.

Table K-5 Surface Seepage Observations

Seep Number	Northing (m)	Easting (m)	Elevation (masl)	Date	Approximate flow rate (L/min)	Photo taken	Trending (°)	Comments
1	7100826	460028	941	10-Jul-11	-	Y	-	Moderate seep on side of the Eagle Pup road
2	7098974	459969	1144	11-Jul-11	-	-	-	
3	7100583	460169	982	11-Jul-11	-	-	-	
4	7099527	459241	899	16-Jul-11	4.5	Y	40	Seeping from two locations 20 m apart beneath topsoil
5	7099502	459276	907	16-Jul-11	13.6-18.2	Y	-	40 m east of seep #4, seeping from under moss
6	7099327	459584	986	16-Jul-11	13.6-18.2	Y	28	Seep through 2 m bank, 6 m wide
7	7100205	459144	936	22-Jul-11	0.5	-	-	Very minor seep at side of road beside TP; a second small seep ~10 m to the North
8	7099601	460594	1334	27-Jul-11	-	-	-	2 very small seeps ~10 m apart on an old drill pad
9	7099623	460571	1330	27-Jul-11	-	-	-	Small seep on road below previous seeps
10	7099978	460937	1320	27-Jul-11	0.5	-	-	Very small seep at old drill pad at top of Stewart Gulch,
11	7101520	461754	1209	27-Jul-11	0.25	-	-	Second small seep ~25m North (~.75L/min)
12	7100836	460035	942	23-Jul-11	< 1	-	-	2-3 coalescing seeps along side of road
13	7100379	460384	1069	23-Jul-11	< 5	-	-	Moderate seep beside drill pad
14	7100358	460356	1067	23-Jul-11	> 5-10	-	-	Large seep along old access road
15	7100283	460307	1067	23-Jul-11	< 1	-	-	Small seep along access road

Seep Number	Northing (m)	Easting (m)	Elevation (masl)	Date	Approximate flow rate (L/min)	Photo taken	Trending (°)	Comments
16	7100259	460295	1068	23-Jul-11	< 5	-	-	Moderate seep
17	7100230	460277	1068	23-Jul-11	< 100	-	-	Very small creek
18	7100234	460688	1204	23-Jul-11	1-5	-	-	Moderate seep along road cut
19	7100144	460664	1207	23-Jul-11	< 1	-	-	Small seep along road cut
20	7100120	460652	1208	23-Jul-11	< 1	-	-	Small seep along road cut
21	7100094	460633	1208	23-Jul-11	< 0.5	-	-	Very small seep along road cut
22	7100078	460624	1208	23-Jul-11	< 1	-	-	Very small seep at old drill pad ct
23	7099047	459965	1125	29-Jul-11	-	-	-	
24	7099116	460250	1264	31-Jul-11	-	-	-	Large seep along existing access road
25	7098868	460034	1162	29-Jul-11	-	-	-	
26	7099061	459007	922	17-Aug-11	-	-	-	
27	7101806	461903	1166	12-Jul-11	-	-	-	Logged at test pit TP-BGC11-79
28	7100144	460540	1158	27-Aug-11	-	Y	-	Coordinates are for test pit TP-BGC11-144. Several seeps noted along access trail to the test pit.

1. Location for BGC holes from handheld GPS measurements.
2. Coordinates in UTM NAD 83, Zone 8N.



Seep 1



Seep 4



Seep 5



Seep 6 – View A



Seep 6 – View B



Seep 28 – Seep found at TP-BGC11-144

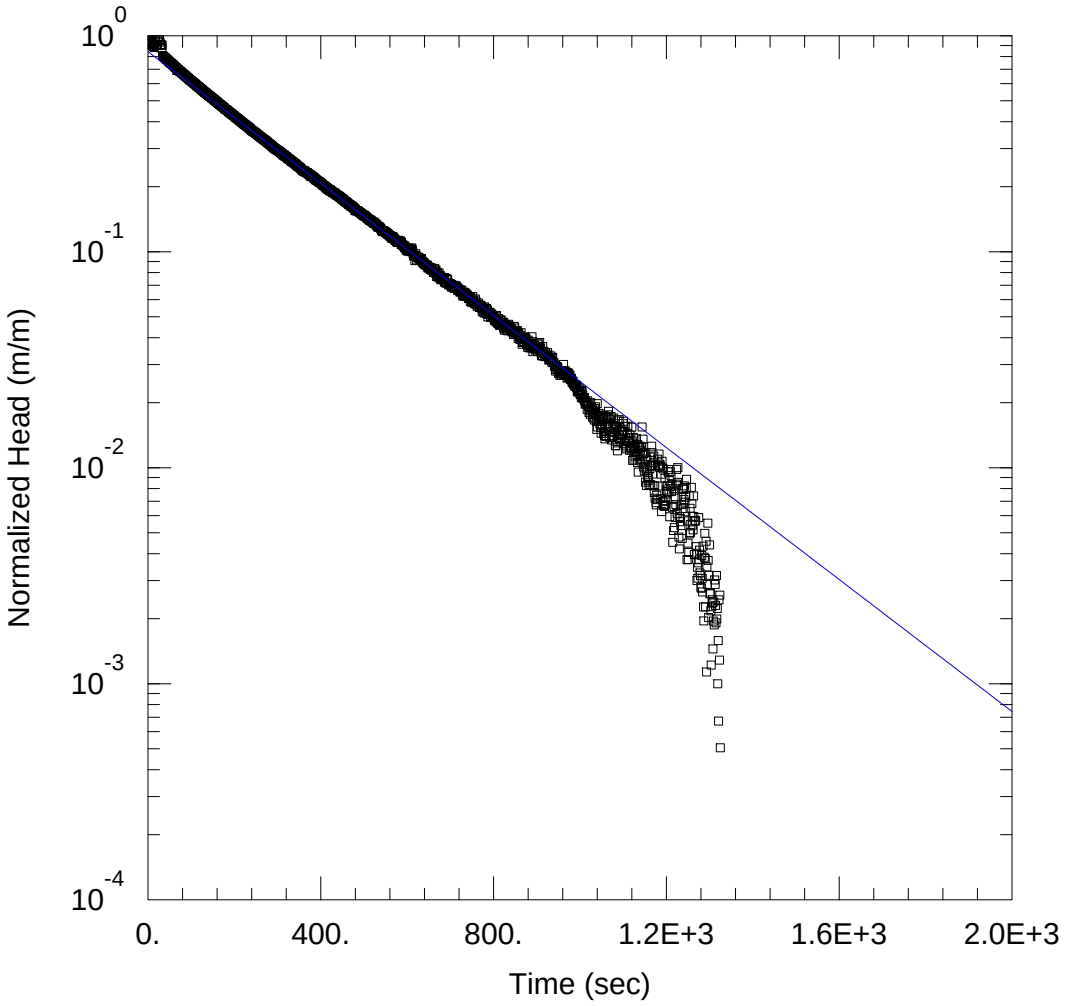
6.0 REFERENCES

Hvorslev, M.J., 1951. Time Lag and Soil Permeability in Ground-Water Observations, Bull. No. 36, Waterways Exper. Sta. Corps of Engrs, U.S. Army, Vicksburg, Mississippi, pp. 1-50.

FIGURES

BH-BGC11-32 Test 1

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-32 Test 1.aqt
Date: 10/18/11 Time: 11:36:23

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 1.564E-6 m/sec y0 = 0.3743 m

AQUIFER DATA

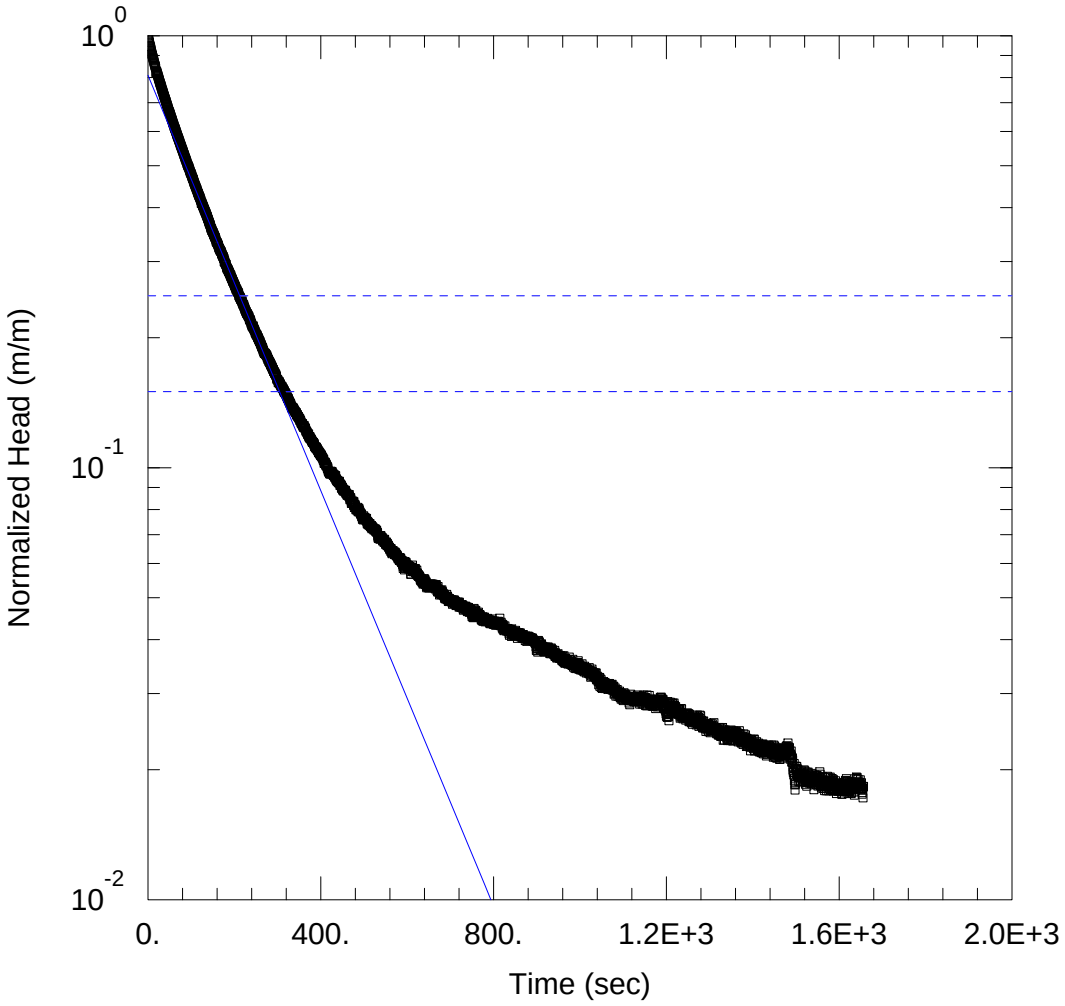
Saturated Thickness: 3.5 rAnisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-32)

Initial Displacement: 0.4436 m
Static Water Column Height: 12.29 m
Total Well Penetration Depth: 3.3 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-32 Test 2

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-32 Test 2.aqt
Date: 10/18/11 Time: 11:39:58

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 2.873E-6 m/sec y0 = 0.4243 m

AQUIFER DATA

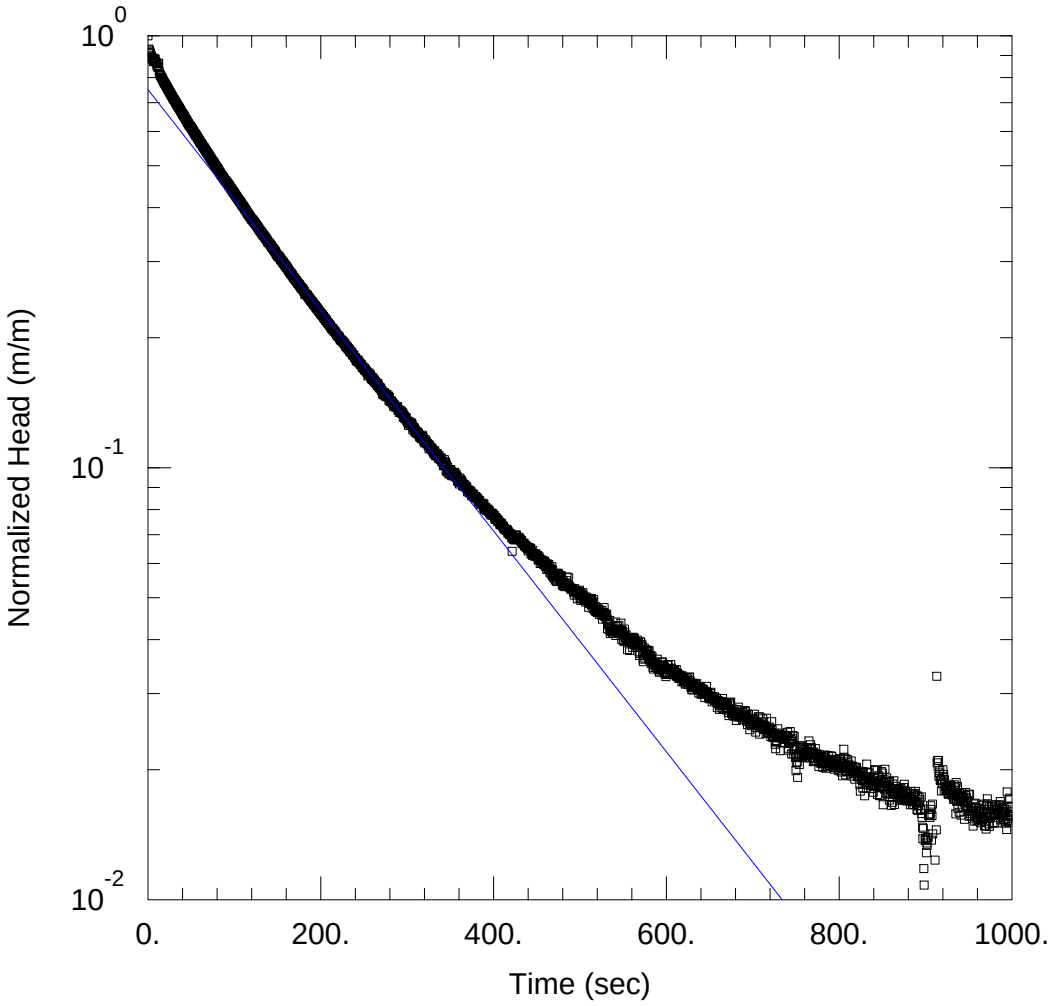
Saturated Thickness: 3.3 rAnisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-32)

Initial Displacement: 0.5241 m
Static Water Column Height: 12.31 m
Total Well Penetration Depth: 3.3 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-32 Test 3

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-32 Test 3.aqt
Date: 10/18/11 Time: 11:42:04

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 3.054E-6 m/sec y0 = 0.3856 m

AQUIFER DATA

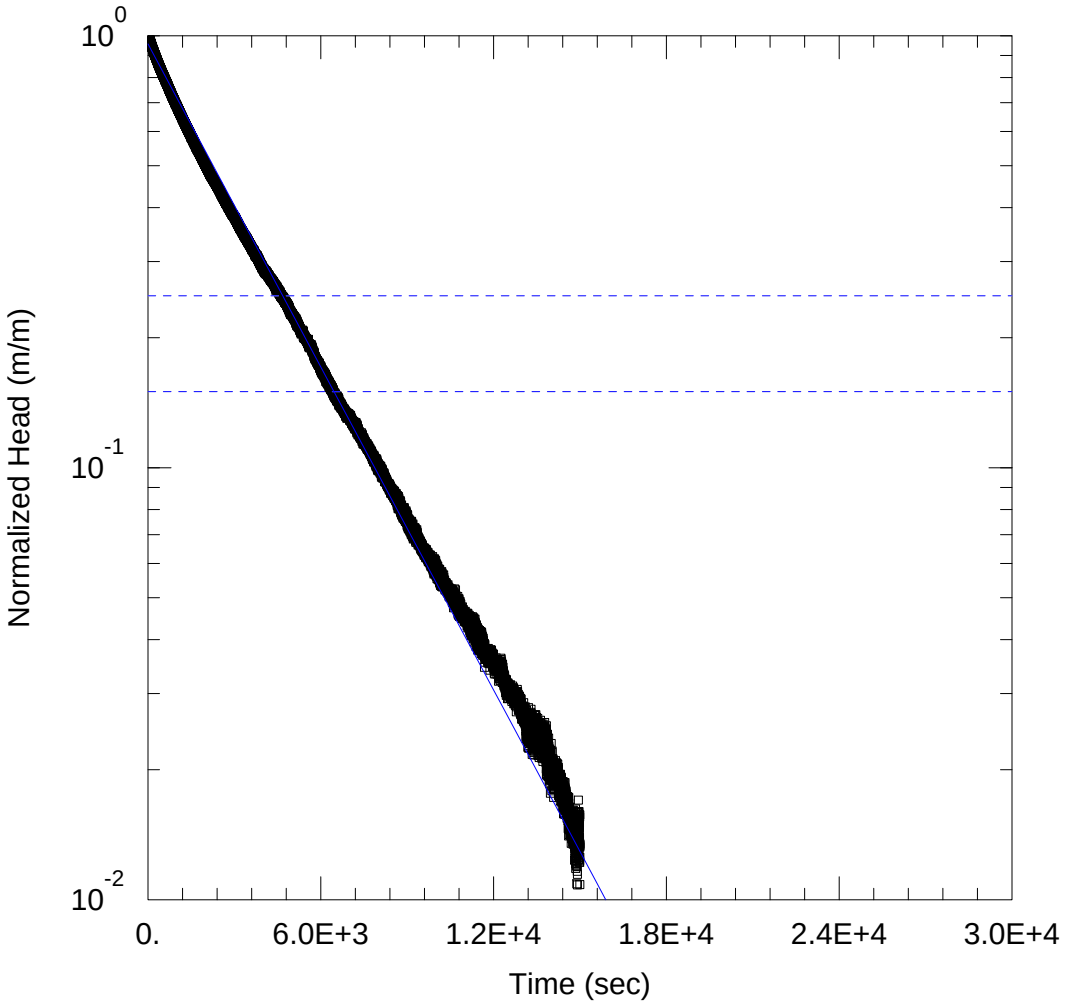
Saturated Thickness: 3.3 rAnisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-32)

Initial Displacement: 0.514 m
Static Water Column Height: 12.31 m
Total Well Penetration Depth: 3.3 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-33 Test 1

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-33 Test 1.aqt
Date: 10/18/11 Time: 13:19:19

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 1.276E-7 m/sec y0 = 0.4767 m

AQUIFER DATA

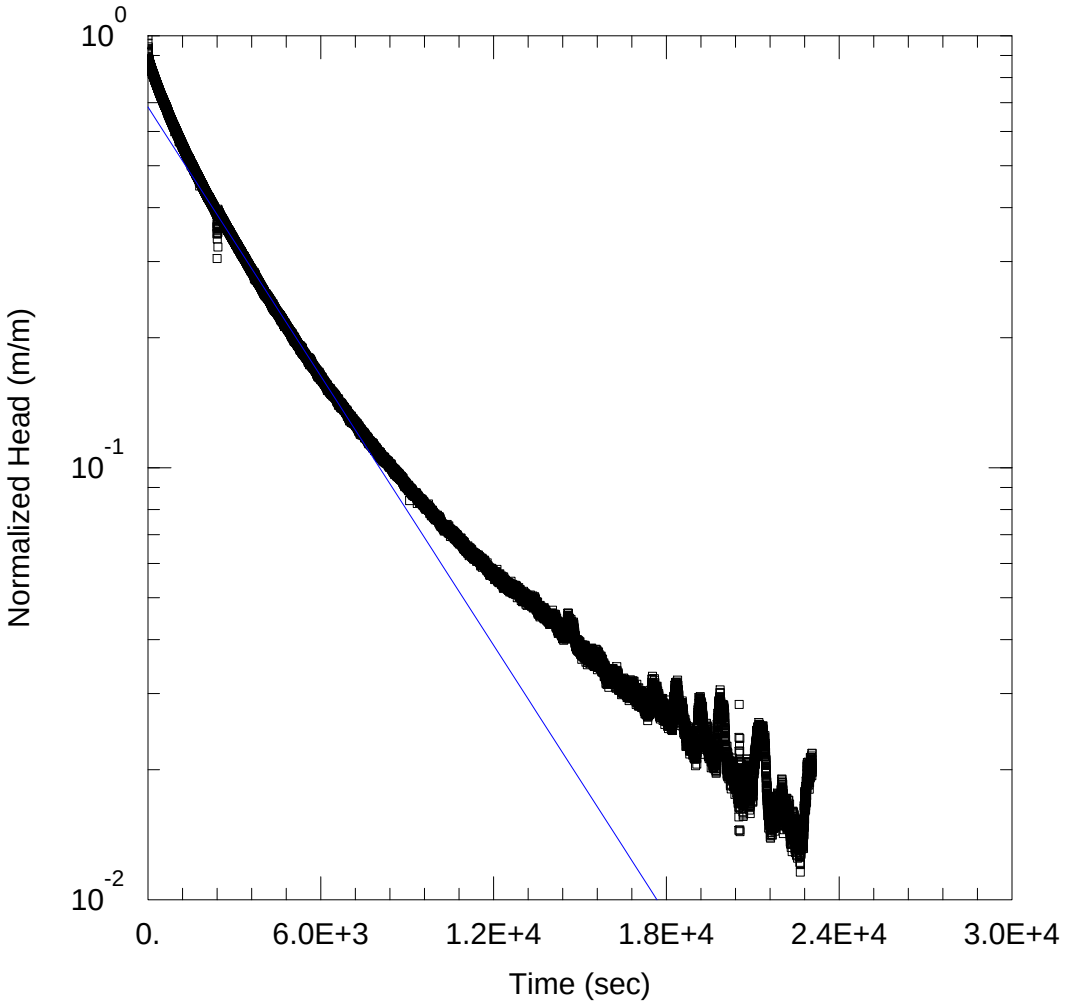
Saturated Thickness: 29.6 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-33)

Initial Displacement: 0.498 m
Static Water Column Height: 33.98 m
Total Well Penetration Depth: 28.95 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-33 Test 2

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-33 Test 2.aqt
Date: 10/18/11 Time: 11:55:48

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 1.063E-7 m/sec y0 = 0.3466 m

AQUIFER DATA

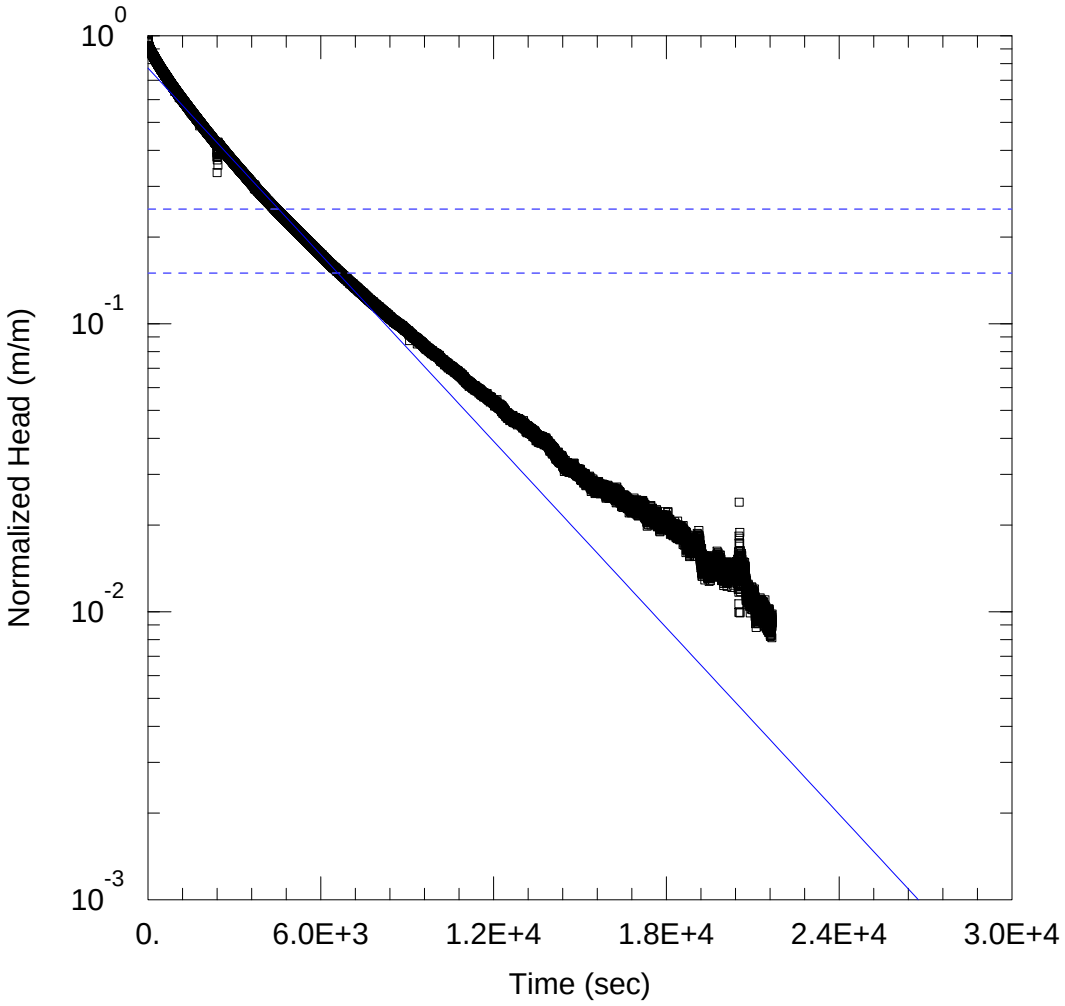
Saturated Thickness: 29.6 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-33)

Initial Displacement: 0.507 m
Static Water Column Height: 34. m
Total Well Penetration Depth: 28.95 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-33 Test 3

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-33 Test 3.aqt
Date: 10/18/11 Time: 11:58:19

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 1.105E-7 m/sec y0 = 0.3905 m

AQUIFER DATA

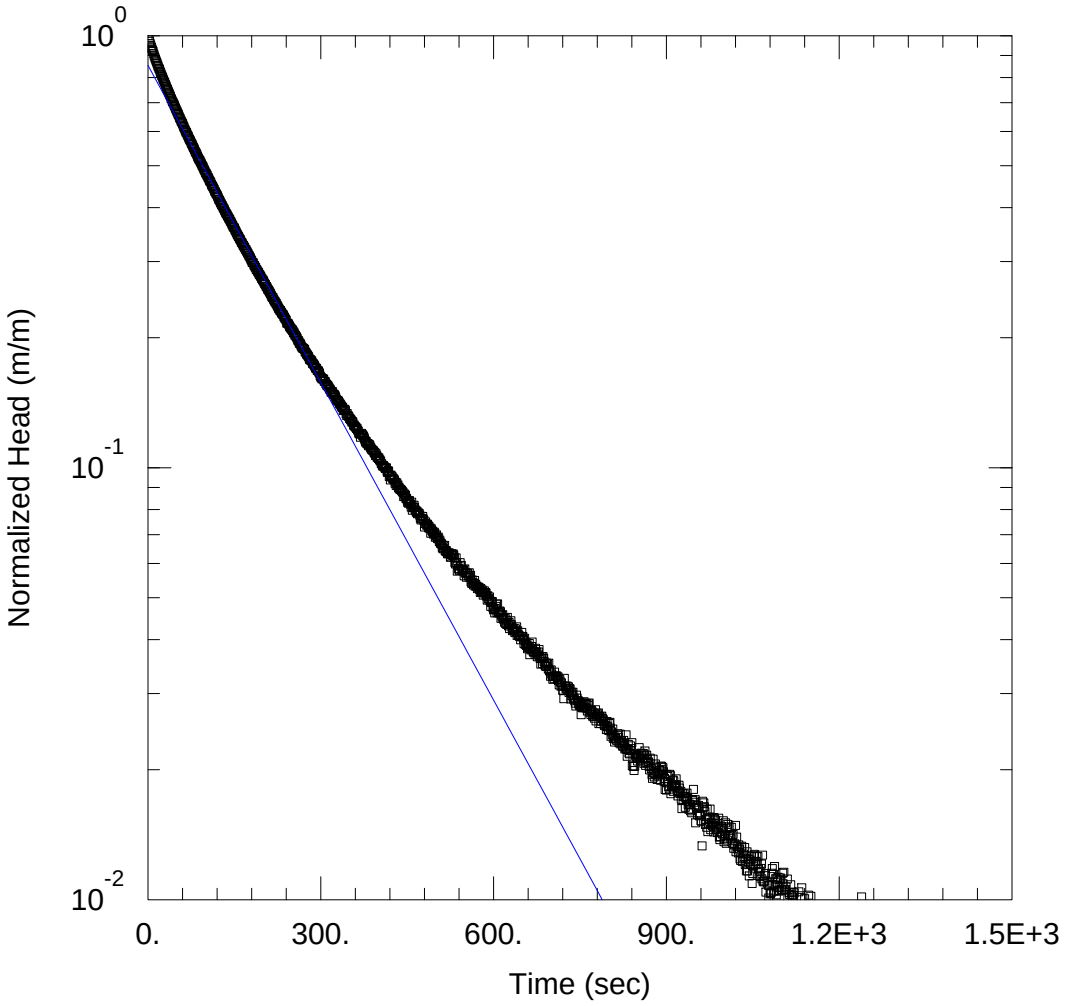
Saturated Thickness: 29.6 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-33)

Initial Displacement: 0.506 m
Static Water Column Height: 34. m
Total Well Penetration Depth: 28.95 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-34 Test 1

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-34 Test 1.aqt
Date: 10/18/11 Time: 12:58:00

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 2.507E-6 m/sec y0 = 0.455 m

AQUIFER DATA

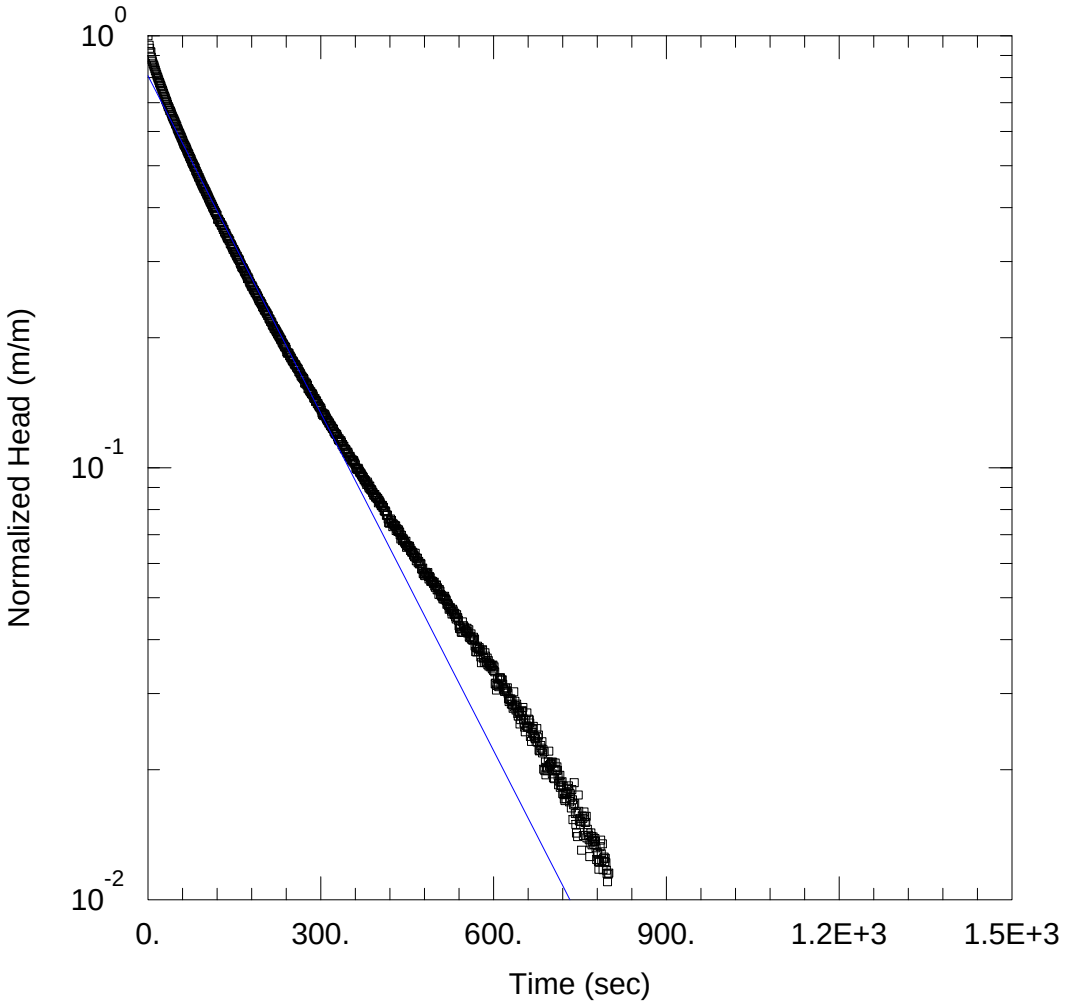
Saturated Thickness: 16.3 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-34)

Initial Displacement: 0.533 m
Static Water Column Height: 24.48 m
Total Well Penetration Depth: 15.75 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-34 Test 2

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-34 Test 2.aqt
Date: 10/18/11 Time: 12:59:56

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 2.666E-6 m/sec y0 = 0.4499 m

AQUIFER DATA

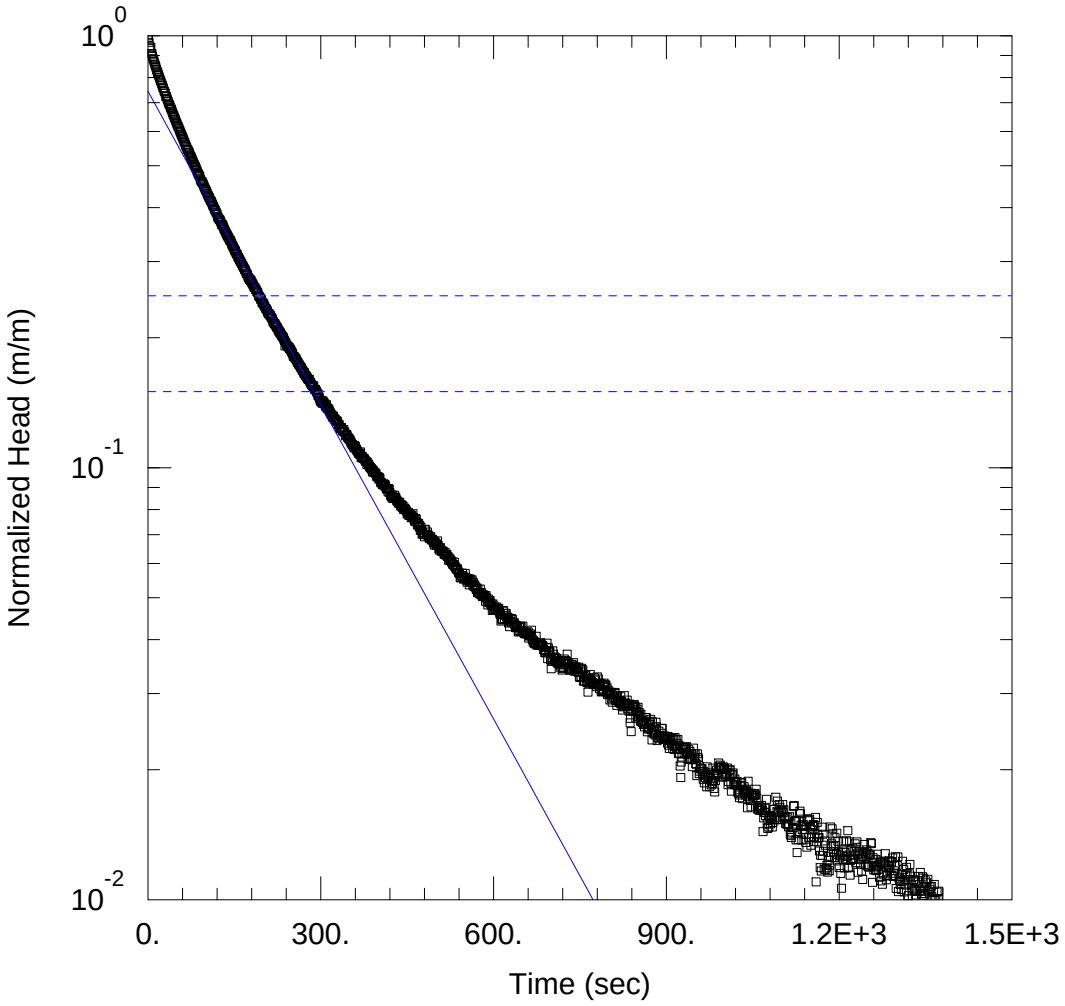
Saturated Thickness: 16.3 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-34)

Initial Displacement: 0.557 m
Static Water Column Height: 24.48 m
Total Well Penetration Depth: 15.75 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-34 Test 3

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-34 Test 3.aqt
Date: 10/18/11 Time: 13:16:59

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 2.479E-6 m/sec y0 = 0.3887 m

AQUIFER DATA

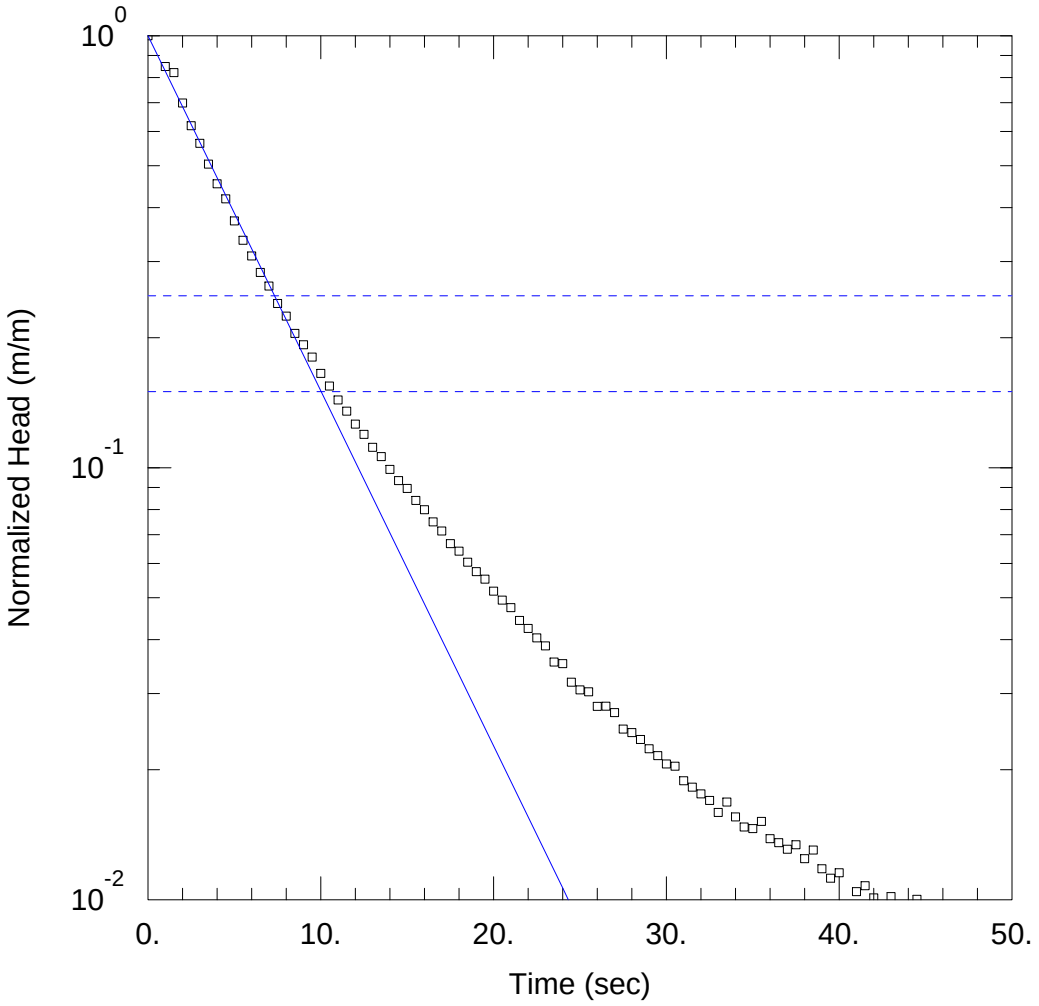
Saturated Thickness: 16.3 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-34)

Initial Displacement: 0.523 m
Static Water Column Height: 24.49 m
Total Well Penetration Depth: 15.75 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-39 Test 1

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-39 Test 1_twc_CaseA.aqt
Date: 10/18/11 Time: 14:17:36

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0001074 m/sec y0 = 0.4792 m

AQUIFER DATA

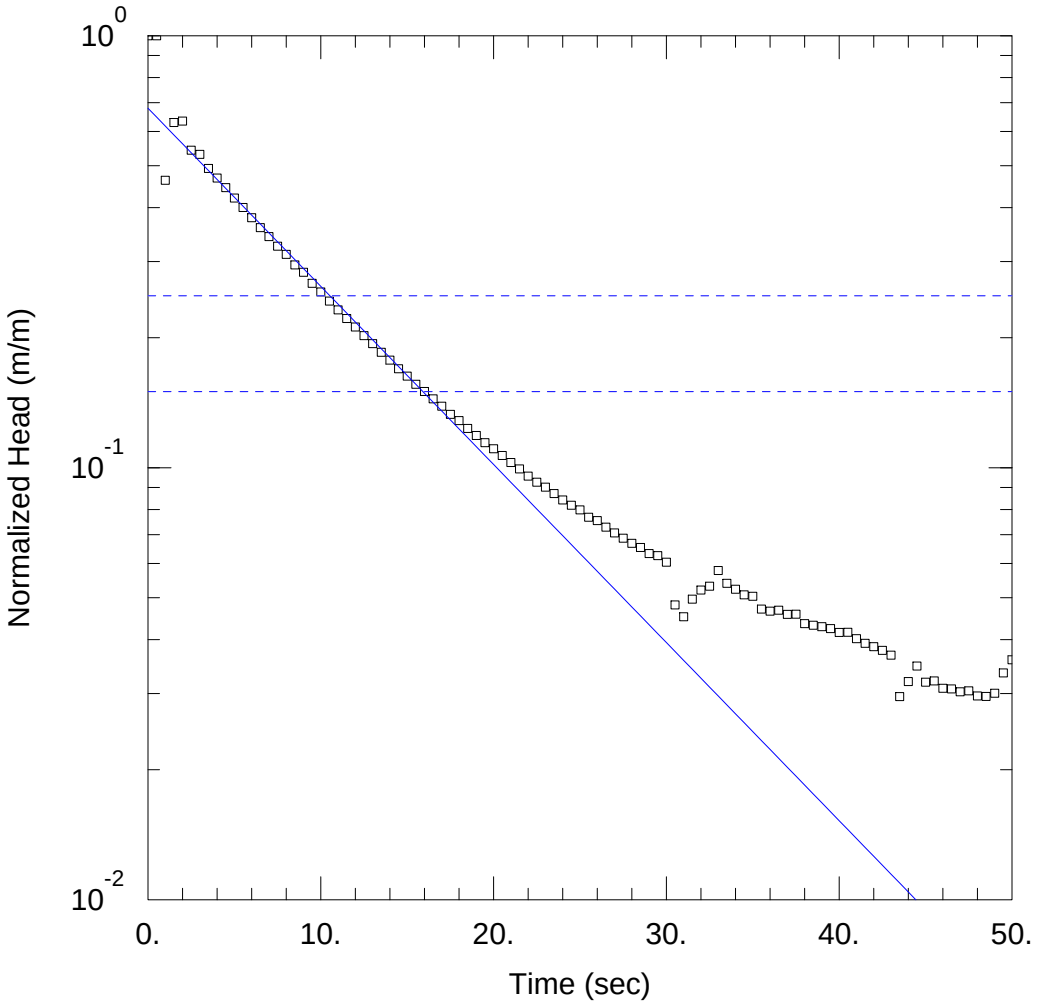
Saturated Thickness: 8.84 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-39)

Initial Displacement: 0.479 m
Static Water Column Height: 9.73 m
Total Well Penetration Depth: 6.74 m
Screen Length: 1.8 m
Casing Radius: 0.0254 m
Well Radius: 0.076 m

BH-BGC11-39 Test 2

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-39 Test 2twc_CaseA.aqt
Date: 10/18/11 Time: 13:38:47

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 5.387E-5 m/sec y0 = 0.4056 m

AQUIFER DATA

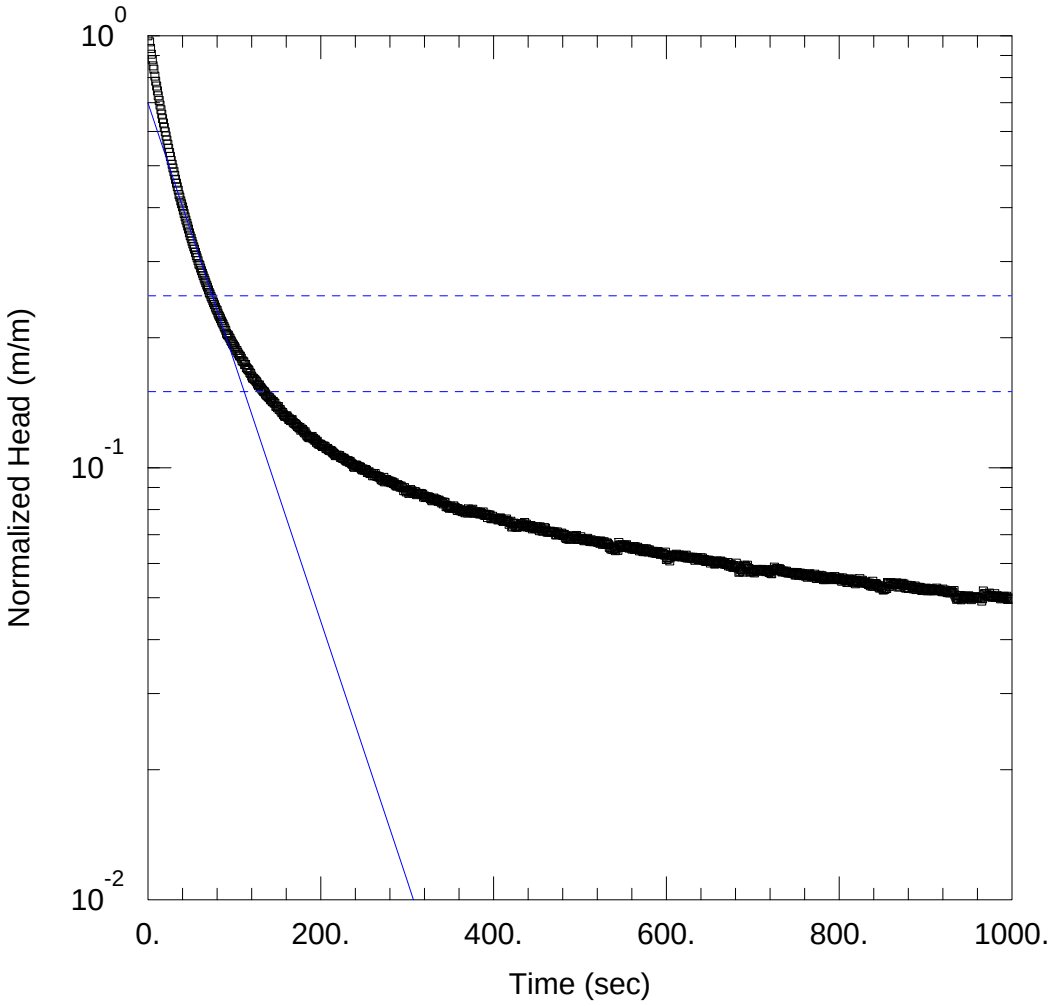
Saturated Thickness: 8.82 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-39)

Initial Displacement: 0.597 m
Static Water Column Height: 9.78 m
Total Well Penetration Depth: 6.72 m
Screen Length: 1.8 m
Casing Radius: 0.0254 m
Well Radius: 0.076 m

BH-BGC11-52 Test 1

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-52 Test 1.aqt
Date: 10/18/11 Time: 14:06:37

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 7.174E-6 m/sec y0 = 0.376 m

AQUIFER DATA

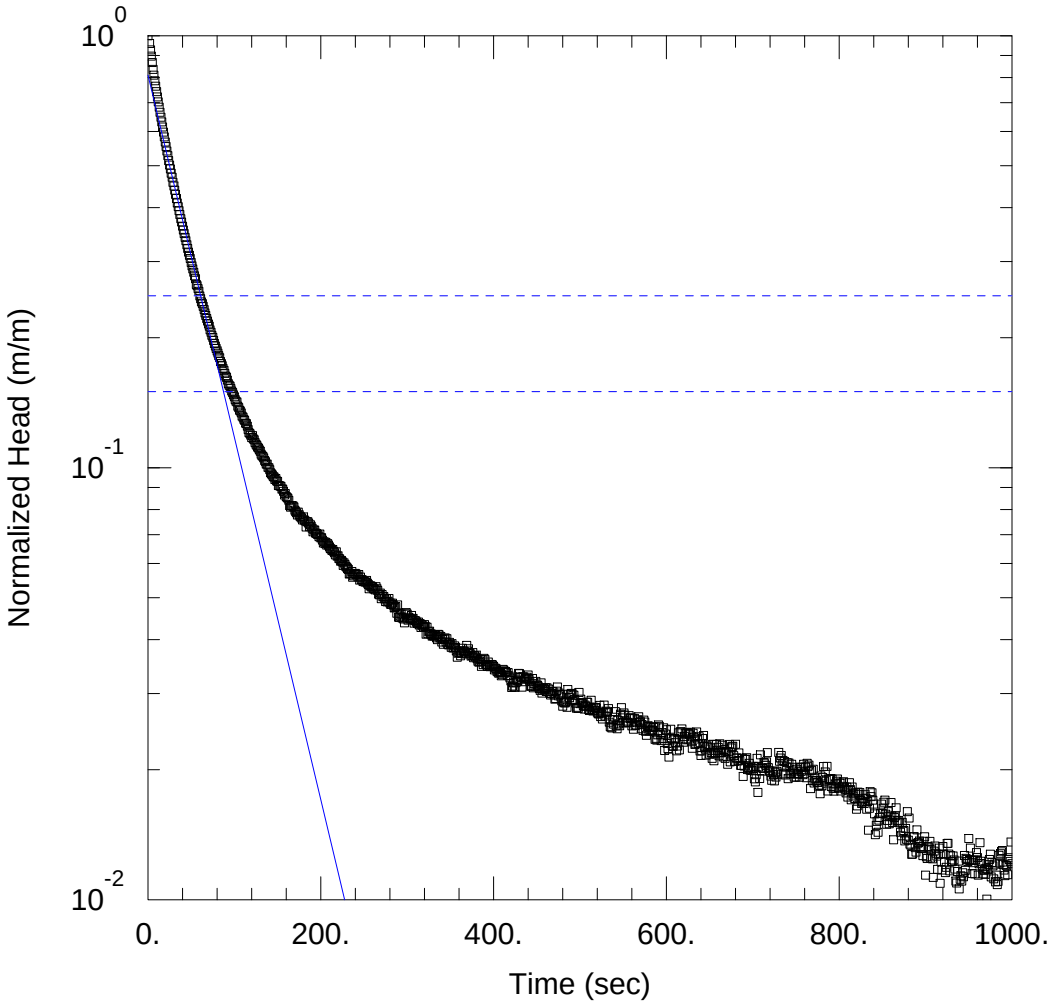
Saturated Thickness: 10.5 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-52)

Initial Displacement: 0.538 m
Static Water Column Height: 17.72 m
Total Well Penetration Depth: 10.5 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-52 Test 2

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-52 Test 2.aqt
Date: 10/18/11 Time: 14:09:38

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 1.003E-5 m/sec y0 = 0.4369 m

AQUIFER DATA

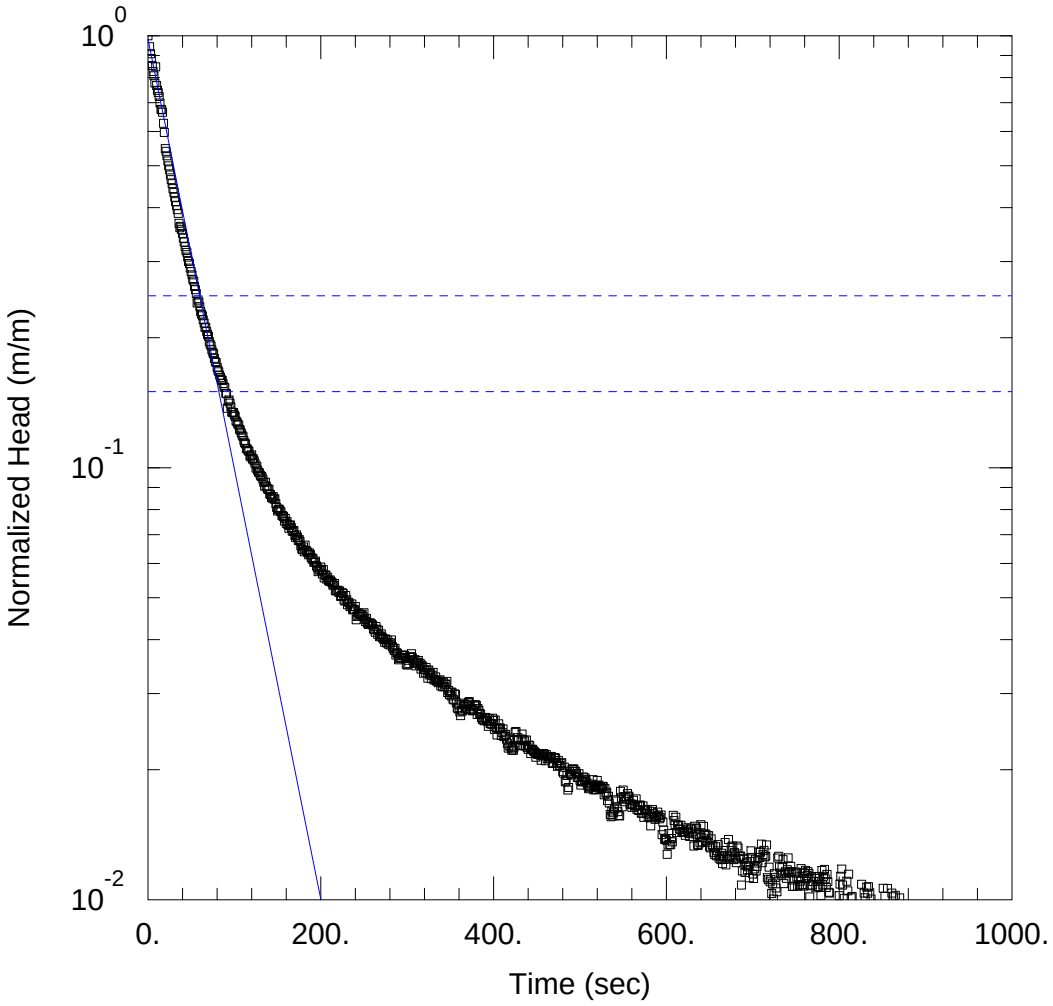
Saturated Thickness: 10.5 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-52)

Initial Displacement: 0.539 m
Static Water Column Height: 17.67 m
Total Well Penetration Depth: 10.5 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

BH-BGC11-52 Test 3

Prepared By:	Prepared For:
BGC Engineering	Victoria Gold Corp.
Project:	**Location:**
0792006	Dublin Gulch, YT



Data Set: N:\...\BH-BGC11-52 Test 3.aqt
Date: 10/18/11 Time: 14:12:10

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 1.19E-5 m/sec y0 = 0.5338 m

AQUIFER DATA

Saturated Thickness: 10.5 Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-BGC11-52)

Initial Displacement: 0.543 m
Static Water Column Height: 17.66 m
Total Well Penetration Depth: 10.5 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.048 m

APPENDIX L
LABORATORY REPORTS

PARTICLE SIZE ANALYSIS OF SOILS

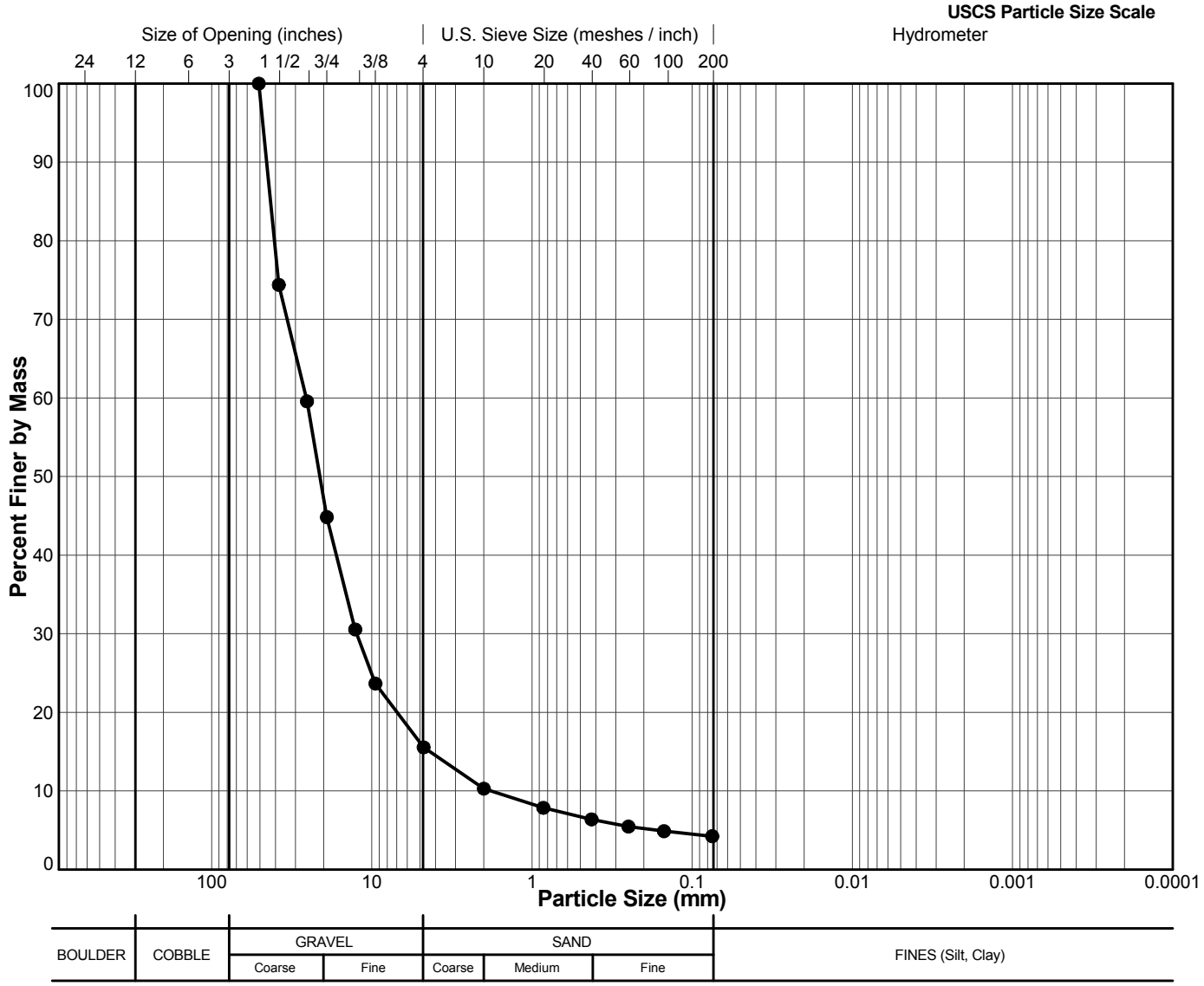
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-50**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.80 to 3.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



RS	14/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

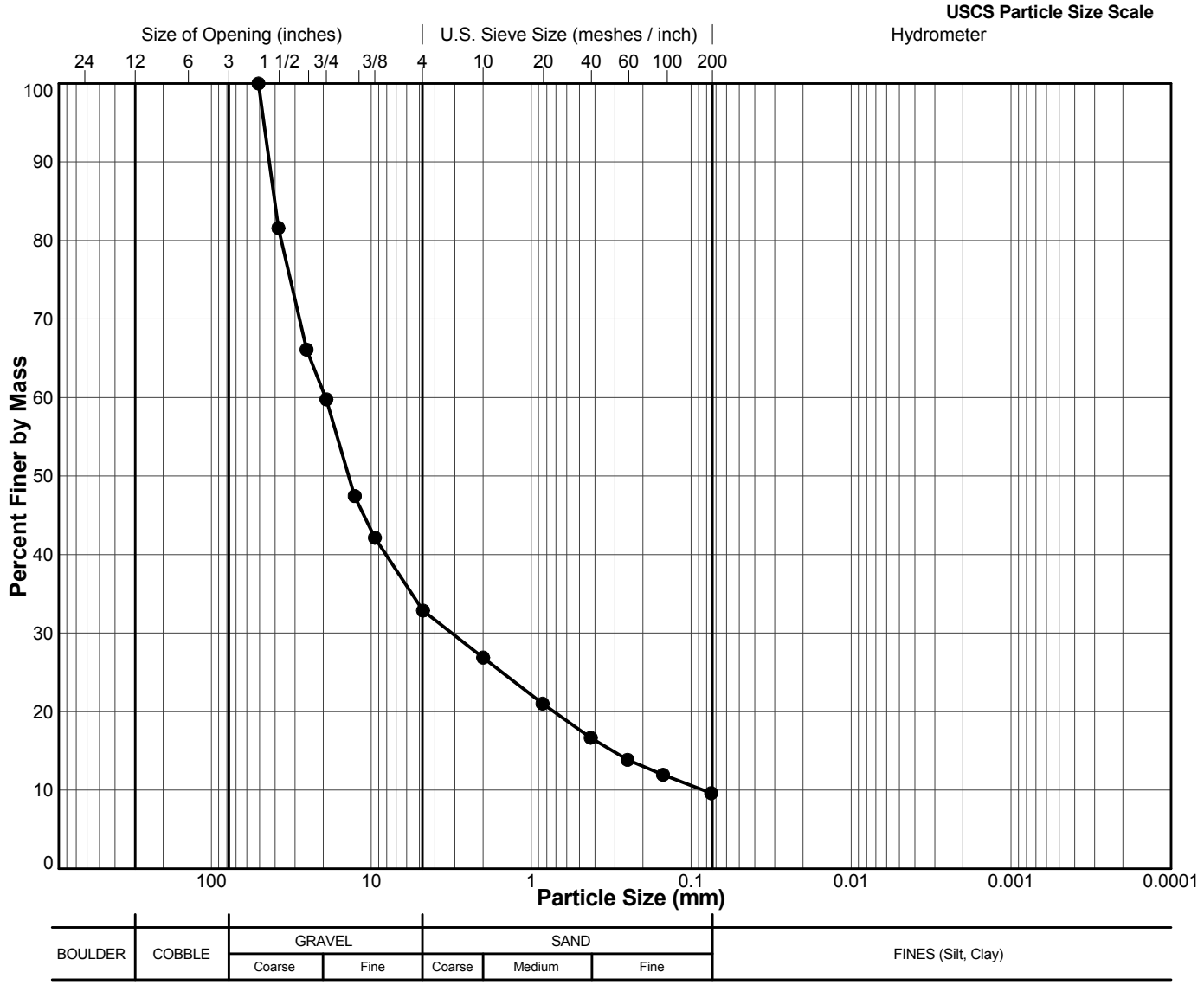
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-50**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.30 to 3.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



RS	04/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

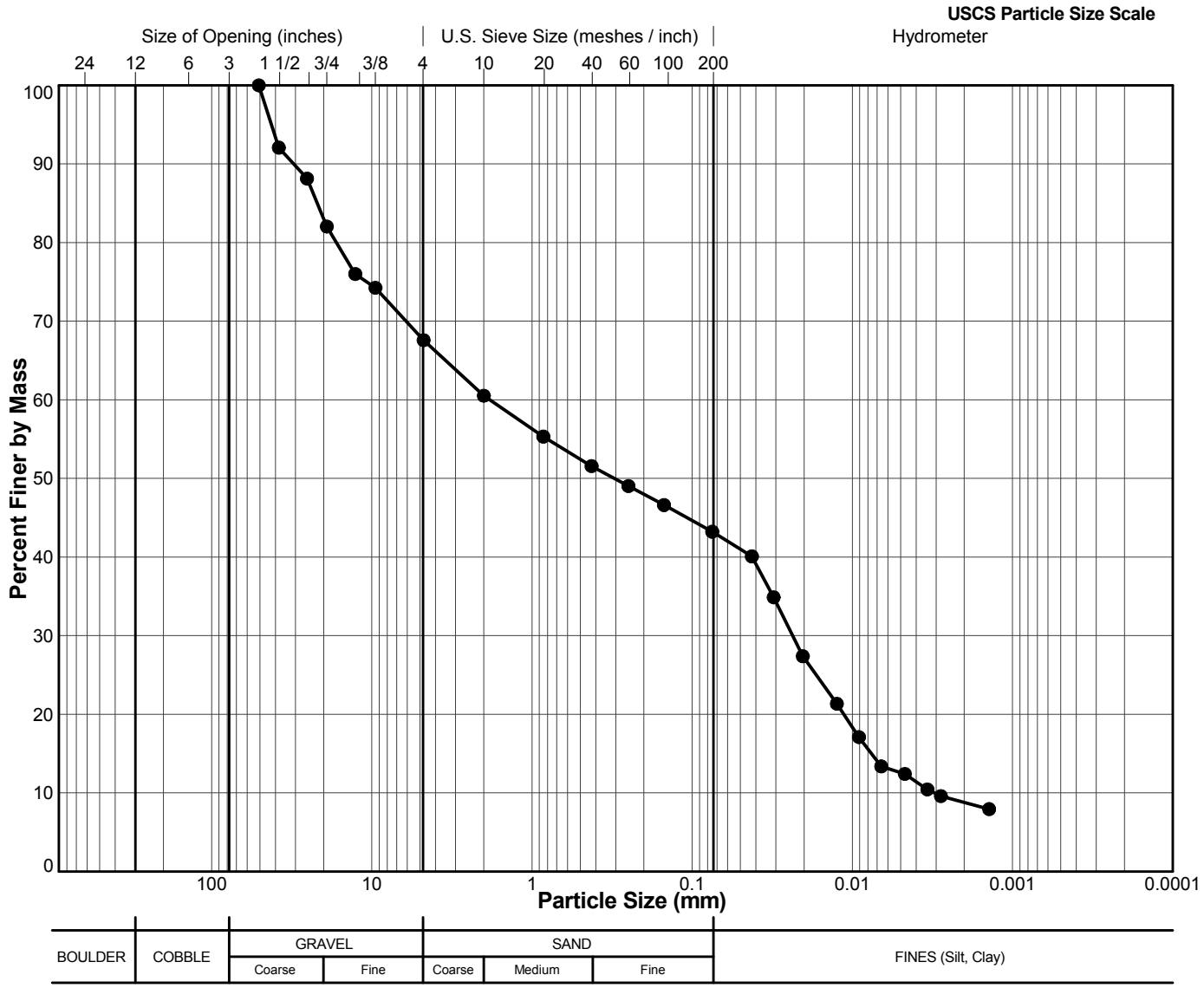
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-51**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.20 to 1.44
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	22/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

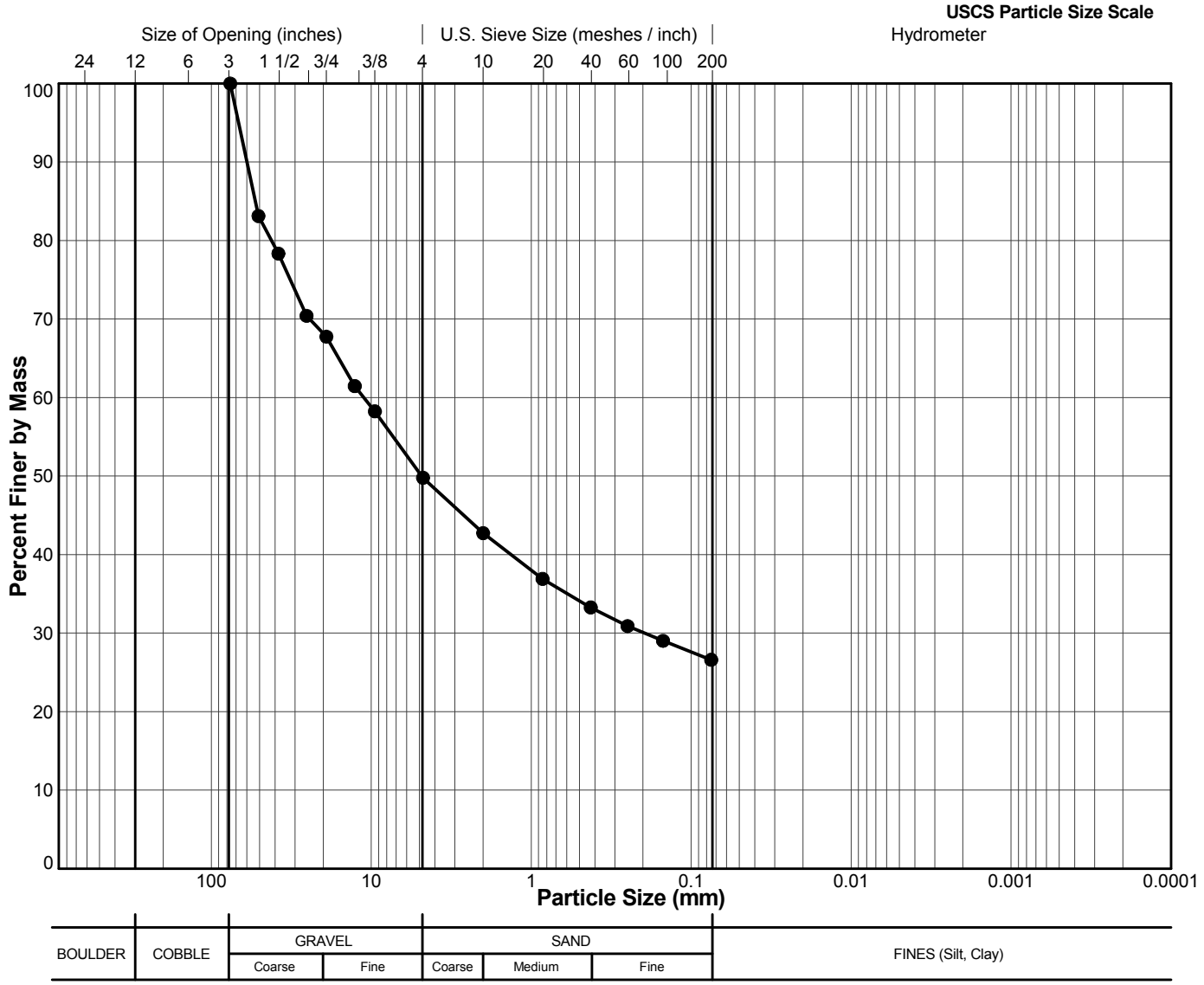
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-51**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.40 to 2.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 76.2	

Method: Split, Washed



RS	27/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

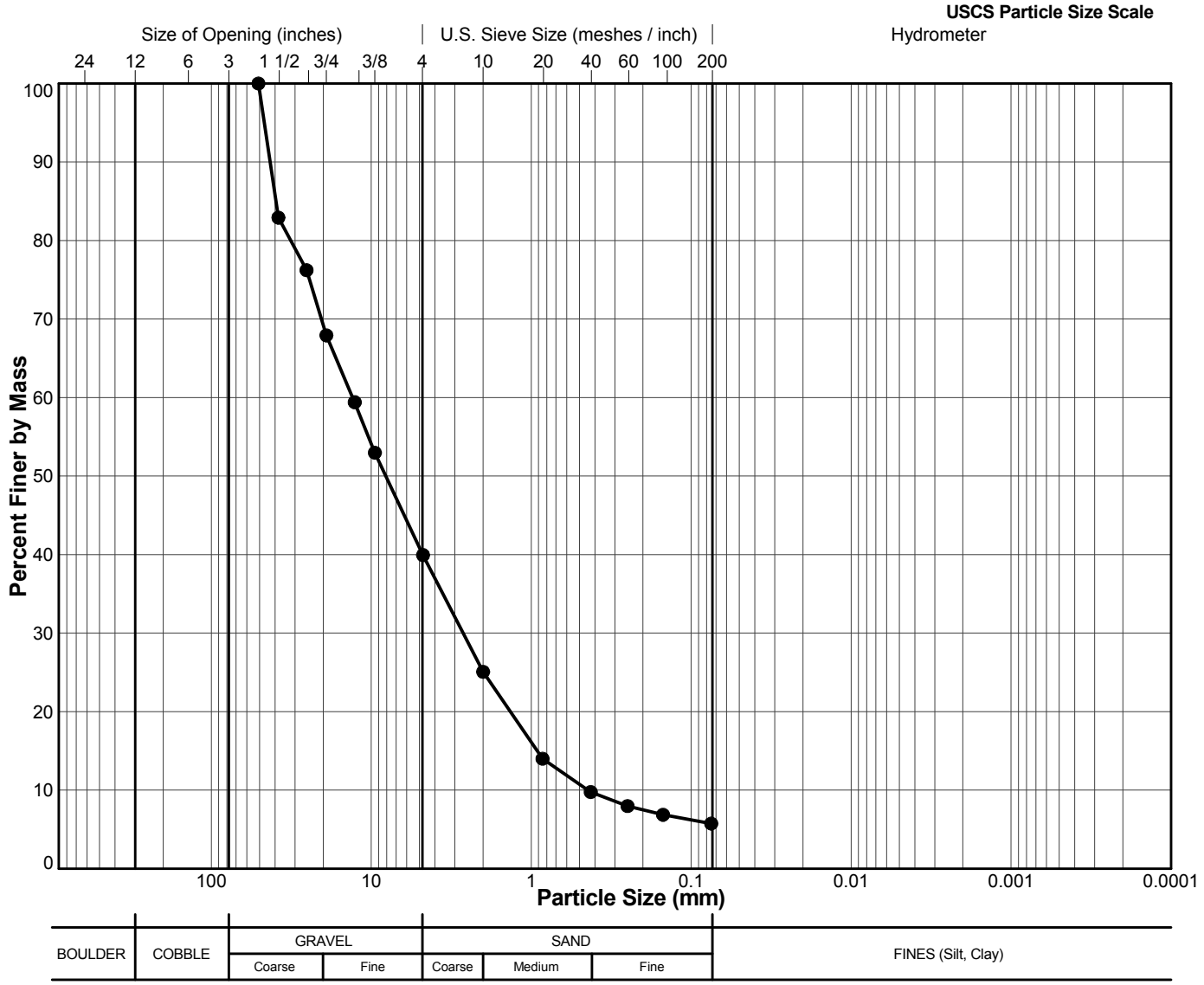
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-51**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 3**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 4.20 to 4.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



RS	22/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

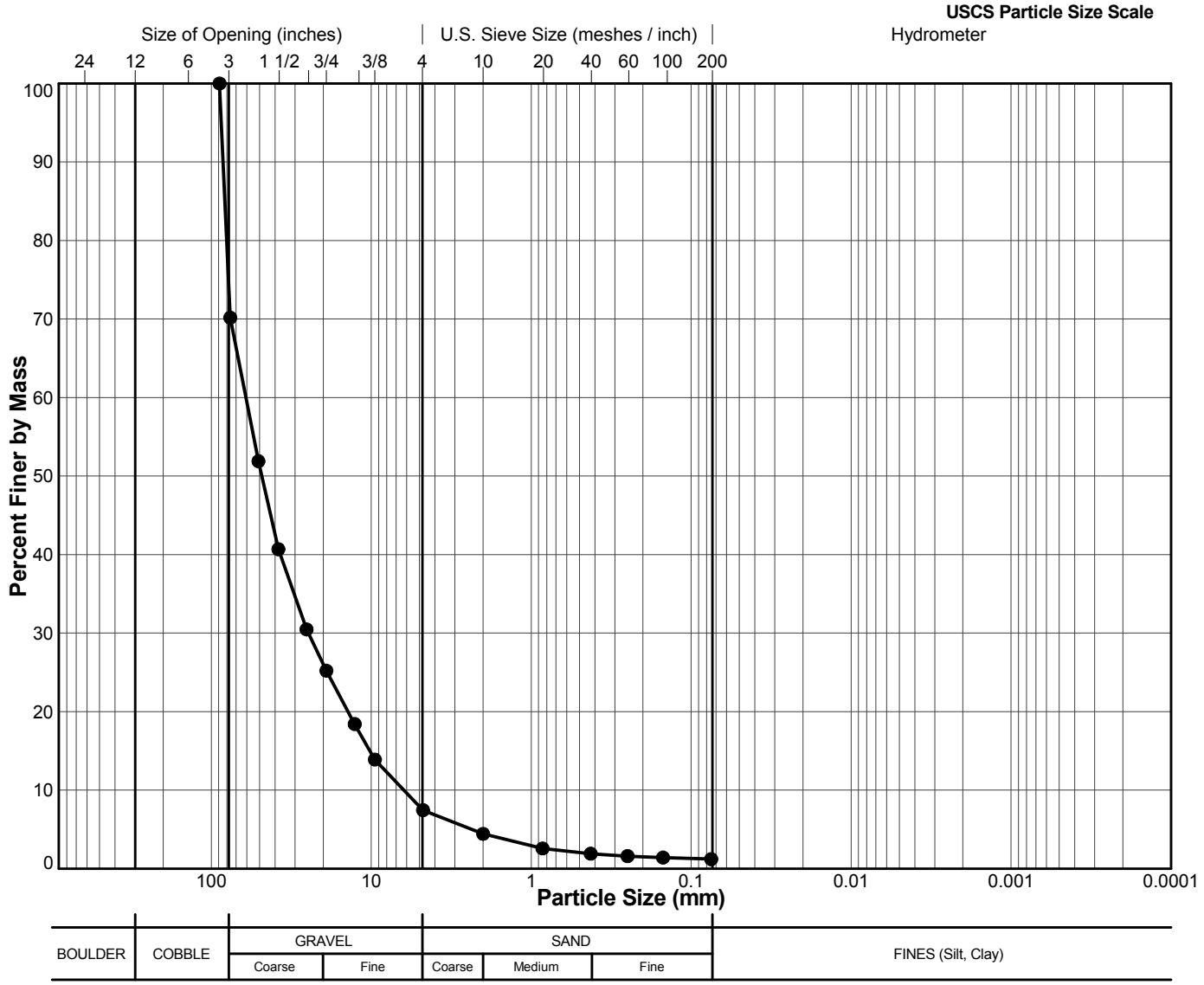
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-52**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.30 to 3.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 88.9	

Method: Split, Washed



SK	**06/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

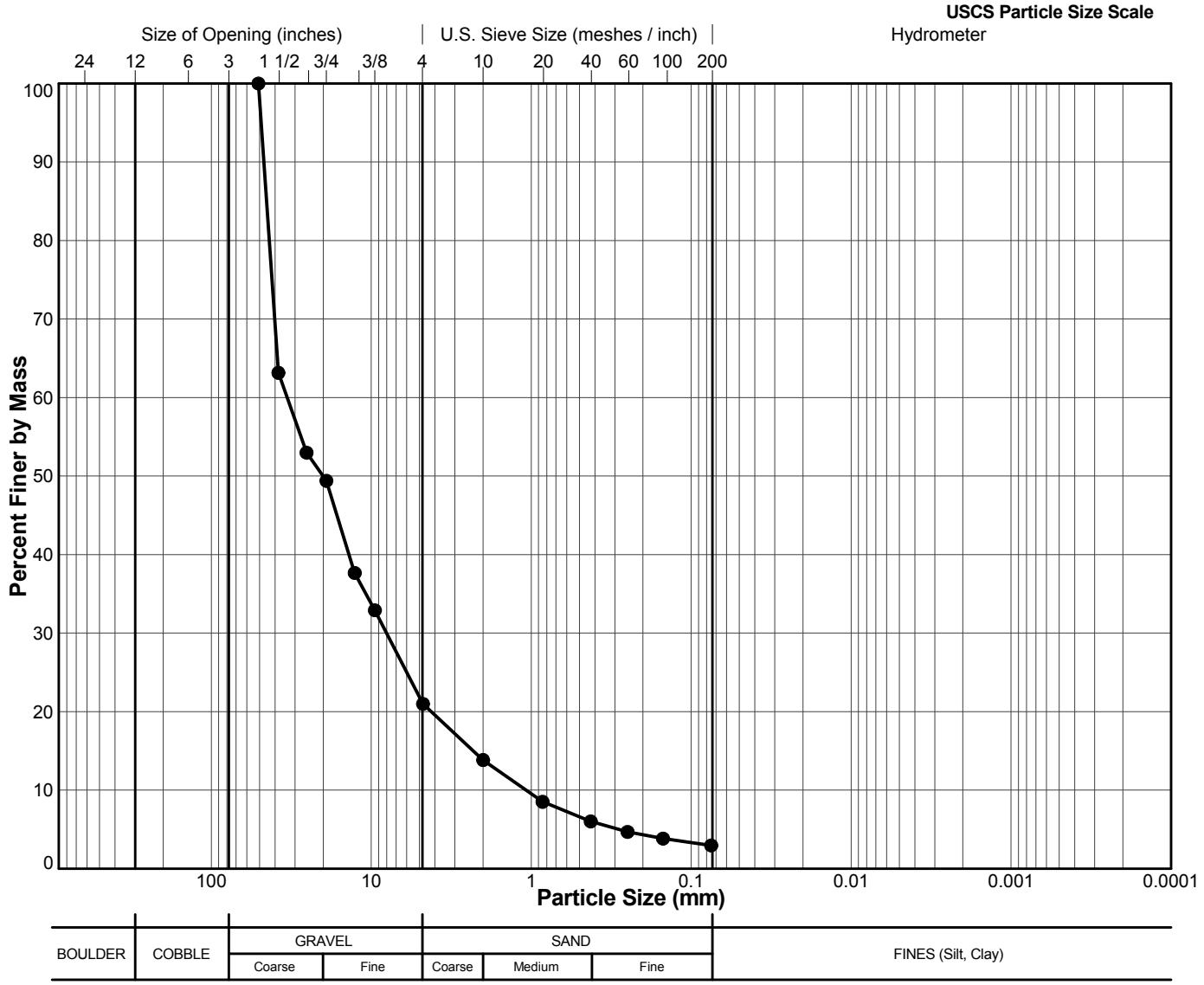
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-53**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.00 to 2.20
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



RS	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

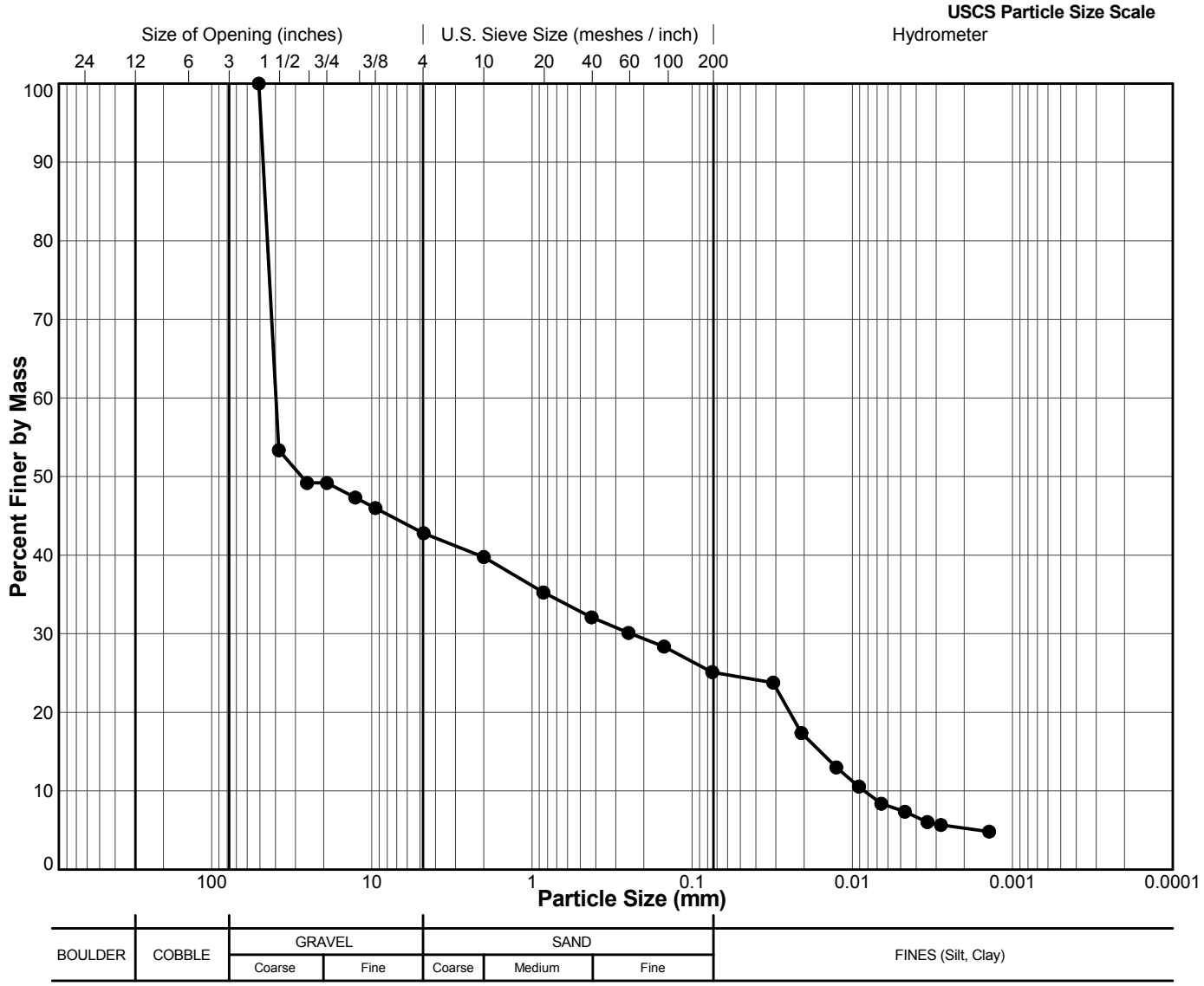
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-54**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**
Hydrometer ID: BURNABY - 87024	



RS	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

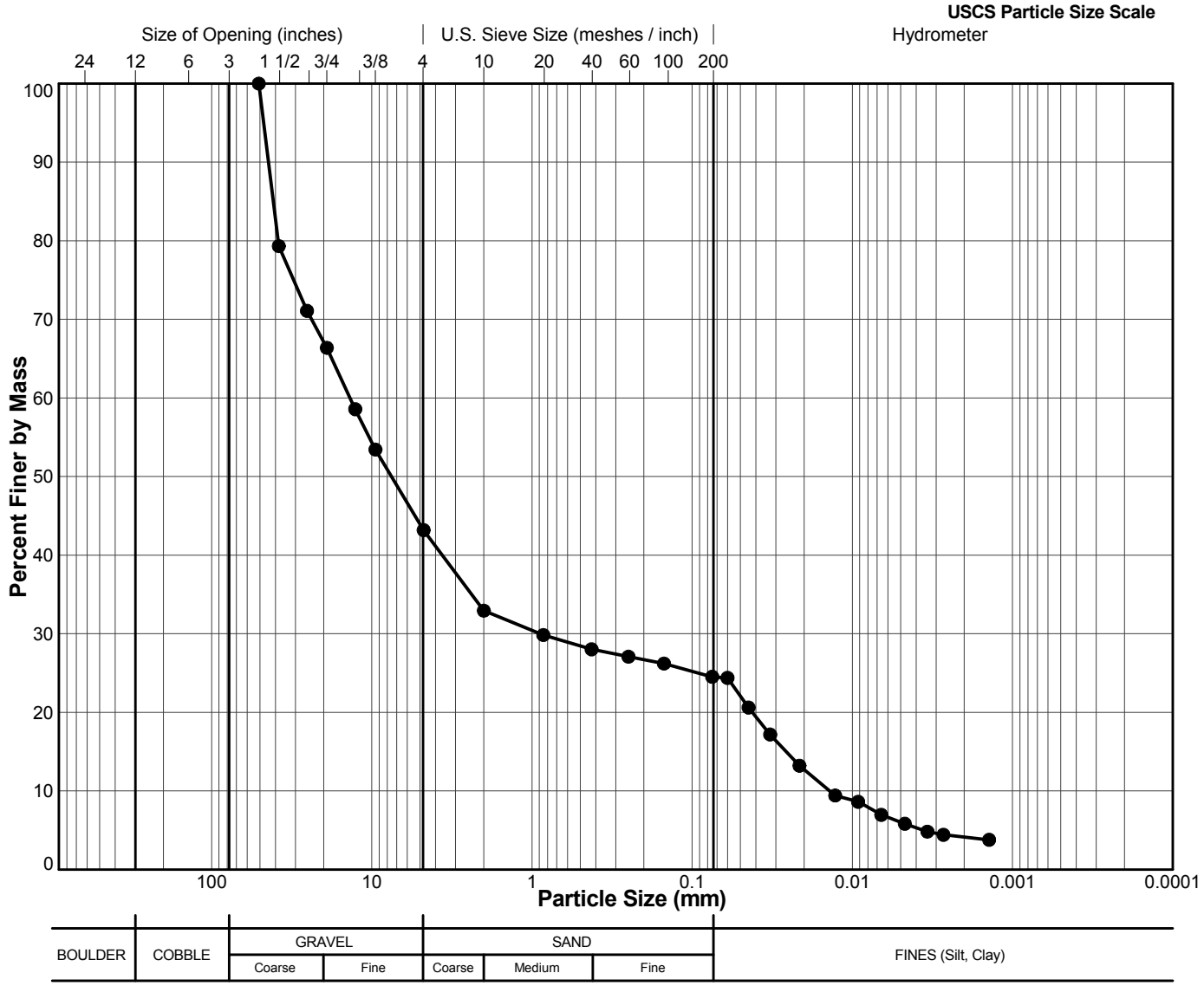
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-55**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	21/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

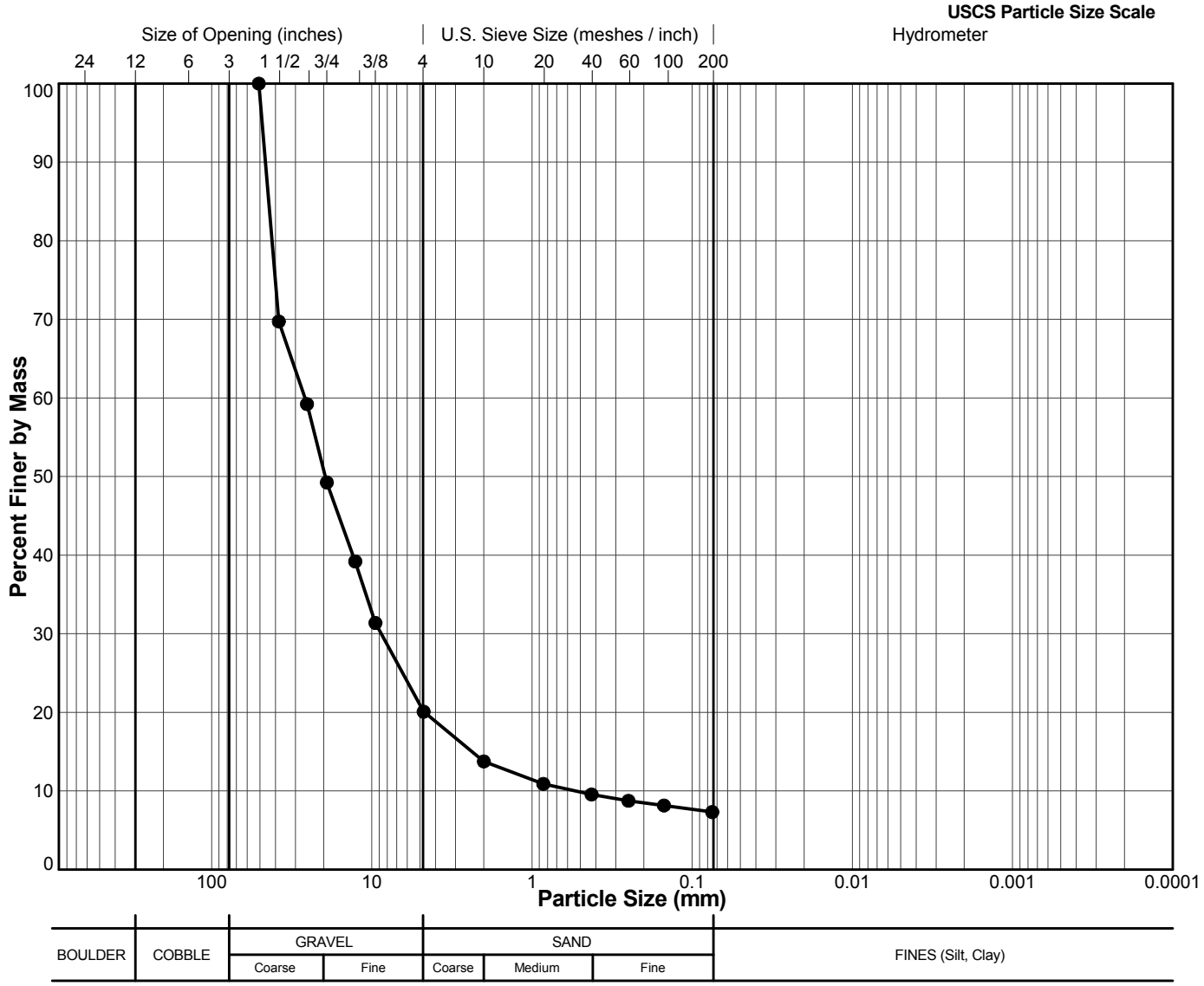
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-55**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.90 to 2.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



SK	**26/09/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

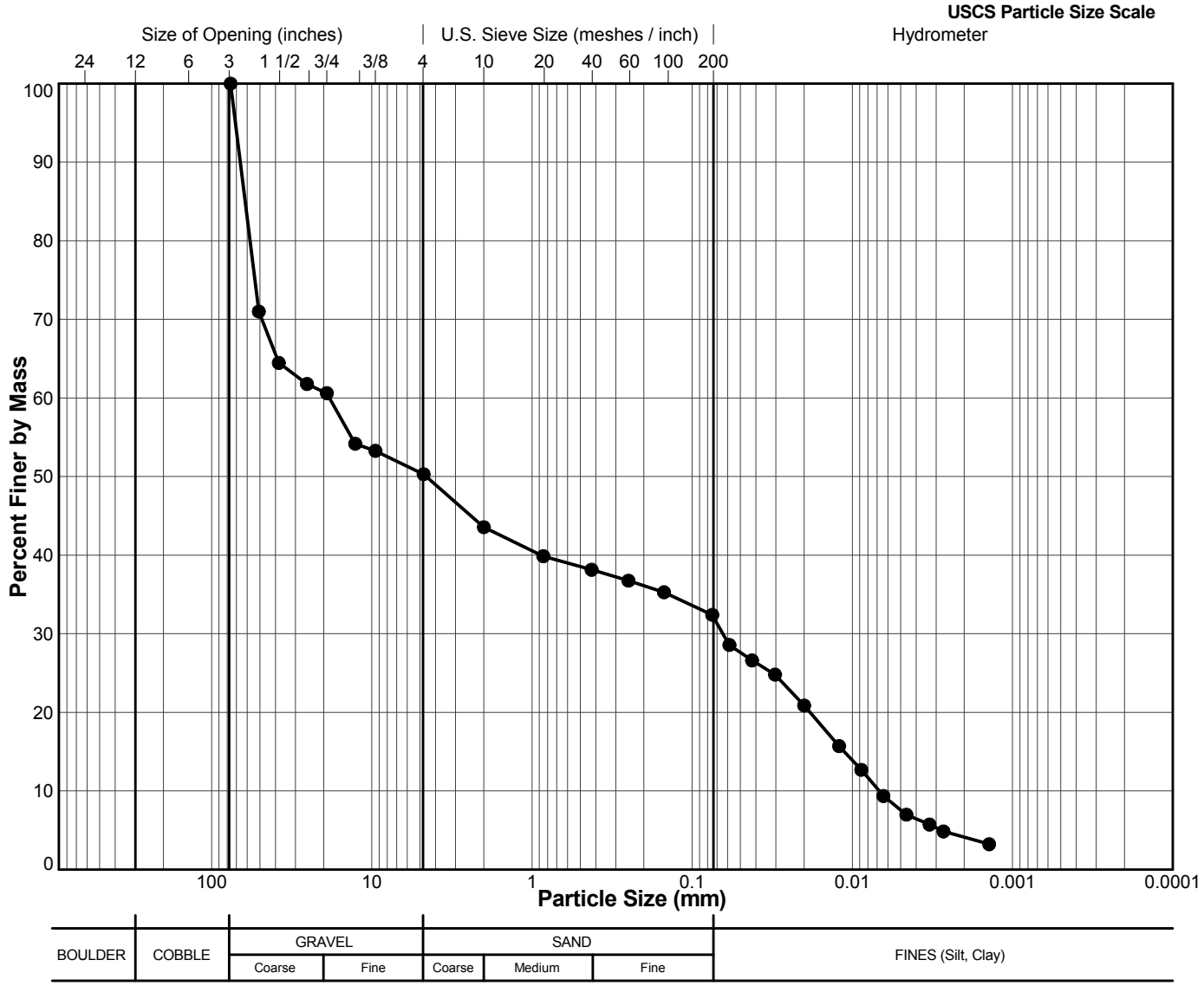
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-57**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.90 to 1.10
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 76.2	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



SK	**04/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

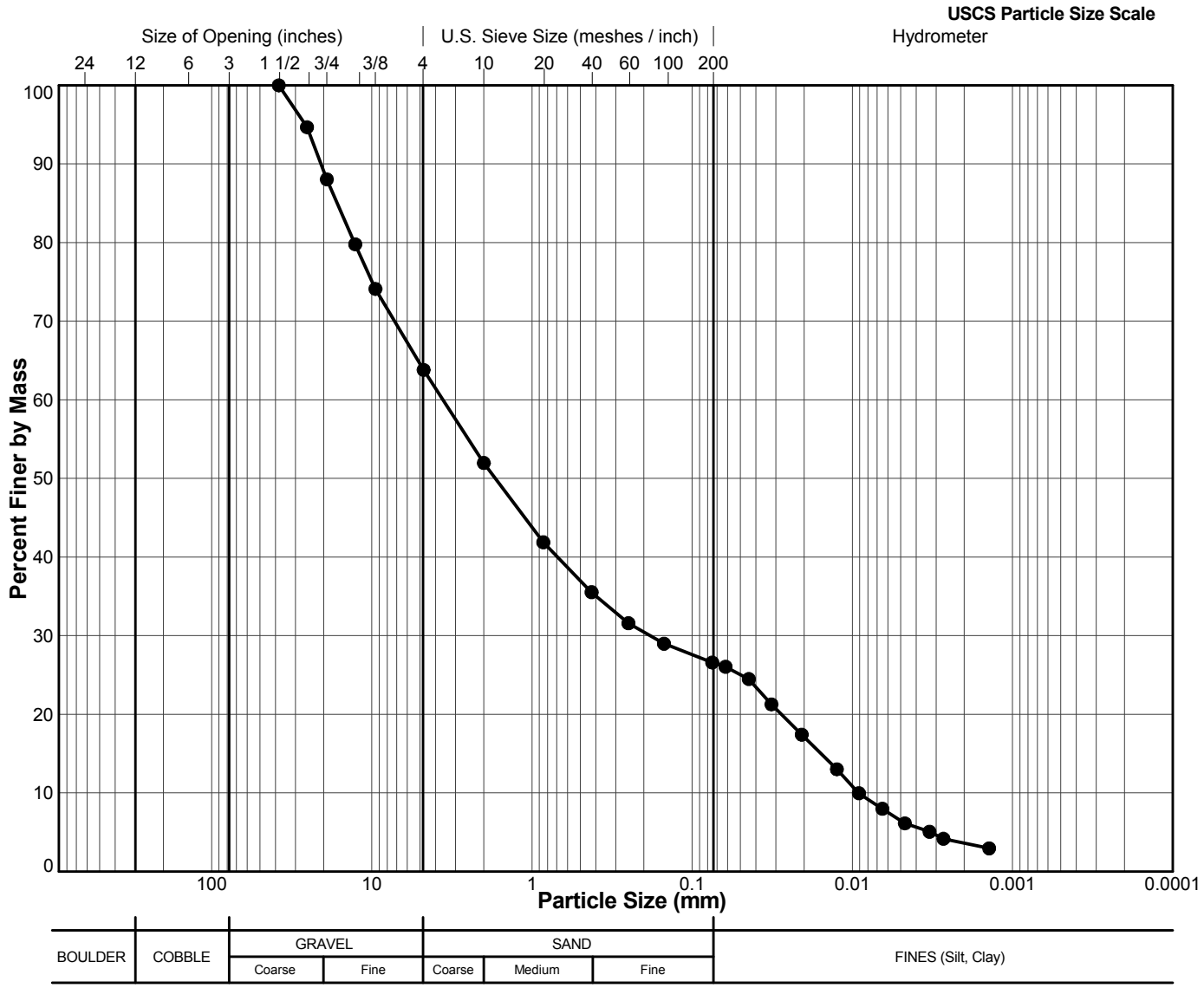
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-58**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 0.70
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 38.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



RS	22/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

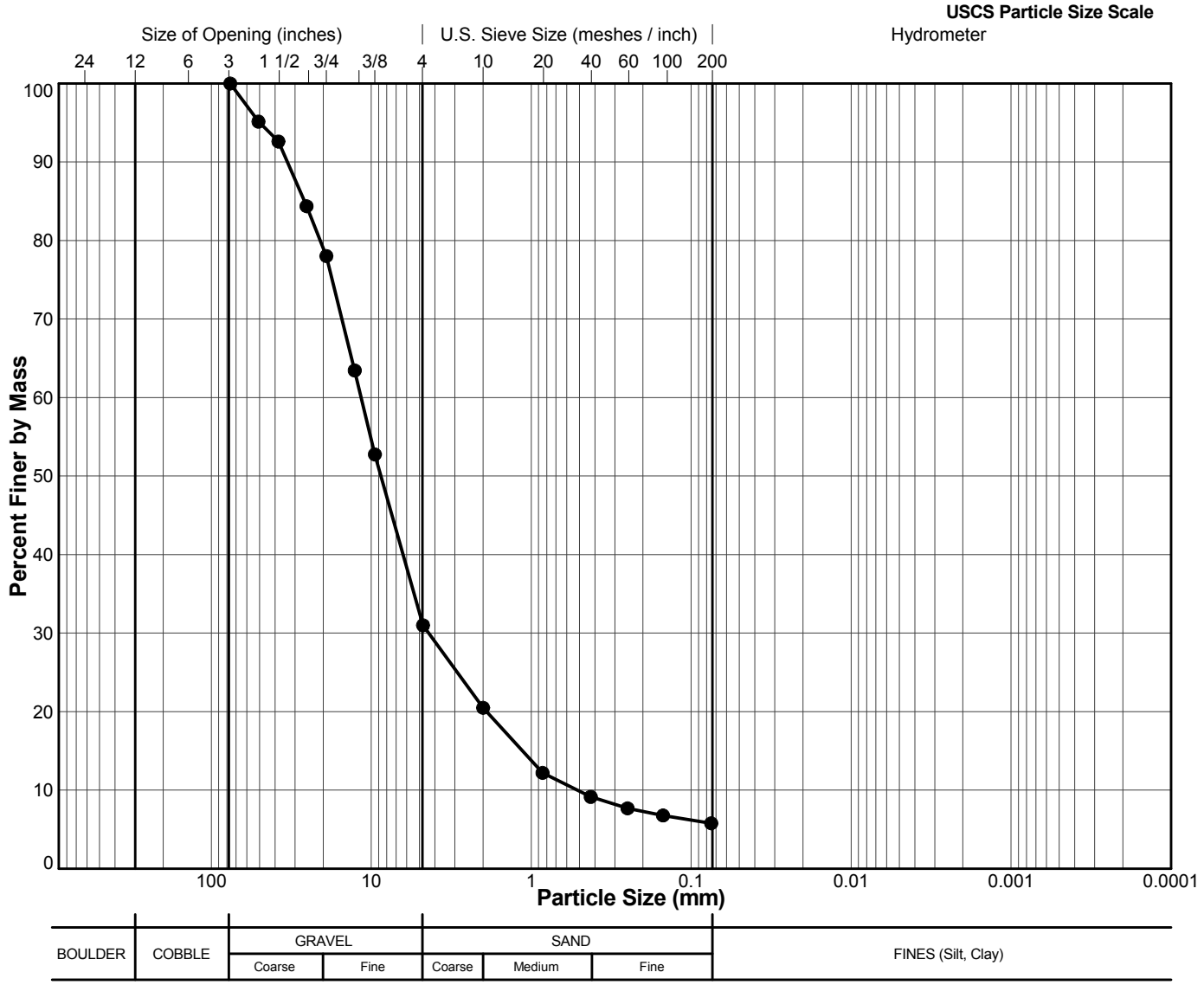
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-58**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.90 to 1.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 76.2	

Method: Split, Washed



SK	**06/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

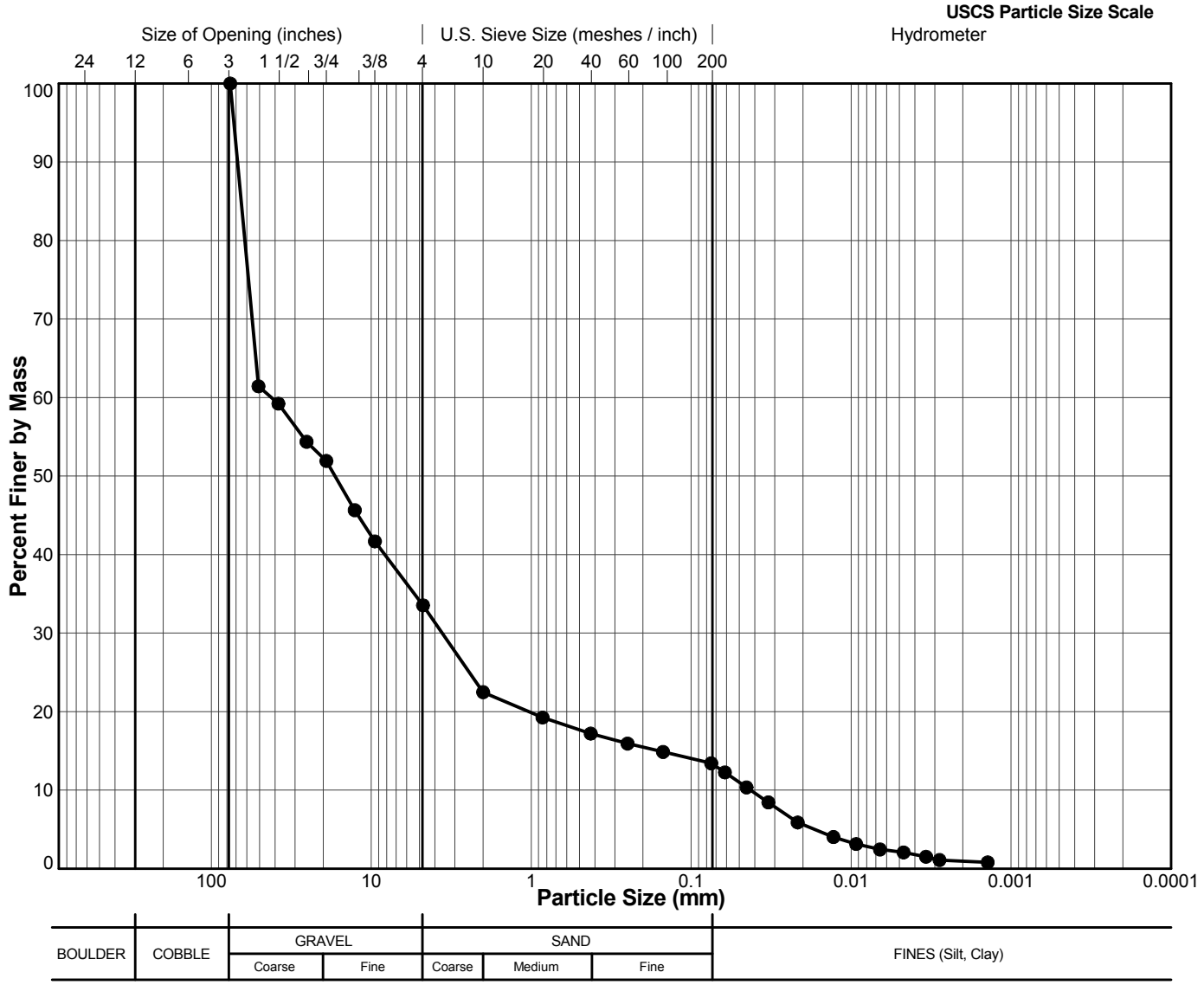
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-59**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 76.2	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



SK	**07/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

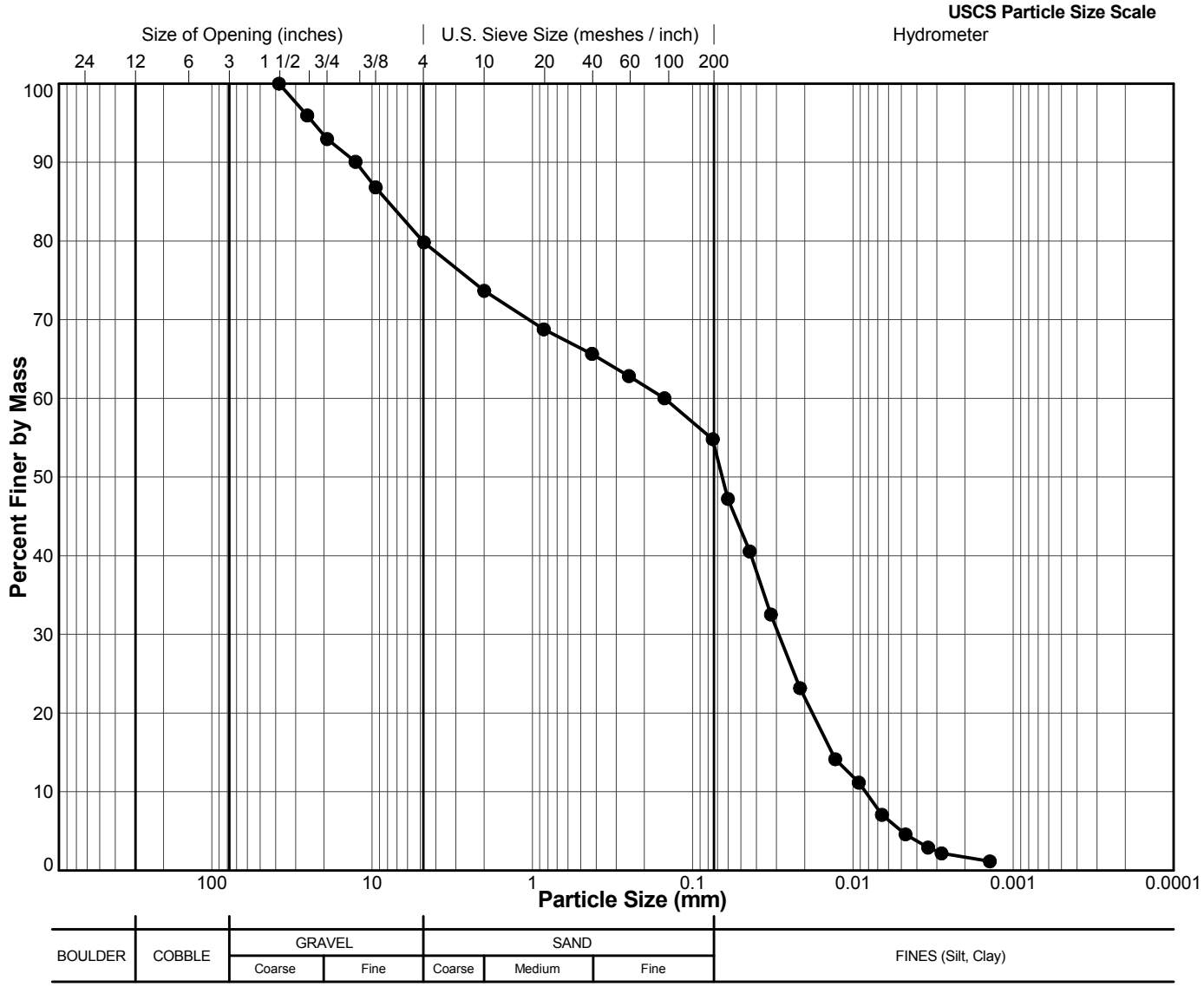
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-60**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 0.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 38.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



SK	**03/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

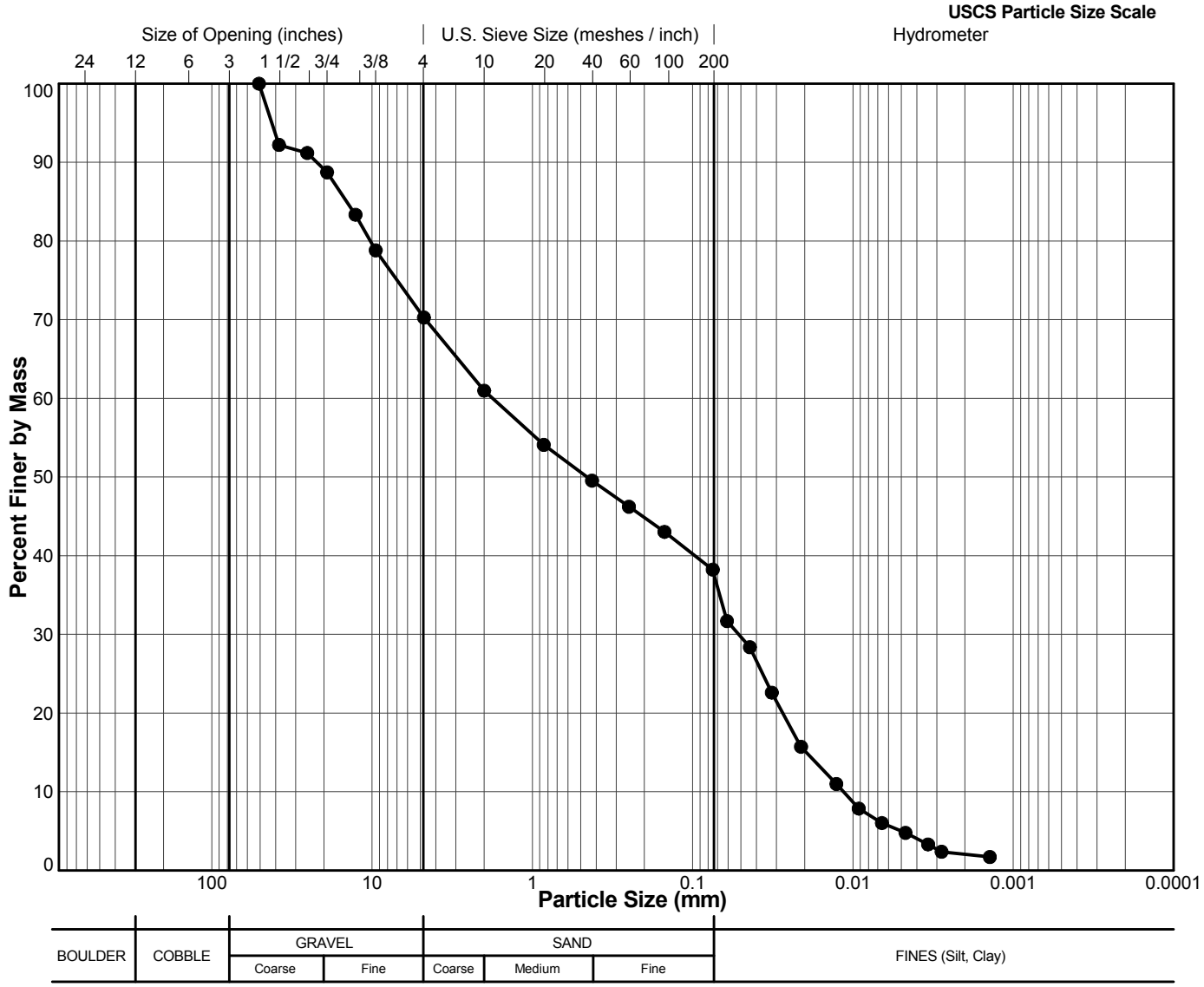
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-61**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 0.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



RS	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

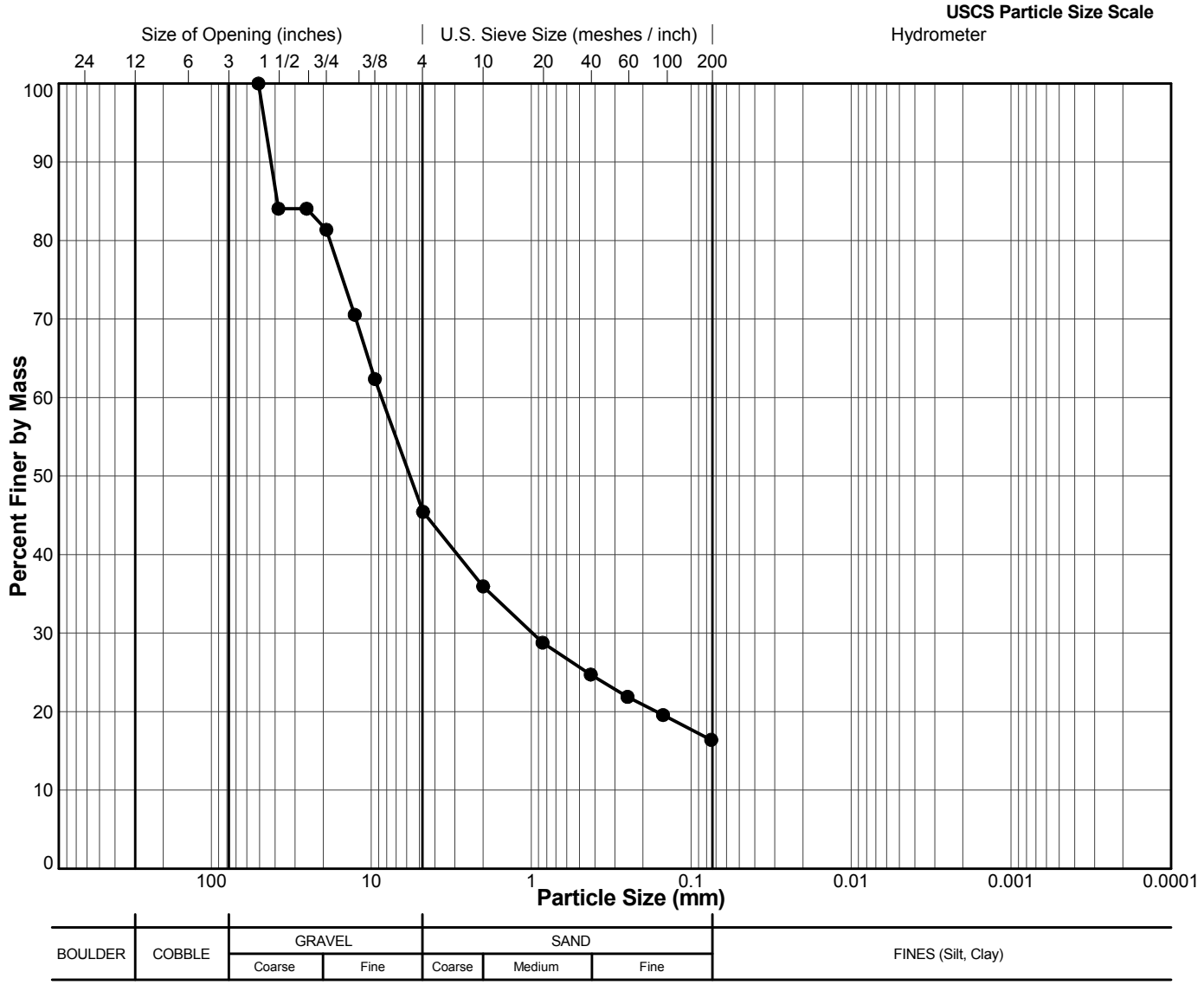
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-60**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.70 to 1.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



SK	**26/09/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

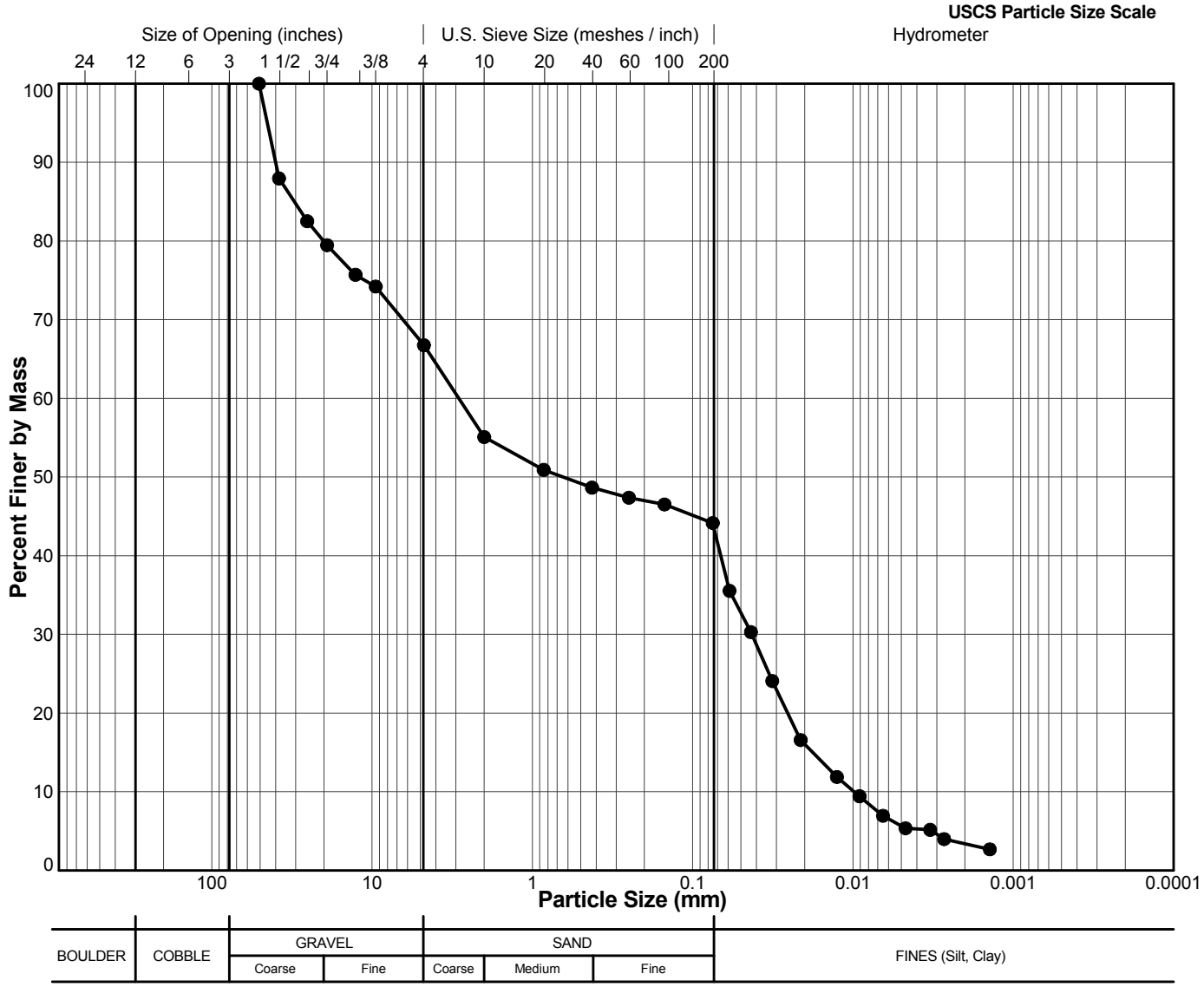
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-62**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.90 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



RS	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

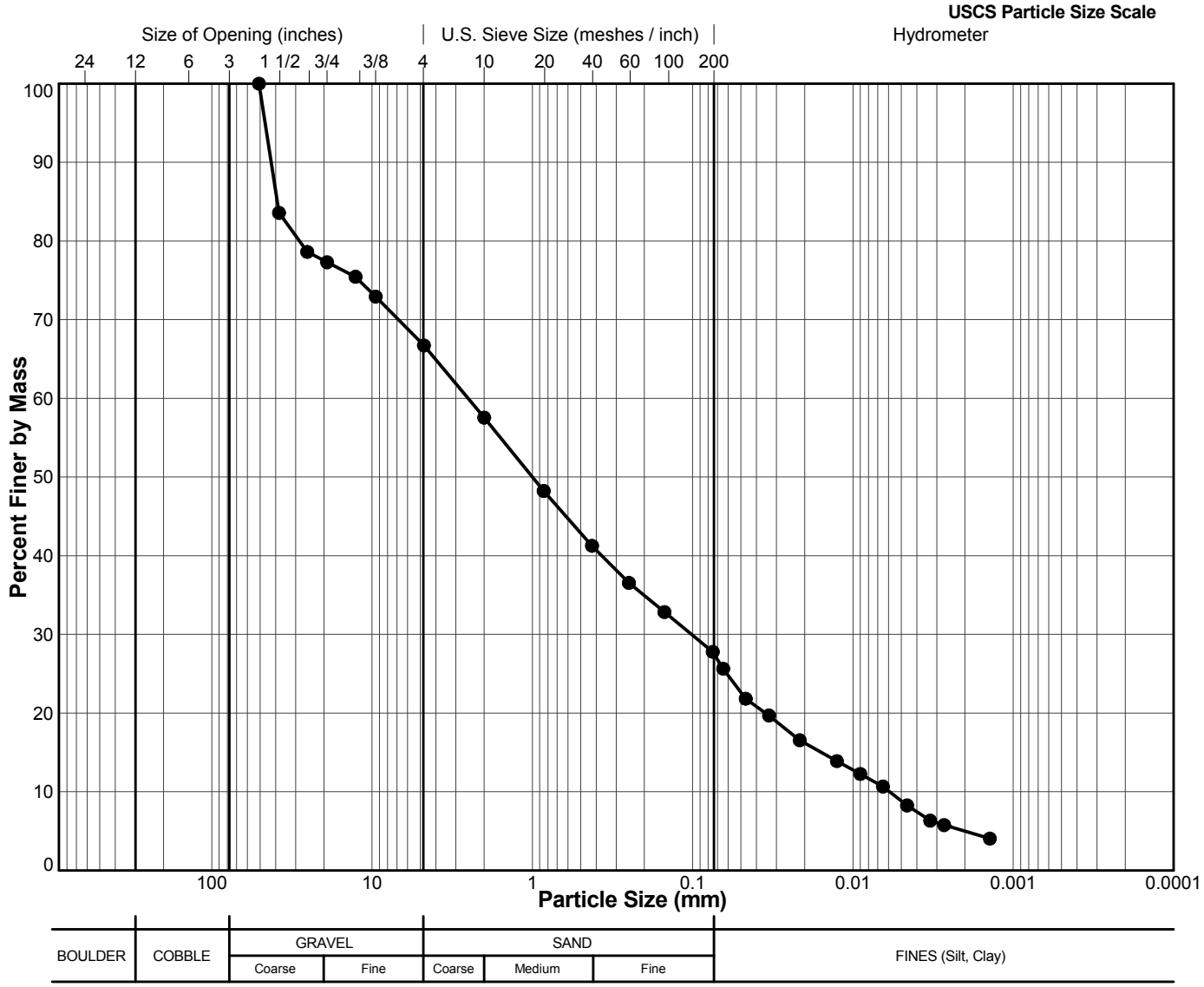
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-62**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.50 to 3.70
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



SK	**03/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

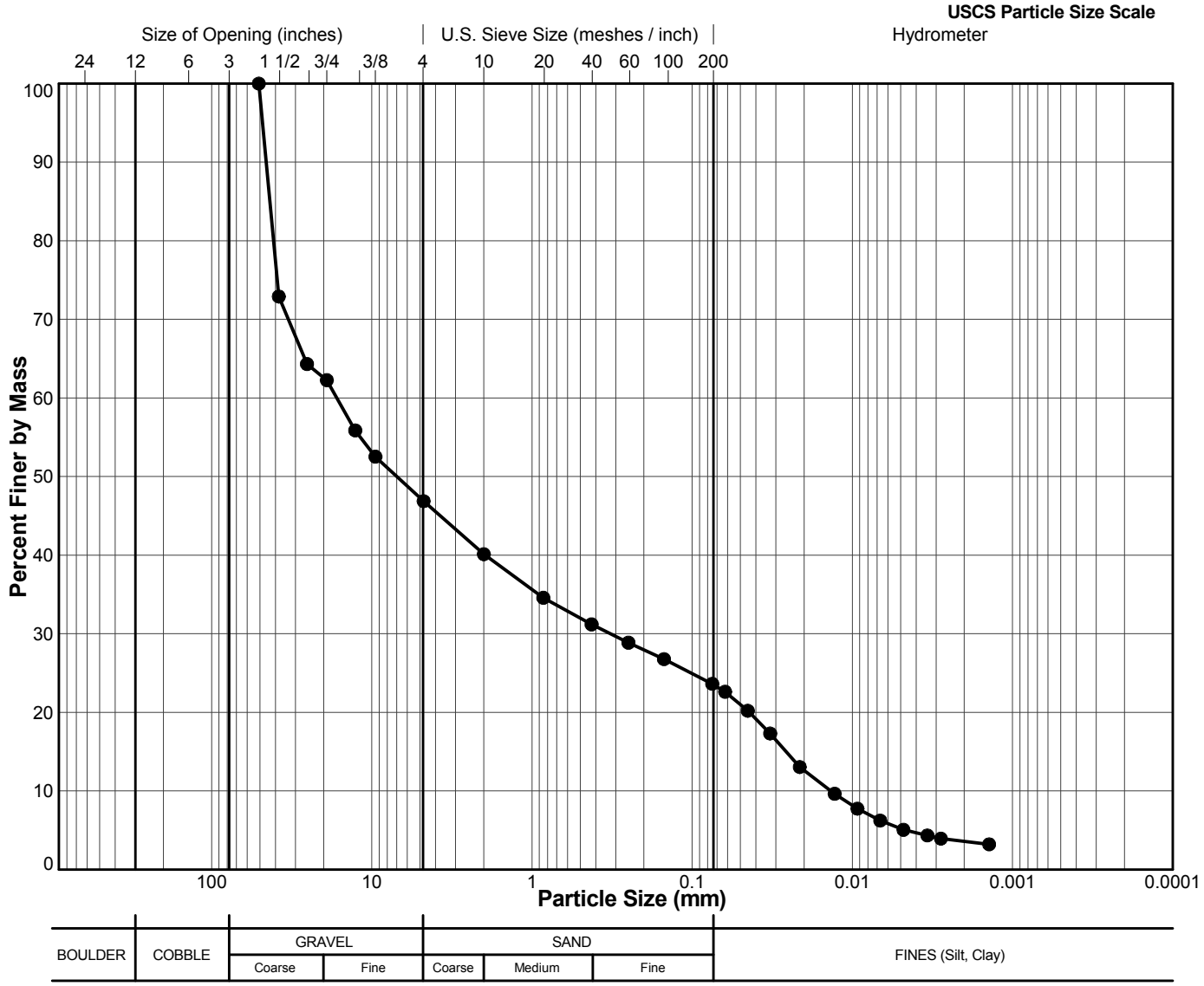
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-63**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

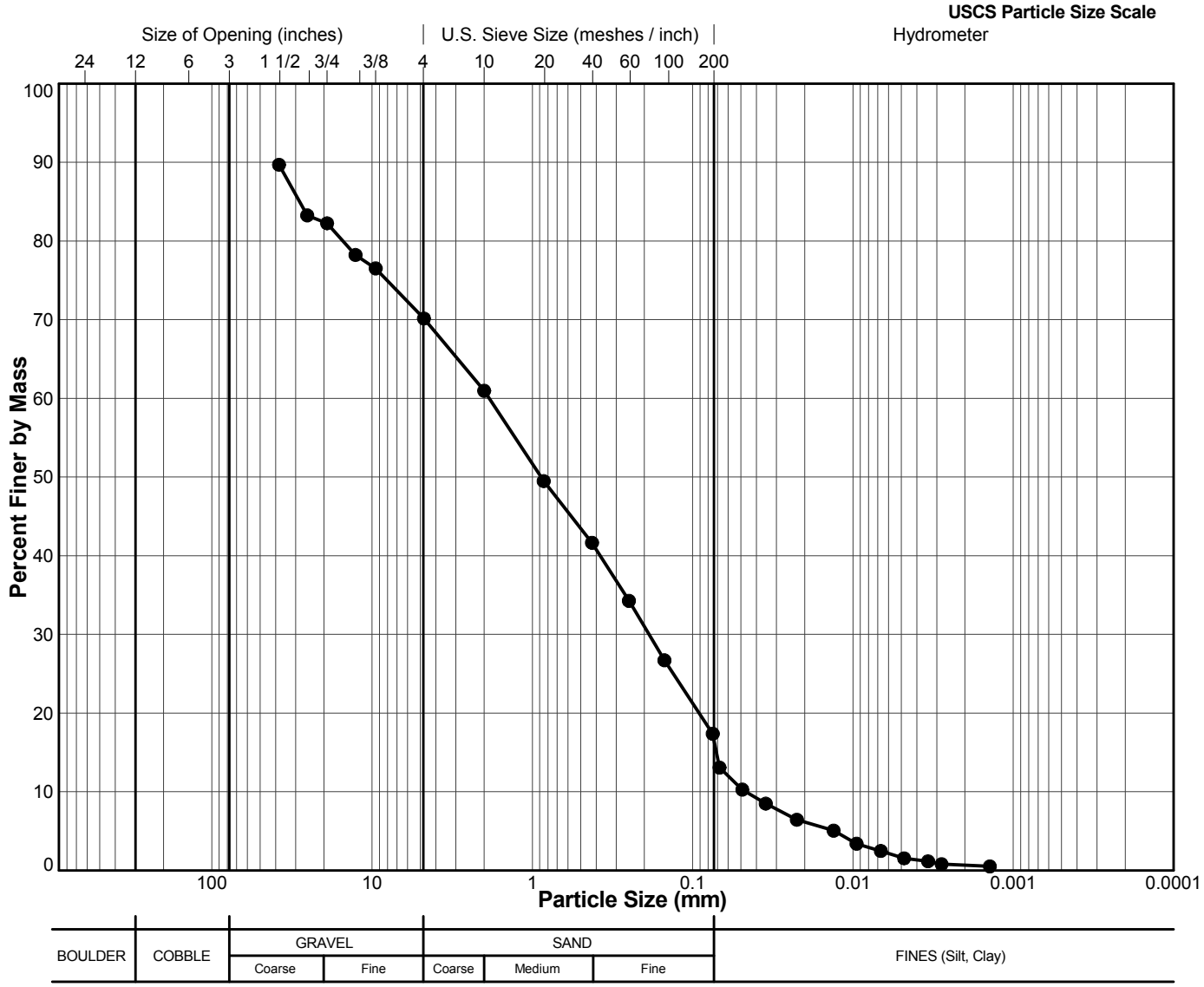
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-64**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.50 to 1.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm):	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



SK	**01/11/2011**	**LP**	**03/11/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

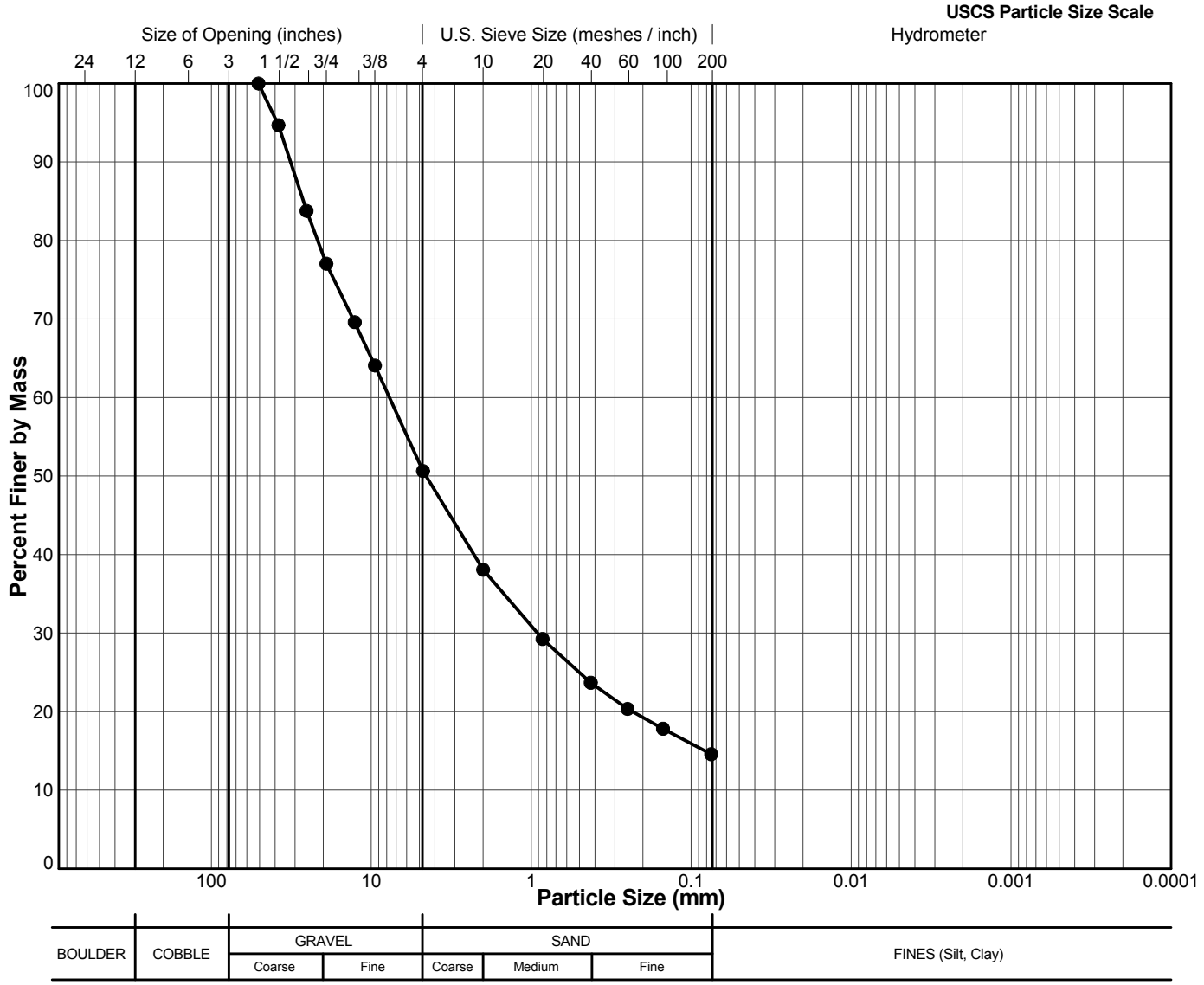
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-65**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



RS	07/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

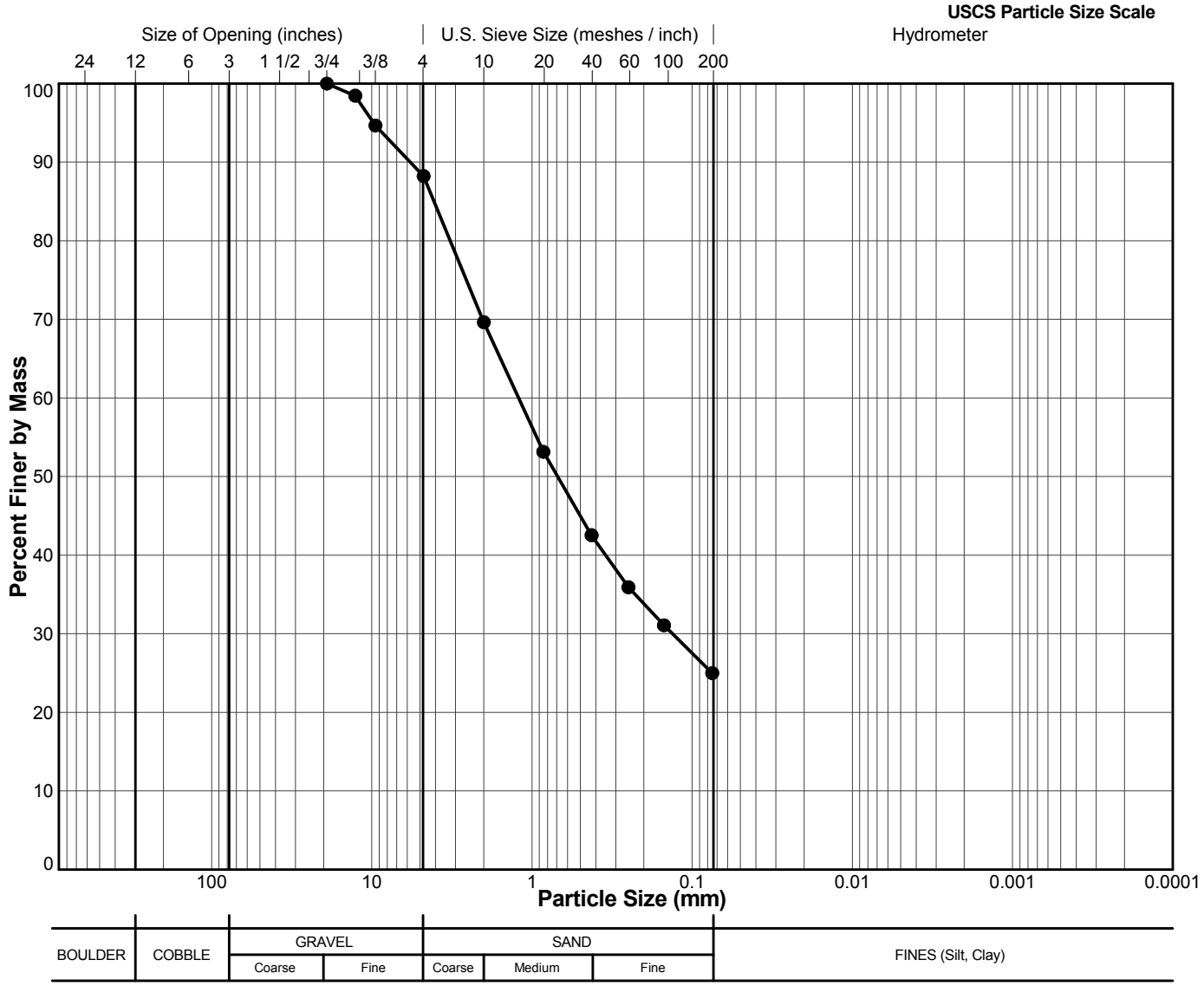
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-66**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.30
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	

Method: Split, Washed



RS	14/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

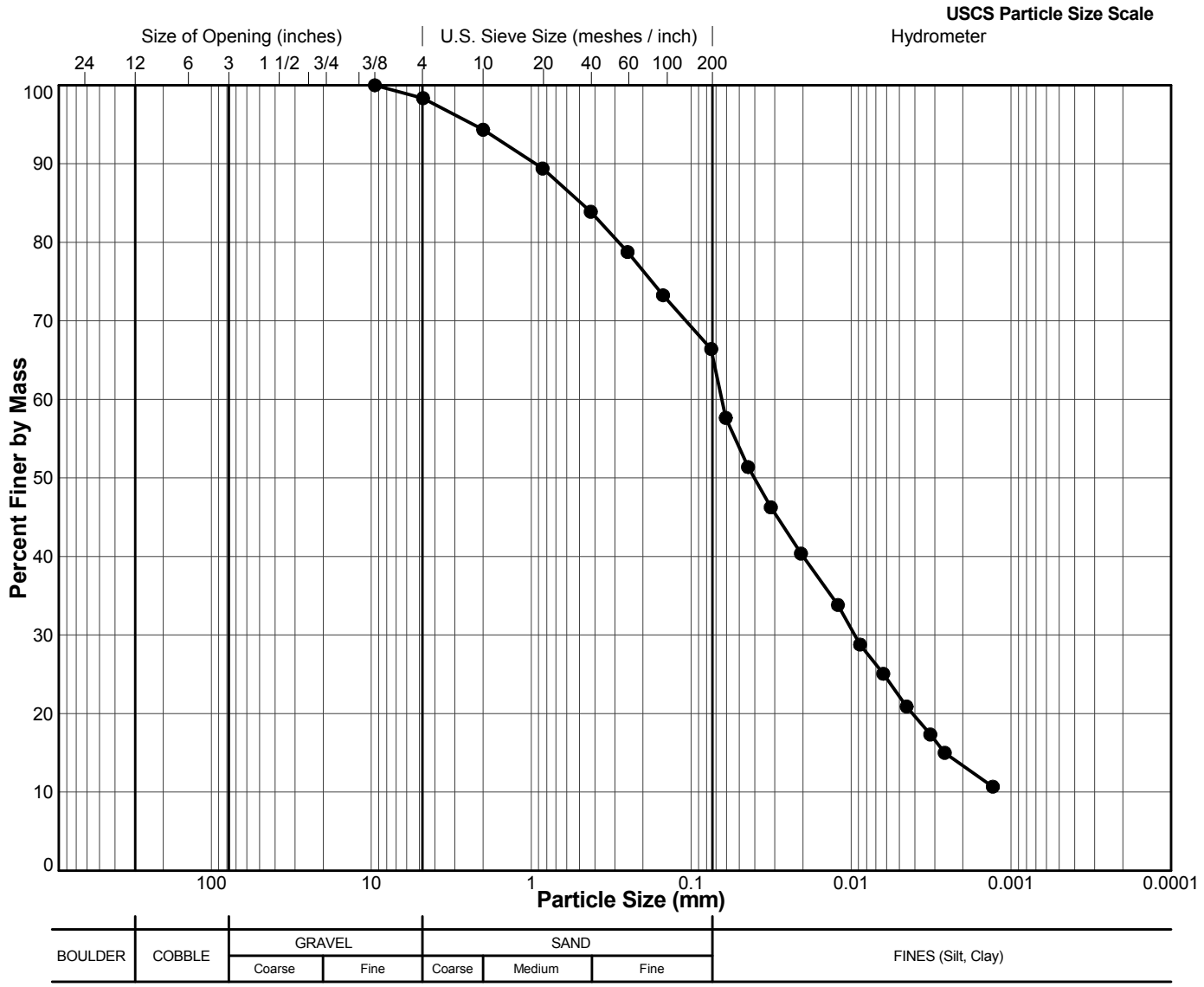
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-66**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.80 to 1.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 9.5	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



RS	26/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

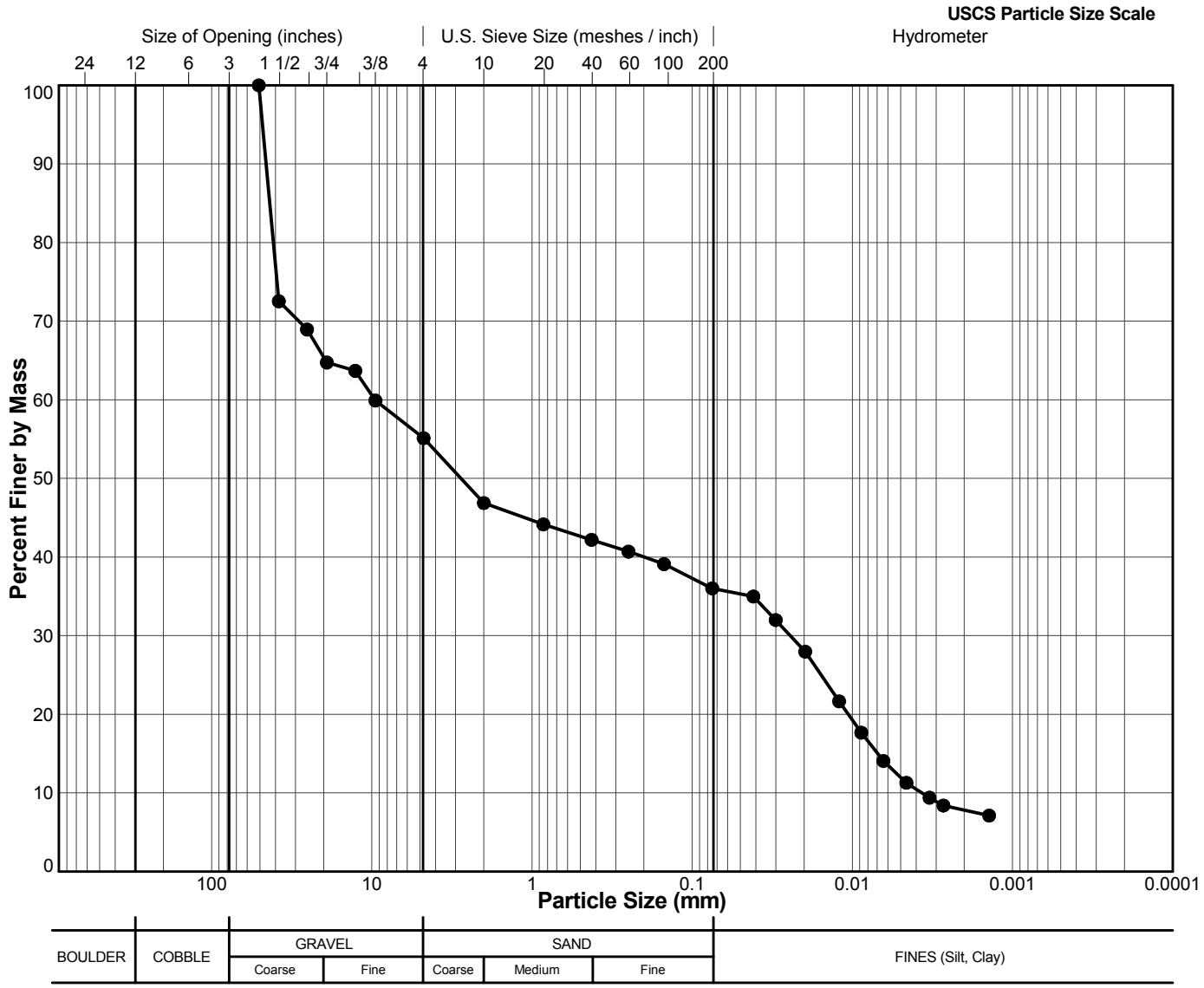
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-67**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 0.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

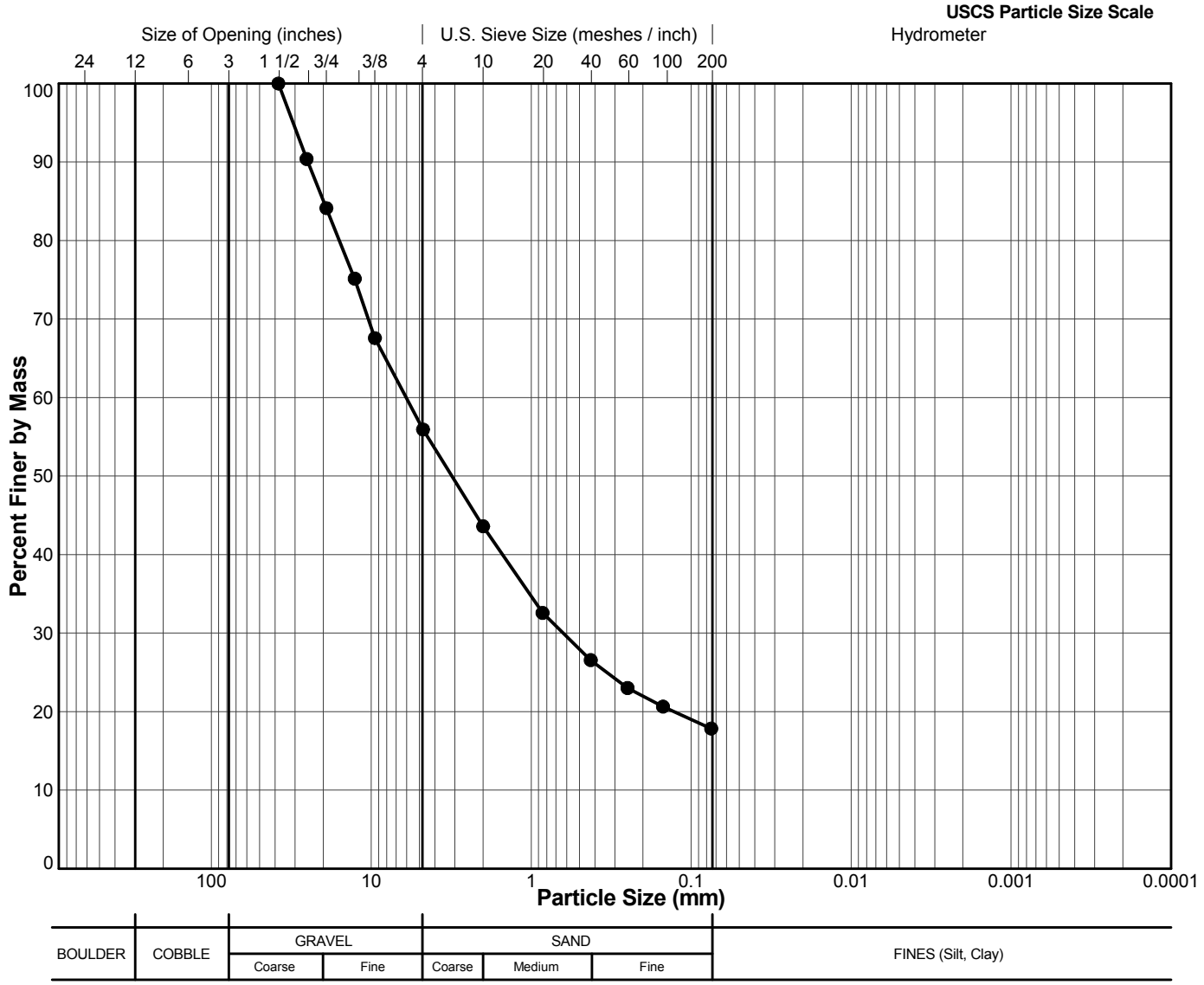
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-68**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.60 to 1.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 38.1	

Method: Split, Washed



SK	**26/09/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

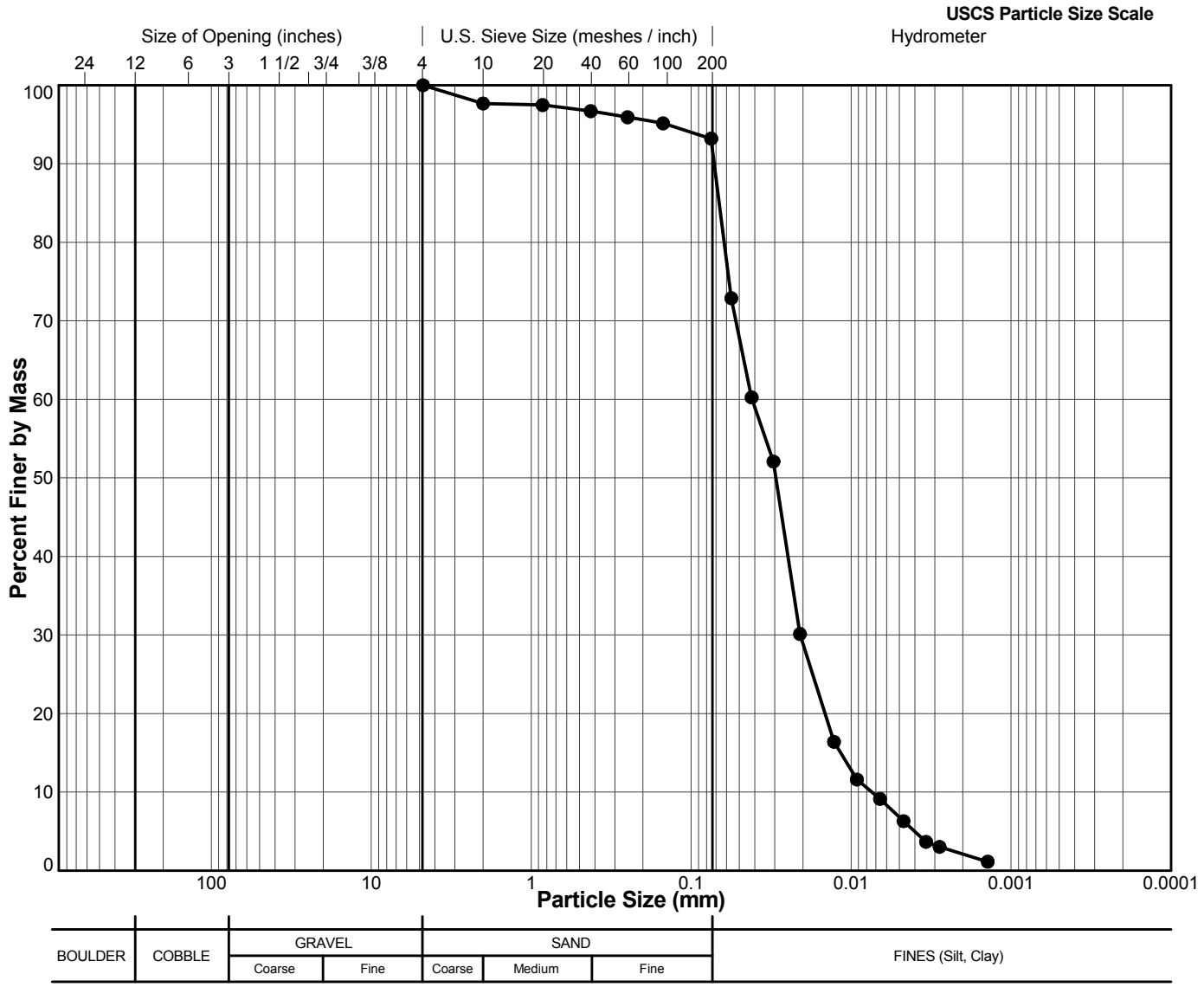
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-69**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.50 to 1.70
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 4.75	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



RS	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

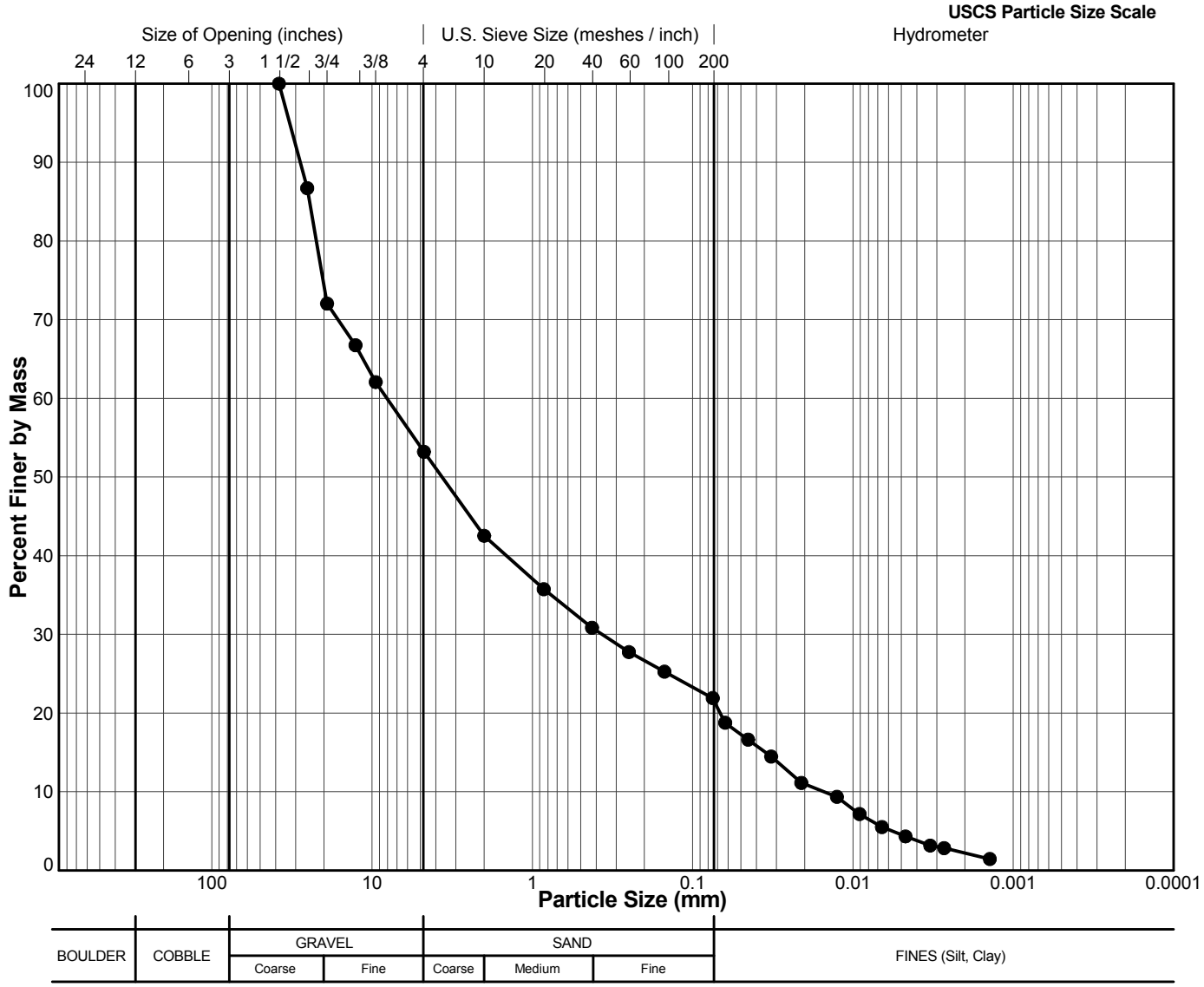
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-69**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.80 to 2.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 38.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



RS	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

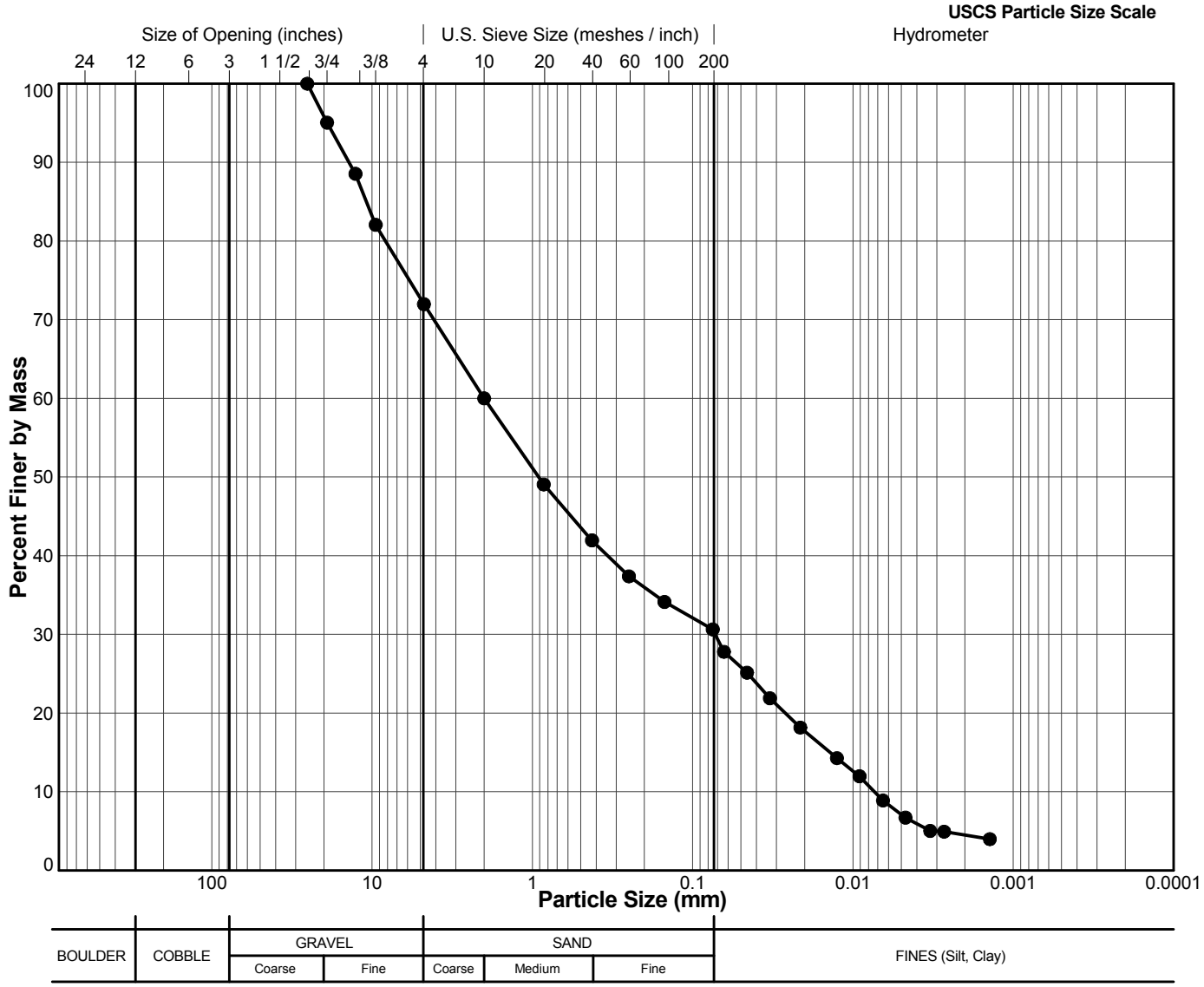
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-71**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 25.4	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**
Hydrometer ID: BURNABY - 541360	



RS	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

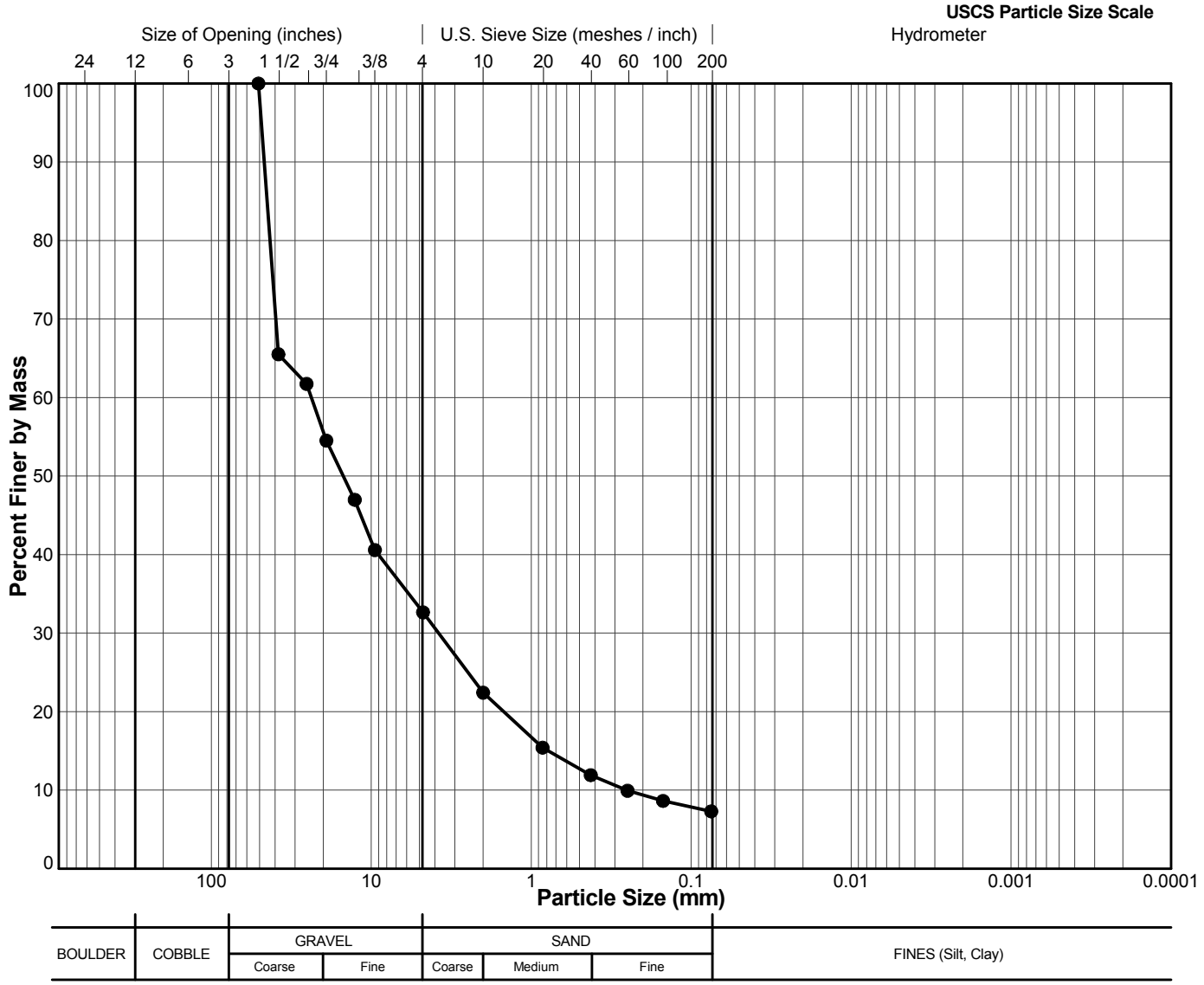
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-72**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.40 to 2.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



RS	21/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

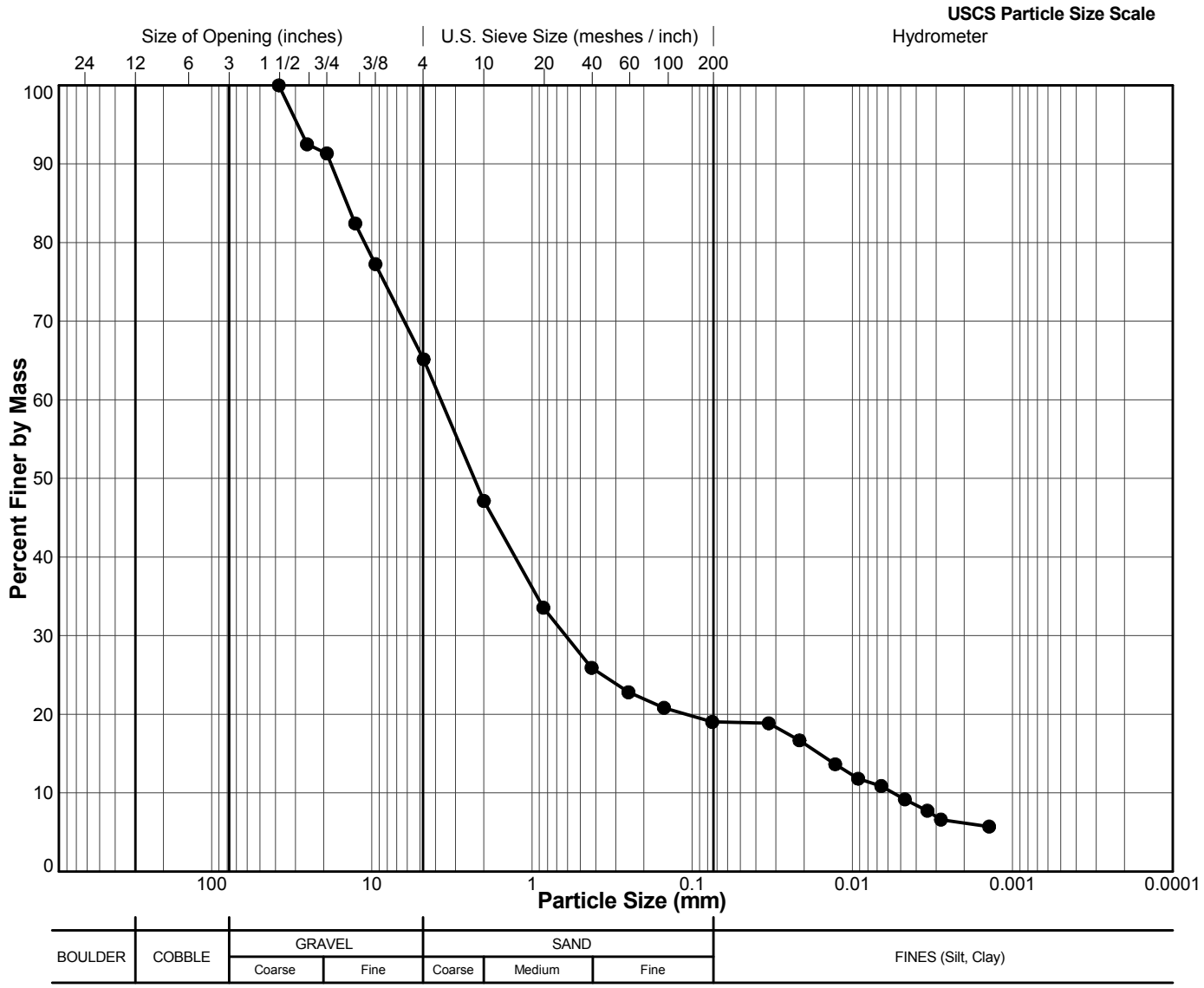
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-72**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 38.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	21/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

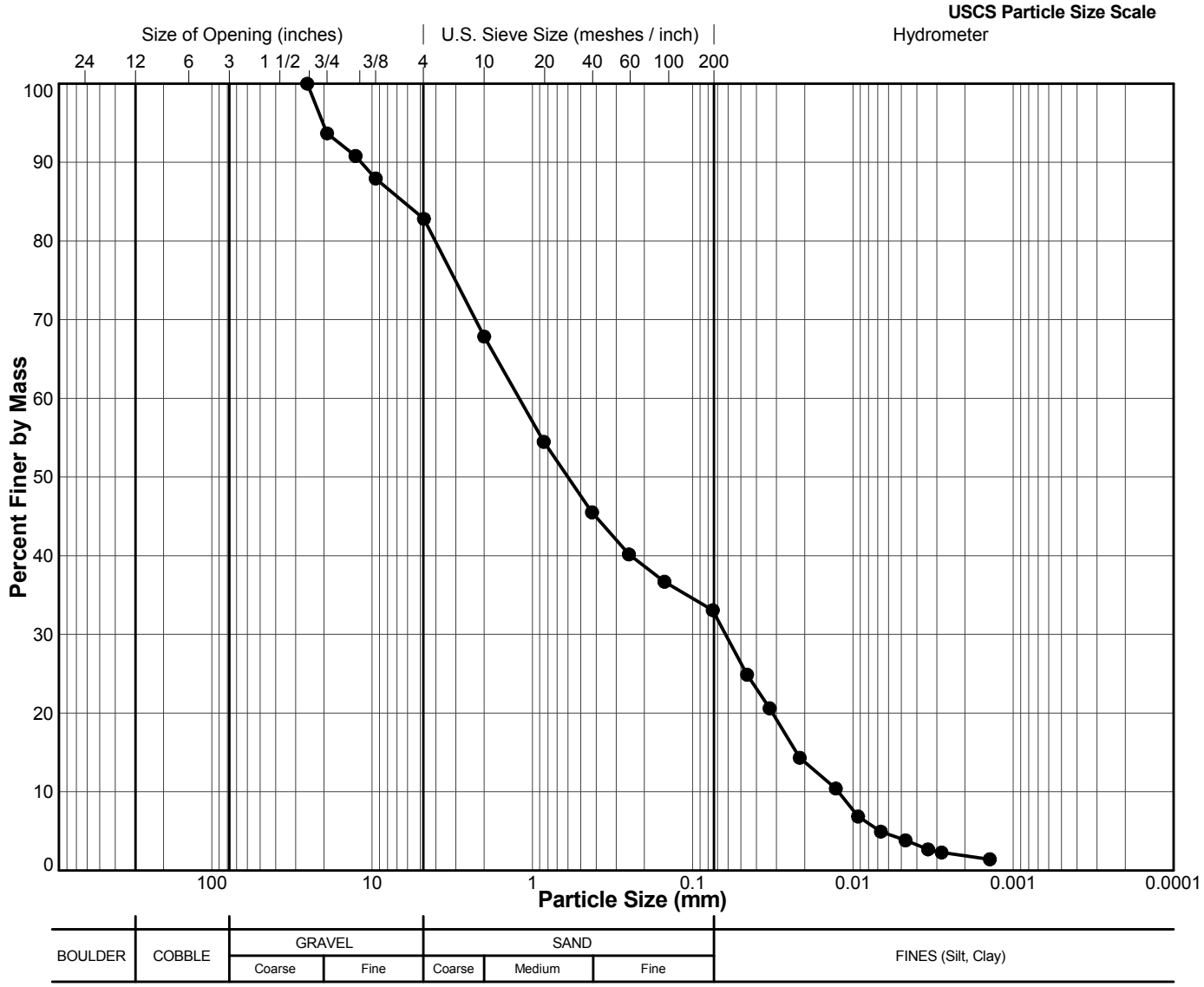
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-73**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 25.4	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



RS	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

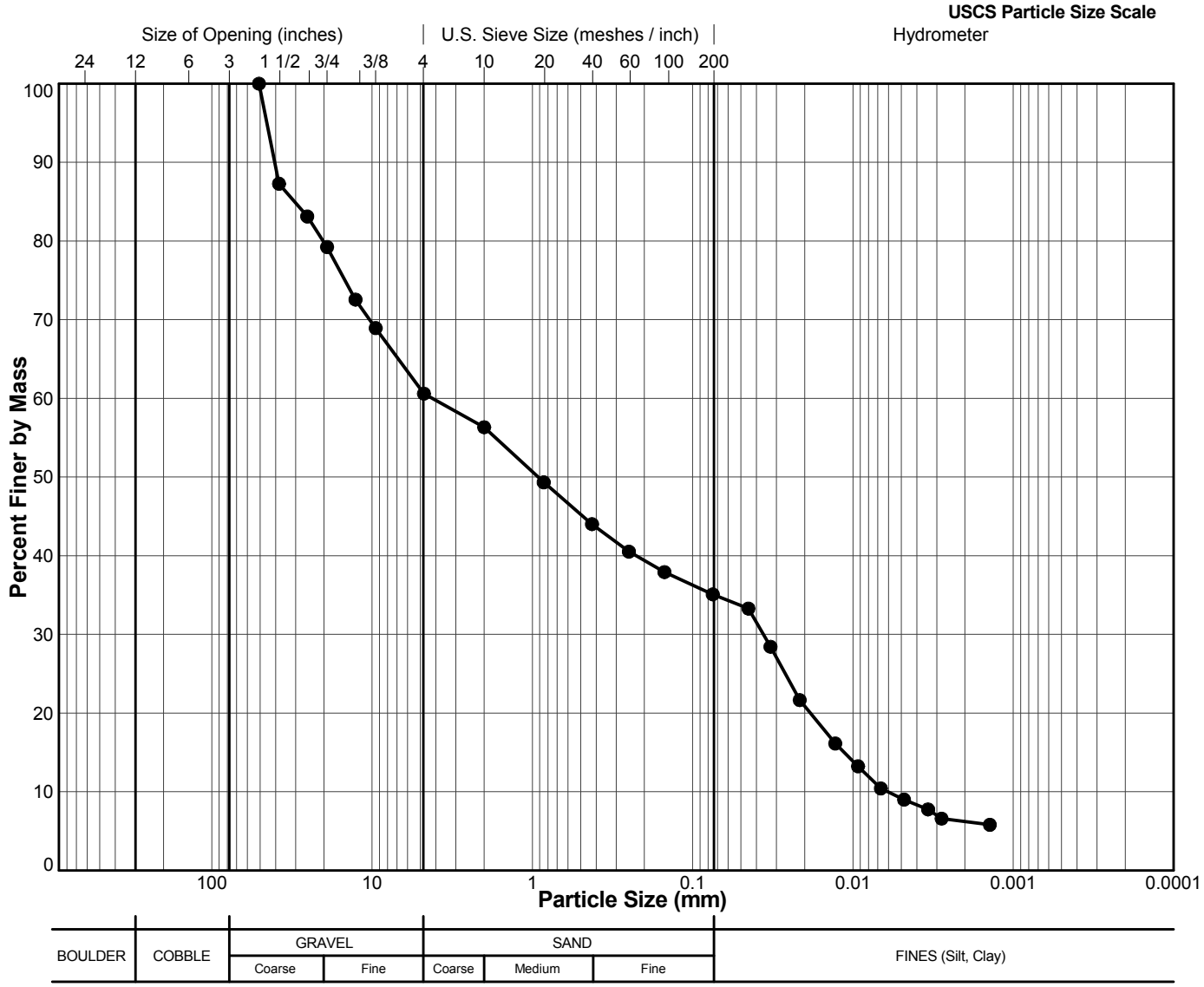
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-74**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.20 to 1.40
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



SK	**21/09/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

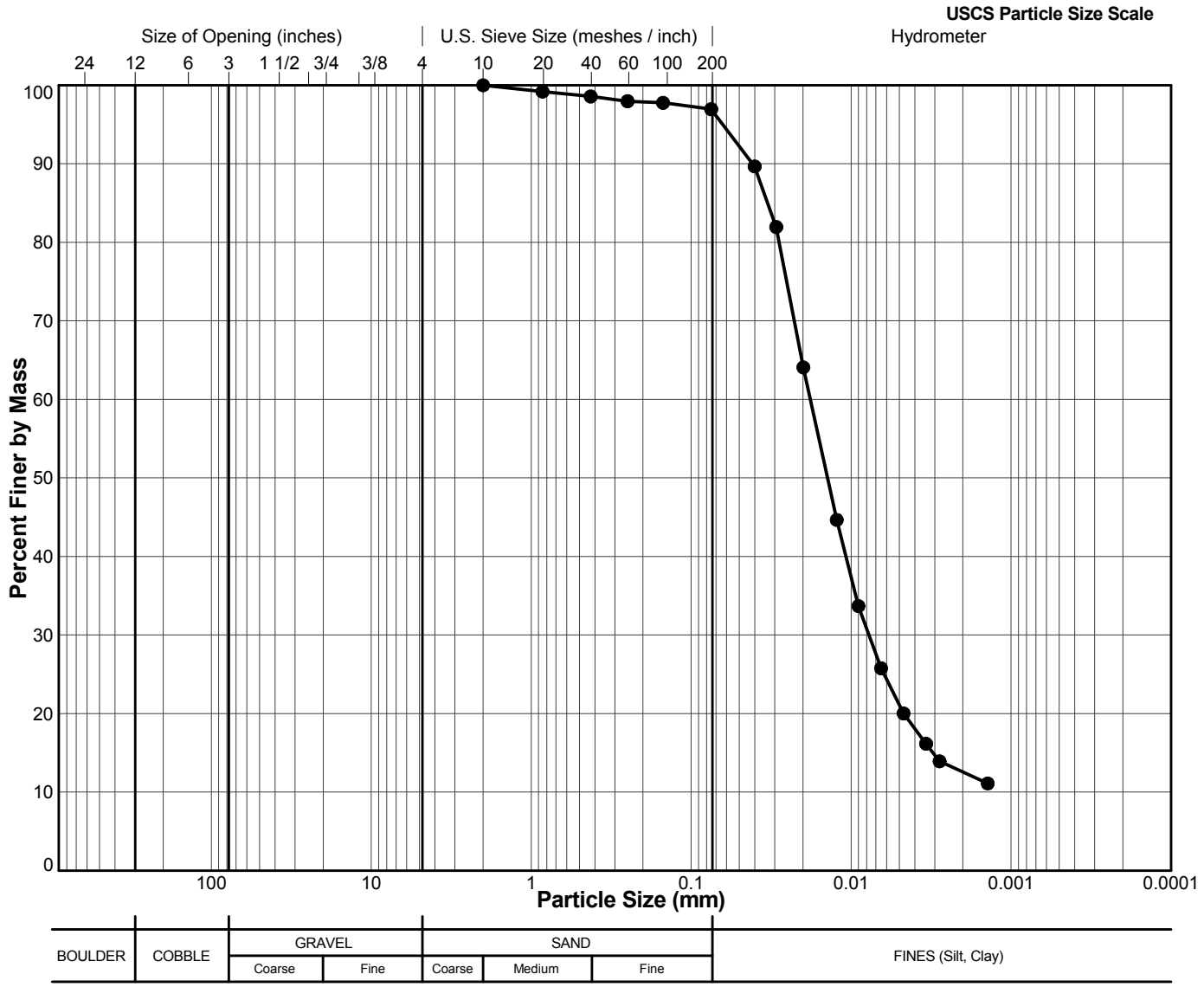
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-74**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.00 to 3.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 2	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



SK	**21/09/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

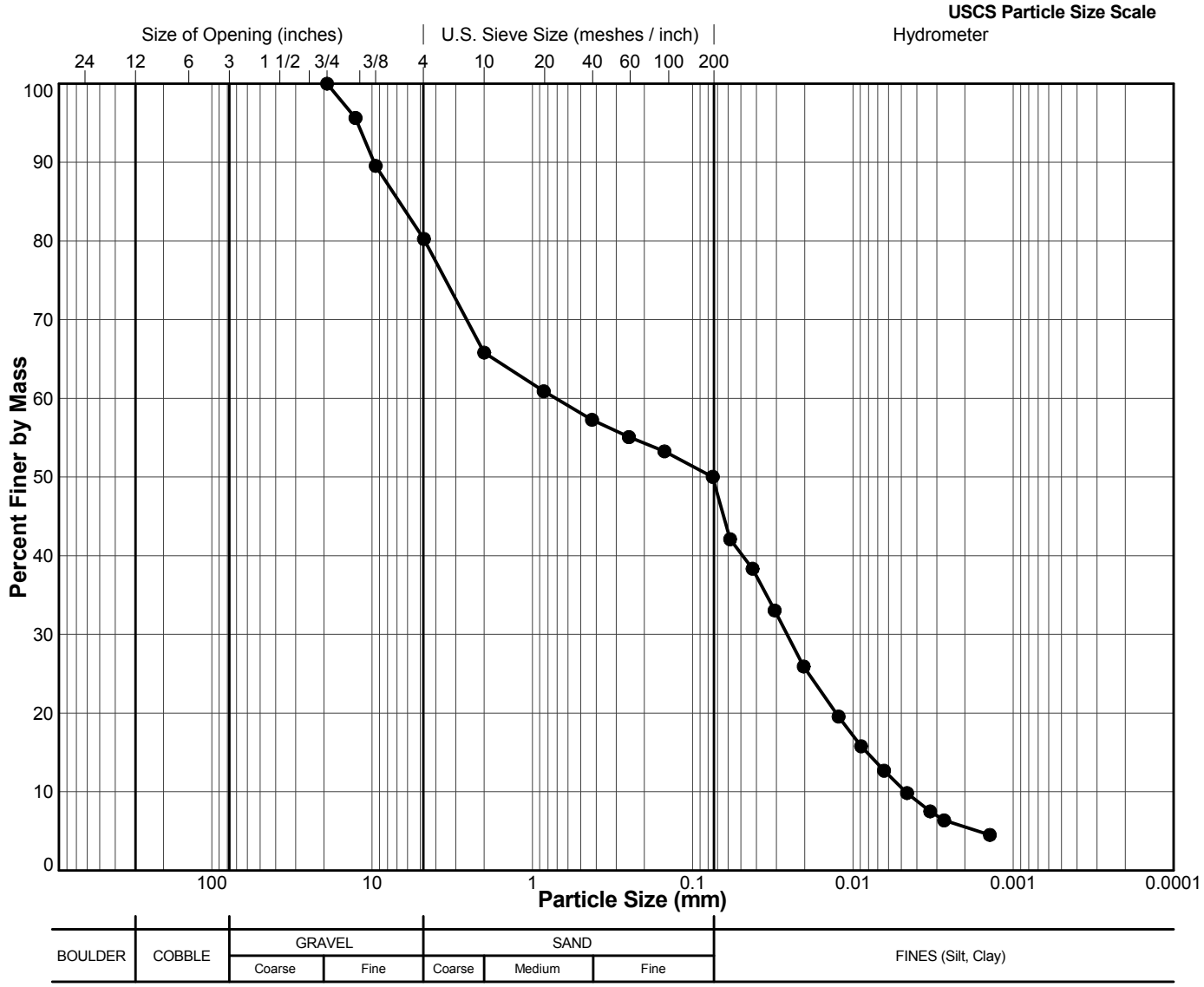
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-74**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 3**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 4.50 to 4.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



RS	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

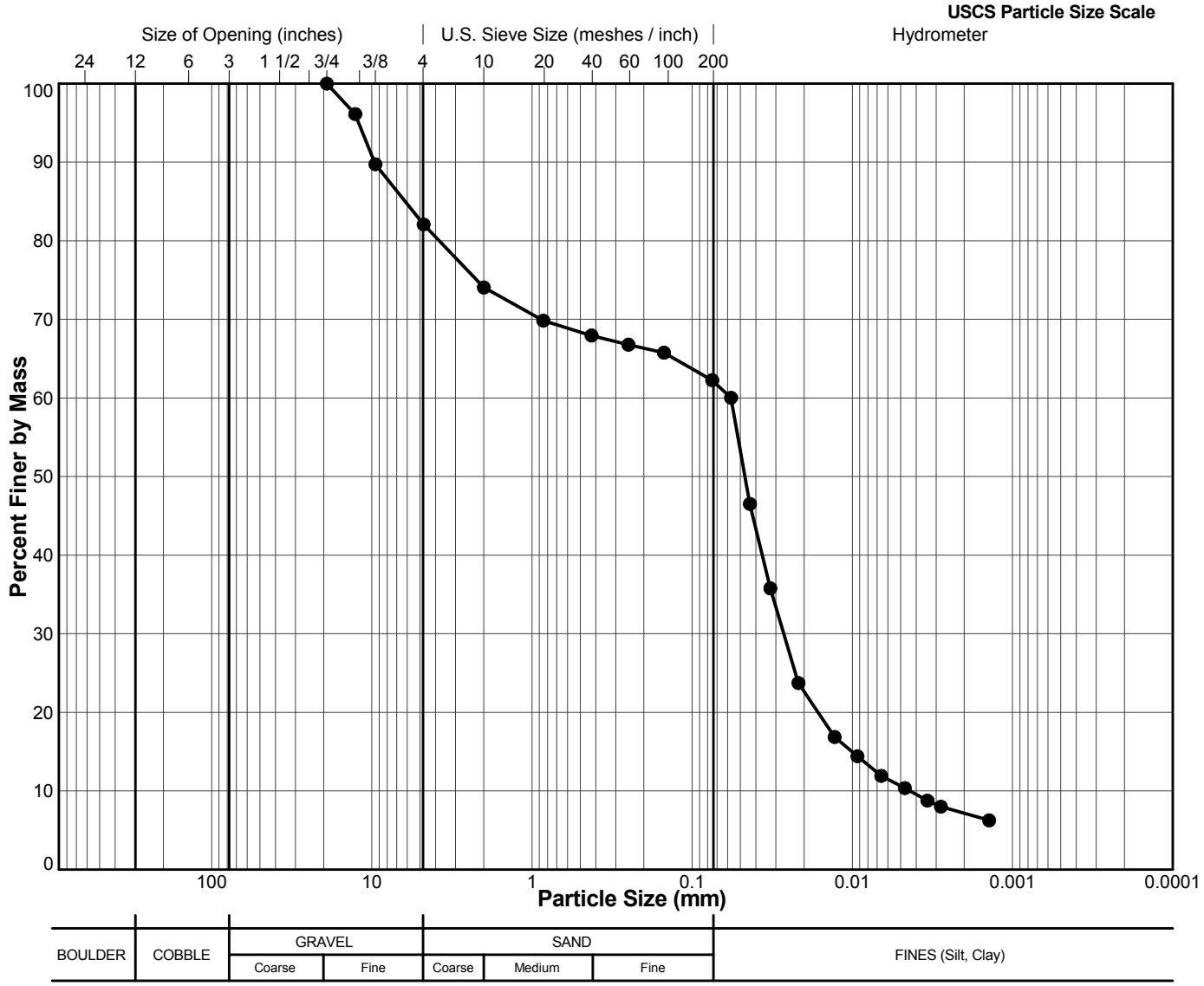
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-76**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	20/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

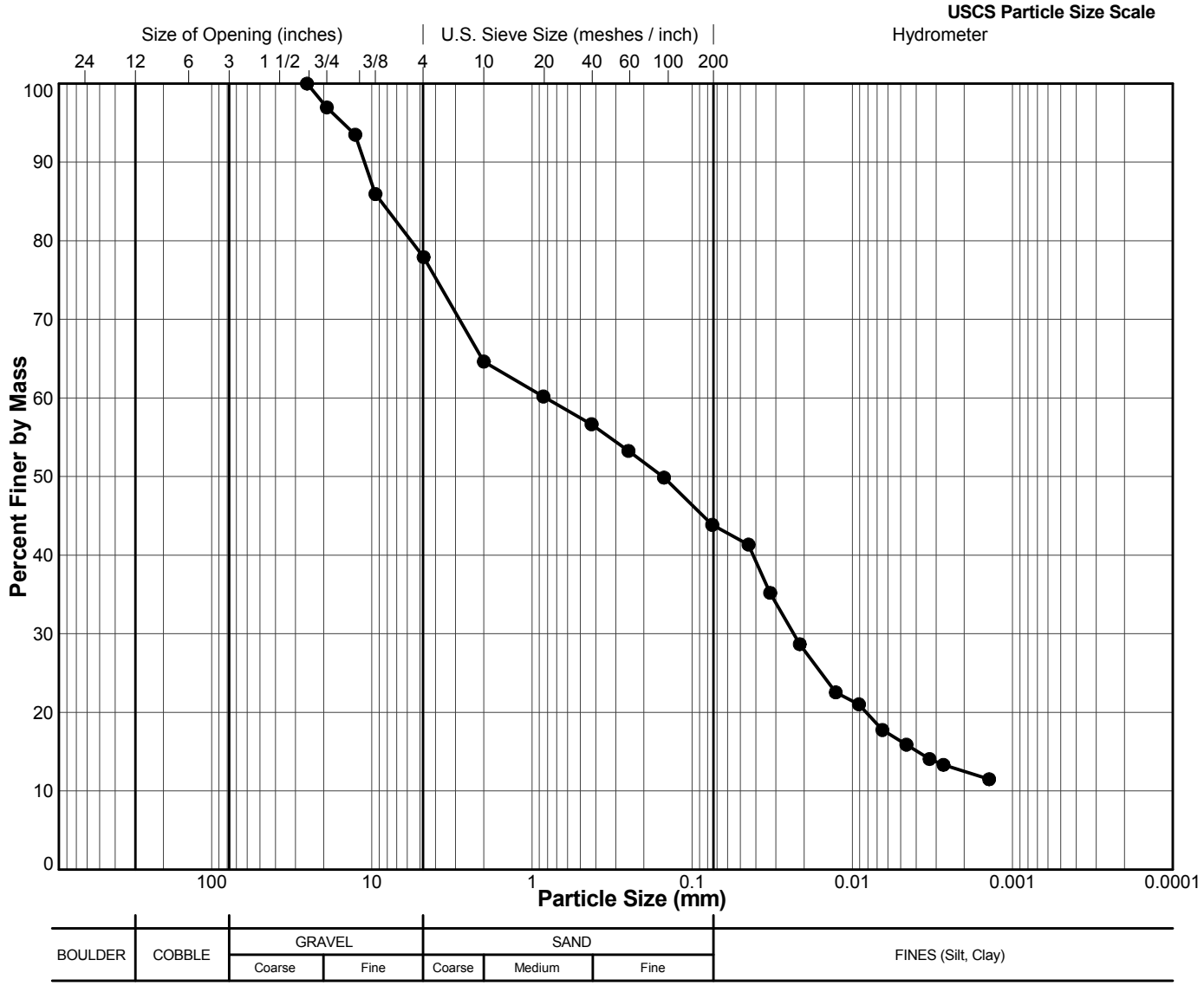
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-77**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 25.4	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**
Hydrometer ID: BURNABY - 87024	



RS	03/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

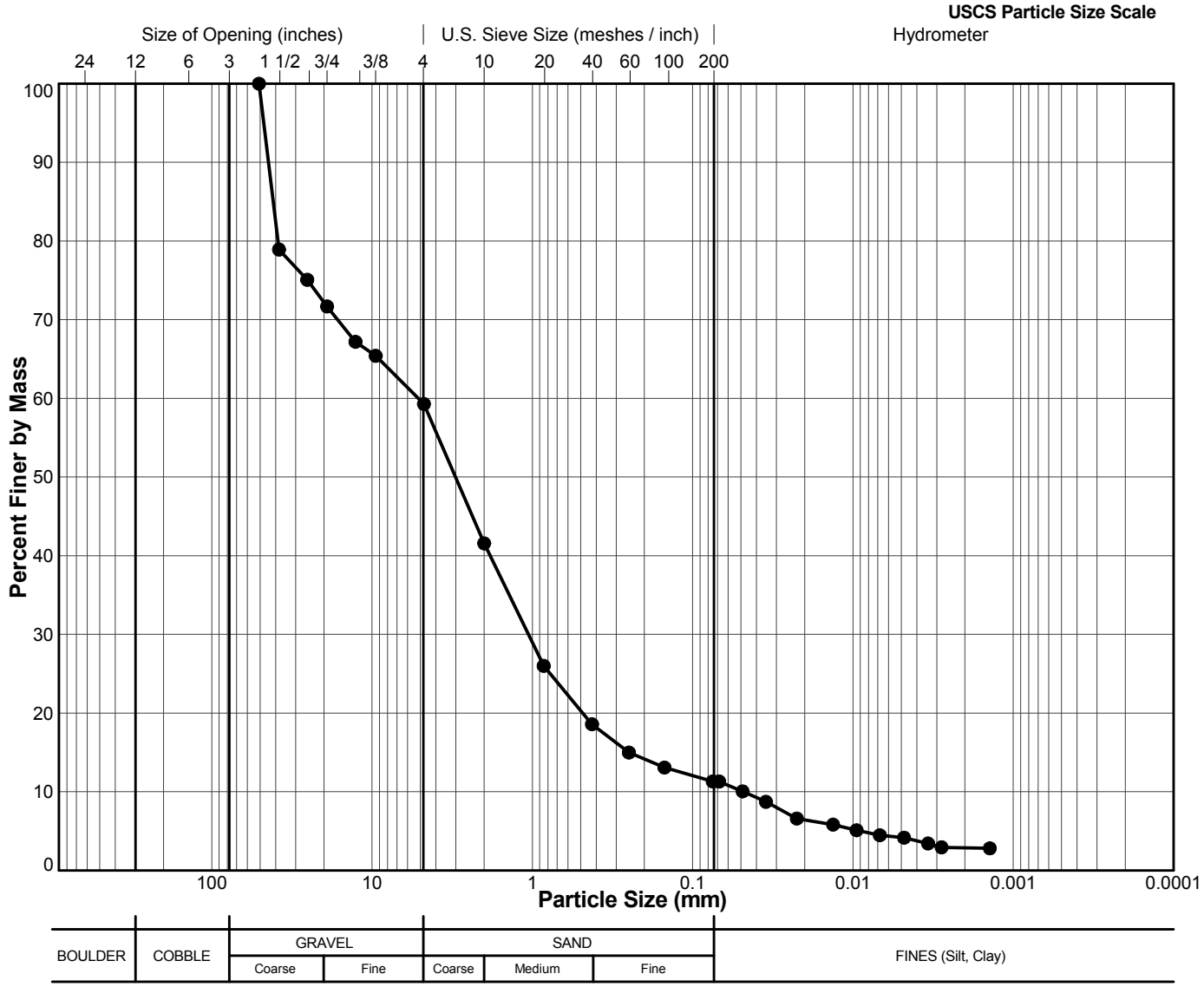
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-79**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

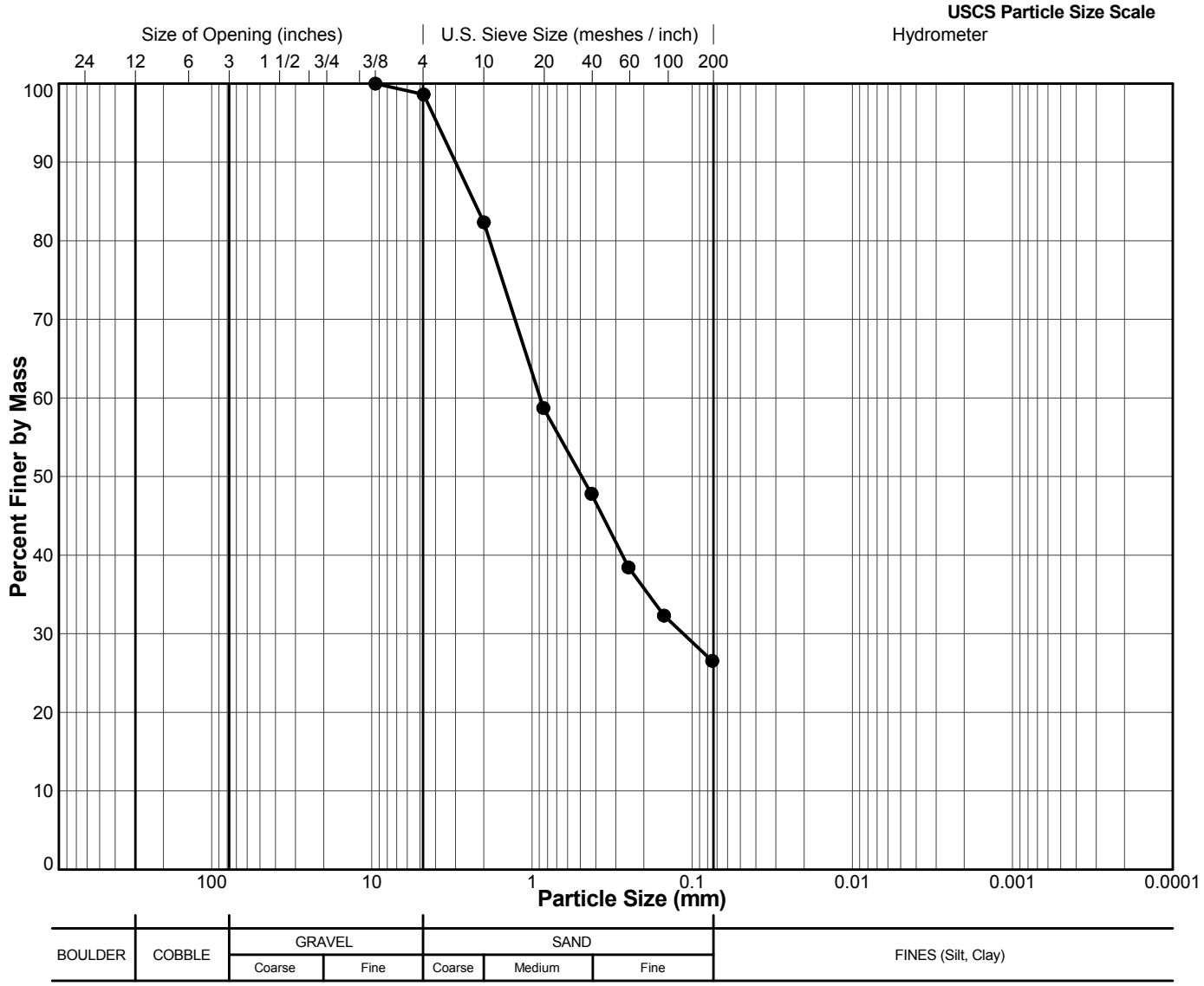
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-79**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.20 to 1.30
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 9.5	

Method: Split, Washed



RS	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

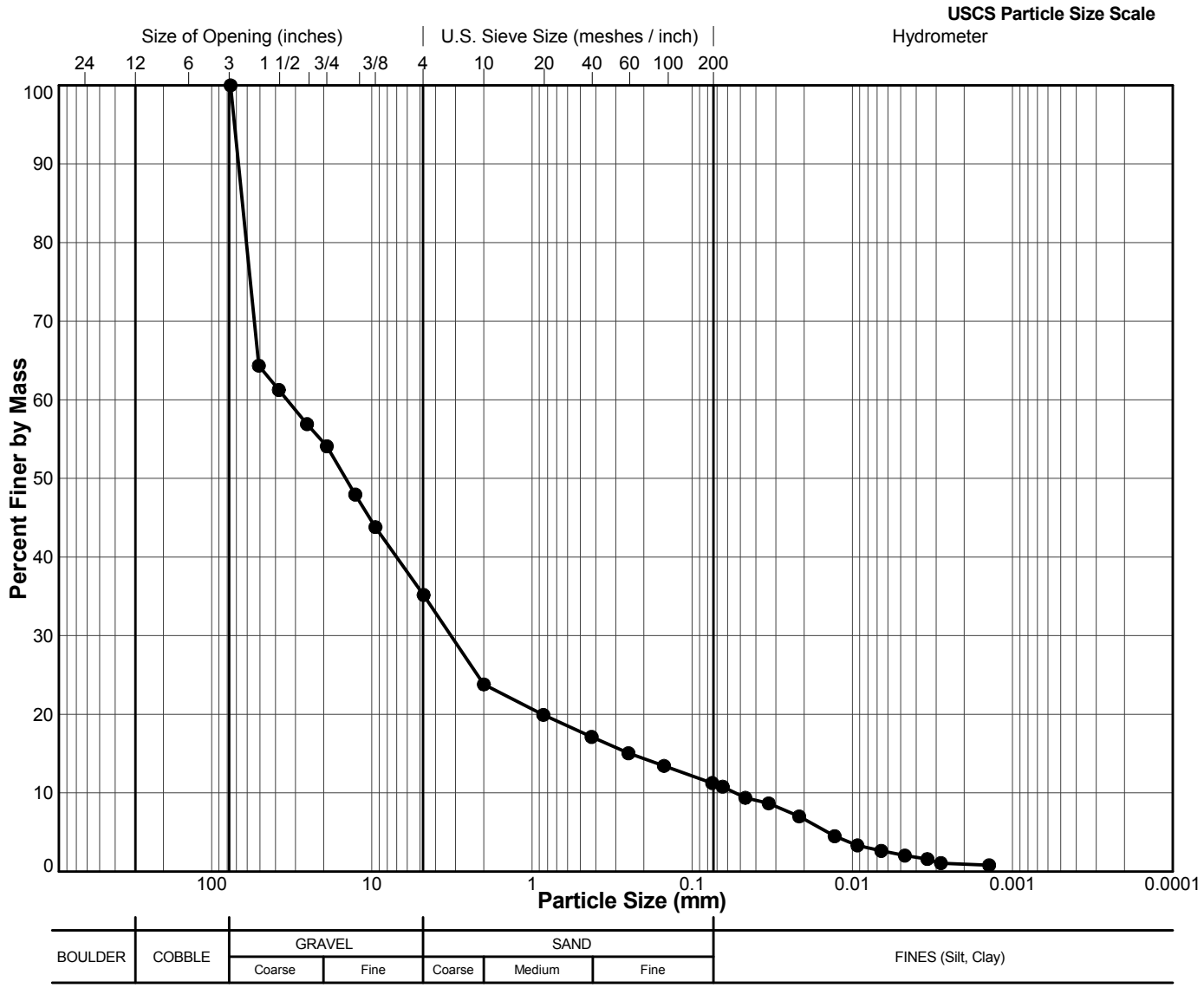
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-81**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 76.2	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



SK	**07/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

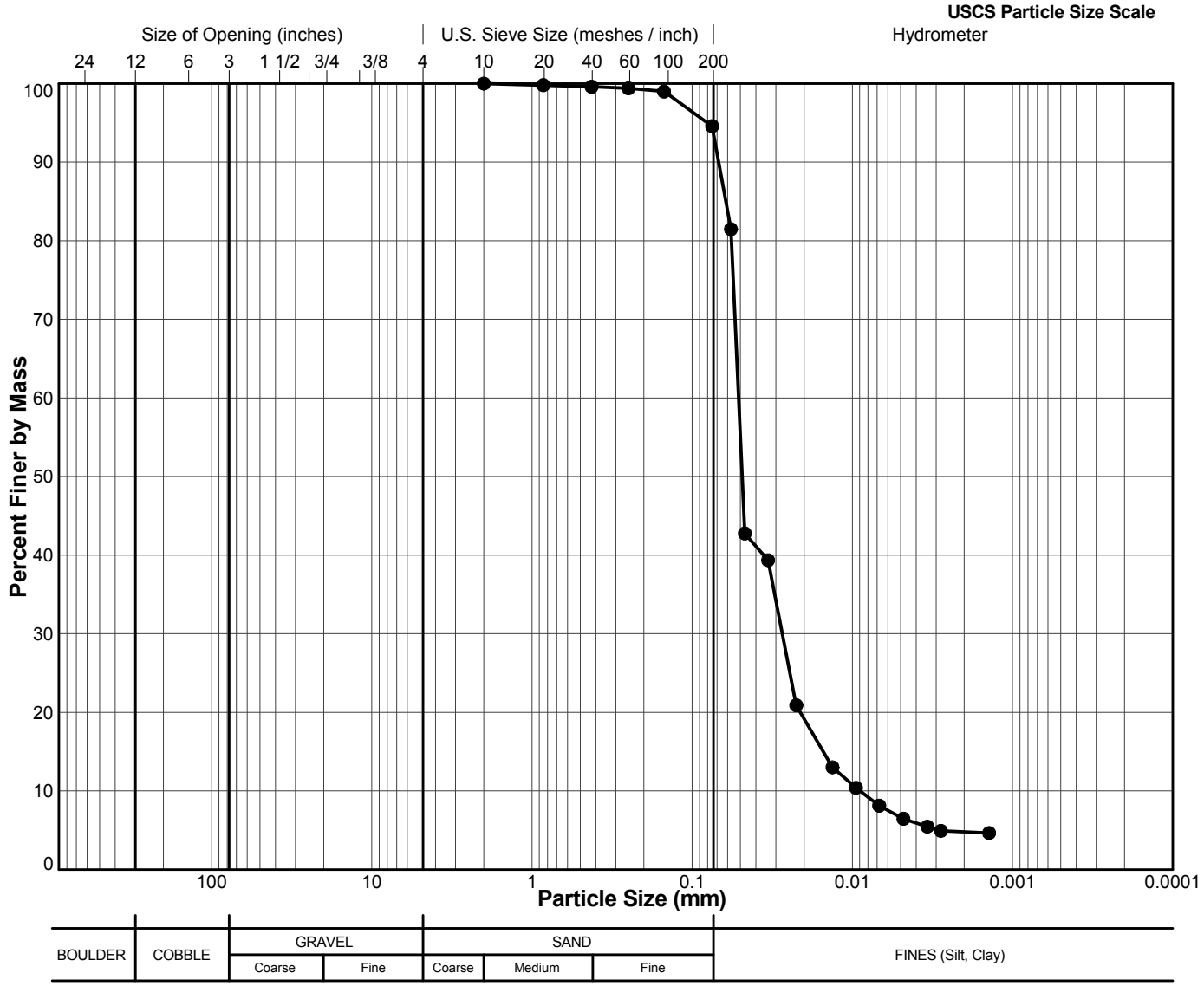
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 4.70 to 4.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 2	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024 (2006)



RS	22/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

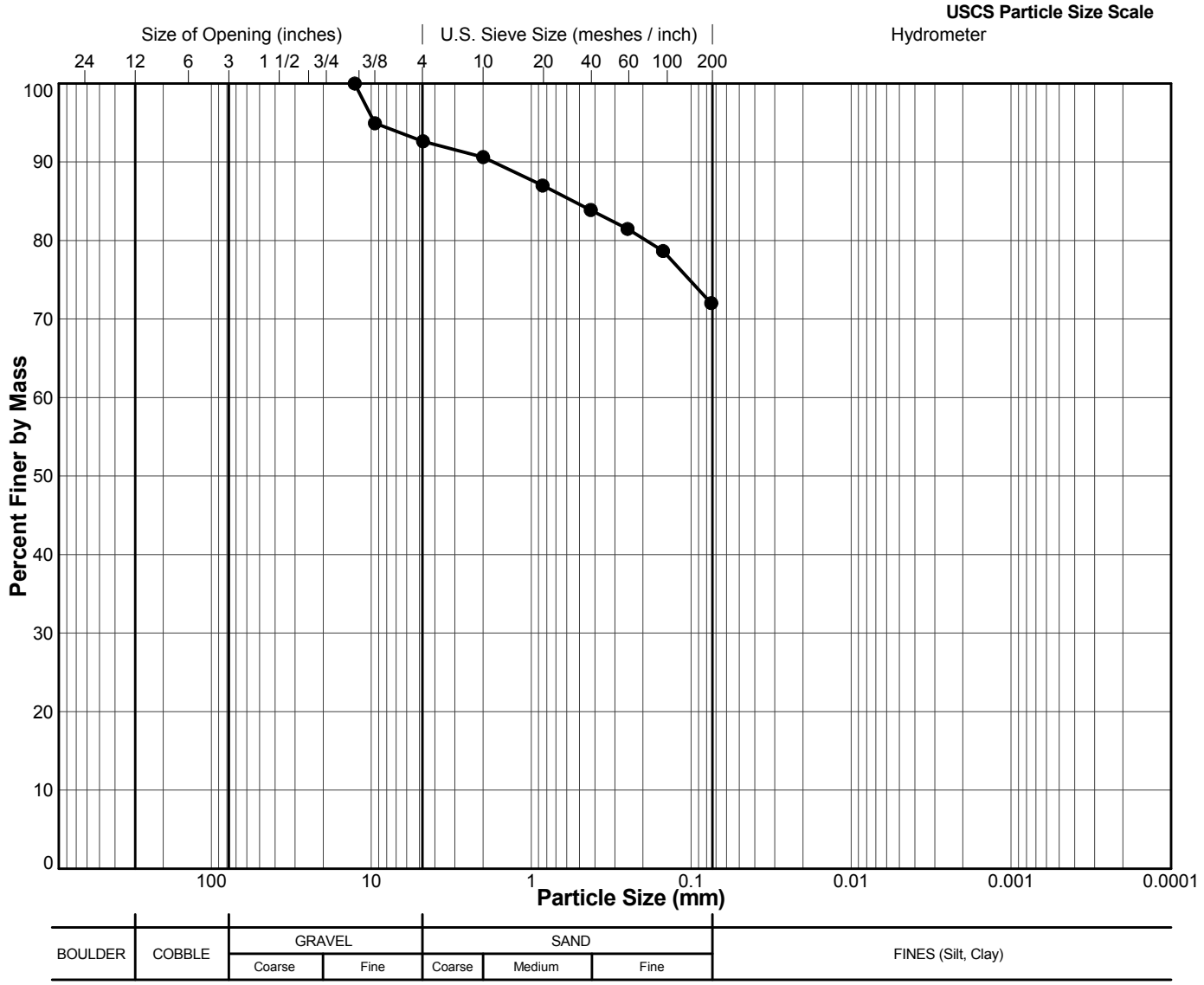
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.00 to 3.30
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 12.7	

Method: Split, Washed



RS	22/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

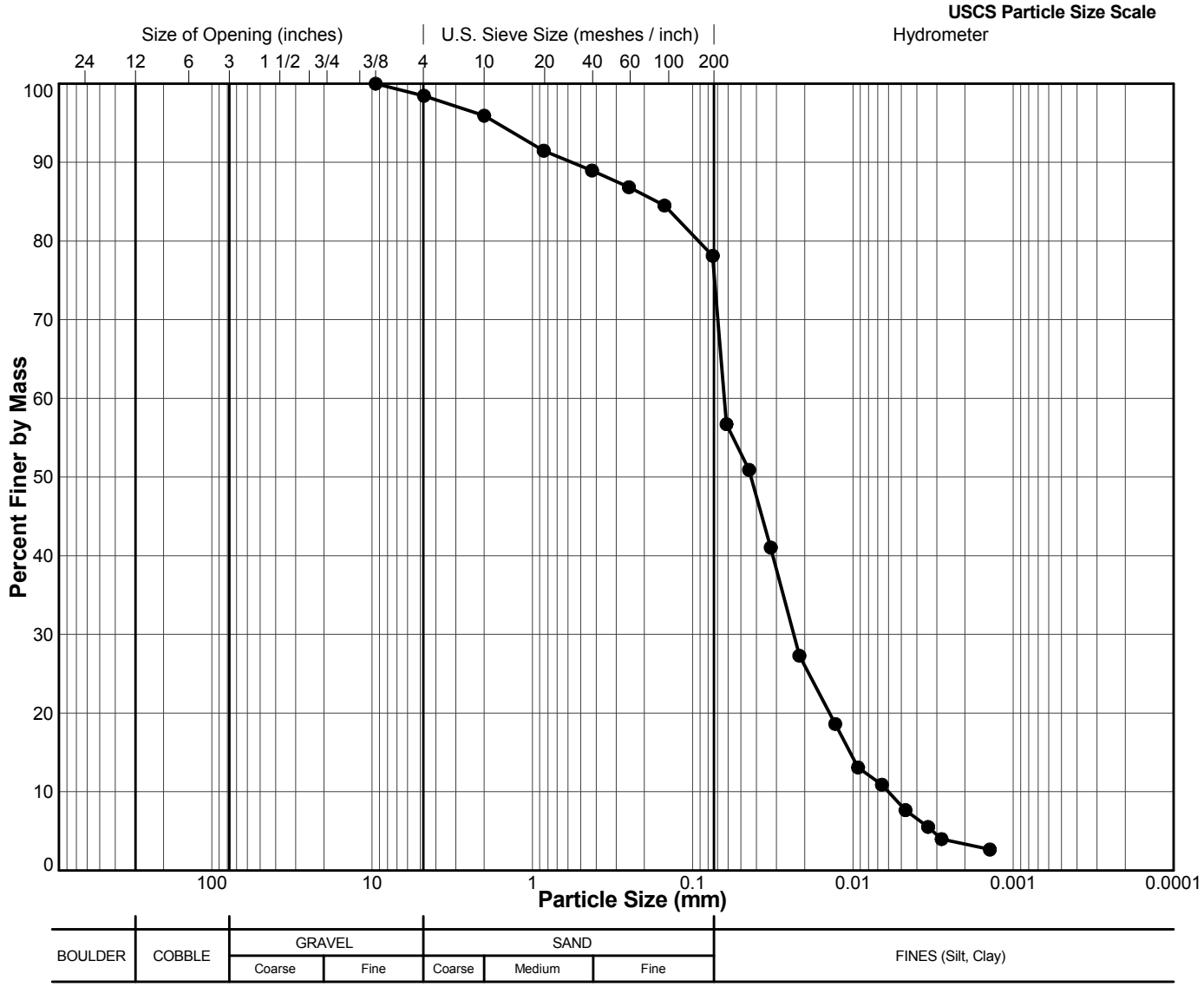
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M3**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 6.70 to 7.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 9.5	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



RS	26/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

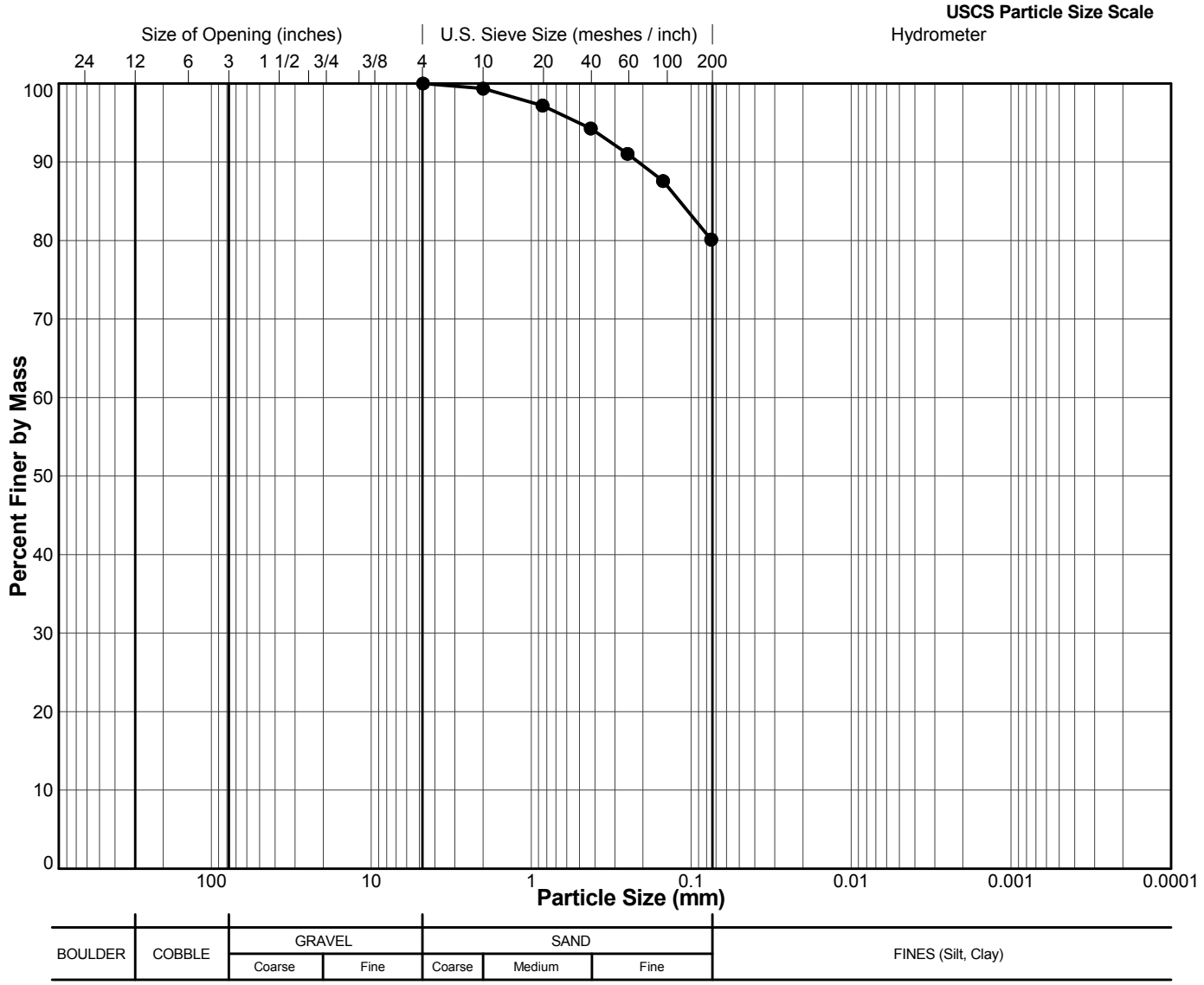
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M4**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 1.10
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 4.75	

Method: Split, Washed



RS	22/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

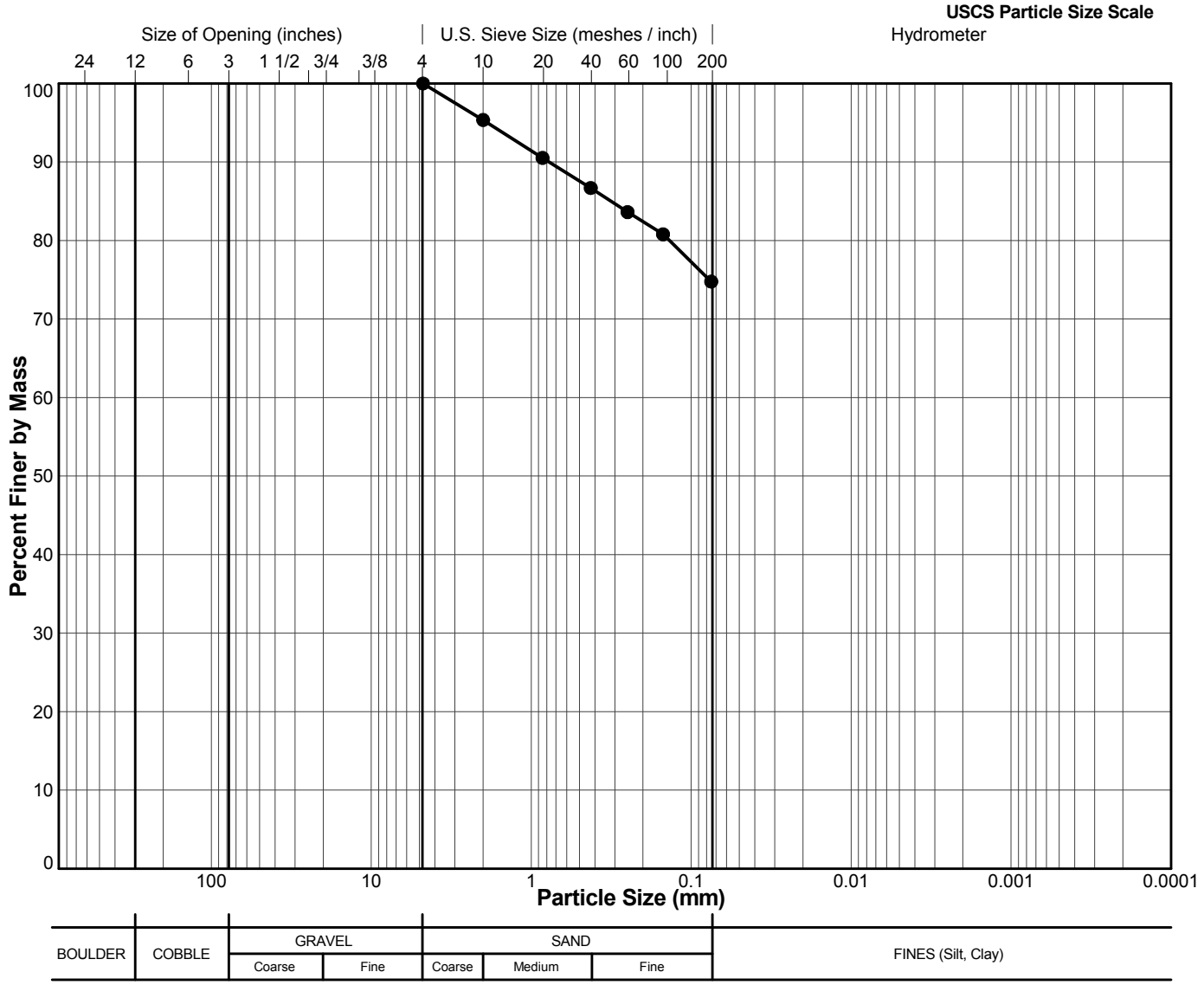
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M5**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.90 to 2.10
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 4.75	

Method: Split, Washed



RS	22/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

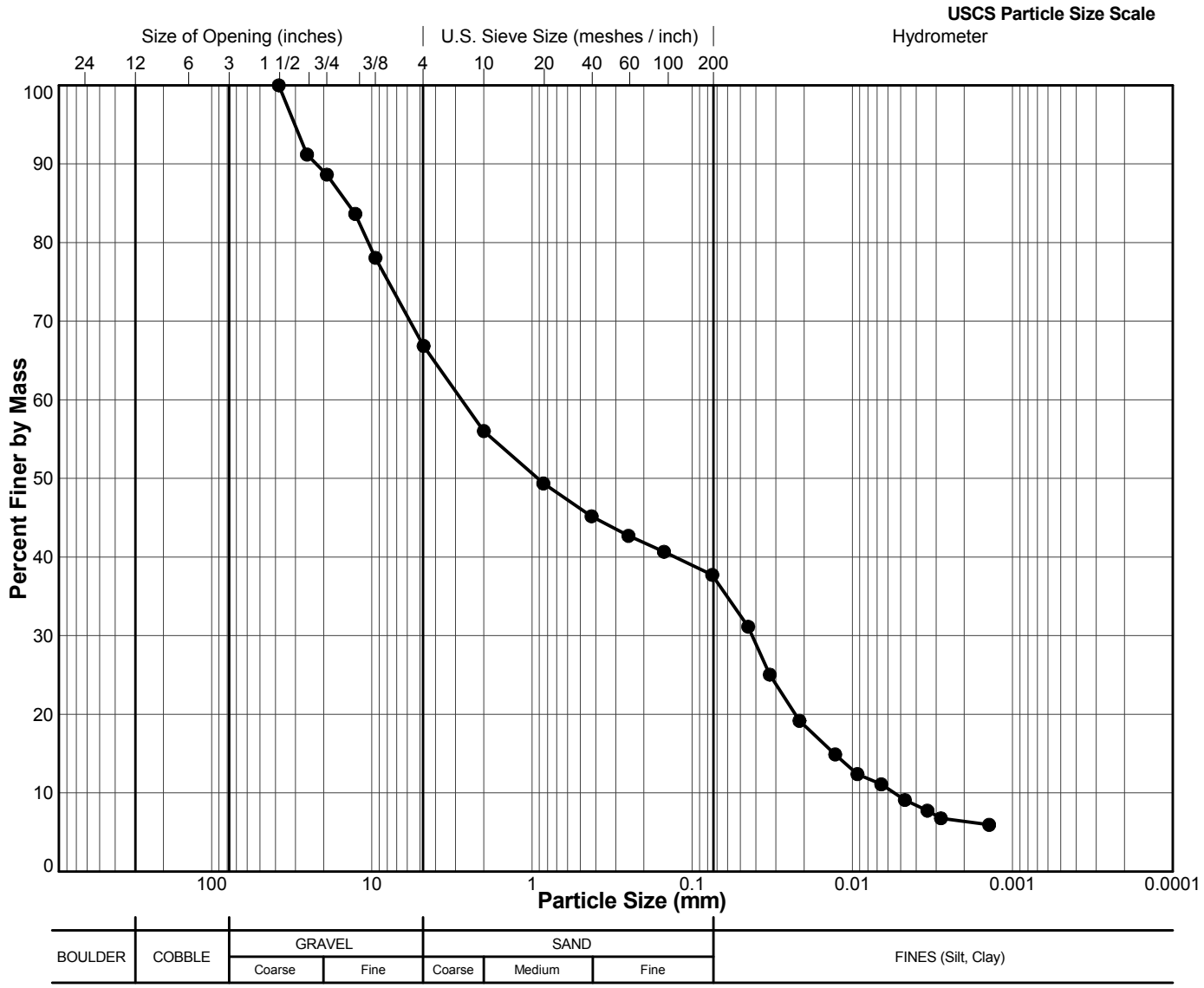
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-83**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 38.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

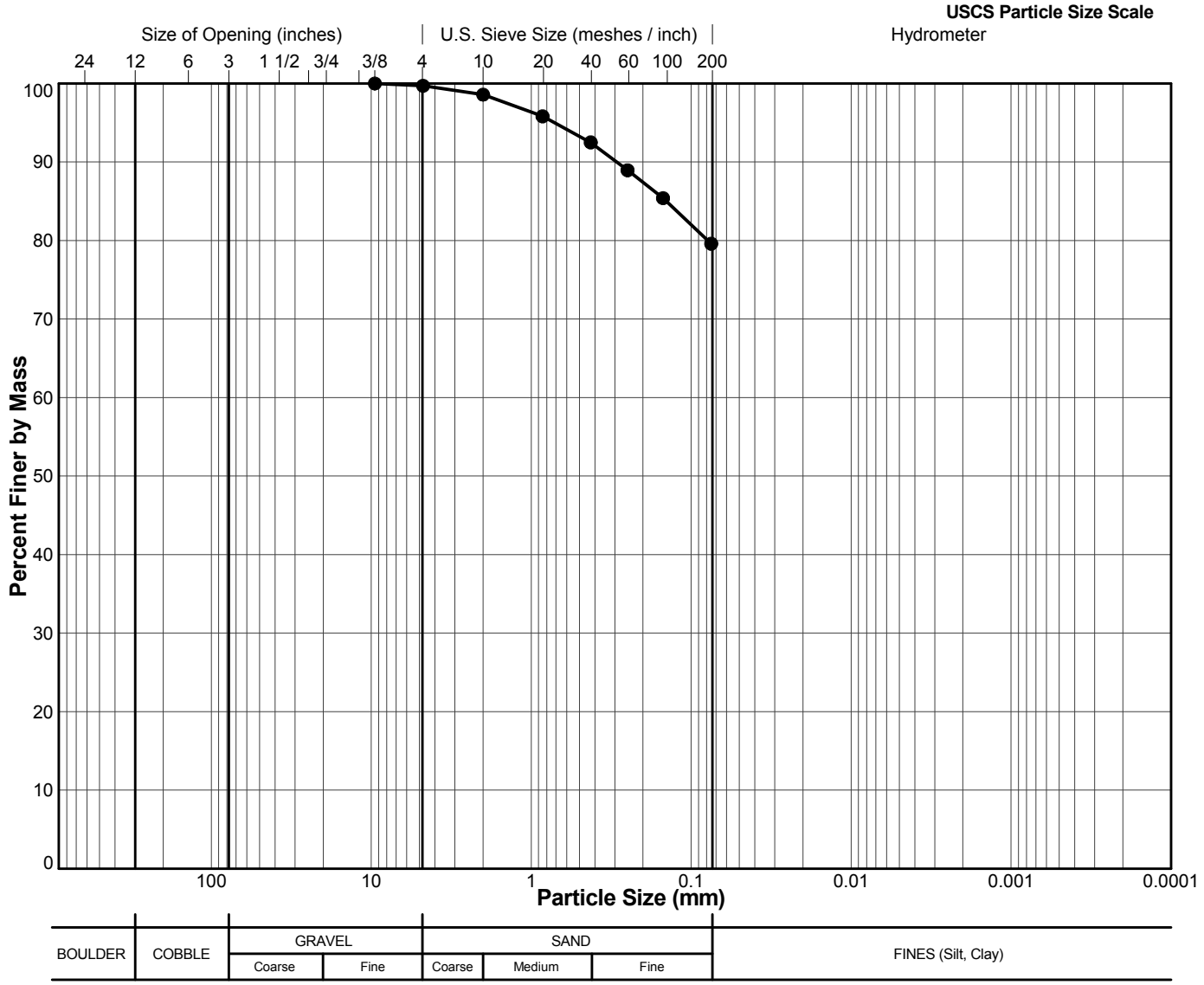
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-84**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 9.5	

Method: Split, Washed



RS	27/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

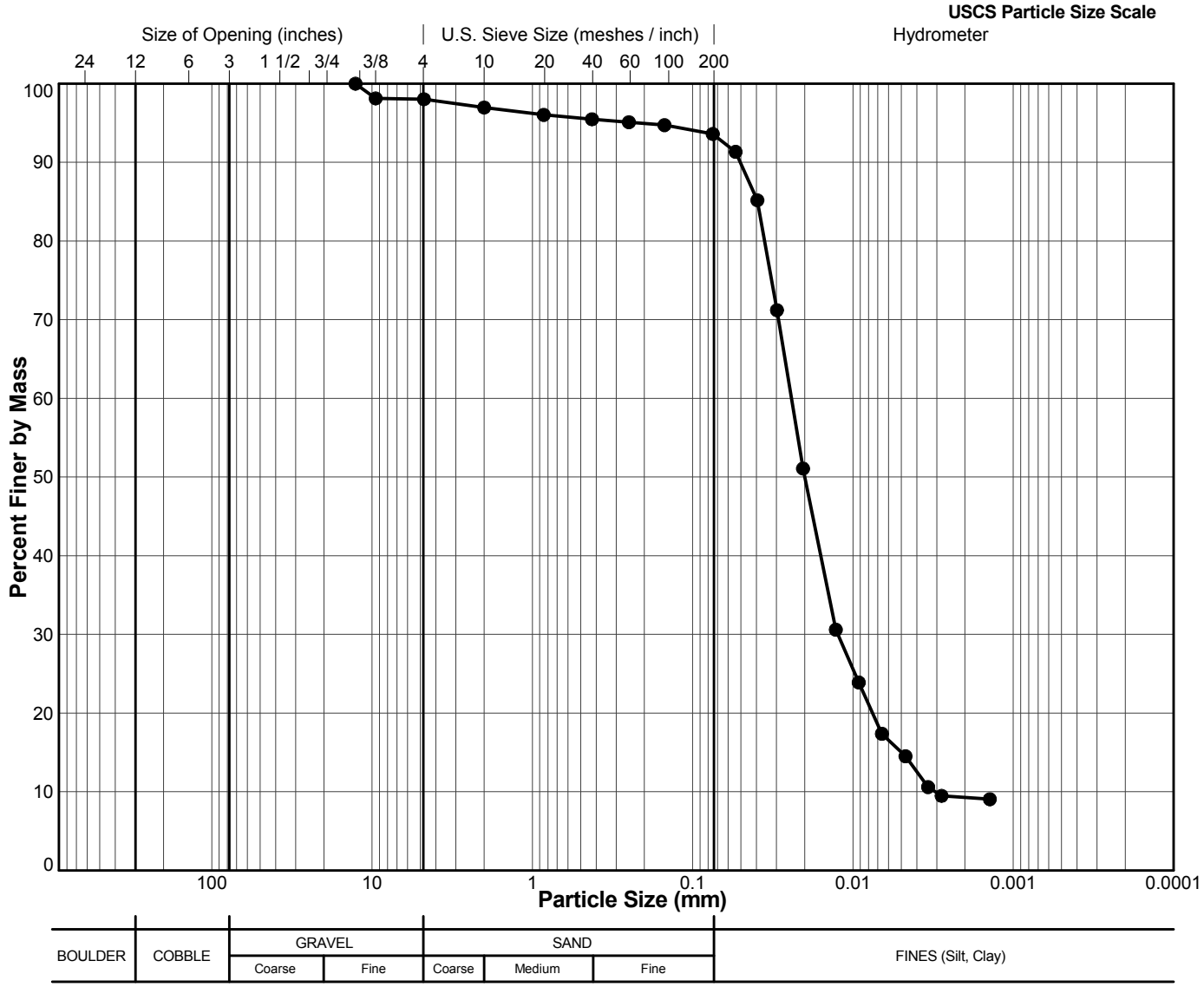
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-84**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.50 to 2.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 12.7	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



SK	**03/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

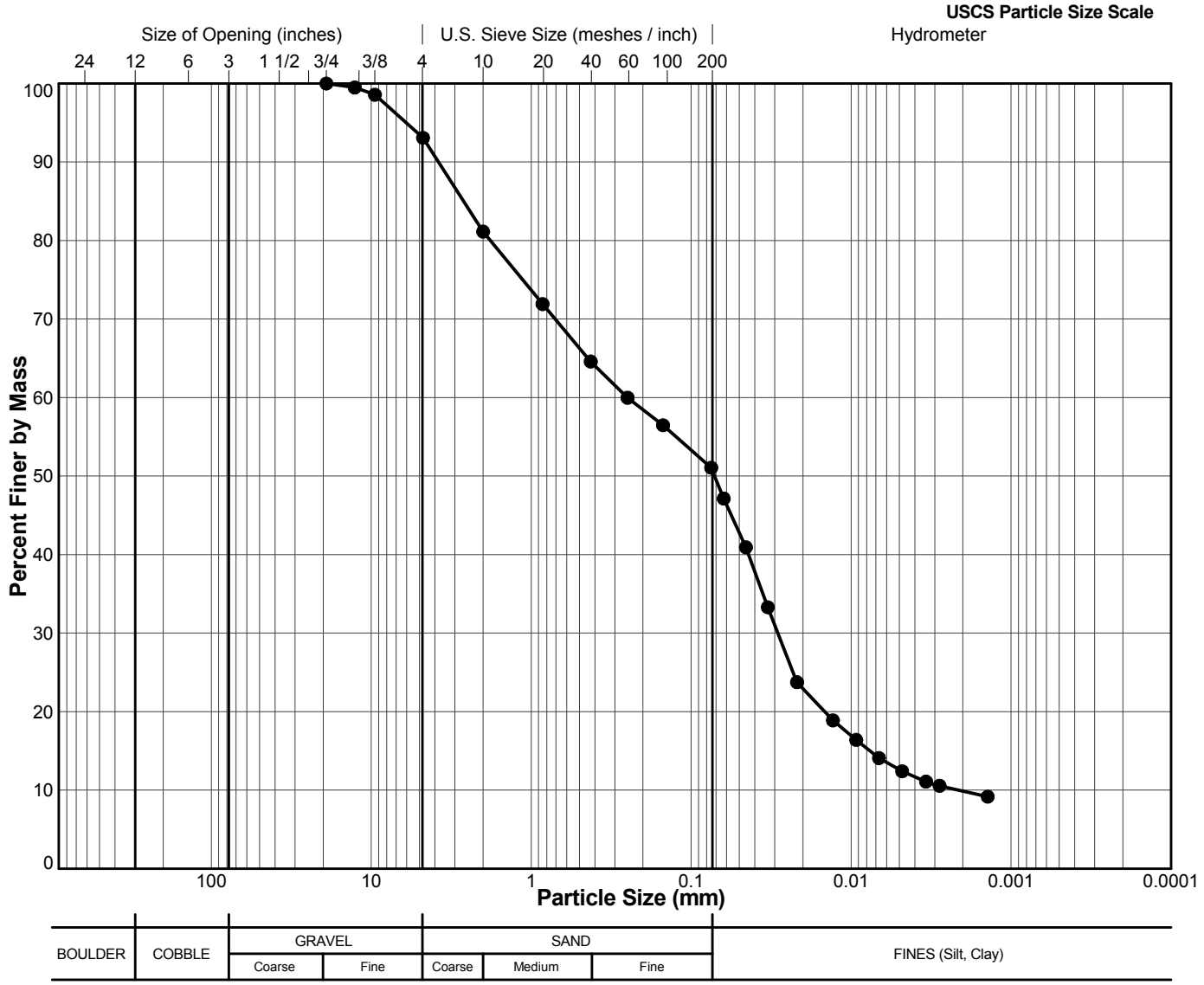
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-85**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

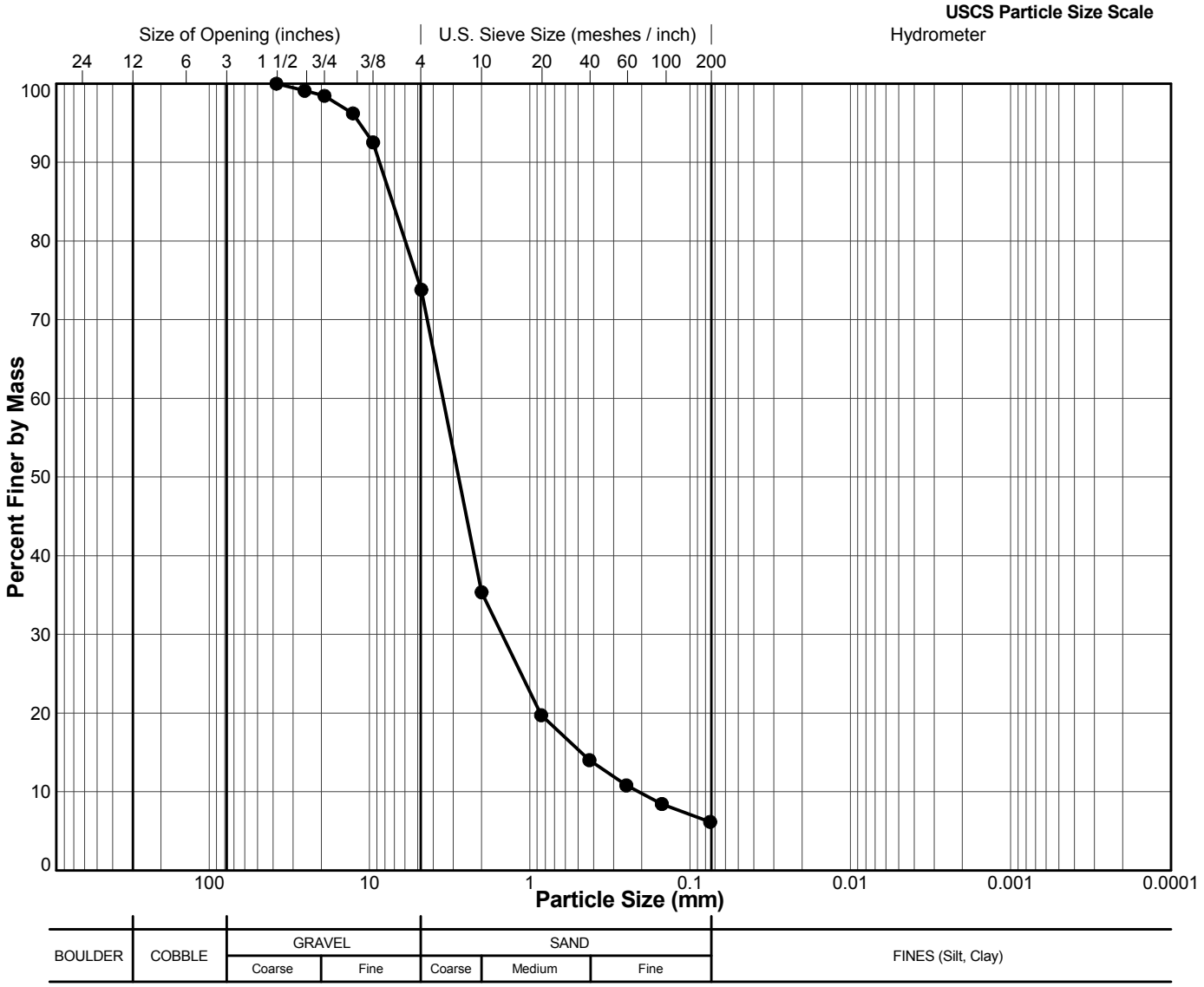
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-87**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 38.1	

Method: Split, Washed



RS	16/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

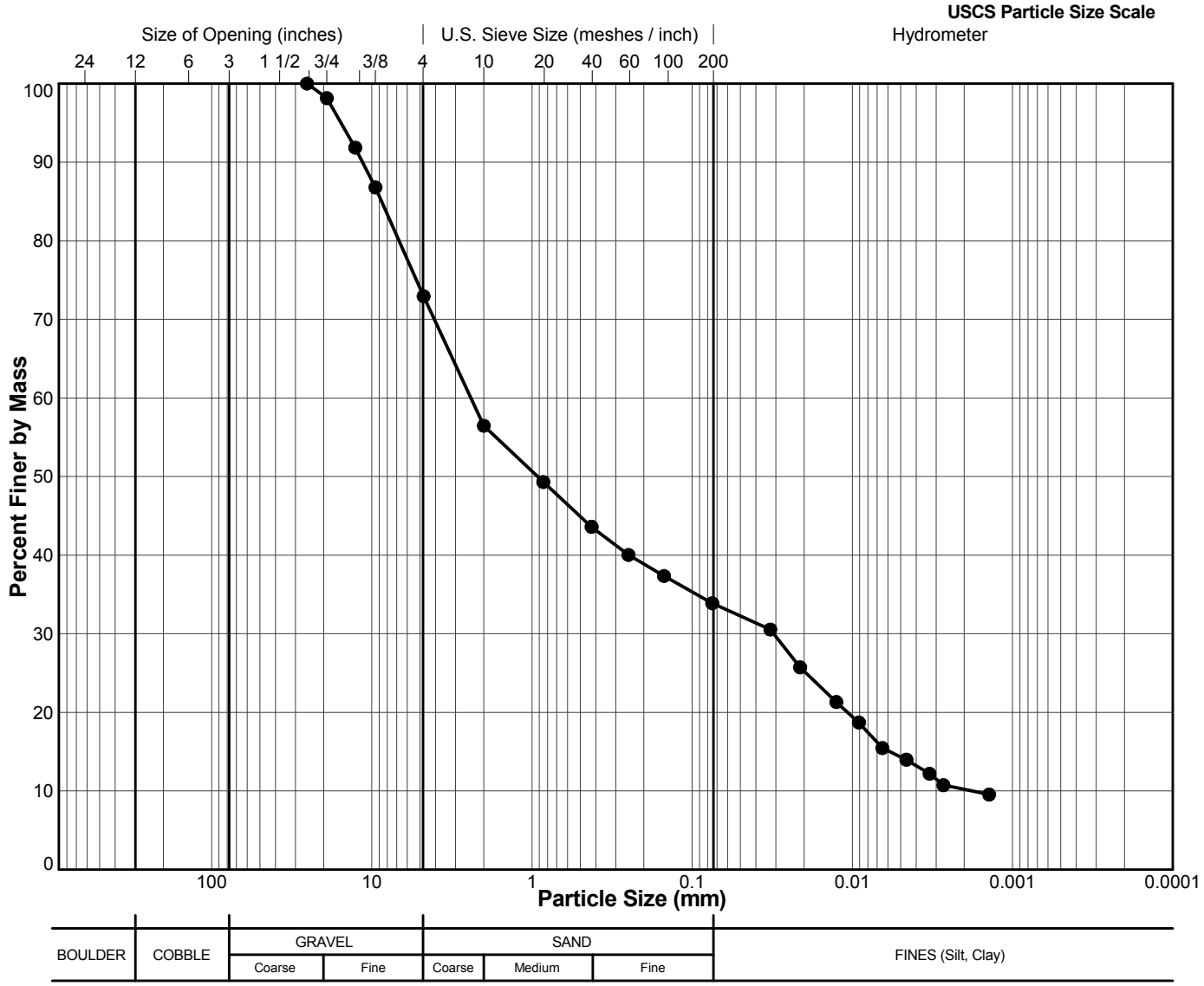
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-88**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.50 to 1.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 25.4	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**
Hydrometer ID: BURNABY - 87024	



SK	**04/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

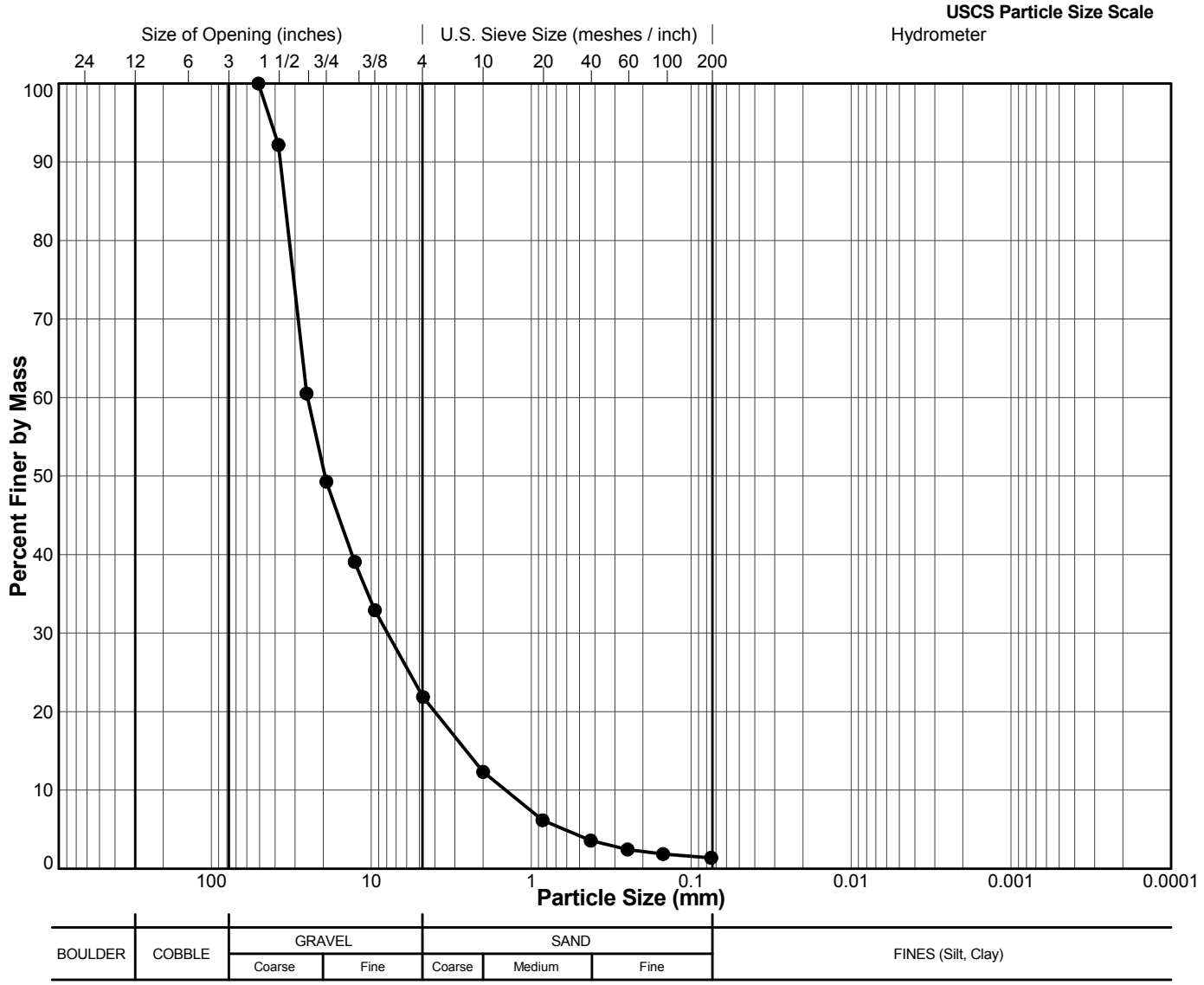
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-89**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



RS	22/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

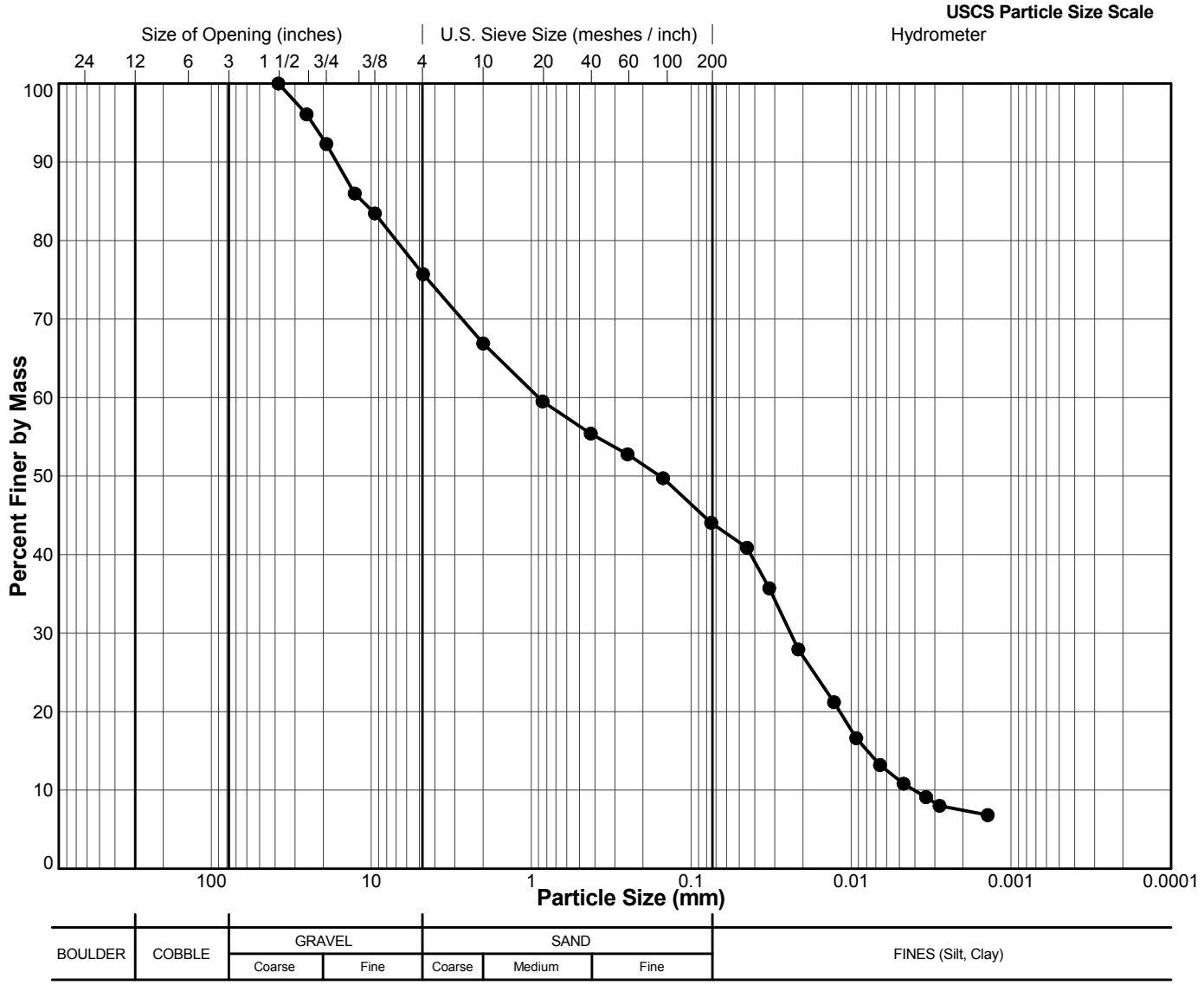
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-89**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 38.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	21/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

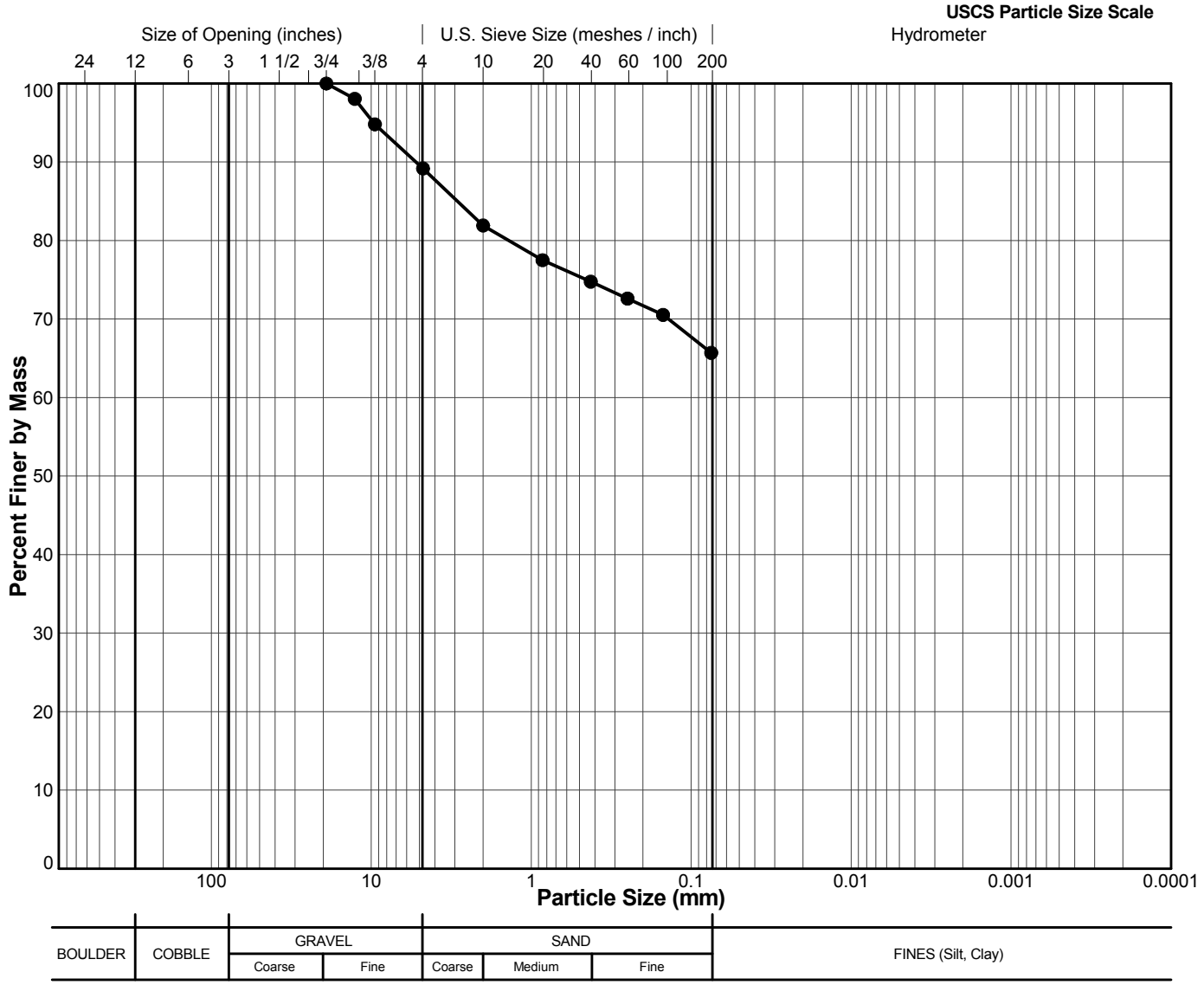
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-90**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	

Method: Split, Washed



RS	21/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

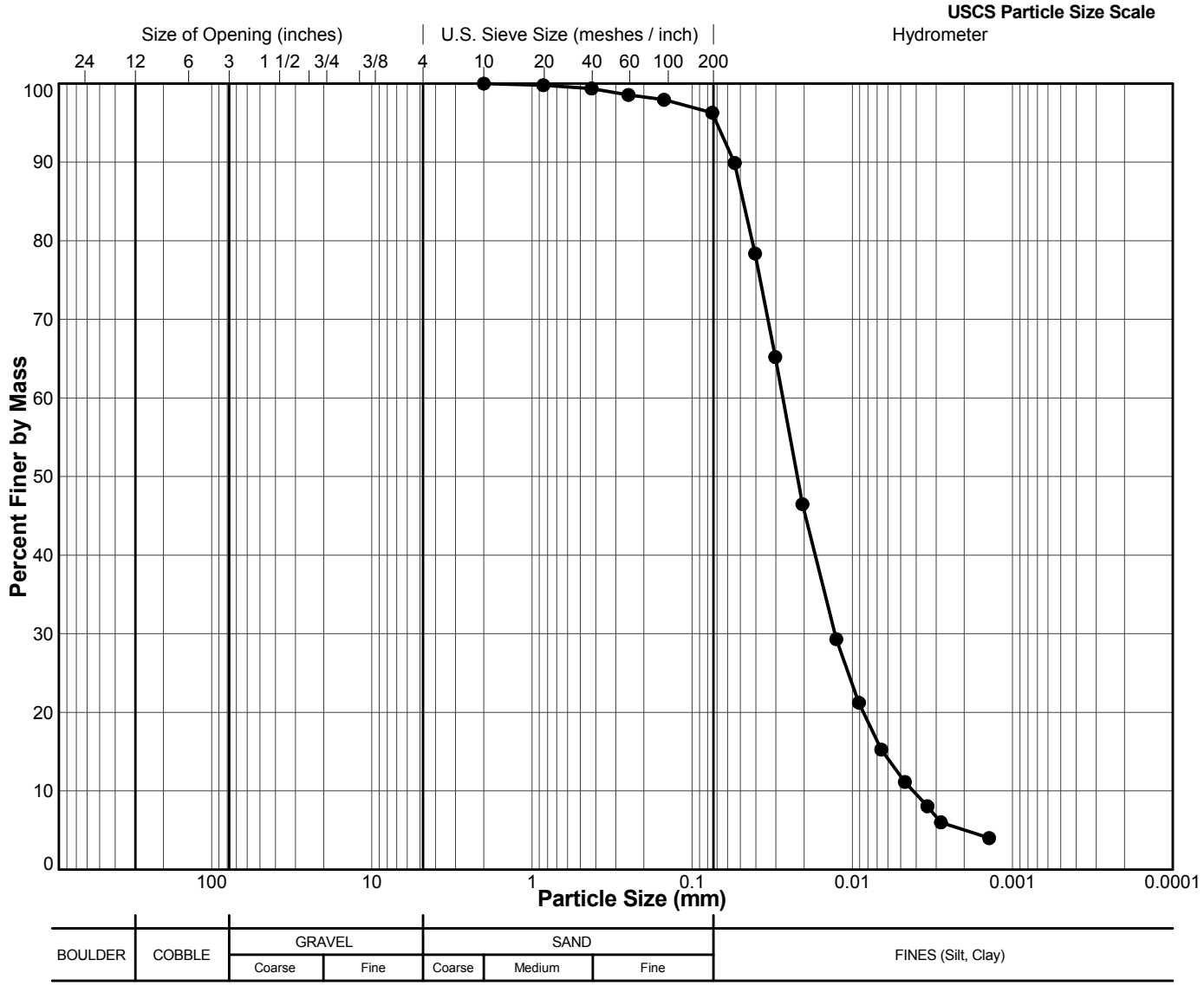
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-90**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.50 to 3.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 2	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 541360



SK	**04/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

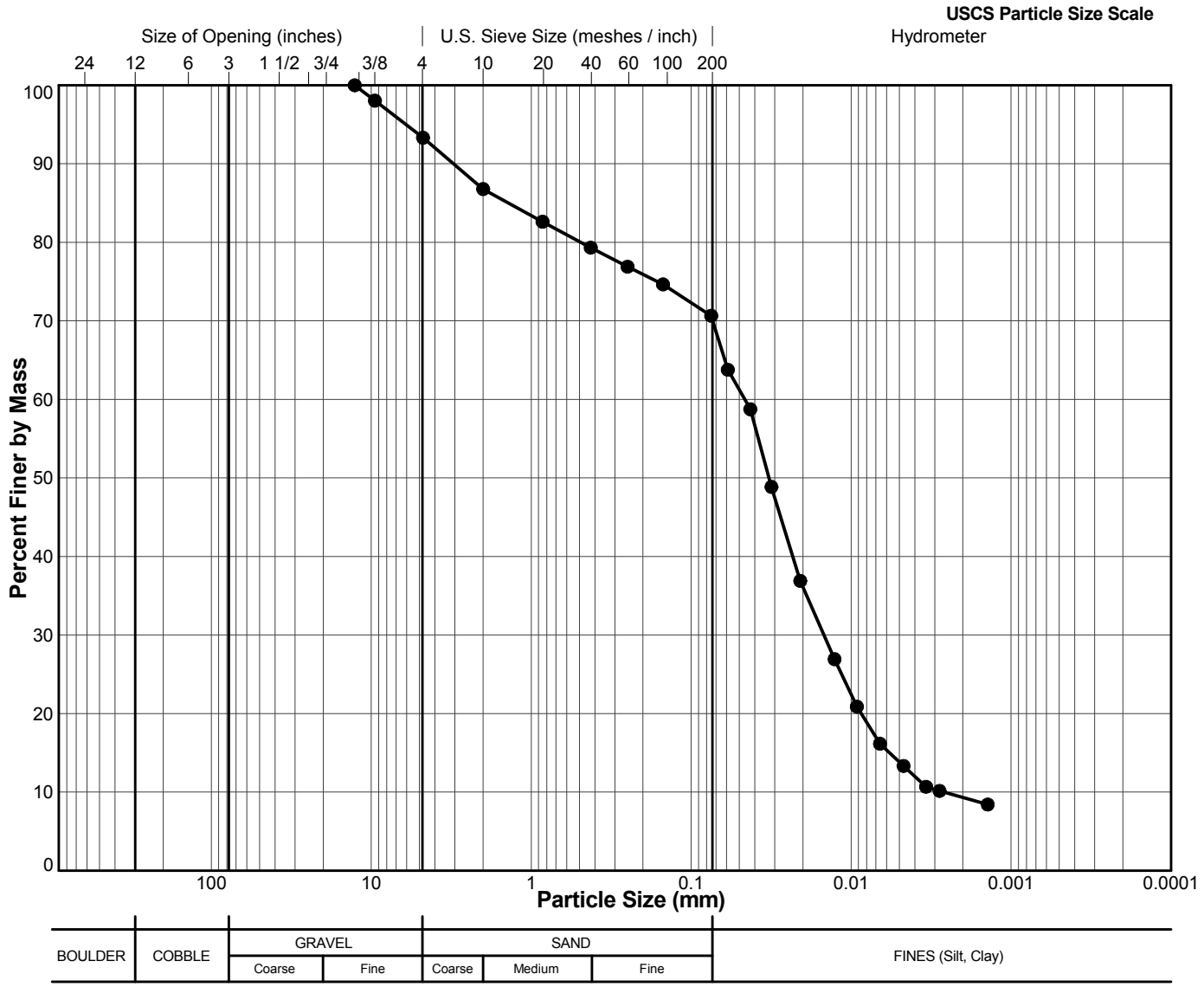
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-91**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 12.7	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

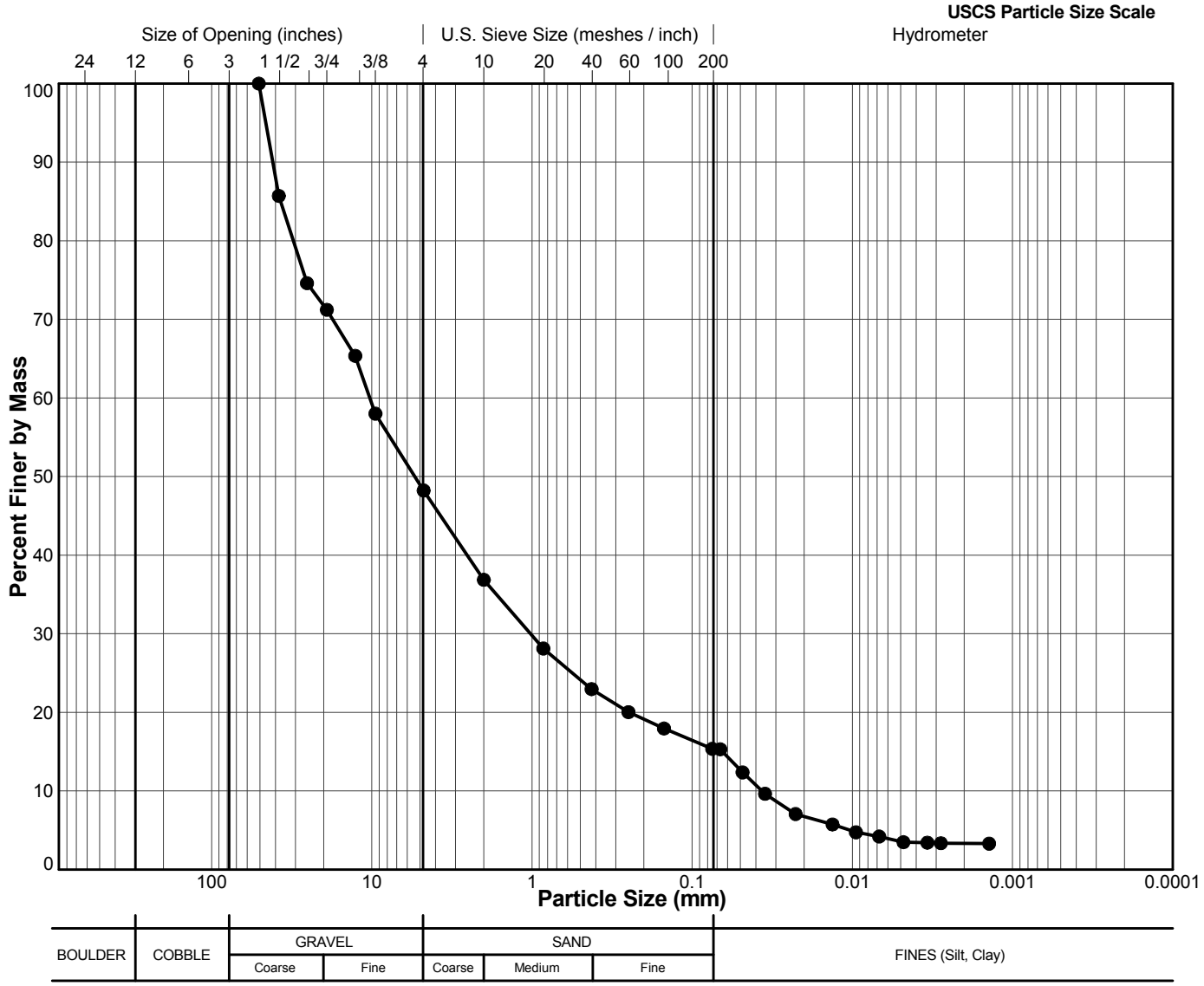
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-91**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.60 to 1.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



RS	21/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

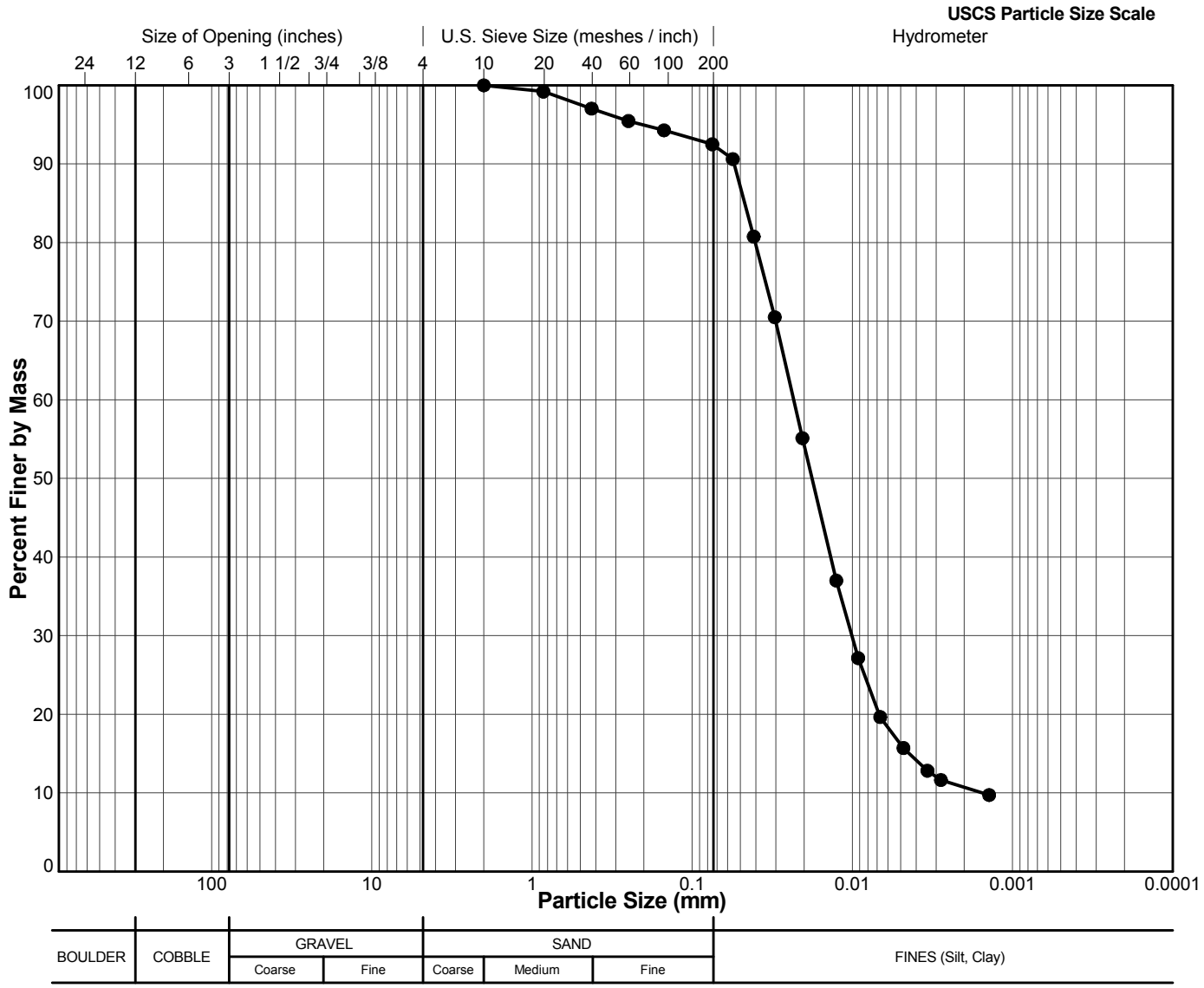
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-92**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 2	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



SK	**04/10/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

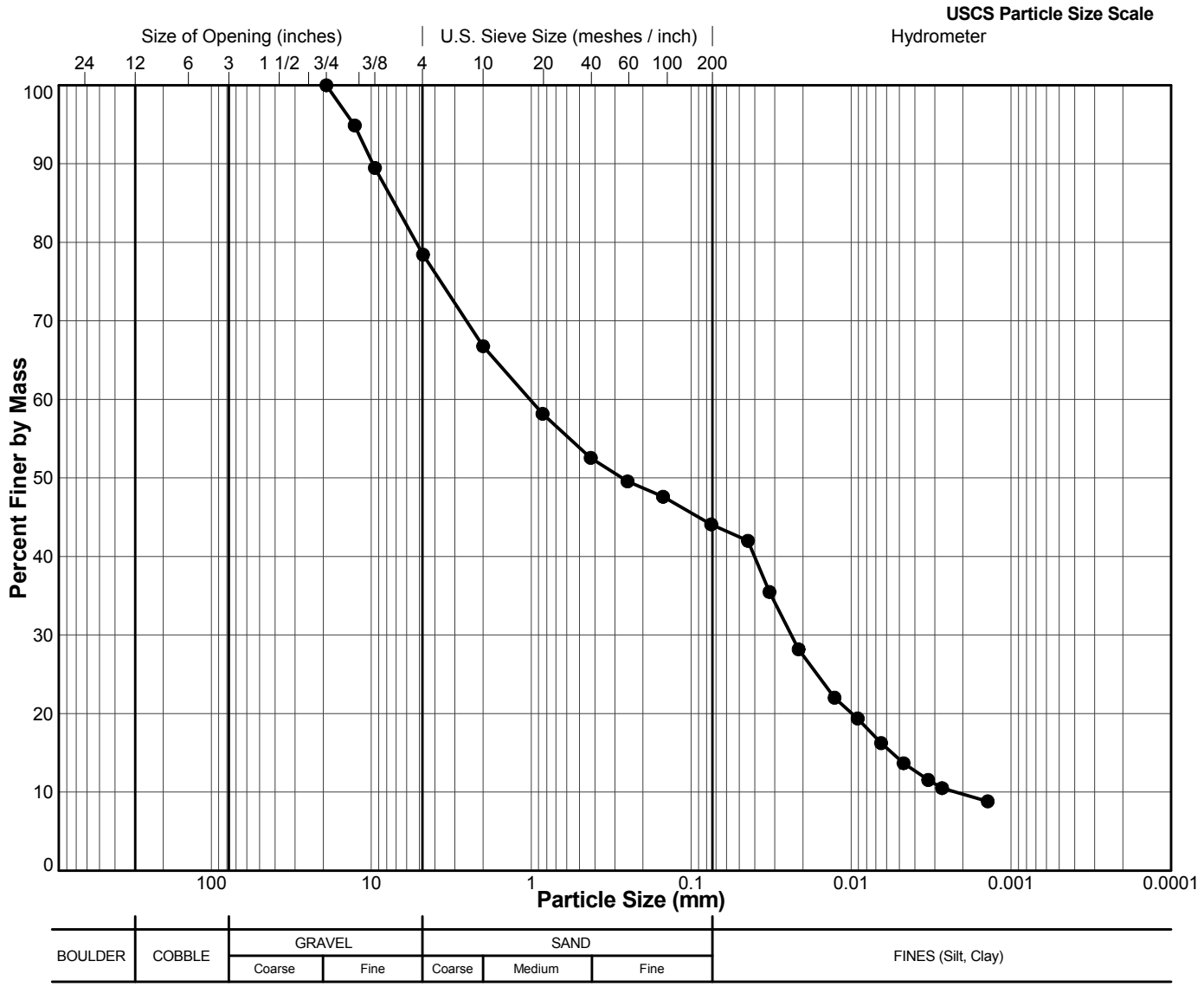
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-94**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.20 to 1.30
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



SK	**27/09/2011**	**LP**	**15/10/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

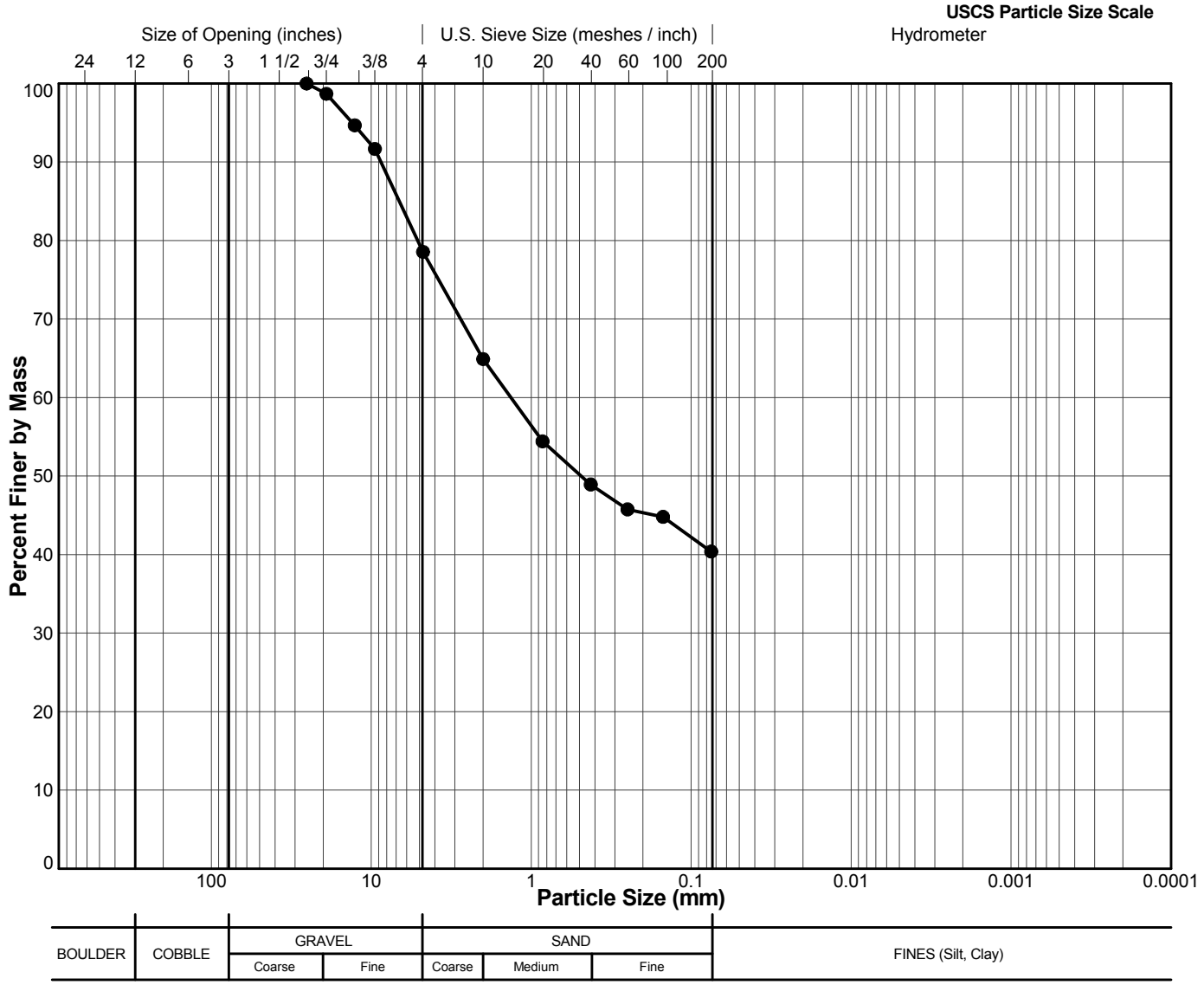
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-94**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.30 to 2.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 25.4	

Method: Split, Washed



RS	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

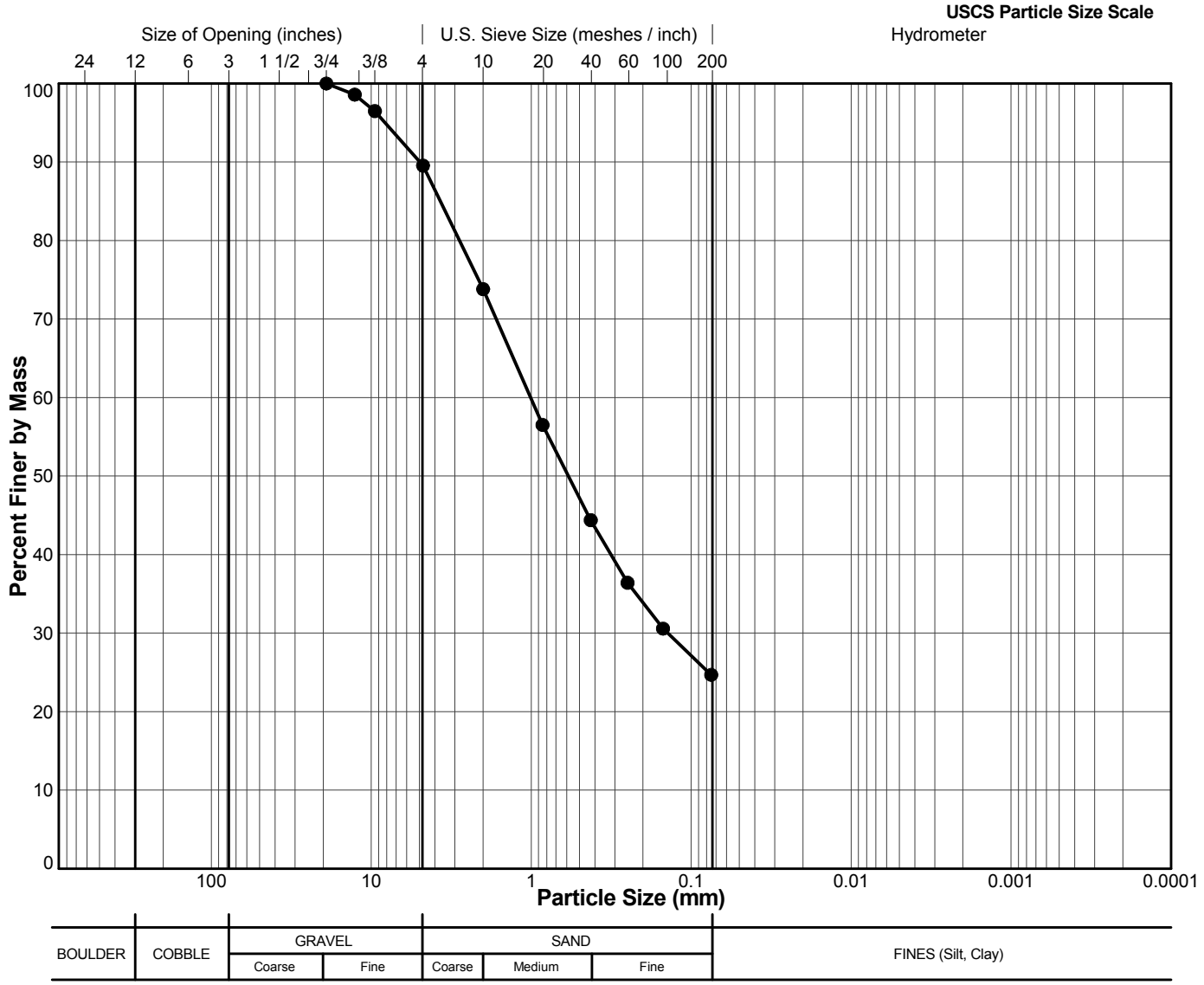
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-95**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.90 to 1.10
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	

Method: Split, Washed



SK	**01/11/2011**	**LP**	**03/11/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

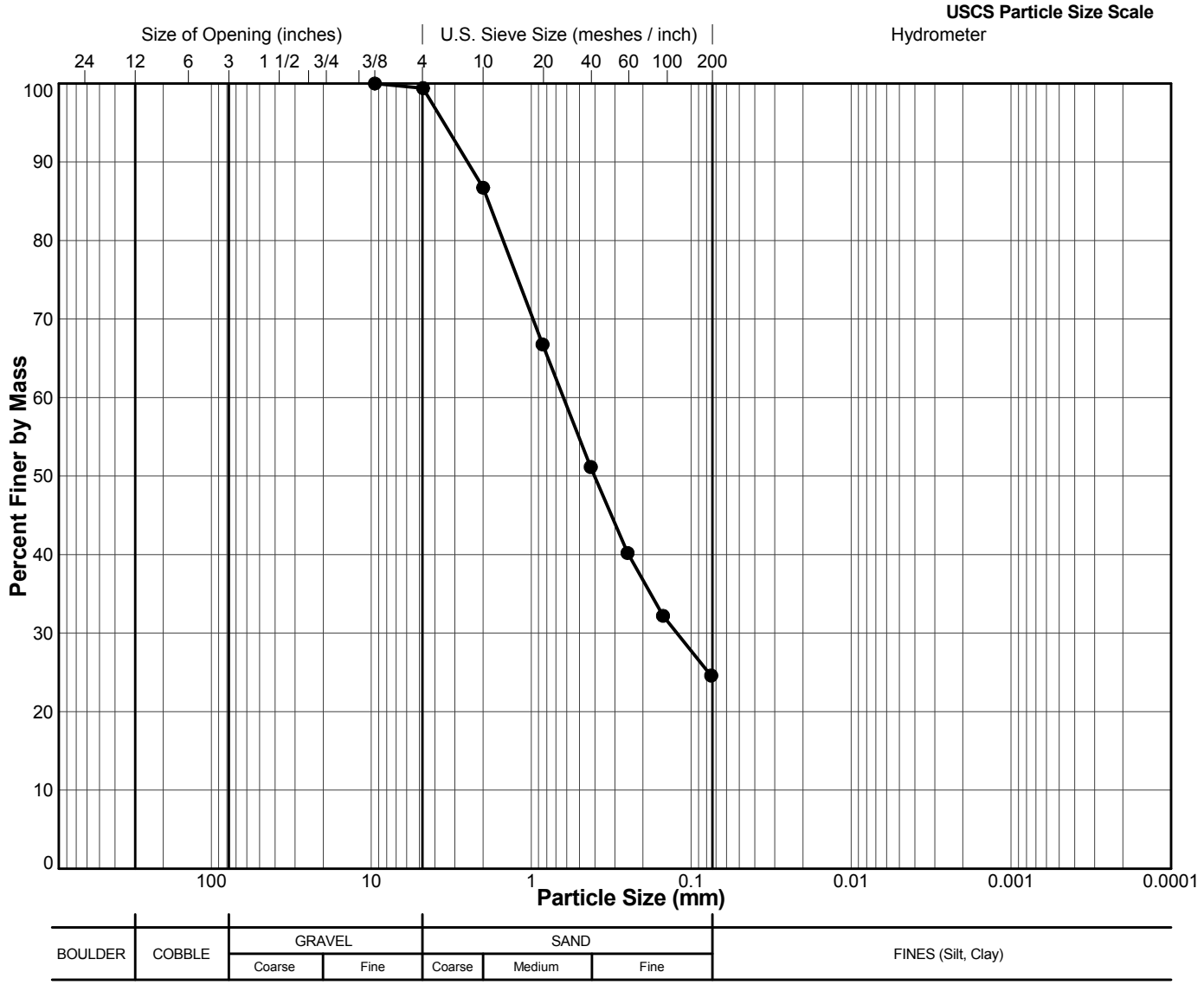
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-95**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.00 to 3.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 9.5	

Method: Split, Washed



SK	**01/11/2011**	**LP**	**03/11/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

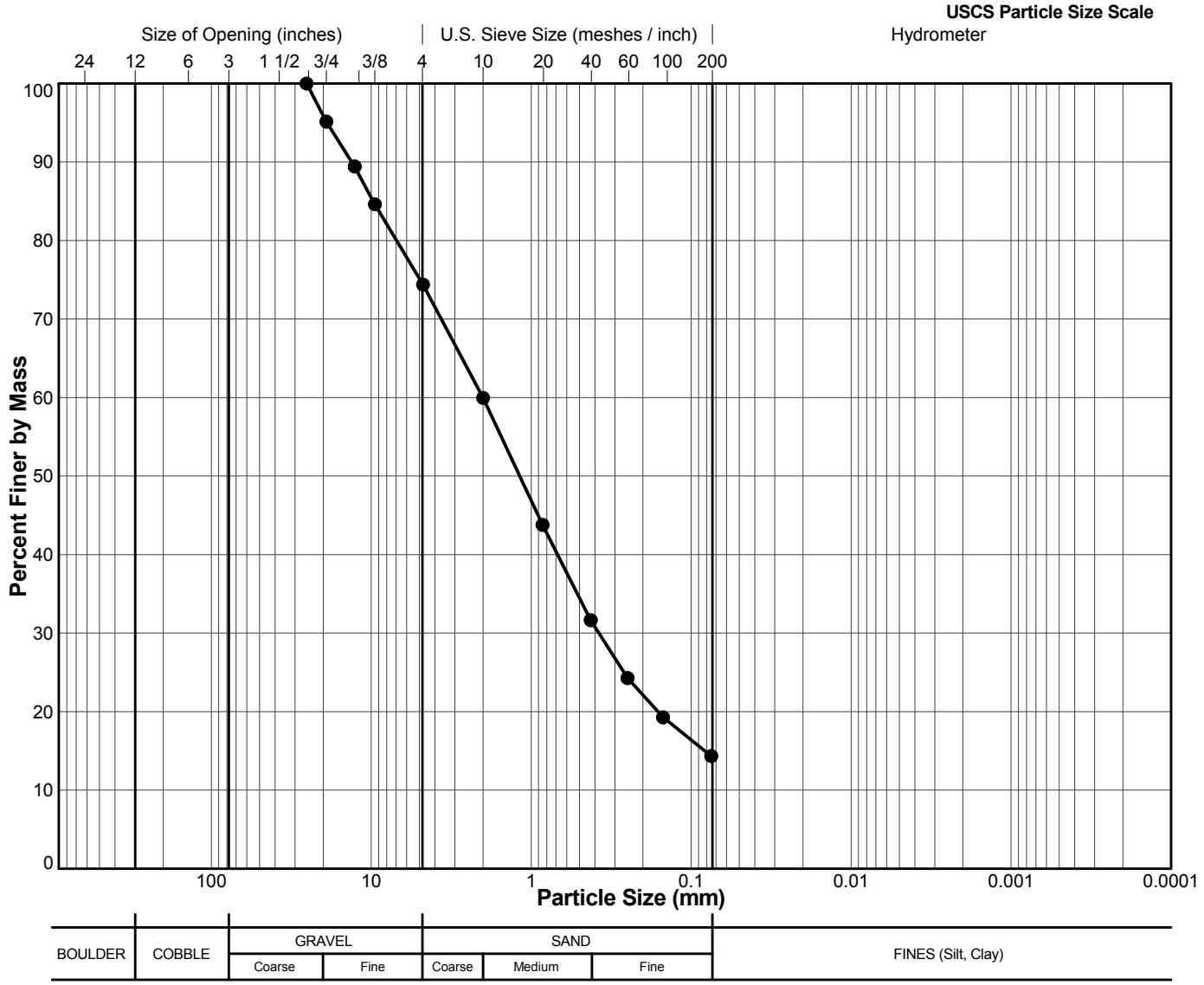
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-96**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 0.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 25.4	

Method: Split, Washed



SK	**01/11/2011**	**LP**	**03/11/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

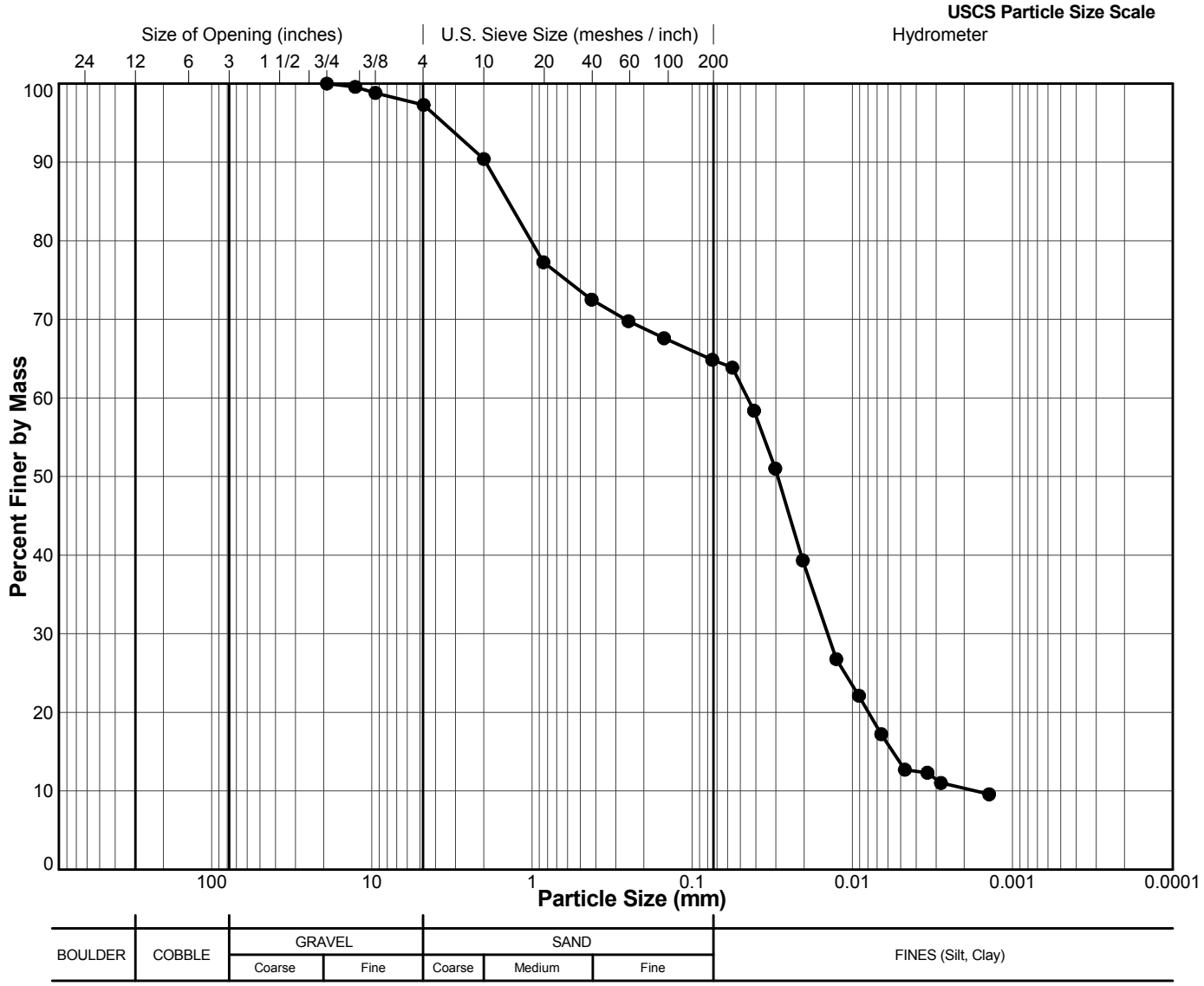
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-96**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



SK	**01/11/2011**	**LP**	**03/11/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

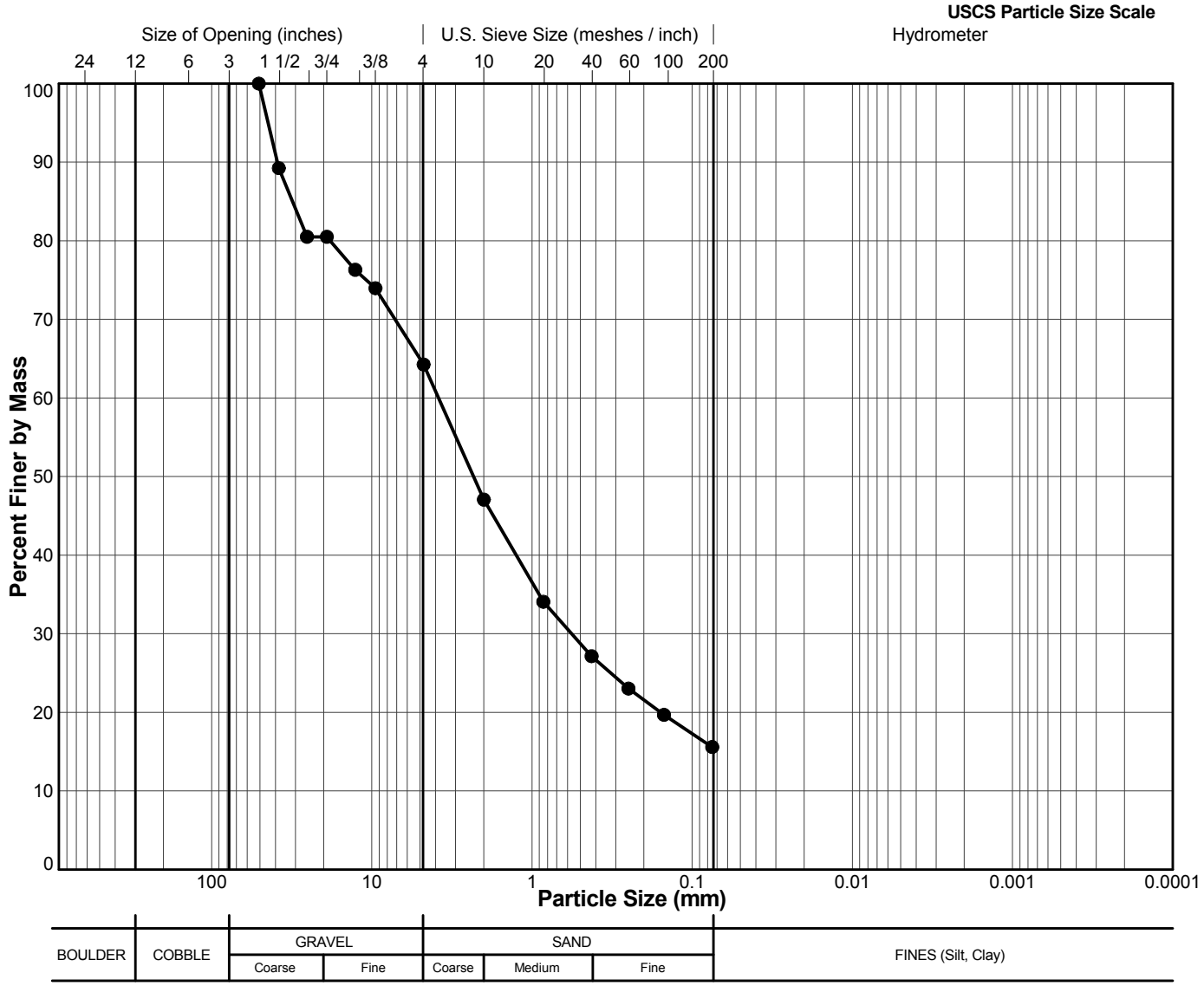
Reference(s)
ASTM D 422-63 (2007)

Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-96**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 3**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.80 to 2.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



SK	**01/11/2011**	**LP**	**03/11/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

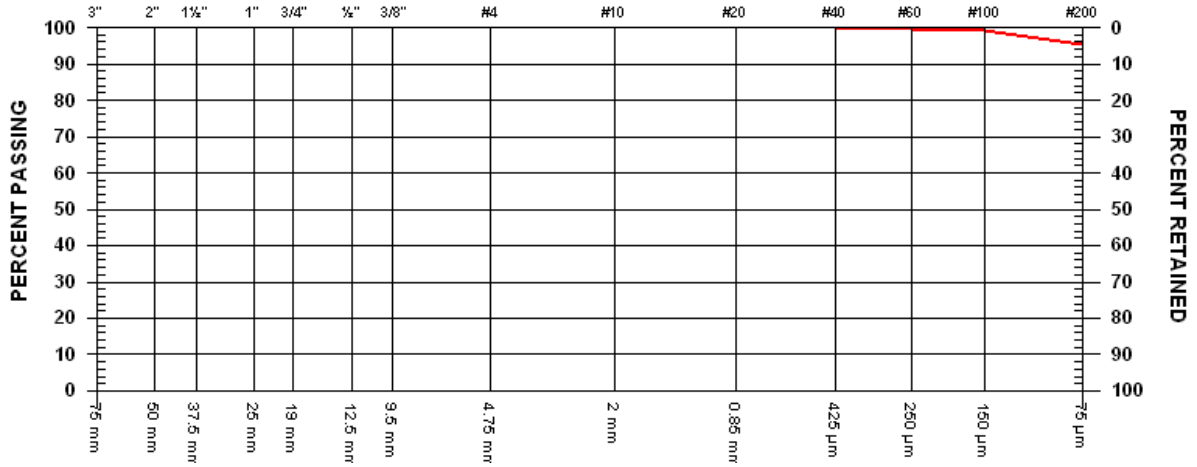
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 26 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT1 @ 1.15 - 1.60m
SPECIFICATION
MATERIAL TYPE Sand

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm		
1/2"	12.5 mm		
3/8"	9.5 mm		

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm		
No. 10	2.00 mm	100.0	
No. 20	850 µm	99.9	
No. 40	425 µm	99.9	
No. 60	250 µm	99.8	
No. 100	150 µm	99.4	
No. 200	75 µm	95.4	

COMMENTS

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

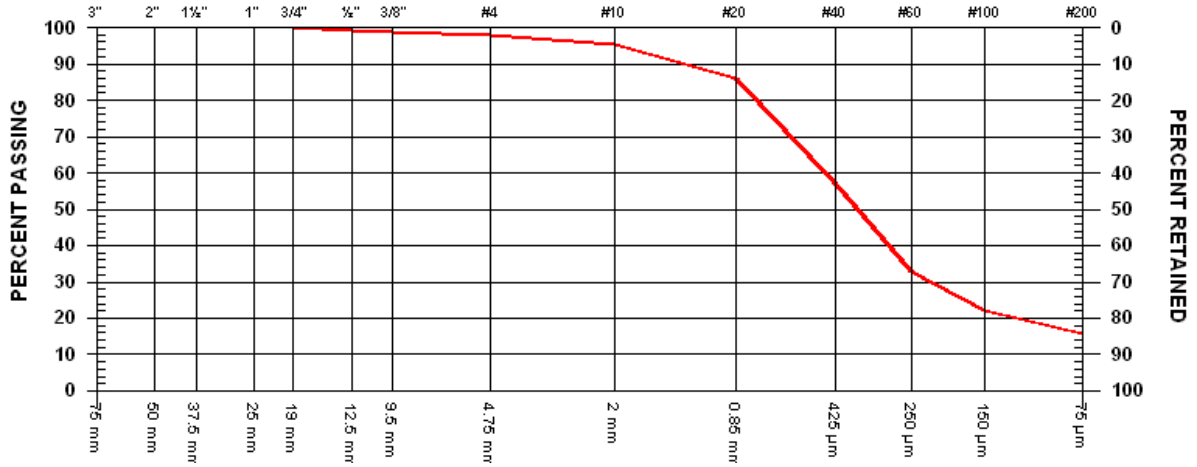
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 35 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT10 @ 8.71 - 9.16m
SPECIFICATION
MATERIAL TYPE Sand,gravelly

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm	100.0	
1/2"	12.5 mm	99.1	
3/8"	9.5 mm	98.6	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	97.8	
No. 10	2.00 mm	95.3	
No. 20	850 µm	86.2	
No. 40	425 µm	56.9	
No. 60	250 µm	32.6	
No. 100	150 µm	22.3	
No. 200	75 µm	15.6	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

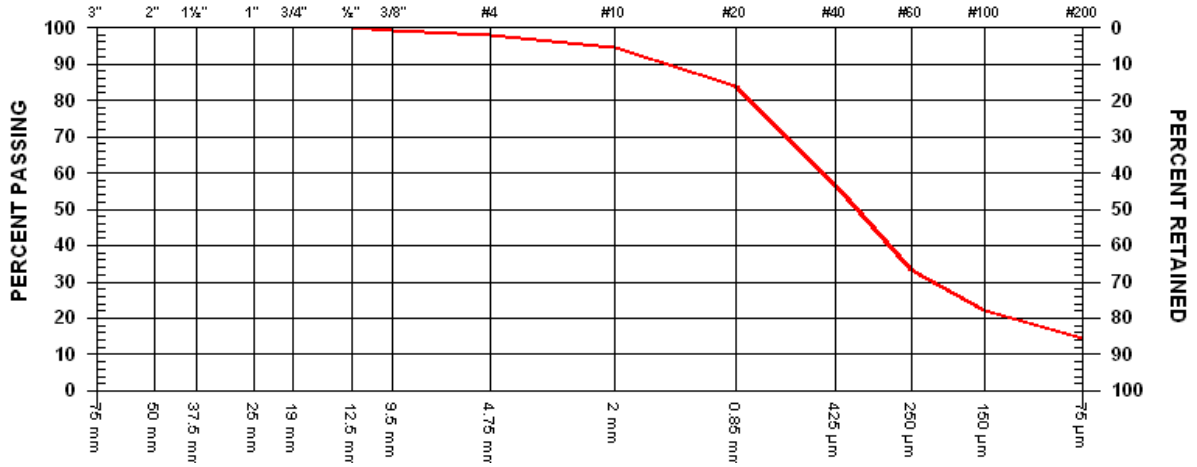
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 36 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT11 @ 9.25 - 9.70m
SPECIFICATION
MATERIAL TYPE Sand

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm		
1/2"	12.5 mm	100.0	
3/8"	9.5 mm	99.2	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	98.1	
No. 10	2.00 mm	94.7	
No. 20	850 µm	84.0	
No. 40	425 µm	56.7	
No. 60	250 µm	33.4	
No. 100	150 µm	22.0	
No. 200	75 µm	14.4	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

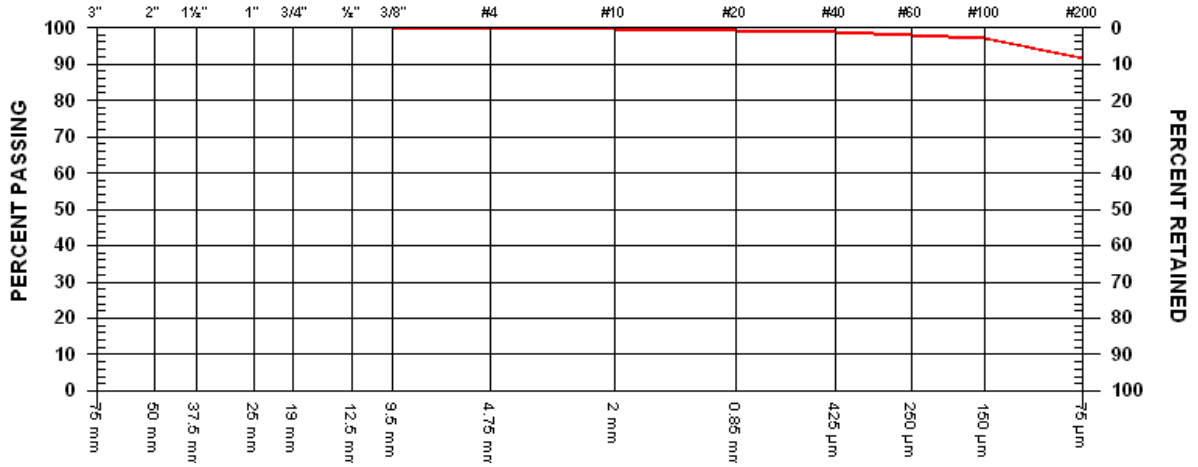
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 27 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT2 @ 1.60 - 2.05m
SPECIFICATION
MATERIAL TYPE Sand

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm		
1/2"	12.5 mm		
3/8"	9.5 mm	100.0	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	99.8	
No. 10	2.00 mm	99.6	
No. 20	850 µm	99.2	
No. 40	425 µm	98.8	
No. 60	250 µm	98.1	
No. 100	150 µm	97.0	
No. 200	75 µm	91.5	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

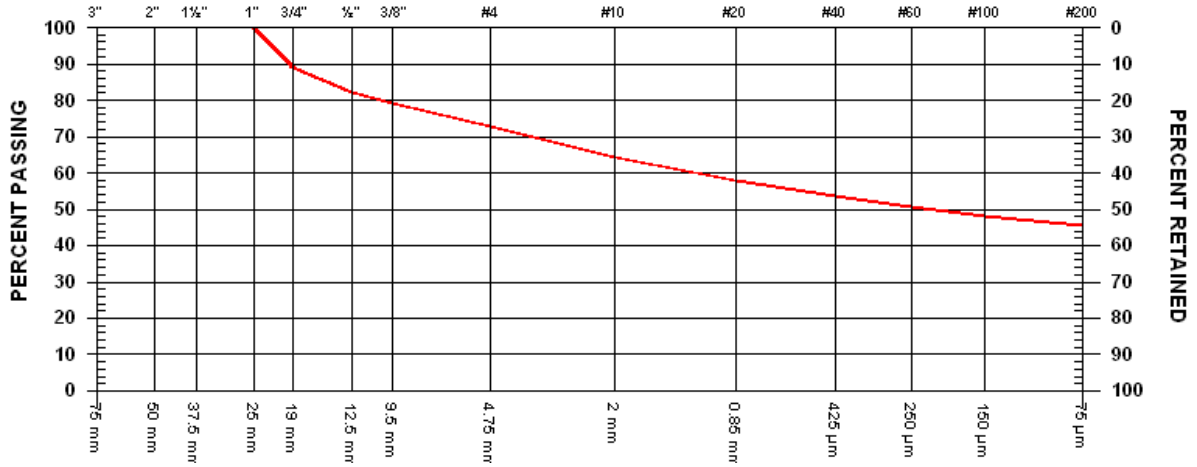
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 28 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT3 @ 2.28 - 2.73m
SPECIFICATION
MATERIAL TYPE Gravel, sandy

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm	100.0	
3/4"	19 mm	88.9	
1/2"	12.5 mm	82.3	
3/8"	9.5 mm	79.2	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	72.7	
No. 10	2.00 mm	64.3	
No. 20	850 µm	57.9	
No. 40	425 µm	53.5	
No. 60	250 µm	50.5	
No. 100	150 µm	48.3	
No. 200	75 µm	45.4	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

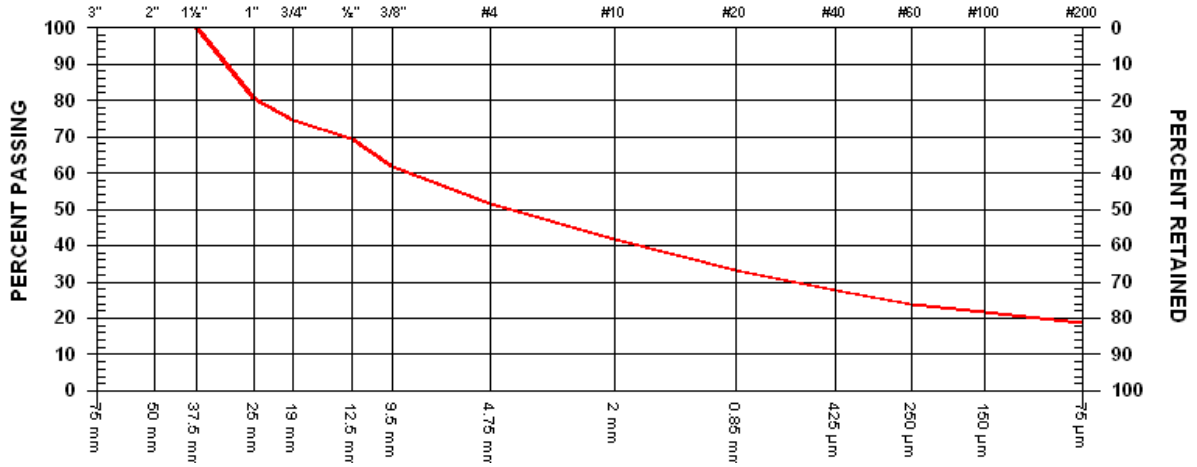
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 29 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT4 @ 2.75 - 3.20m
SPECIFICATION
MATERIAL TYPE Gravel, sandy

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	80.5	
3/4"	19 mm	74.5	
1/2"	12.5 mm	69.4	
3/8"	9.5 mm	61.6	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	51.6	
No. 10	2.00 mm	41.7	
No. 20	850 µm	33.2	
No. 40	425 µm	27.6	
No. 60	250 µm	24.0	
No. 100	150 µm	21.7	
No. 200	75 µm	18.7	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

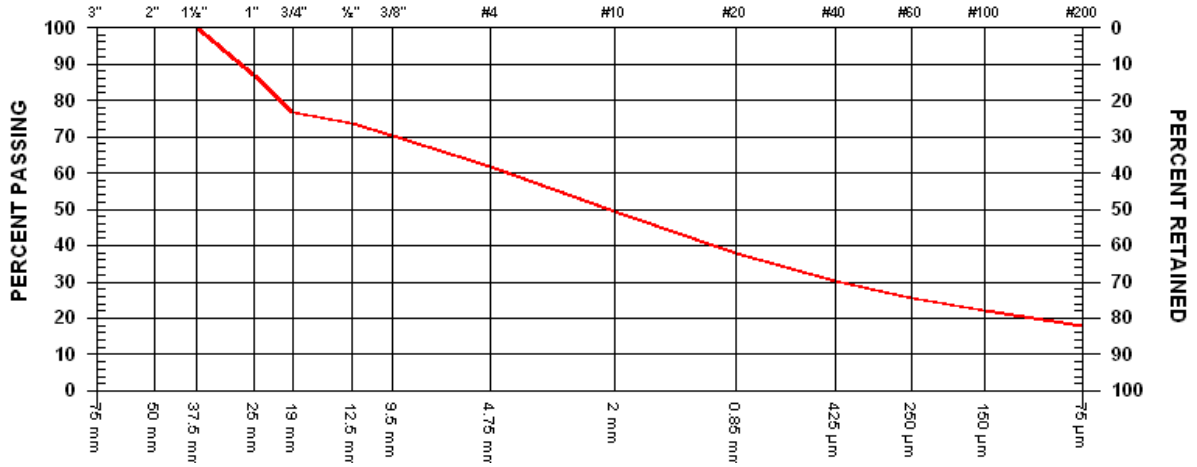
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 30 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT5 @ 4.6 - 5.05m
SPECIFICATION
MATERIAL TYPE Gravel, sandy

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	86.9	
3/4"	19 mm	76.7	
1/2"	12.5 mm	73.7	
3/8"	9.5 mm	70.2	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	61.6	
No. 10	2.00 mm	49.2	
No. 20	850 µm	37.9	
No. 40	425 µm	30.4	
No. 60	250 µm	25.7	
No. 100	150 µm	22.2	
No. 200	75 µm	17.7	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

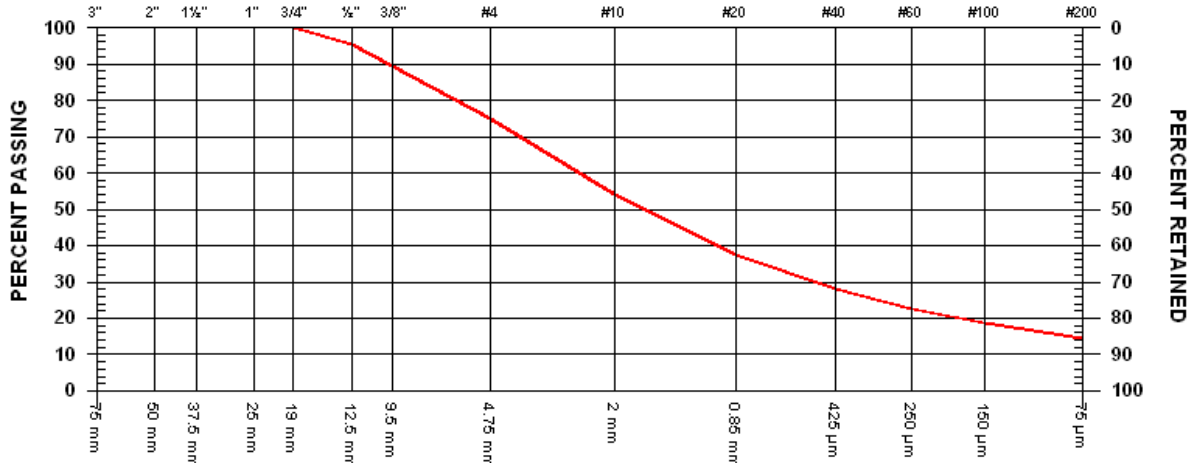
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 31 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT6 @ 5.53 - 5.98m
SPECIFICATION
MATERIAL TYPE Silt

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm	100.0	
1/2"	12.5 mm	95.5	
3/8"	9.5 mm	89.6	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	75.1	
No. 10	2.00 mm	54.2	
No. 20	850 µm	37.6	
No. 40	425 µm	27.9	
No. 60	250 µm	22.5	
No. 100	150 µm	18.8	
No. 200	75 µm	14.5	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

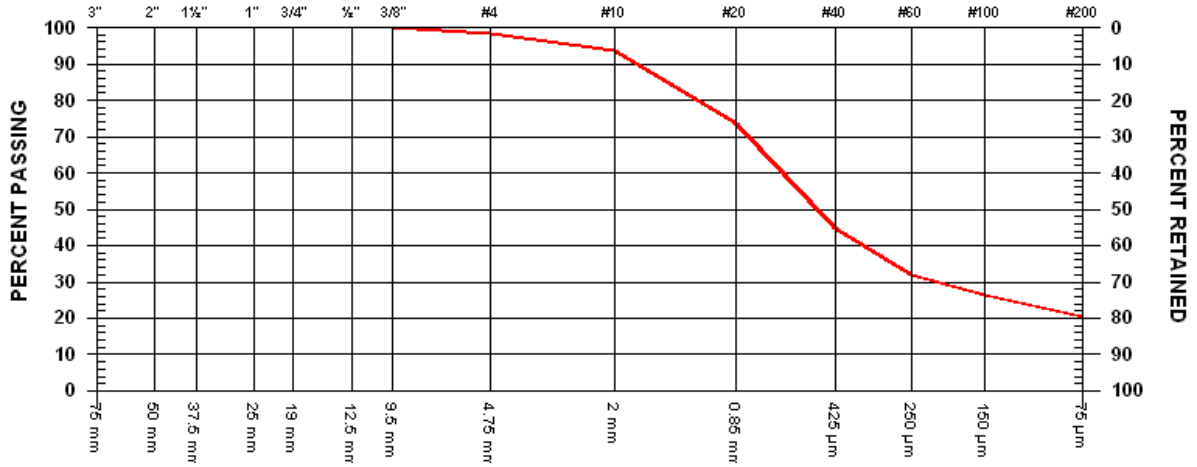
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 32 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT7 @ 6.22 - 6.67m
SPECIFICATION
MATERIAL TYPE Sand

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm		
1/2"	12.5 mm		
3/8"	9.5 mm	100.0	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	98.3	
No. 10	2.00 mm	93.5	
No. 20	850 µm	73.6	
No. 40	425 µm	44.5	
No. 60	250 µm	31.9	
No. 100	150 µm	26.3	
No. 200	75 µm	20.5	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

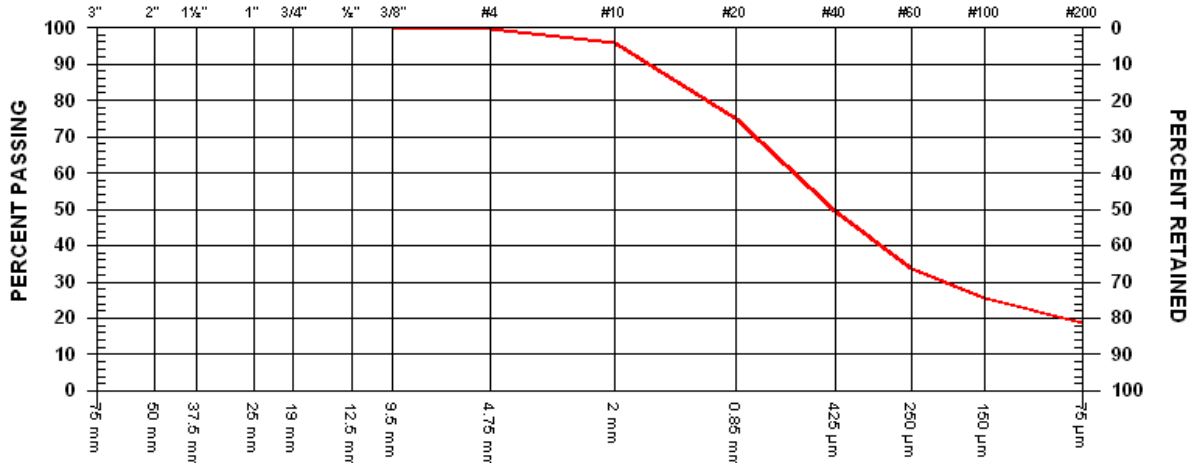
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 33 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT8 @ 7.16 - 7.61m
SPECIFICATION
MATERIAL TYPE Sand

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm		
1/2"	12.5 mm		
3/8"	9.5 mm	100.0	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	99.7	
No. 10	2.00 mm	96.0	
No. 20	850 µm	74.9	
No. 40	425 µm	49.4	
No. 60	250 µm	33.5	
No. 100	150 µm	25.5	
No. 200	75 µm	18.9	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

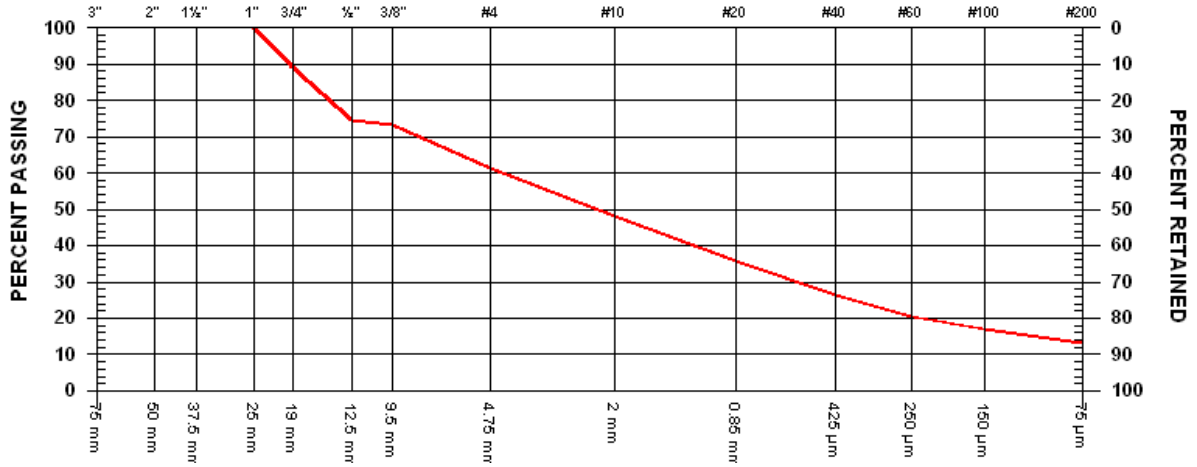
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 34 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Jul.27

SUPPLIER BH-BGC11-39
SOURCE SPT9 @ 7.75 - 8.20m
SPECIFICATION
MATERIAL TYPE Sand, gravelly

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



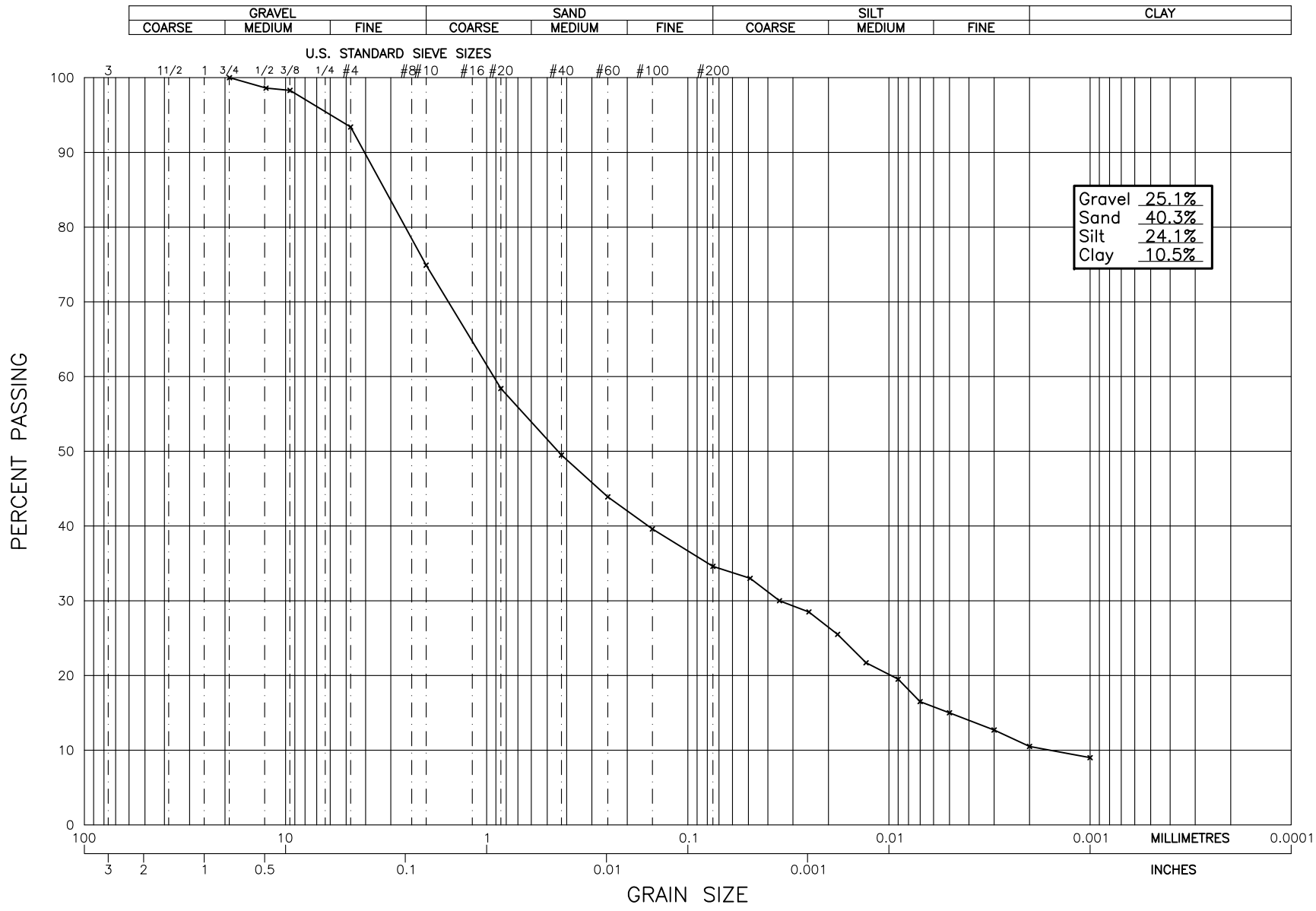
GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm	100.0	
3/4"	19 mm	88.9	
1/2"	12.5 mm	74.7	
3/8"	9.5 mm	73.4	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	61.4	
No. 10	2.00 mm	48.3	
No. 20	850 µm	35.6	
No. 40	425 µm	26.2	
No. 60	250 µm	20.5	
No. 100	150 µm	16.9	
No. 200	75 µm	13.0	

COMMENTS

 2011.Nov.11 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-42-S2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH42-S2

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

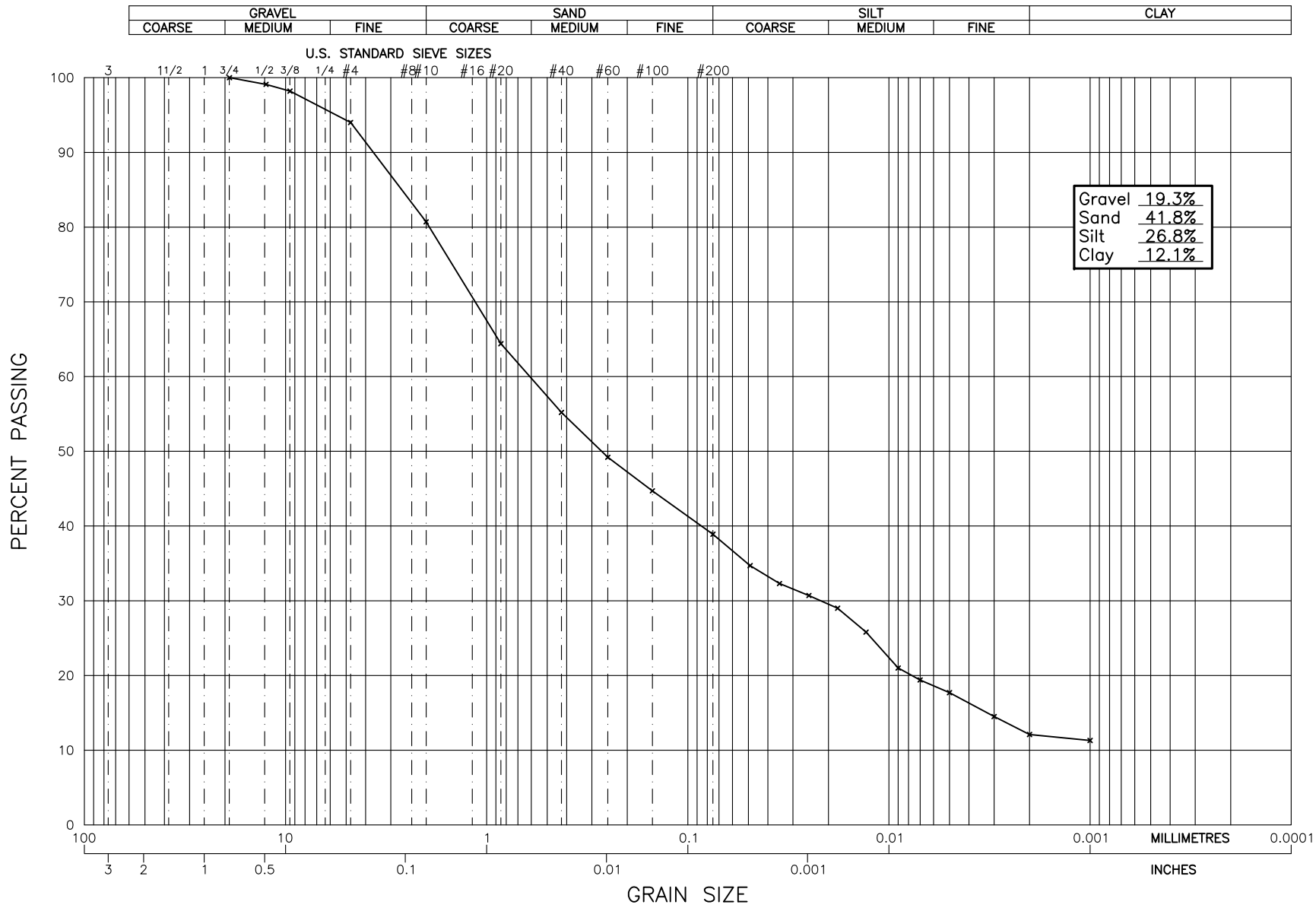
Client: BGC Engineering Ltd.				Date: November 8, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand, gravelly,silty, trace clay
Sample #: **2**	Test #:	**Hole #: BH-BGC11-42**	**Depth: 1.8 - 2.27m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: July 29, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.7, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**74.9**
Wet Wt. & Tare	1350.5	25.4				20	11.0	39.0	78.0	**58.4**
Dry Wt. & Tare	1180.8	19.0		984.0	**100.0**	40	6.0	33.0	66.0	**49.5**
Water Wt.	169.7	12.5	14.2	969.8	**98.6**	60	3.7	29.3	58.6	**43.9**
Tare Wt.	196.8	9.5	2.1	967.7	**98.3**	100	2.9	26.4	52.8	**39.6**
Wt. Of Dry Soil	984.0	4.75	48.3	919.4	**93.4**	200	3.3	23.1	46.2	**34.6**
Moisture Content %	**17.2**	10	182.1	737.3	**74.9**	Pan	23.1			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	984.0			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.749	0.5	30.0	20.0	0.01365	23.0	12.5	5.000	0.068	46.0	**34.5**
50.0	0.749	1	29.0	20.0	0.01365	22.0	12.7	3.559	0.049	44.0	**33.0**
50.0	0.749	2	27.0	20.0	0.01365	20.0	13.0	2.549	0.035	40.0	**30.0**
50.0	0.749	4	26.0	20.0	0.01365	19.0	13.2	1.814	0.025	38.0	**28.5**
50.0	0.749	8	24.0	20.0	0.01365	17.0	13.5	1.299	0.018	34.0	**25.5**
50.0	0.749	15	21.5	20.0	0.01365	14.5	13.9	0.963	0.013	29.0	**21.7**
50.0	0.749	30	20.0	20.0	0.01365	13.0	14.2	0.687	0.009	26.0	**19.5**
50.0	0.749	60	18.0	20.0	0.01365	11.0	14.5	0.491	0.007	22.0	**16.5**
50.0	0.749	120	17.0	21.0	0.01348	10.0	14.6	0.349	0.005	20.0	**15.0**
50.0	0.749	240	15.5	21.0	0.01348	8.5	14.9	0.249	0.003	17.0	**12.7**
50.0	0.749	480	14.0	21.0	0.01348	7.0	15.1	0.178	0.002	14.0	**10.5**
50.0	0.749	1440	13.0	21.0	0.01348	6.0	15.3	0.103	0.001	12.0	**9.0**

Hydrometer #: 932452	Graduate #: 5	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-42-S5

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH42-S5

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

Client: BGC Engineering Ltd.				Date: November 8, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand,silty,some gravel and clay
Sample #: **5**	Test #:	**Hole #: BH-BGC11-42**	**Depth: 6.4 - 6.84m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: July 29, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.7, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**80.7**
Wet Wt. & Tare	1265.1	25.4				20	10.1	39.9	79.8	**64.4**
Dry Wt. & Tare	1136.5	19.0		945.4	**100.0**	40	5.7	34.2	68.4	**55.2**
Water Wt.	128.6	12.5	8.4	937.0	**99.1**	60	3.7	30.5	61.0	**49.2**
Tare Wt.	191.1	9.5	8.7	928.3	**98.2**	100	2.8	27.7	55.4	**44.7**
Wt. Of Dry Soil	945.4	4.75	39.3	889.0	**94.0**	200	3.6	24.1	48.2	**38.9**
Moisture Content %	**13.6**	10	126.3	762.7	**80.7**	Pan	24.1			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	945.4			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.807	0.5	31.0	20.0	0.01365	24.0	12.3	4.967	0.068	48.0	**38.7**
50.0	0.807	1	28.5	20.0	0.01365	21.5	12.7	3.570	0.049	43.0	**34.7**
50.0	0.807	2	27.0	20.0	0.01365	20.0	13.0	2.549	0.035	40.0	**32.3**
50.0	0.807	4	26.0	20.0	0.01365	19.0	13.2	1.814	0.025	38.0	**30.7**
50.0	0.807	8	25.0	20.0	0.01365	18.0	13.3	1.291	0.018	36.0	**29.0**
50.0	0.807	15	23.0	20.0	0.01365	16.0	13.7	0.954	0.013	32.0	**25.8**
50.0	0.807	30	20.0	20.0	0.01365	13.0	14.2	0.687	0.009	26.0	**21.0**
50.0	0.807	60	19.0	20.0	0.01365	12.0	14.3	0.488	0.007	24.0	**19.4**
50.0	0.807	120	18.0	21.0	0.01348	11.0	14.5	0.347	0.005	22.0	**17.7**
50.0	0.807	240	16.0	21.0	0.01348	9.0	14.8	0.248	0.003	18.0	**14.5**
50.0	0.807	480	14.5	21.0	0.01348	7.5	15.1	0.177	0.002	15.0	**12.1**
50.0	0.807	1440	14.0	21.0	0.01348	7.0	15.1	0.103	0.001	14.0	**11.3**

Hydrometer #: 932452	Graduate #: 4	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

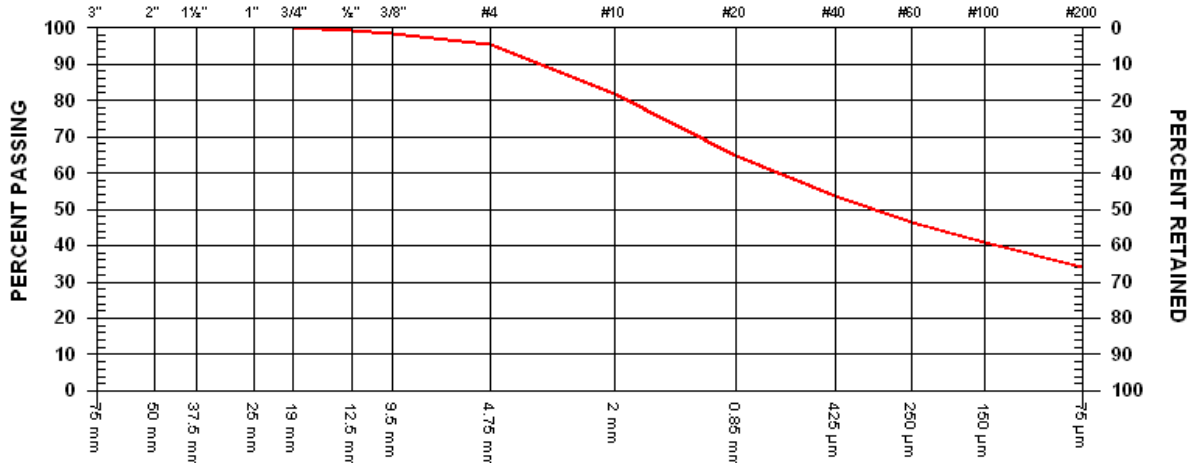
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 8 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.02 DATE SAMPLED 2011.Jul.07

SUPPLIER BH-BGC11-42
SOURCE SA#7 @ 9.4 - 9.88m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm	100.0	
1/2"	12.5 mm	99.3	
3/8"	9.5 mm	98.5	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	95.2	
No. 10	2.00 mm	81.7	
No. 20	850 µm	64.9	
No. 40	425 µm	53.7	
No. 60	250 µm	46.3	
No. 100	150 µm	40.8	
No. 200	75 µm	33.9	

COMMENTS

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

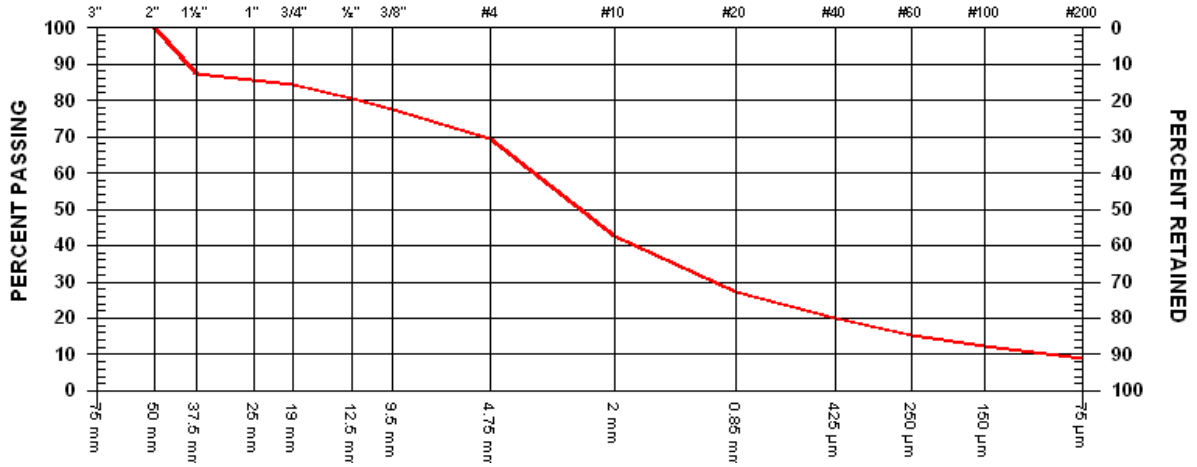
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 9 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.02 DATE SAMPLED 2011.Jul.30

SUPPLIER BH-BGC11-42
SOURCE SA#12 @ 13.3 - 13.65m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED

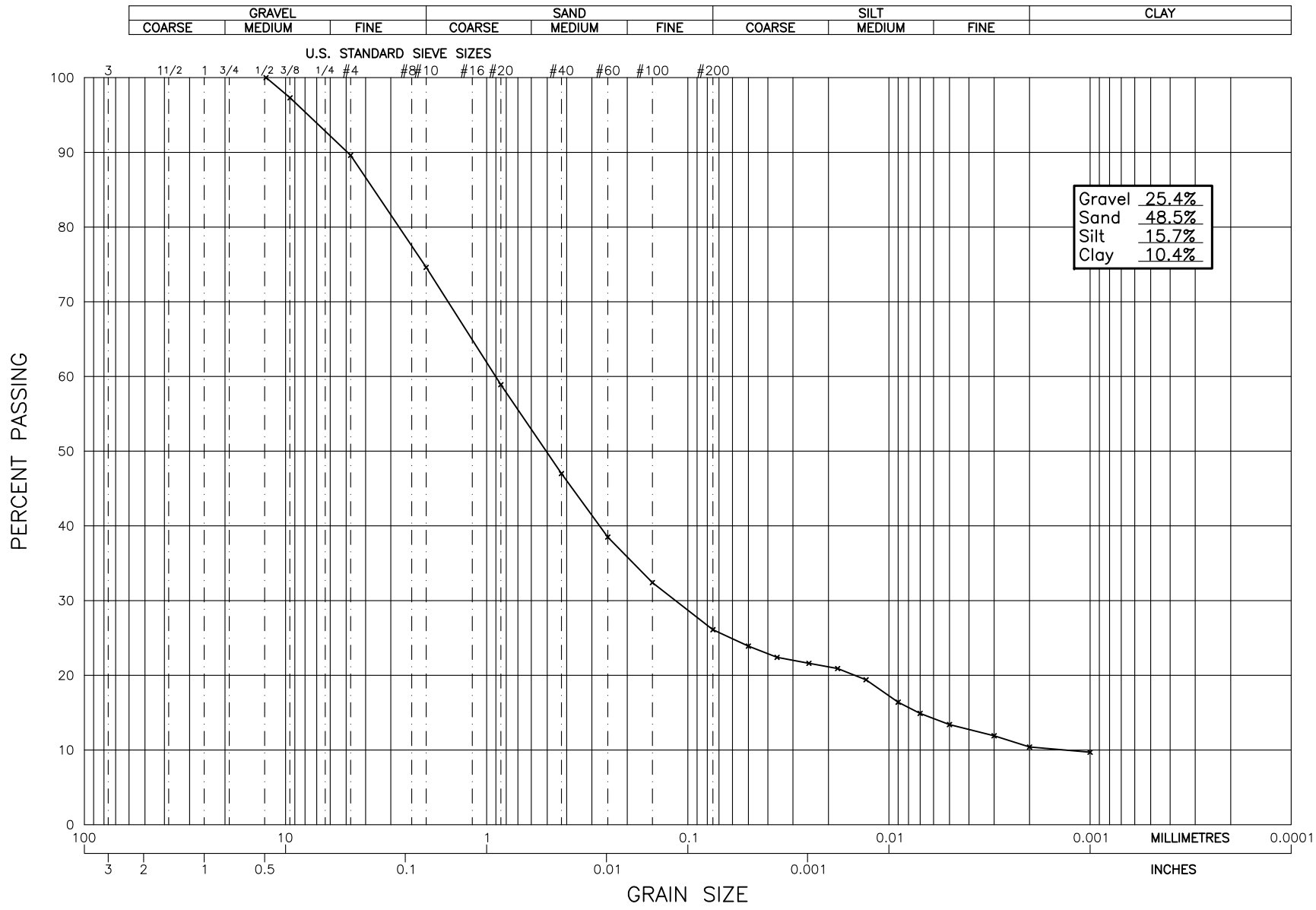


GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm	100.0	
1 1/2"	37.5 mm	87.1	
1"	25 mm		
3/4"	19 mm	84.1	
1/2"	12.5 mm	80.5	
3/8"	9.5 mm	77.6	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	69.2	
No. 10	2.00 mm	42.5	
No. 20	850 µm	27.1	
No. 40	425 µm	19.8	
No. 60	250 µm	15.4	
No. 100	150 µm	12.3	
No. 200	75 µm	8.8	

COMMENTS

Report System Software Registered to: GeoNorth Engineering, Prince George



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-42-S20

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH42-S20

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

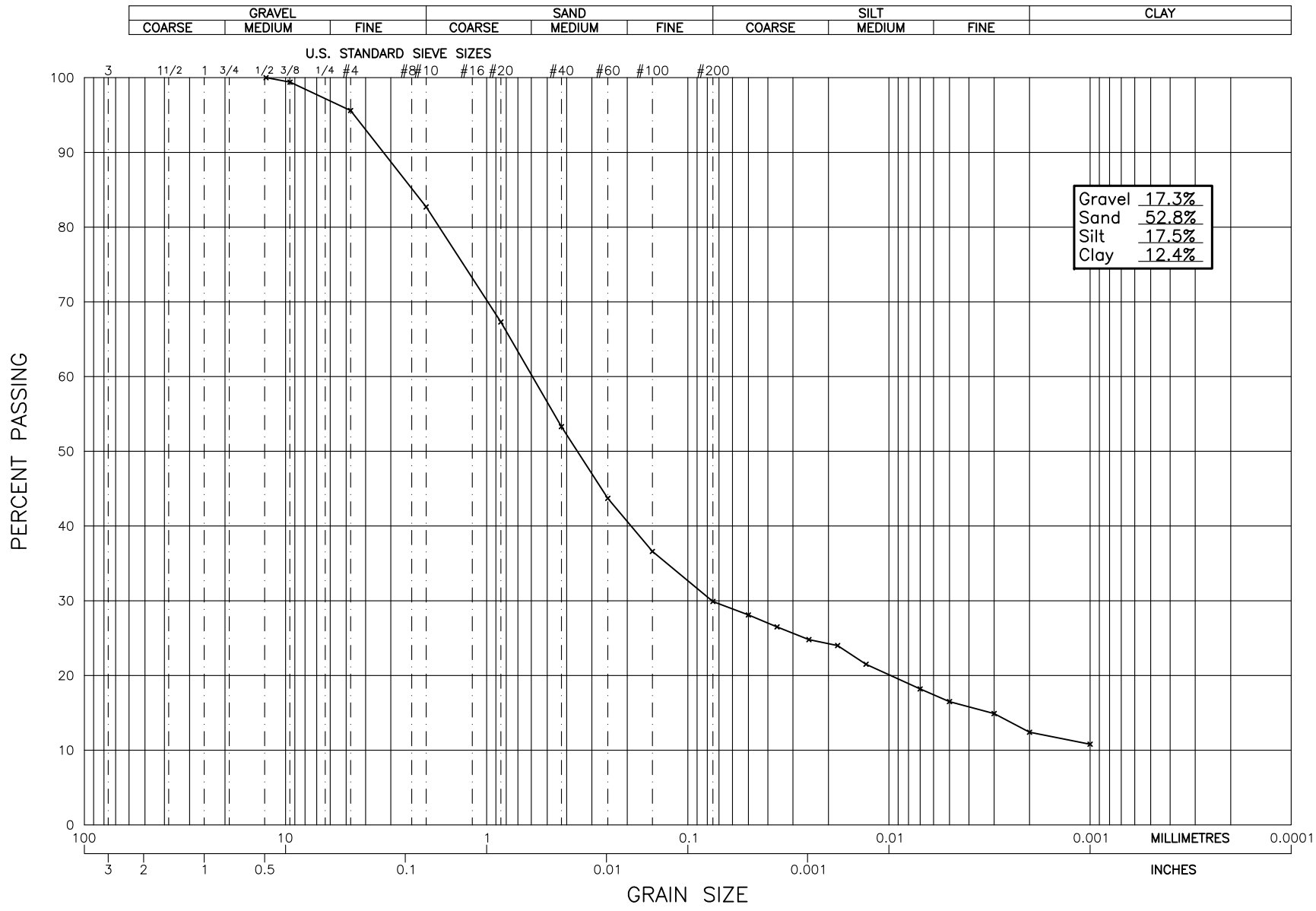
Client: BGC Engineering Ltd.				Date: November 8, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand,gravelly,some silt and clay
Sample #: **20**	Test #:	**Hole #: BH-BGC11-42**	**Depth: 19.7 - 20.0m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: July 30, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.8, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**74.6**
Wet Wt. & Tare	597.3	25.4				20	10.5	39.5	79.0	**58.9**
Dry Wt. & Tare	532.7	19.0				40	8.0	31.5	63.0	**47.0**
Water Wt.	64.6	12.5		353.5	**100.0**	60	5.7	25.8	51.6	**38.5**
Tare Wt.	179.2	9.5	9.6	343.9	**97.3**	100	4.1	21.7	43.4	**32.4**
Wt. Of Dry Soil	353.5	4.75	27.1	316.8	**89.6**	200	4.2	17.5	35.0	**26.1**
Moisture Content %	**18.3**	10	53.2	263.6	**74.6**	Pan	17.5			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	353.5			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.746	0.5	24.5	20.0	0.01365	17.5	13.4	5.178	0.071	35.0	**26.1**
50.0	0.746	1	23.0	20.0	0.01365	16.0	13.7	3.695	0.050	32.0	**23.9**
50.0	0.746	2	22.0	20.0	0.01365	15.0	13.8	2.629	0.036	30.0	**22.4**
50.0	0.746	4	21.5	20.0	0.01365	14.5	13.9	1.864	0.025	29.0	**21.6**
50.0	0.746	8	21.0	20.0	0.01365	14.0	14.0	1.322	0.018	28.0	**20.9**
50.0	0.746	15	20.0	20.0	0.01365	13.0	14.2	0.971	0.013	26.0	**19.4**
50.0	0.746	30	18.0	20.0	0.01365	11.0	14.5	0.695	0.009	22.0	**16.4**
50.0	0.746	60	17.0	20.0	0.01365	10.0	14.6	0.494	0.007	20.0	**14.9**
50.0	0.746	120	16.0	21.0	0.01348	9.0	14.8	0.351	0.005	18.0	**13.4**
50.0	0.746	240	15.0	21.0	0.01348	8.0	15.0	0.250	0.003	16.0	**11.9**
50.0	0.746	480	14.0	21.0	0.01348	7.0	15.1	0.178	0.002	14.0	**10.4**
50.0	0.746	1440	13.5	21.0	0.01348	6.5	15.2	0.103	0.001	13.0	**9.7**

Hydrometer #: 932452	Graduate #: 3	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-42-S22

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH42-S22

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

Client: BGC Engineering Ltd.				Date: November 8, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand, some gravel,silt,clay
Sample #: **22**	Test #:	**Hole #: BH-BGC11-42**	**Depth: 21.55 - 21.90m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: July 30, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.7, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**82.7**
Wet Wt. & Tare	653.2	25.4				20	9.3	40.7	81.4	**67.3**
Dry Wt. & Tare	576.8	19.0				40	8.5	32.2	64.4	**53.3**
Water Wt.	76.4	12.5		395.6	**100.0**	60	5.8	26.4	52.8	**43.7**
Tare Wt.	181.2	9.5	2.5	393.1	**99.4**	100	4.3	22.1	44.2	**36.6**
Wt. Of Dry Soil	395.6	4.75	14.8	378.3	**95.6**	200	4.0	18.1	36.2	**29.9**
Moisture Content %	**19.3**	10	51.1	327.2	**82.7**	Pan	18.1			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	395.6			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.827	0.5	25.0	20.0	0.01365	18.0	13.3	5.162	0.070	36.0	**29.8**
50.0	0.827	1	24.0	20.0	0.01365	17.0	13.5	3.673	0.050	34.0	**28.1**
50.0	0.827	2	23.0	20.0	0.01365	16.0	13.7	2.613	0.036	32.0	**26.5**
50.0	0.827	4	22.0	20.0	0.01365	15.0	13.8	1.859	0.025	30.0	**24.8**
50.0	0.827	8	21.5	20.0	0.01365	14.5	13.9	1.318	0.018	29.0	**24.0**
50.0	0.827	15	20.0	20.0	0.01365	13.0	14.2	0.971	0.013	26.0	**21.5**
50.0	0.827	30	20.0	20.0	0.01365	13.0	14.2	0.687	0.009	26.0	**21.5**
50.0	0.827	60	18.0	20.0	0.01365	11.0	14.5	0.491	0.007	22.0	**18.2**
50.0	0.827	120	17.0	21.0	0.01348	10.0	14.6	0.349	0.005	20.0	**16.5**
50.0	0.827	240	16.0	21.0	0.01348	9.0	14.8	0.248	0.003	18.0	**14.9**
50.0	0.827	480	14.5	21.0	0.01348	7.5	15.1	0.177	0.002	15.0	**12.4**
50.0	0.827	1440	13.5	21.0	0.01348	6.5	15.2	0.103	0.001	13.0	**10.8**

Hydrometer #: 932452	Graduate #: 2	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

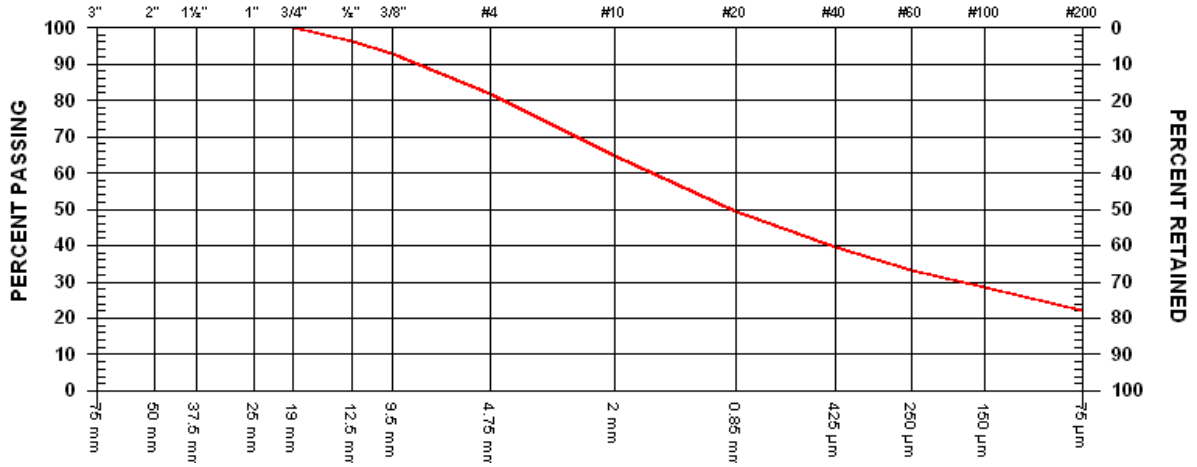
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 10 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.02 DATE SAMPLED 2011.Jul.30

SUPPLIER BH-BGC11-42
SOURCE SA#26 @ 27.60 - 28.0m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



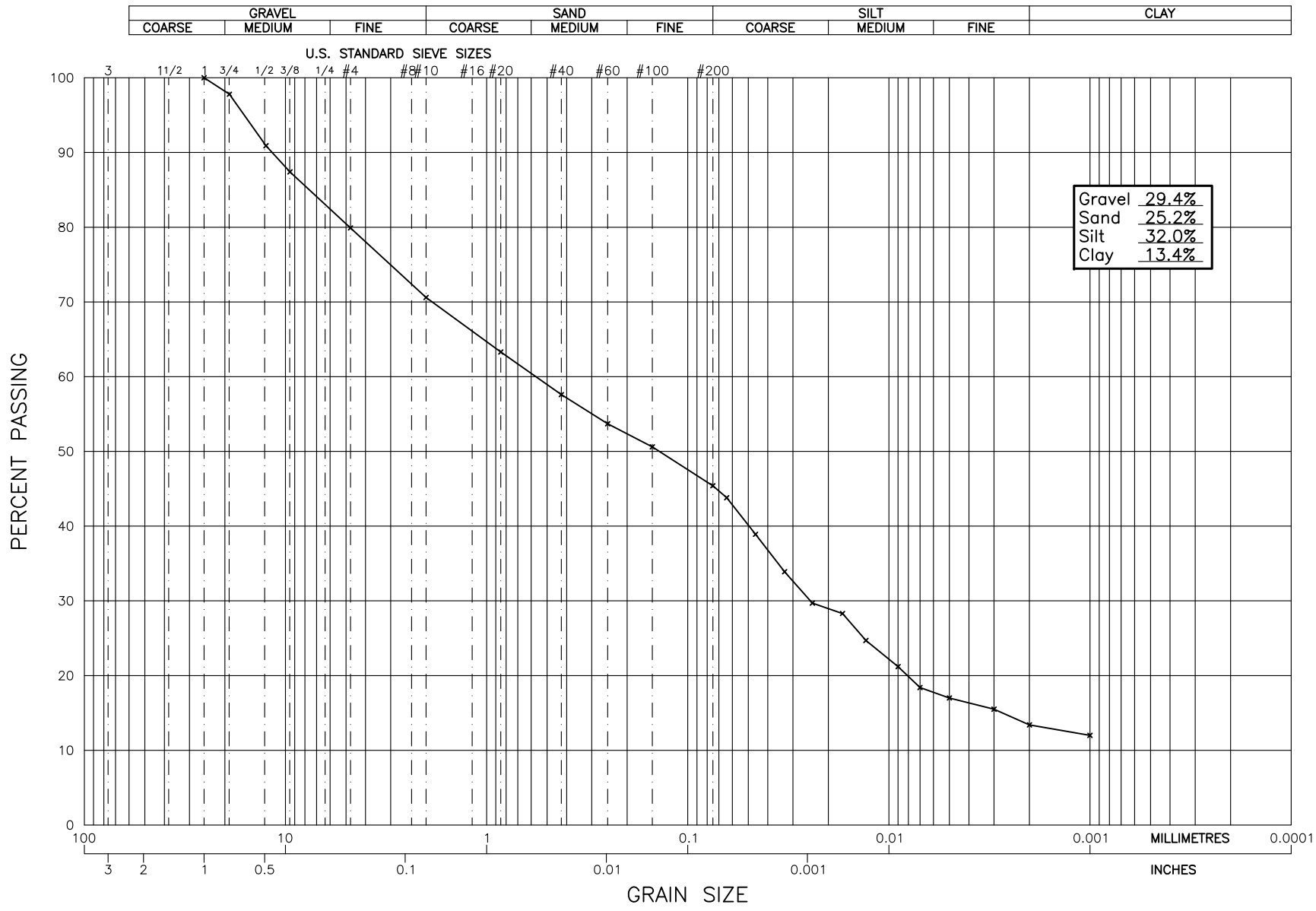
GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm	100.0	
1/2"	12.5 mm	96.4	
3/8"	9.5 mm	92.7	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	81.6	
No. 10	2.00 mm	64.9	
No. 20	850 µm	49.4	
No. 40	425 µm	39.7	
No. 60	250 µm	33.4	
No. 100	150 µm	28.5	
No. 200	75 µm	22.3	

COMMENTS

 2011.Nov.04 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-44-S1

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH44-S1

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

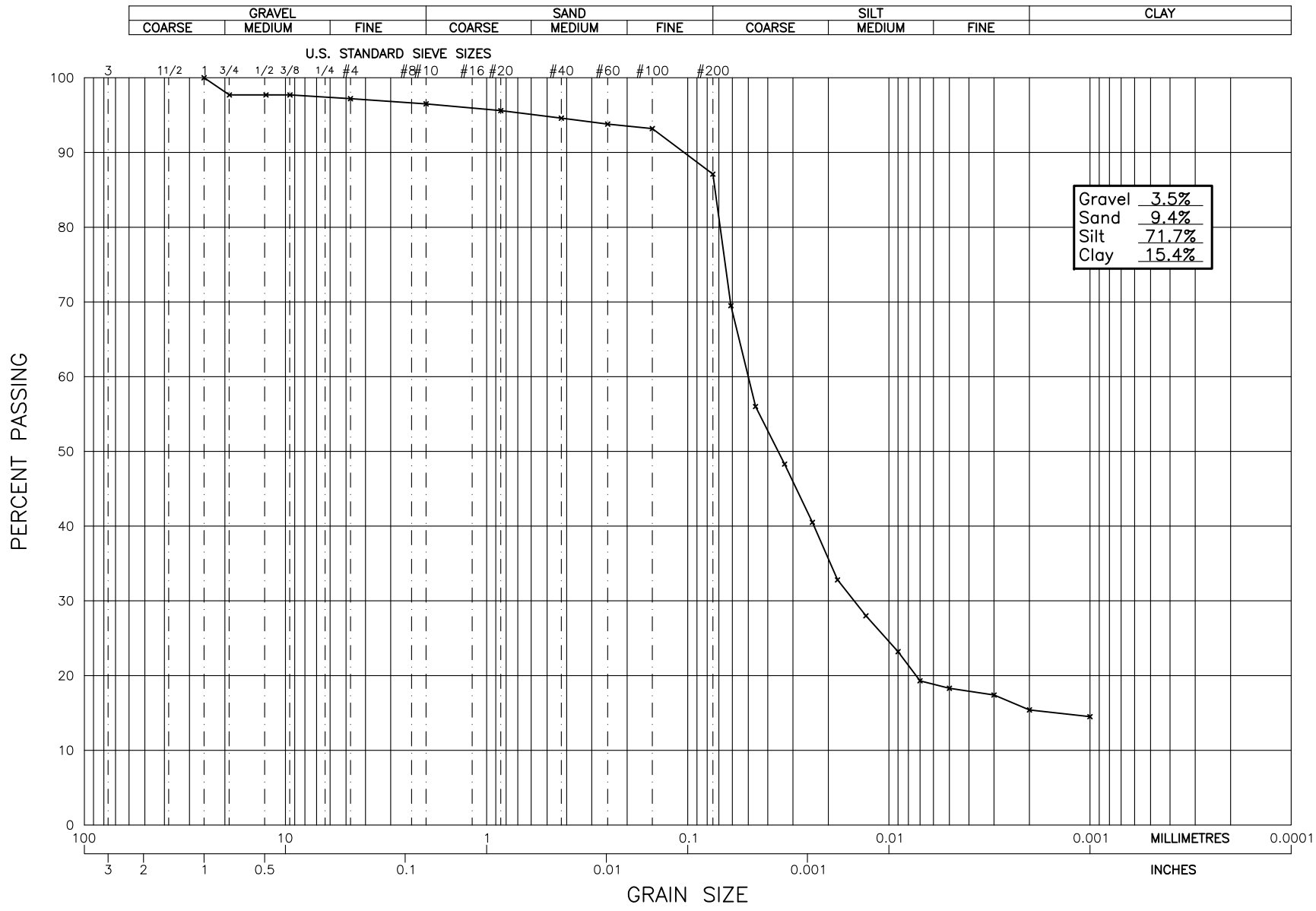
Client: BGC Engineering Inc.				Date: Sept.28, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt/Gravel/Sand,some clay
Sample #: **S1**	Test #:	**Hole #: BH-BGC11-44**	**Depth: 0.2 - 0.4m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 3, 2011	Date Received: September 13, 2011			Date Tested: Sept.27, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**70.6**
Wet Wt. & Tare	976.4	25.4		696.3	**100.0**	20	5.2	44.8	89.6	**63.3**
Dry Wt. & Tare	876.8	19.0	15.1	681.2	**97.8**	40	4.0	40.8	81.6	**57.6**
Water Wt.	99.6	12.5	48.2	633.0	**90.9**	60	2.8	38.0	76.0	**53.7**
Tare Wt.	180.5	9.5	24.5	608.5	**87.4**	100	2.2	35.8	71.6	**50.6**
Wt. Of Dry Soil	696.3	4.75	51.9	556.6	**79.9**	200	3.7	32.1	64.2	**45.4**
Moisture Content %	**14.3**	10	64.7	491.9	**70.6**	Pan	32.1			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	696.3			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.706	0.5	38.0	21.0	0.01348	31.0	11.2	4.729	0.064	62.0	**43.8**
50.0	0.706	1	34.5	21.0	0.01348	27.5	11.8	3.429	0.046	55.0	**38.9**
50.0	0.706	2	31.0	21.0	0.01348	24.0	12.3	2.483	0.033	48.0	**33.9**
50.0	0.706	4	28.0	21.0	0.01348	21.0	12.8	1.791	0.024	42.0	**29.7**
50.0	0.706	8	27.0	21.0	0.01348	20.0	13.0	1.275	0.017	40.0	**28.3**
50.0	0.706	15	24.5	21.0	0.01348	17.5	13.4	0.945	0.013	35.0	**24.7**
50.0	0.706	30	22.0	21.0	0.01348	15.0	13.8	0.679	0.009	30.0	**21.2**
50.0	0.706	60	20.0	21.0	0.01348	13.0	14.2	0.486	0.007	26.0	**18.4**
50.0	0.706	120	19.0	21.0	0.01348	12.0	14.3	0.345	0.005	24.0	**17.0**
50.0	0.706	240	18.0	21.0	0.01348	11.0	14.5	0.246	0.003	22.0	**15.5**
50.0	0.706	480	16.0	22.0	0.01332	9.5	14.7	0.175	0.002	19.0	**13.4**
50.0	0.706	1440	15.0	22.0	0.01332	8.5	14.9	0.102	0.001	17.0	**12.0**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-44-S3

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH44-S3

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

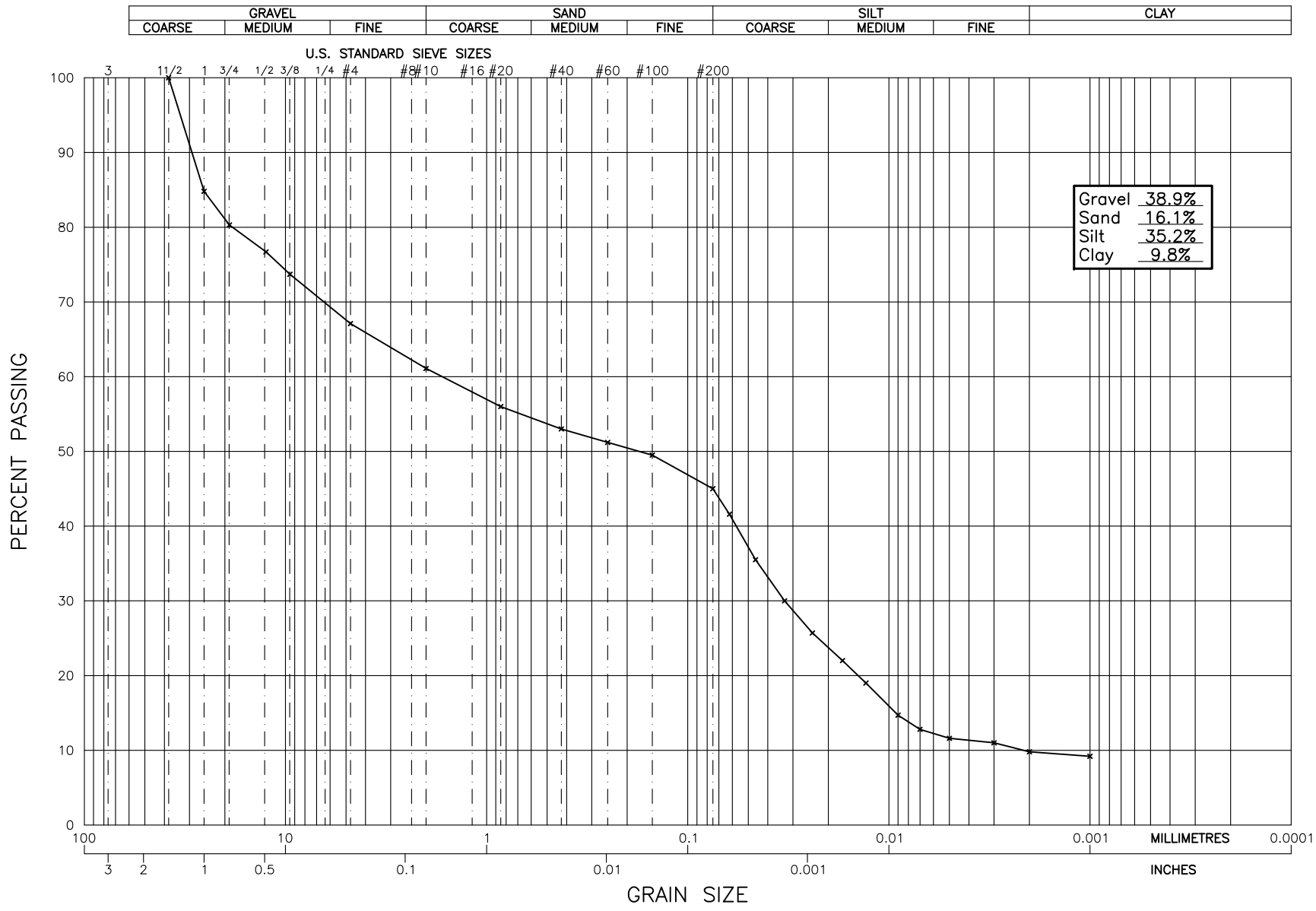
Client: BGC Engineering Inc.				Date: Sept.28, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt,clayey
Sample #: **S3**	Test #:	**Hole #: BH-BGC11-44**	**Depth: 1.6 - 2.0m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 3, 2011	Date Received: September 13, 2011			Date Tested: Sept.27, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**96.5**
Wet Wt. & Tare	1044.3	25.4		680.4	**100.0**	20	0.5	49.5	99.0	**95.6**
Dry Wt. & Tare	885.5	19.0	15.6	664.8	**97.7**	40	0.5	49.0	98.0	**94.6**
Water Wt.	158.8	12.5	0.0	664.8	**97.7**	60	0.4	48.6	97.2	**93.8**
Tare Wt.	205.1	9.5	0.0	664.8	**97.7**	100	0.3	48.3	96.6	**93.2**
Wt. Of Dry Soil	680.4	4.75	3.7	661.1	**97.2**	200	3.2	45.1	90.2	**87.1**
Moisture Content %	**23.3**	10	4.3	656.8	**96.5**	Pan	45.1			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	680.4			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.965	0.5	43.0	21.0	0.01348	36.0	10.4	4.551	0.061	72.0	**69.5**
50.0	0.965	1	36.0	21.0	0.01348	29.0	11.5	3.393	0.046	58.0	**56.0**
50.0	0.965	2	32.0	21.0	0.01348	25.0	12.2	2.467	0.033	50.0	**48.3**
50.0	0.965	4	28.0	21.0	0.01348	21.0	12.8	1.791	0.024	42.0	**40.5**
50.0	0.965	8	24.0	21.0	0.01348	17.0	13.5	1.299	0.018	34.0	**32.8**
50.0	0.965	15	21.5	21.0	0.01348	14.5	13.9	0.963	0.013	29.0	**28.0**
50.0	0.965	30	19.0	21.0	0.01348	12.0	14.3	0.691	0.009	24.0	**23.2**
50.0	0.965	60	17.0	21.0	0.01348	10.0	14.6	0.494	0.007	20.0	**19.3**
50.0	0.965	120	16.5	21.0	0.01348	9.5	14.7	0.350	0.005	19.0	**18.3**
50.0	0.965	240	16.0	21.0	0.01348	9.0	14.8	0.248	0.003	18.0	**17.4**
50.0	0.965	480	14.5	22.0	0.01332	8.0	15.0	0.177	0.002	16.0	**15.4**
50.0	0.965	1440	14.0	22.0	0.01332	7.5	15.1	0.102	0.001	15.0	**14.5**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-44-S5

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH44-S5

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

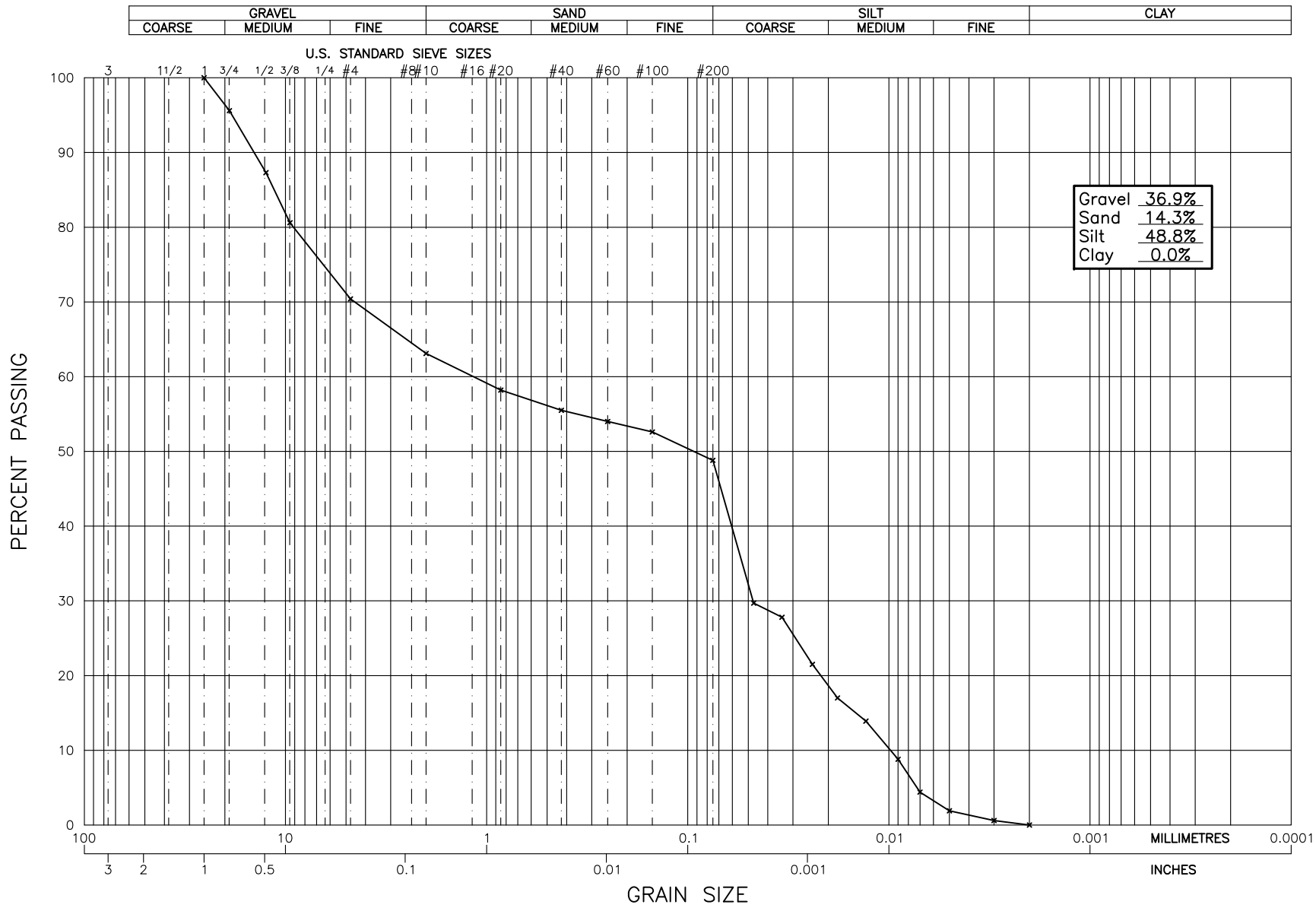
Client: BGC Engineering Inc.				Date: Sept.28, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel,silty
Sample #: **S5**	Test #:	**Hole #: BH-BGC11-44**	**Depth: 4.8 - 5.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 3, 2011	Date Received: September 13, 2011			Date Tested: Sept.27, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		1268.4	**100.0**	10		50.0	100.0	**61.1**
Wet Wt. & Tare	1634.4	25.4	193.1	1075.3	**84.8**	20	4.2	45.8	91.6	**56.0**
Dry Wt. & Tare	1461.3	19.0	57.0	1018.3	**80.3**	40	2.5	43.3	86.6	**53.0**
Water Wt.	173.1	12.5	45.6	972.7	**76.7**	60	1.4	41.9	83.8	**51.2**
Tare Wt.	192.9	9.5	37.9	934.8	**73.7**	100	1.4	40.5	81.0	**49.5**
Wt. Of Dry Soil	1268.4	4.75	83.5	851.3	**67.1**	200	3.7	36.8	73.6	**45.0**
Moisture Content %	**13.6**	10	75.7	775.6	**61.1**	Pan	36.8			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	1268.4			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.611	0.5	41.0	21.0	0.01348	34.0	10.7	4.623	0.062	68.0	**41.6**
50.0	0.611	1	36.0	21.0	0.01348	29.0	11.5	3.393	0.046	58.0	**35.5**
50.0	0.611	2	31.5	21.0	0.01348	24.5	12.3	2.475	0.033	49.0	**30.0**
50.0	0.611	4	28.0	21.0	0.01348	21.0	12.8	1.791	0.024	42.0	**25.7**
50.0	0.611	8	25.0	21.0	0.01348	18.0	13.3	1.291	0.017	36.0	**22.0**
50.0	0.611	15	22.5	21.0	0.01348	15.5	13.7	0.957	0.013	31.0	**19.0**
50.0	0.611	30	19.0	21.0	0.01348	12.0	14.3	0.691	0.009	24.0	**14.7**
50.0	0.611	60	17.5	21.0	0.01348	10.5	14.6	0.493	0.007	21.0	**12.8**
50.0	0.611	120	16.5	21.0	0.01348	9.5	14.7	0.350	0.005	19.0	**11.6**
50.0	0.611	240	16.0	21.0	0.01348	9.0	14.8	0.248	0.003	18.0	**11.0**
50.0	0.611	480	14.5	22.0	0.01332	8.0	15.0	0.177	0.002	16.0	**9.8**
50.0	0.611	1440	14.0	22.0	0.01332	7.5	15.1	0.102	0.001	15.0	**9.2**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

Noelco



GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-44-S7

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH44-S7

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

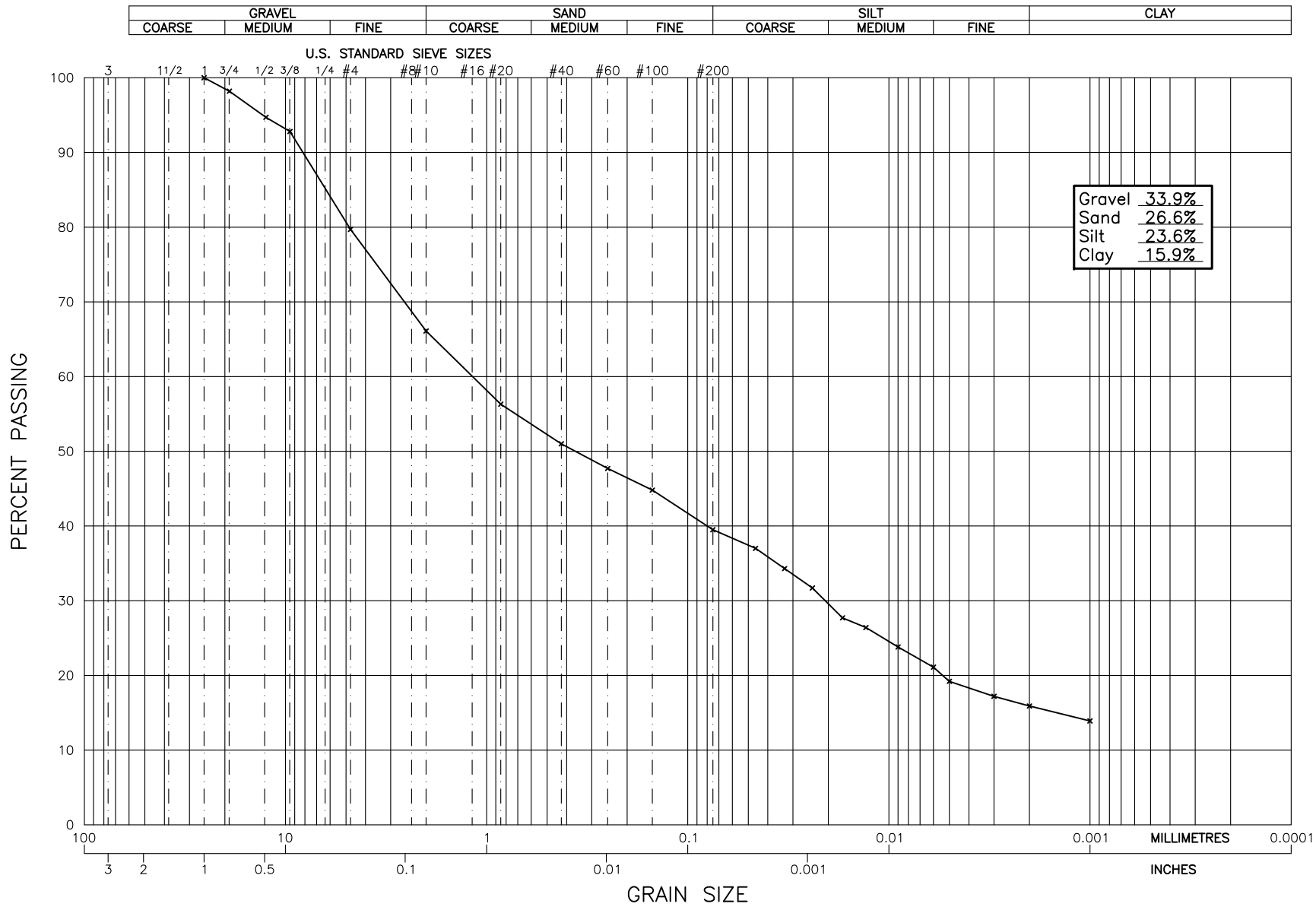
Client: BGC Engineering Inc.				Date: Sept.29, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt/Gravel,some sand
Sample #: **S7**	Test #:	**Hole #: BH-BGC11-44**	**Depth: 6.3 - 6.6m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 3, 2011	Date Received: September 13, 2011			Date Tested: Sept.28, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**63.1**
Wet Wt. & Tare	1543.7	25.4		1089.2	**100.0**	20	3.9	46.1	92.2	**58.2**
Dry Wt. & Tare	1280.7	19.0	48.1	1041.1	**95.6**	40	2.1	44.0	88.0	**55.5**
Water Wt.	263.0	12.5	90.3	950.8	**87.3**	60	1.2	42.8	85.6	**54.0**
Tare Wt.	191.5	9.5	72.9	877.9	**80.6**	100	1.1	41.7	83.4	**52.6**
Wt. Of Dry Soil	1089.2	4.75	110.6	767.3	**70.4**	200	3.0	38.7	77.4	**48.8**
Moisture Content %	**24.1**	10	80.1	687.2	**63.1**	Pan	38.7			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	1089.2			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.631	0.5	35.0	22.0	0.01332	28.5	11.6	4.815	0.064	57.0	**36.0**
50.0	0.631	1	30.0	22.0	0.01332	23.5	12.4	3.524	0.047	47.0	**29.7**
50.0	0.631	2	28.5	22.0	0.01332	22.0	12.7	2.516	0.034	44.0	**27.8**
50.0	0.631	4	23.5	22.0	0.01332	17.0	13.5	1.836	0.024	34.0	**21.5**
50.0	0.631	8	20.0	22.0	0.01332	13.5	14.1	1.326	0.018	27.0	**17.0**
50.0	0.631	15	17.5	22.0	0.01332	11.0	14.5	0.983	0.013	22.0	**13.9**
50.0	0.631	30	13.5	22.0	0.01332	7.0	15.1	0.710	0.009	14.0	**8.8**
50.0	0.631	60	10.0	22.0	0.01332	3.5	15.7	0.512	0.007	7.0	**4.4**
50.0	0.631	120	8.0	22.0	0.01332	1.5	16.0	0.366	0.005	3.0	**1.9**
50.0	0.631	240	6.5	24.0	0.01301	0.5	16.2	0.260	0.003	1.0	**0.6**
50.0	0.631	480	6.0	24.0	0.01301	0.0	16.3	0.184	0.002	0.0	**0.0**
50.0	0.631	1440	6.0	24.0	0.01301	0.0	16.3	0.106	0.001	0.0	**0.0**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-44-S11

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH44-S11

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

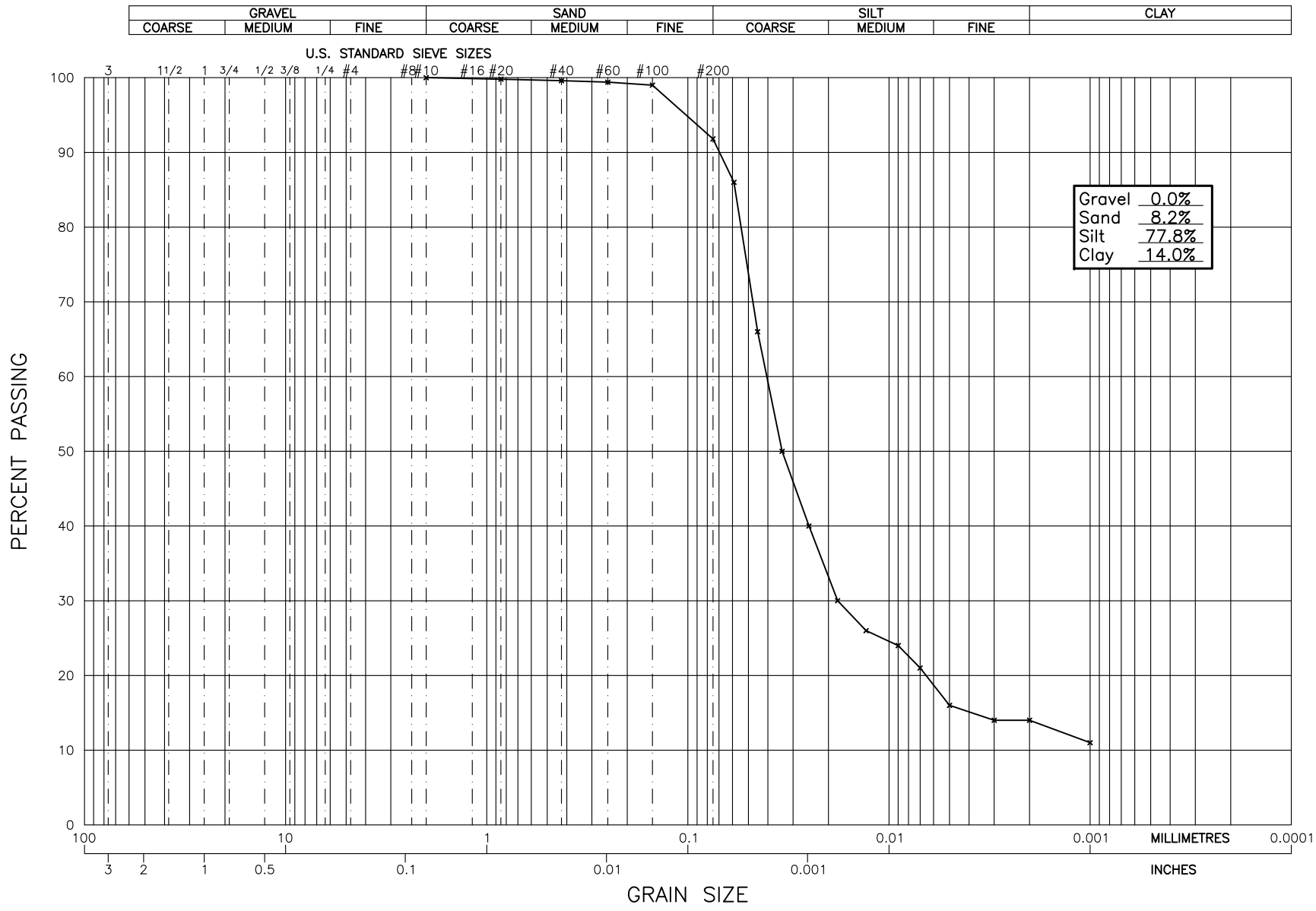
Client: BGC Engineering Inc.				Date: Sept.28, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type:Gravel,sandy,silty,some clay
Sample #: **S11**	Test #:	**Hole #: Bh-BGC11-44**	**Depth: 9.6 - 9.9m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: August 3, 2011	Date Received: September 13, 2011			Date Tested: Sept.27, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**66.1**
Wet Wt. & Tare	1079.5	25.4		771.2	**100.0**	20	7.4	42.6	85.2	**56.3**
Dry Wt. & Tare	950.9	19.0	13.7	757.5	**98.2**	40	4.0	38.6	77.2	**51.0**
Water Wt.	128.6	12.5	27.1	730.4	**94.7**	60	2.5	36.1	72.2	**47.7**
Tare Wt.	179.7	9.5	14.6	715.8	**92.8**	100	2.2	33.9	67.8	**44.8**
Wt. Of Dry Soil	771.2	4.75	101.2	614.6	**79.7**	200	4.0	29.9	59.8	**39.5**
Moisture Content %	**16.7**	10	105.2	509.4	**66.1**	Pan	29.9			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	771.2			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.661	0.5	36.5	21.0	0.01348	29.5	11.4	4.781	0.064	59.0	**39.0**
50.0	0.661	1	35.0	21.0	0.01348	28.0	11.7	3.417	0.046	56.0	**37.0**
50.0	0.661	2	33.0	21.0	0.01348	26.0	12.0	2.450	0.033	52.0	**34.3**
50.0	0.661	4	31.0	21.0	0.01348	24.0	12.3	1.756	0.024	48.0	**31.7**
50.0	0.661	8	28.0	21.0	0.01348	21.0	12.8	1.266	0.017	42.0	**27.7**
50.0	0.661	15	27.0	21.0	0.01348	20.0	13.0	0.931	0.013	40.0	**26.4**
50.0	0.661	30	25.0	21.0	0.01348	18.0	13.3	0.666	0.009	36.0	**23.8**
50.0	0.661	60	23.0	21.0	0.01348	16.0	13.7	0.477	0.006	32.0	**21.1**
50.0	0.661	120	21.5	21.0	0.01348	14.5	13.9	0.340	0.005	29.0	**19.2**
50.0	0.661	240	20.0	21.0	0.01348	13.0	14.2	0.243	0.003	26.0	**17.2**
50.0	0.661	480	18.5	22.0	0.01332	12.0	14.3	0.173	0.002	24.0	**15.9**
50.0	0.661	1440	17.0	22.0	0.01332	10.5	14.6	0.101	0.001	21.0	**13.9**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-47-G4

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH47-G3

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

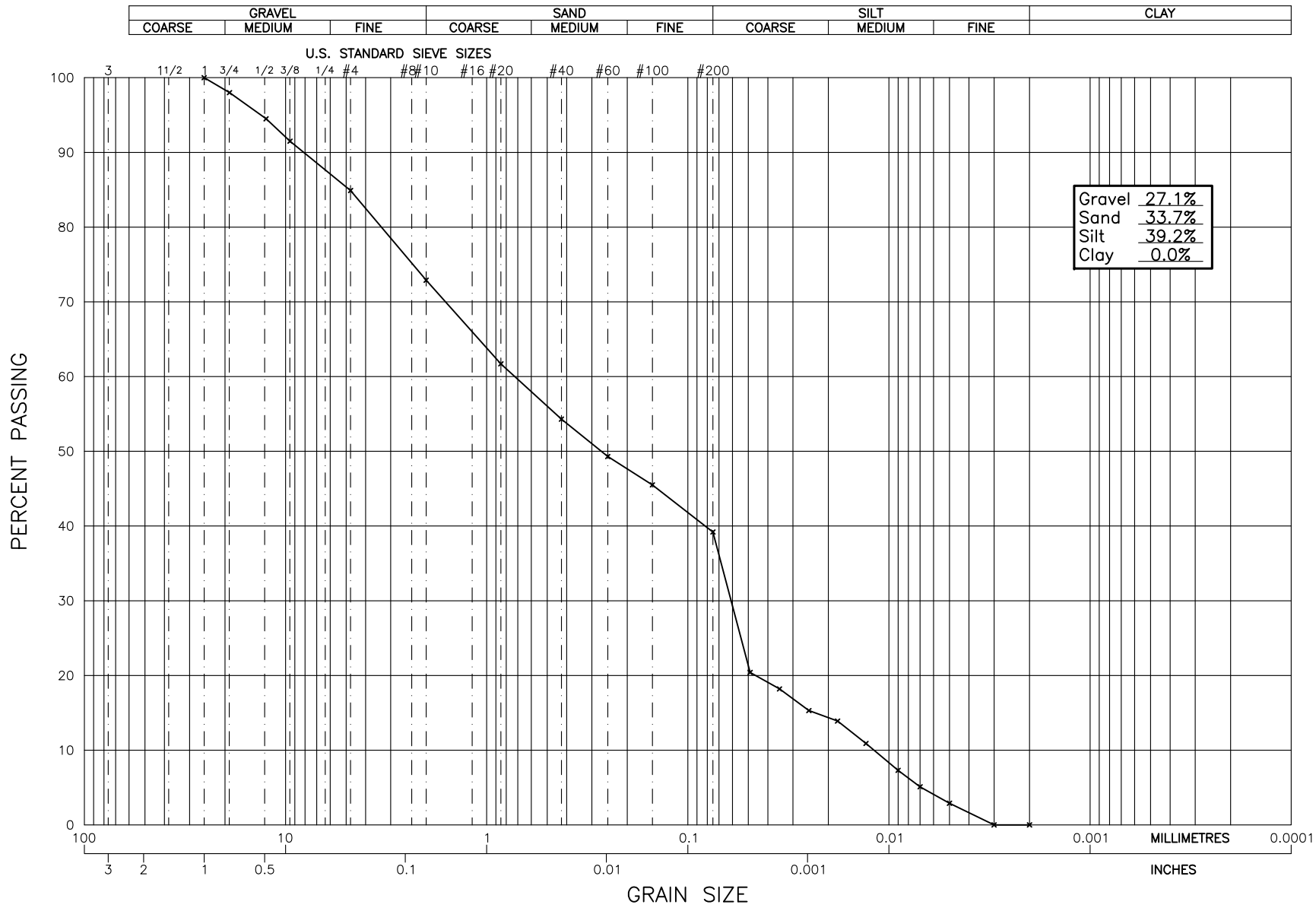
Client: BGC Engineering Ltd.				Date: Sept. 27, 2011
Project Name: Eagle Gold Soil and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt, some clay
Sample #: **G3**	Test #:	**Hole #: BH-BGC11-47**	**Depth: 2.0 - 2.27m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 4, 2011	Date Received: September 13, 2011			Date Tested: Sept.26, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**100.0**
Wet Wt. & Tare	924.7	25.4				20	0.1	49.9	99.8	**99.8**
Dry Wt. & Tare	764.9	19.0				40	0.1	49.8	99.6	**99.6**
Water Wt.	159.8	12.5				60	0.1	49.7	99.4	**99.4**
Tare Wt.	181.1	9.5				100	0.2	49.5	99.0	**99.0**
Wt. Of Dry Soil	583.8	4.75				200	3.6	45.9	91.8	**91.8**
Moisture Content %	**27.4**	10		583.8	**100.0**	Pan	45.9			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	583.8			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	1.000	0.5	50.0	20.0	0.01365	43.0	9.2	4.290	0.059	86.0	**86.0**
50.0	1.000	1	40.0	20.0	0.01365	33.0	10.9	3.294	0.045	66.0	**66.0**
50.0	1.000	2	32.0	20.0	0.01365	25.0	12.2	2.467	0.034	50.0	**50.0**
50.0	1.000	4	27.0	20.0	0.01365	20.0	13.0	1.802	0.025	40.0	**40.0**
50.0	1.000	8	22.0	20.0	0.01365	15.0	13.8	1.314	0.018	30.0	**30.0**
50.0	1.000	15	20.0	20.0	0.01365	13.0	14.2	0.971	0.013	26.0	**26.0**
50.0	1.000	30	19.0	20.0	0.01365	12.0	14.3	0.691	0.009	24.0	**24.0**
50.0	1.000	60	17.5	20.0	0.01365	10.5	14.6	0.493	0.007	21.0	**21.0**
50.0	1.000	120	15.0	20.0	0.01365	8.0	15.0	0.353	0.005	16.0	**16.0**
50.0	1.000	240	14.0	20.0	0.01365	7.0	15.1	0.251	0.003	14.0	**14.0**
50.0	1.000	480	13.0	23.0	0.01317	7.0	15.1	0.178	0.002	14.0	**14.0**
50.0	1.000	1440	12.5	21.0	0.01348	5.5	15.4	0.103	0.001	11.0	**11.0**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-47-G10

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH47-G10

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

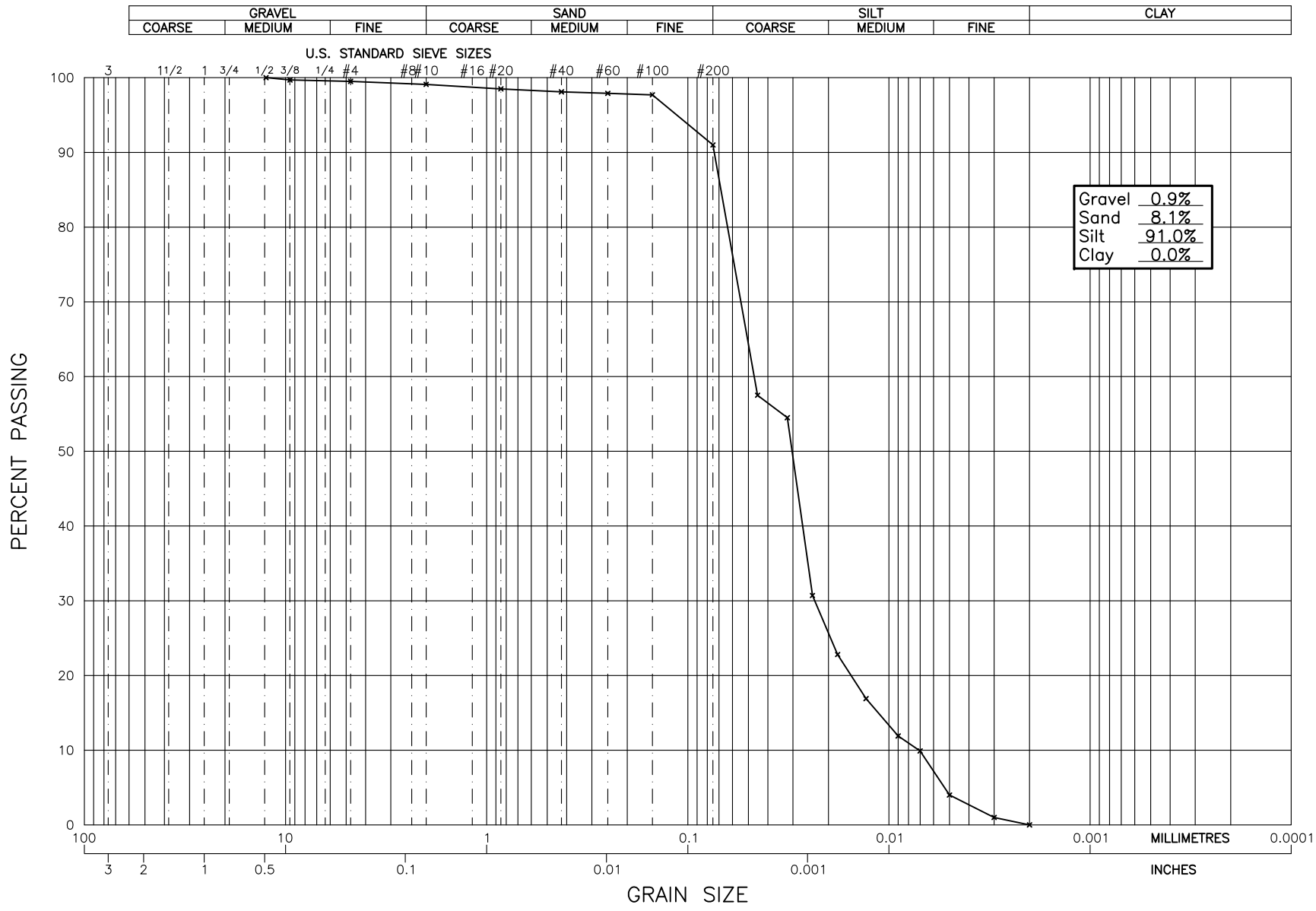
Client: BGC Engineering Ltd.				Date: Sept. 26, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt/Sand/Gravel
Sample #: **G10**	Test #:	**Hole #: BH-BGC11-47**	**Depth: 11.8 - 12.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 4, 2011	Date Received: September 13, 2011			Date Tested: Sept. 23, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**72.9**
Wet Wt. & Tare	1089.1	25.4		814.4	**100.0**	20	7.7	42.3	84.6	**61.7**
Dry Wt. & Tare	995.9	19.0	15.9	798.5	**98.0**	40	5.1	37.2	74.4	**54.3**
Water Wt.	93.2	12.5	29.1	769.4	**94.5**	60	3.4	33.8	67.6	**49.3**
Tare Wt.	181.5	9.5	23.9	745.5	**91.5**	100	2.6	31.2	62.4	**45.5**
Wt. Of Dry Soil	814.4	4.75	54.0	691.5	**84.9**	200	4.3	26.9	53.8	**39.2**
Moisture Content %	**11.4**	10	97.6	593.9	**72.9**	Pan	26.9			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	814.4			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.729	0.5	25.0	23.0	0.01317	19.0	13.2	5.130	0.068	38.0	**27.7**
50.0	0.729	1	20.0	23.0	0.01317	14.0	14.0	3.740	0.049	28.0	**20.4**
50.0	0.729	2	18.5	23.0	0.01317	12.5	14.2	2.668	0.035	25.0	**18.2**
50.0	0.729	4	16.5	23.0	0.01317	10.5	14.6	1.908	0.025	21.0	**15.3**
50.0	0.729	8	15.5	23.0	0.01317	9.5	14.7	1.357	0.018	19.0	**13.9**
50.0	0.729	15	13.5	23.0	0.01317	7.5	15.1	1.002	0.013	15.0	**10.9**
50.0	0.729	30	11.0	23.0	0.01317	5.0	15.5	0.718	0.009	10.0	**7.3**
50.0	0.729	60	9.5	23.0	0.01317	3.5	15.7	0.512	0.007	7.0	**5.1**
50.0	0.729	120	8.0	23.0	0.01317	2.0	16.0	0.365	0.005	4.0	**2.9**
50.0	0.729	240	6.0	23.0	0.01317	0.0	16.3	0.261	0.003	0.0	**0.0**
50.0	0.729	480	6.0	23.0	0.01317	0.0	16.3	0.184	0.002	0.0	**0.0**
50.0	0.729	1469	6.0	23.0	0.01317	0.0	16.3	0.105	0.001	0.0	**0.0**

Hydrometer #: 932452	23	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-47-SPT1

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH47-SPT1

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

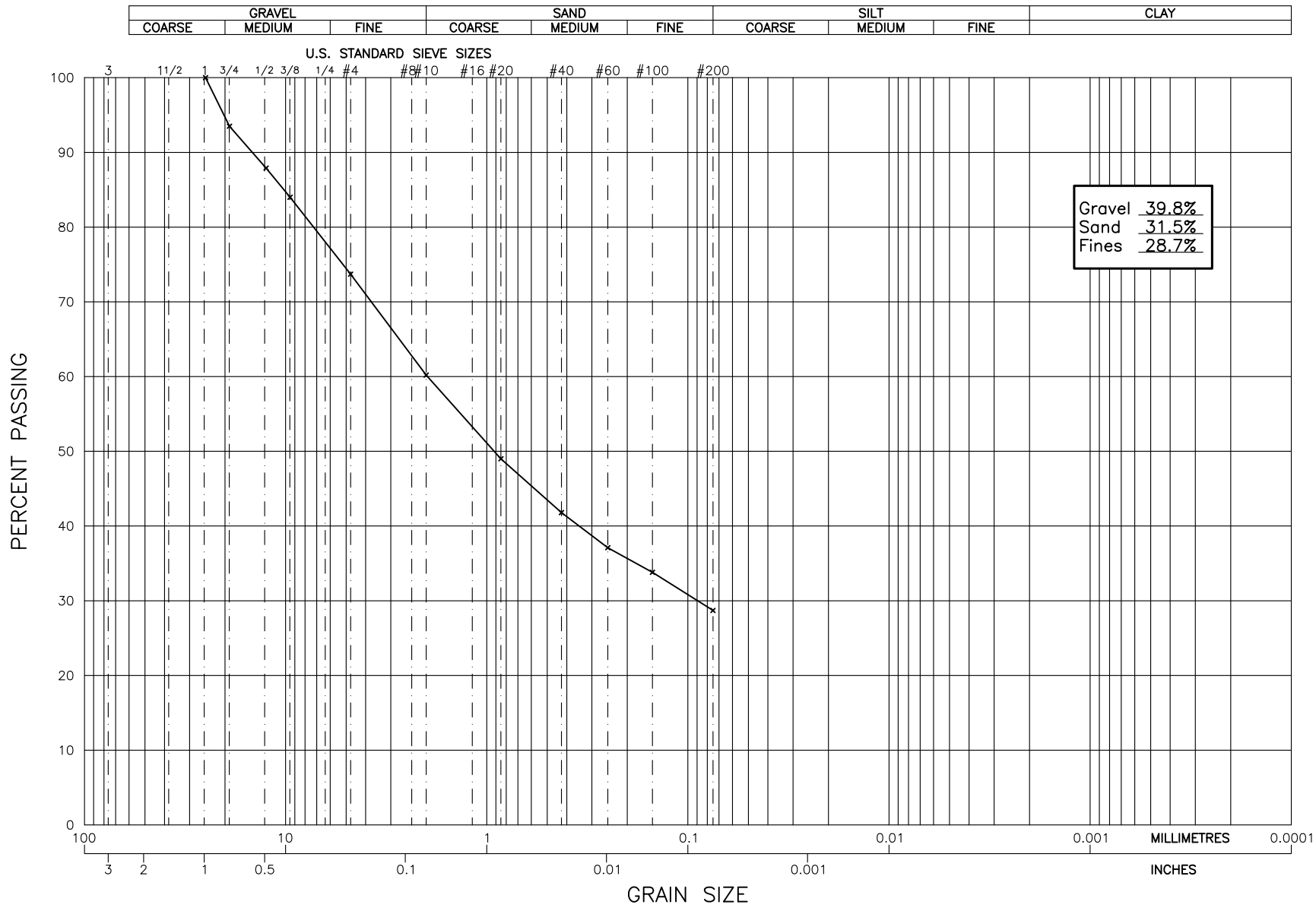
Client: BGC Engineering Ltd.				Date: Sept. 26, 2011
Project Name: Eagle Gold Soil and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt
Sample #: SPT1	Test #:	**Hole #: BH-BGC11-47**	**Depth: 0.75 - 1.2m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 4, 2011	Date Received: September 13, 2011			Date Tested: Sept.23, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**99.1**
Wet Wt. & Tare	894.6	25.4				20	0.3	49.7	99.4	**98.5**
Dry Wt. & Tare	747.3	19.0				40	0.2	49.5	99.0	**98.1**
Water Wt.	147.3	12.5		566.9	**100.0**	60	0.1	49.4	98.8	**97.9**
Tare Wt.	180.4	9.5	1.7	565.2	**99.7**	100	0.1	49.3	98.6	**97.7**
Wt. Of Dry Soil	566.9	4.75	1.4	563.8	**99.5**	200	3.4	45.9	91.8	**91.0**
Moisture Content %	**26.0**	10	1.8	562.0	**99.1**	Pan	45.9			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	566.9			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.991	0.5	42.0	23.0	0.01317	36.0	10.4	4.551	0.060	72.0	**71.4**
50.0	0.991	1	35.0	23.0	0.01317	29.0	11.5	3.393	0.045	58.0	**57.5**
50.0	0.991	2	33.5	23.0	0.01317	27.5	11.8	2.425	0.032	55.0	**54.5**
50.0	0.991	4	21.5	23.0	0.01317	15.5	13.7	1.853	0.024	31.0	**30.7**
50.0	0.991	8	17.5	23.0	0.01317	11.5	14.4	1.342	0.018	23.0	**22.8**
50.0	0.991	15	14.5	23.0	0.01317	8.5	14.9	0.996	0.013	17.0	**16.9**
50.0	0.991	30	12.0	23.0	0.01317	6.0	15.3	0.714	0.009	12.0	**11.9**
50.0	0.991	60	11.0	23.0	0.01317	5.0	15.5	0.508	0.007	10.0	**9.9**
50.0	0.991	120	8.0	23.0	0.01317	2.0	16.0	0.365	0.005	4.0	**4.0**
50.0	0.991	240	6.5	23.0	0.01317	0.5	16.2	0.260	0.003	1.0	**1.0**
50.0	0.991	480	6.0	23.0	0.01317	0.0	16.3	0.184	0.002	0.0	**0.0**
50.0	0.991	1464	6.0	23.0	0.01317	0.0	16.3	0.106	0.001	0.0	**0.0**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-47-SPT4

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH47-SPT4

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 630 - 1718 Argyle Street
Halifax, Nova Scotia
B3J 3N6

ATTN: Peter Quinn

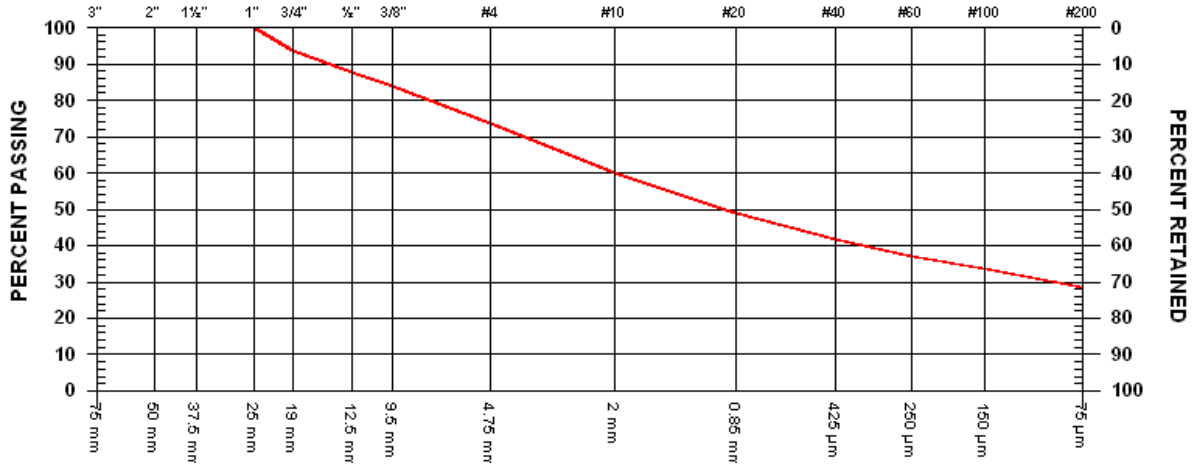
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 3 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Sep.21 DATE SAMPLED 2011.Aug.04

SUPPLIER BH-BGC11-47-SPT4
SOURCE 5.33 - 5.88m
SPECIFICATION
MATERIAL TYPE Sand/Silt

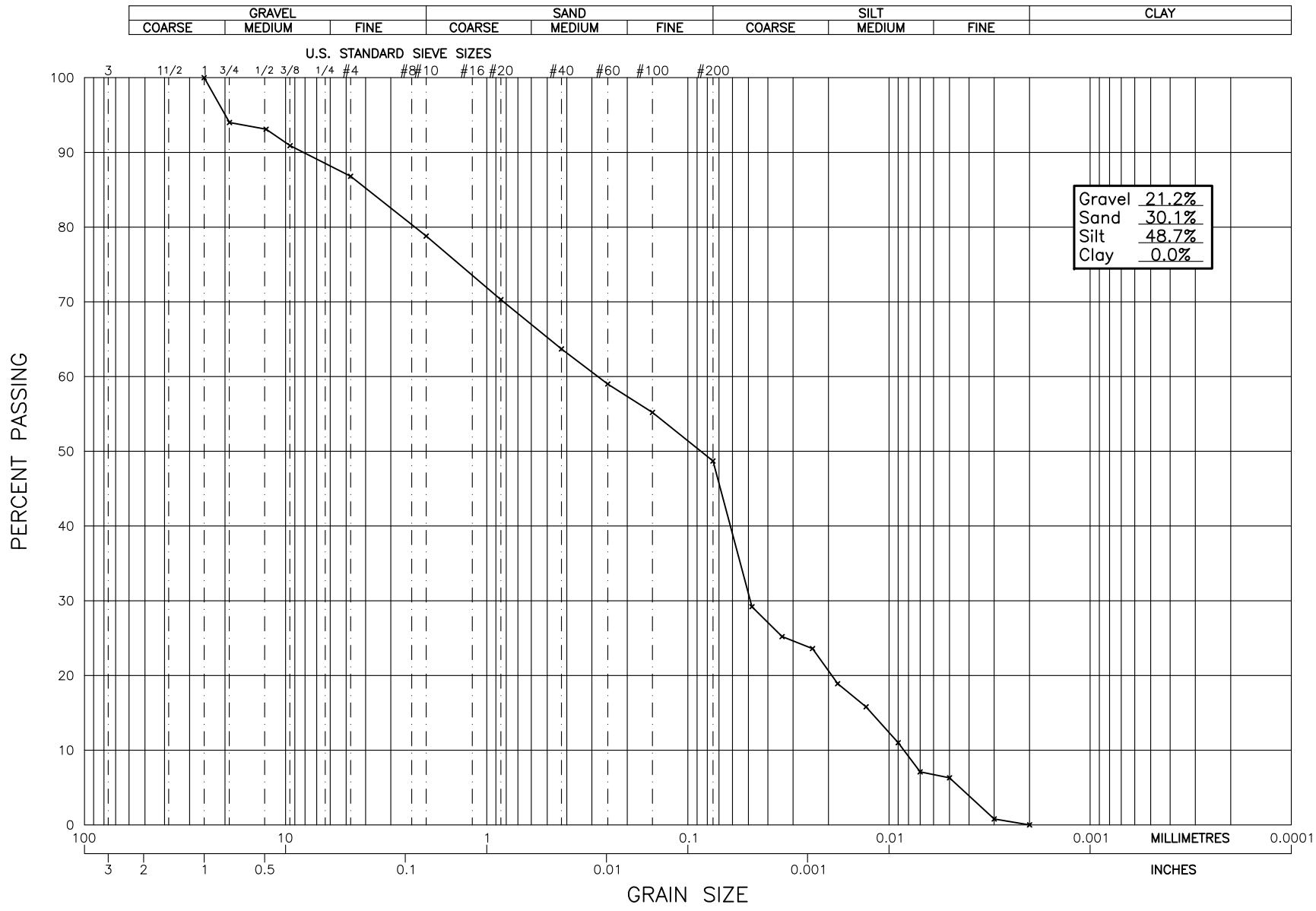
SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm	100.0	
3/4"	19 mm	93.5	
1/2"	12.5 mm	87.9	
3/8"	9.5 mm	84.0	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	73.7	
No. 10	2.00 mm	60.2	
No. 20	850 µm	49.0	
No. 40	425 µm	41.8	
No. 60	250 µm	37.1	
No. 100	150 µm	33.8	
No. 200	75 µm	28.7	

COMMENTS



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-47-SPT6

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH47-SPT6

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

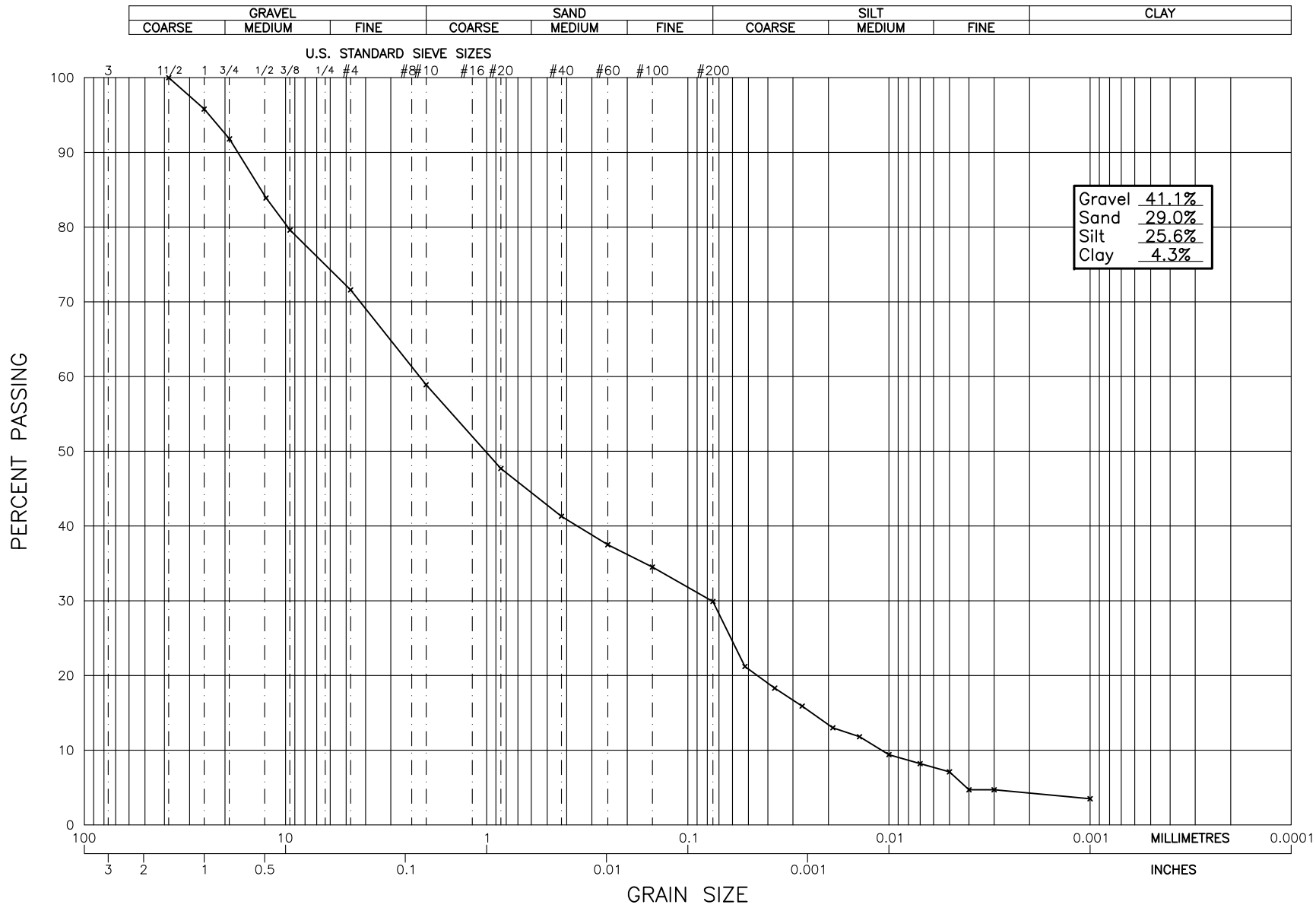
Client: BGC Engineering Ltd.				Date: Sept.26, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt and Sand, gravelly
Sample #: SPT6	Test #:	**Hole #: BH-BGC11-47**	**Depth: 8.38 - 8.58m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 4, 2011	Date Received: September 13, 2011			Date Tested: Sept.21, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**78.8**
Wet Wt. & Tare	583.9	25.4		349.8	**100.0**	20	5.4	44.6	89.2	**70.3**
Dry Wt. & Tare	542.7	19.0	21.0	328.8	**94.0**	40	4.2	40.4	80.8	**63.7**
Water Wt.	41.2	12.5	3.1	325.7	**93.1**	60	3.0	37.4	74.8	**59.0**
Tare Wt.	192.9	9.5	7.7	318.0	**90.9**	100	2.4	35.0	70.0	**55.2**
Wt. Of Dry Soil	349.8	4.75	14.5	303.5	**86.8**	200	4.1	30.9	61.8	**48.7**
Moisture Content %	**11.8**	10	27.8	275.7	**78.8**	Pan	30.9			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	349.8			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.788	0.5	28.0	23.0	0.01317	22.0	12.7	5.033	0.066	44.0	**34.7**
50.0	0.788	1	24.5	23.0	0.01317	18.5	13.2	3.639	0.048	37.0	**29.2**
50.0	0.788	2	22.0	23.0	0.01317	16.0	13.7	2.613	0.034	32.0	**25.2**
50.0	0.788	4	21.0	23.0	0.01317	15.0	13.8	1.859	0.024	30.0	**23.6**
50.0	0.788	8	18.0	23.0	0.01317	12.0	14.3	1.338	0.018	24.0	**18.9**
50.0	0.788	15	16.0	23.0	0.01317	10.0	14.6	0.988	0.013	20.0	**15.8**
50.0	0.788	30	13.0	23.0	0.01317	7.0	15.1	0.710	0.009	14.0	**11.0**
50.0	0.788	60	10.5	23.0	0.01317	4.5	15.6	0.509	0.007	9.0	**7.1**
50.0	0.788	120	10.5	22.0	0.01332	4.0	15.6	0.361	0.005	8.0	**6.3**
50.0	0.788	240	7.0	22.0	0.01332	0.5	16.2	0.260	0.003	1.0	**0.8**
50.0	0.788	480	6.5	22.0	0.01332	0.0	16.3	0.184	0.002	0.0	**0.0**
50.0	0.788	1440	6.5	22.0	0.01332	0.0	16.3	0.106	0.001	0.0	**0.0**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-49-G4

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH49-G4

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

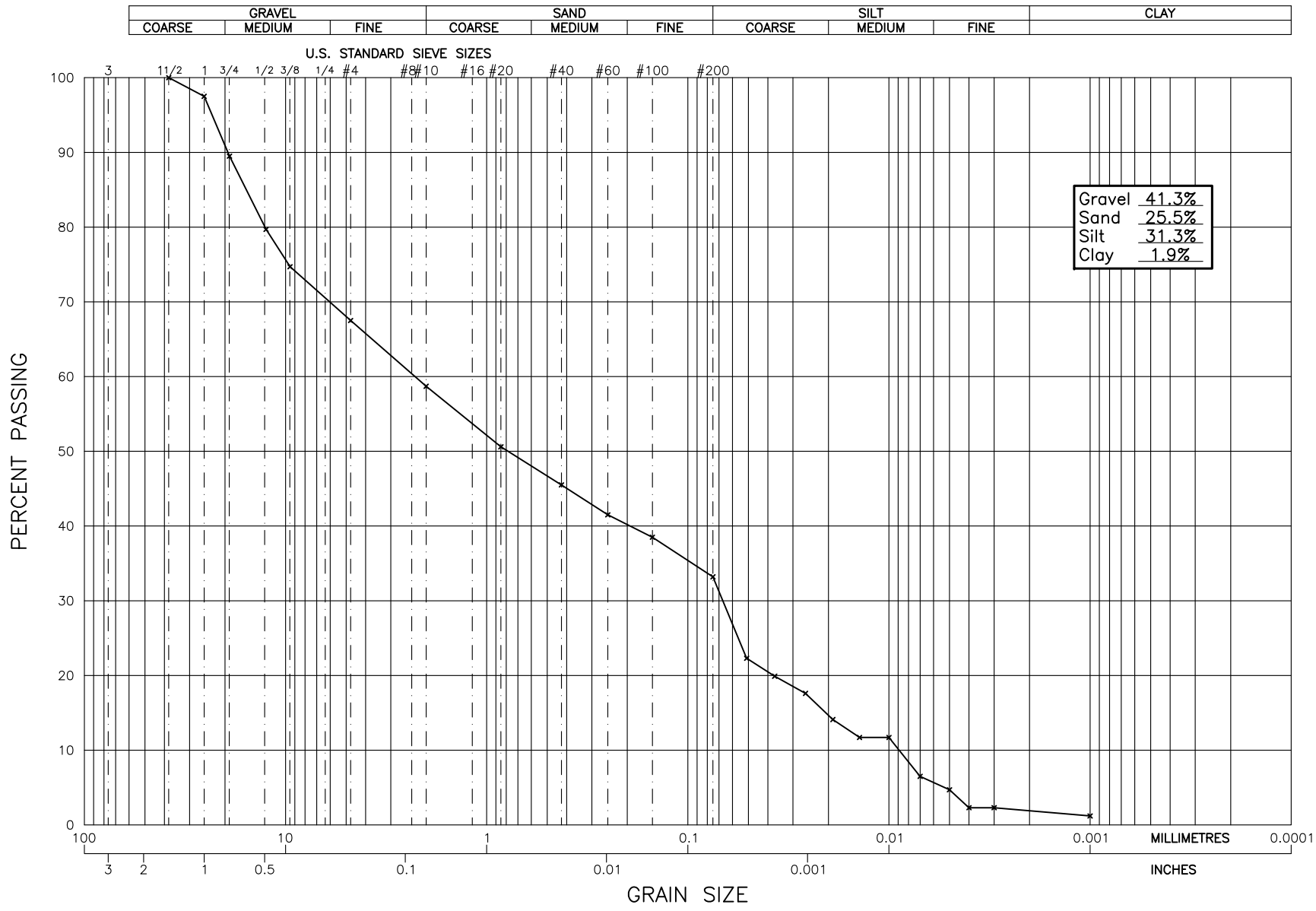
Client: BGC Engineering Inc.				Date: November 15, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel,sandy and silty
Sample #: **G4**	Test #:	**Hole #: BH-BGC11-49**	**Depth: 3.4 - 3.6m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.5, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.14, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		1449.0	**100.0**	10		50.0	100.0	**58.9**
Wet Wt. & Tare	1798.8	25.4	60.3	1388.7	**95.8**	20	9.5	40.5	81.0	**47.7**
Dry Wt. & Tare	1630.5	19.0	57.8	1330.9	**91.8**	40	5.4	35.1	70.2	**41.3**
Water Wt.	168.3	12.5	115.2	1215.7	**83.9**	60	3.3	31.8	63.6	**37.5**
Tare Wt.	181.5	9.5	62.0	1153.7	**79.6**	100	2.5	29.3	58.6	**34.5**
Wt. Of Dry Soil	1449.0	4.75	116.7	1037.0	**71.6**	200	3.9	25.4	50.8	**29.9**
Moisture Content %	**11.6**	10	183.6	853.4	**58.9**	Pan	25.4			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	1449.0			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.589	0.5	32.0	17.0	0.01417	23.0	12.5	5.000	0.071	46.0	**27.1**
50.0	0.589	1	27.0	17.0	0.01417	18.0	13.3	3.650	0.052	36.0	**21.2**
50.0	0.589	2	24.5	17.0	0.01417	15.5	13.7	2.621	0.037	31.0	**18.3**
50.0	0.589	4	22.5	17.0	0.01417	13.5	14.1	1.875	0.027	27.0	**15.9**
50.0	0.589	8	20.0	17.0	0.01417	11.0	14.5	1.345	0.019	22.0	**13.0**
50.0	0.589	15	19.0	17.0	0.01417	10.0	14.6	0.988	0.014	20.0	**11.8**
50.0	0.589	30	17.0	17.0	0.01417	8.0	15.0	0.707	0.010	16.0	**9.4**
50.0	0.589	60	16.0	17.0	0.01417	7.0	15.1	0.502	0.007	14.0	**8.2**
50.0	0.589	120	15.0	17.0	0.01417	6.0	15.3	0.357	0.005	12.0	**7.1**
50.0	0.589	240	13.0	17.0	0.01417	4.0	15.6	0.255	0.004	8.0	**4.7**
50.0	0.589	480	12.0	18.0	0.01399	4.0	15.6	0.180	0.003	8.0	**4.7**
50.0	0.589	1440	11.0	18.0	0.01399	3.0	15.8	0.105	0.001	6.0	**3.5**

Hydrometer #: 932452	Graduate #: 2	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-49-G6

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH49-G6

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

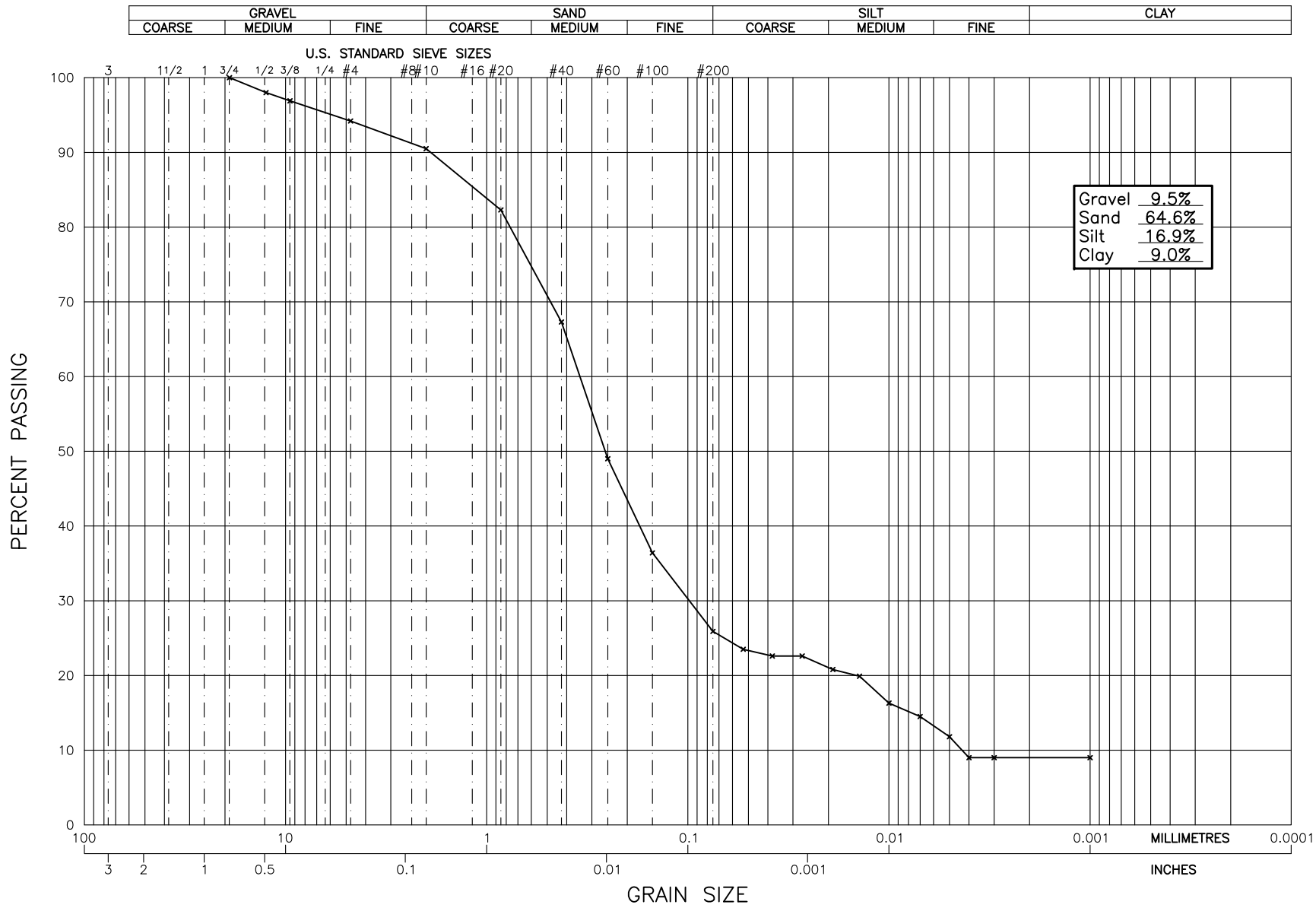
Client: BGC Engineering Inc.				Date: November 15, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel and Silt, sandy
Sample #: **G6**	Test #:	**Hole #: BH-BGC11-49**	**Depth: 6.4 - 6.6m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.5, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.14, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		938.3	**100.0**	10		50.0	100.0	**58.7**
Wet Wt. & Tare	1241.4	25.4	23.9	914.4	**97.5**	20	6.9	43.1	86.2	**50.6**
Dry Wt. & Tare	1118.7	19.0	74.9	839.5	**89.5**	40	4.3	38.8	77.6	**45.5**
Water Wt.	122.7	12.5	92.1	747.4	**79.7**	60	3.4	35.4	70.8	**41.5**
Tare Wt.	180.4	9.5	46.5	700.9	**74.7**	100	2.6	32.8	65.6	**38.5**
Wt. Of Dry Soil	938.3	4.75	67.4	633.5	**67.5**	200	4.5	28.3	56.6	**33.2**
Moisture Content %	**13.1**	10	83.0	550.5	**58.7**	Pan	28.3			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	938.3			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.587	0.5	33.0	17.0	0.01417	24.0	12.3	4.967	0.070	48.0	**28.2**
50.0	0.587	1	28.0	17.0	0.01417	19.0	13.2	3.628	0.051	38.0	**22.3**
50.0	0.587	2	26.0	17.0	0.01417	17.0	13.5	2.597	0.037	34.0	**19.9**
50.0	0.587	4	24.0	17.0	0.01417	15.0	13.8	1.859	0.026	30.0	**17.6**
50.0	0.587	8	21.0	17.0	0.01417	12.0	14.3	1.338	0.019	24.0	**14.1**
50.0	0.587	15	19.0	17.0	0.01417	10.0	14.6	0.988	0.014	20.0	**11.7**
50.0	0.587	30	19.0	17.0	0.01417	10.0	14.6	0.699	0.010	20.0	**11.7**
50.0	0.587	60	14.5	17.0	0.01417	5.5	15.4	0.506	0.007	11.0	**6.5**
50.0	0.587	120	13.0	17.0	0.01417	4.0	15.6	0.361	0.005	8.0	**4.7**
50.0	0.587	240	11.0	17.0	0.01417	2.0	16.0	0.258	0.004	4.0	**2.3**
50.0	0.587	480	10.0	18.0	0.01399	2.0	16.0	0.182	0.003	4.0	**2.3**
50.0	0.587	1440	9.0	18.0	0.01399	1.0	16.1	0.106	0.001	2.0	**1.2**

Hydrometer #: 932452	Graduate #: 3	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

Noelco



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-49-G8

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH49-G8

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

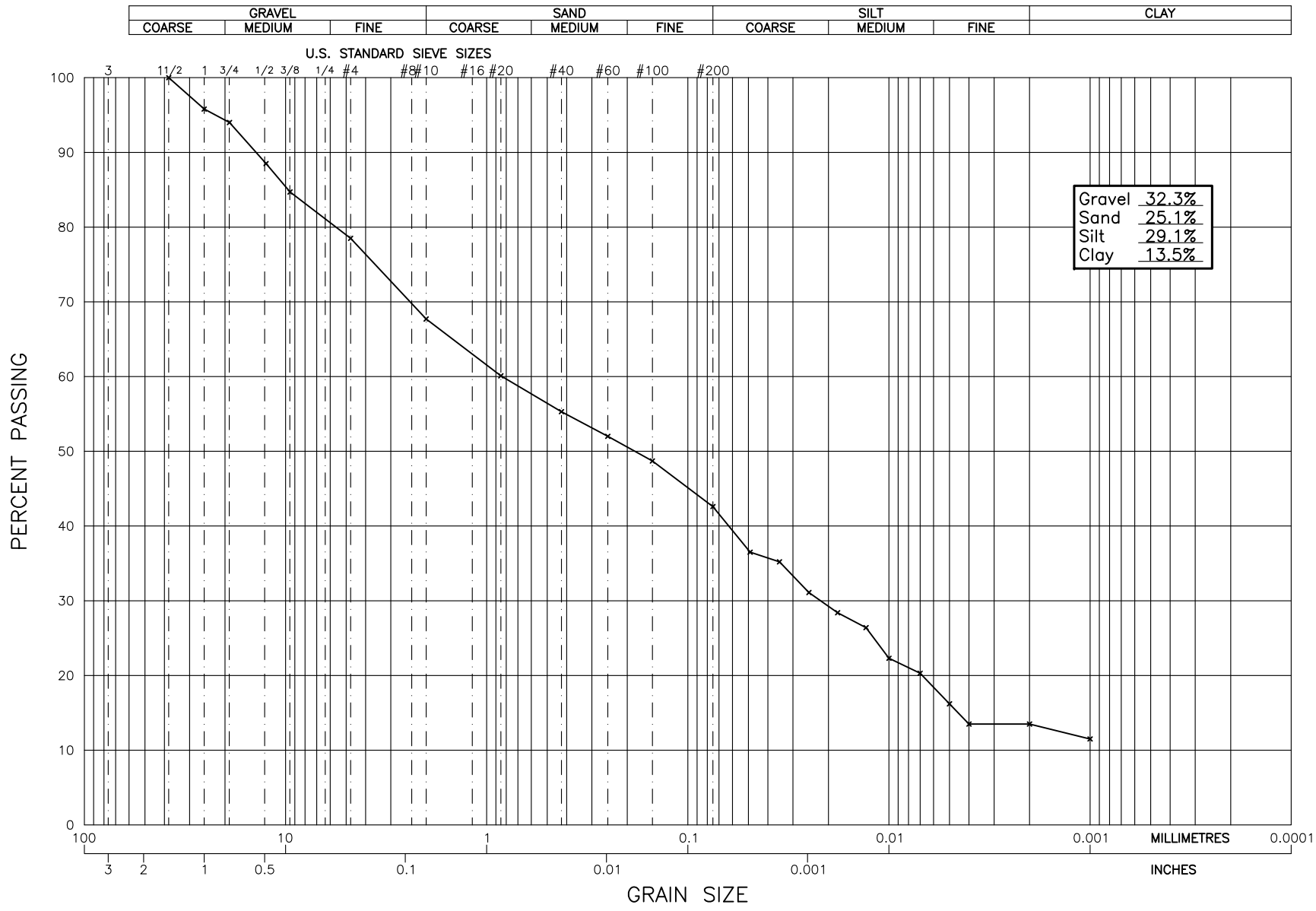
Client: BGC Engineering Inc.				Date: November 15, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand, silty, trace gravel and clay
Sample #: **G8**	Test #:	**Hole #: BH-BGC11-49**	**Depth: 9.4 - 9.6m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.5, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.14, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**90.5**
Wet Wt. & Tare	1302.8	25.4				20	4.5	45.5	91.0	**82.3**
Dry Wt. & Tare	1072.7	19.0		891.9	**100.0**	40	8.3	37.2	74.4	**67.3**
Water Wt.	230.1	12.5	17.5	874.4	**98.0**	60	10.1	27.1	54.2	**49.0**
Tare Wt.	180.8	9.5	10.4	864.0	**96.9**	100	7.0	20.1	40.2	**36.4**
Wt. Of Dry Soil	891.9	4.75	23.9	840.1	**94.2**	200	5.8	14.3	28.6	**25.9**
Moisture Content %	**25.8**	10	33.3	806.8	**90.5**	Pan	14.3			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	891.9			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.905	0.5	23.0	17.0	0.01417	14.0	14.0	5.289	0.075	28.0	**25.3**
50.0	0.905	1	22.0	17.0	0.01417	13.0	14.2	3.762	0.053	26.0	**23.5**
50.0	0.905	2	21.5	17.0	0.01417	12.5	14.2	2.668	0.038	25.0	**22.6**
50.0	0.905	4	21.5	17.0	0.01417	12.5	14.2	1.886	0.027	25.0	**22.6**
50.0	0.905	8	20.5	17.0	0.01417	11.5	14.4	1.342	0.019	23.0	**20.8**
50.0	0.905	15	20.0	17.0	0.01417	11.0	14.5	0.983	0.014	22.0	**19.9**
50.0	0.905	30	18.0	17.0	0.01417	9.0	14.8	0.703	0.010	18.0	**16.3**
50.0	0.905	60	17.0	17.0	0.01417	8.0	15.0	0.500	0.007	16.0	**14.5**
50.0	0.905	120	15.5	17.0	0.01417	6.5	15.2	0.356	0.005	13.0	**11.8**
50.0	0.905	240	14.0	17.0	0.01417	5.0	15.5	0.254	0.004	10.0	**9.0**
50.0	0.905	480	13.0	18.0	0.01399	5.0	15.5	0.180	0.003	10.0	**9.0**
50.0	0.905	1440	13.0	18.0	0.01399	5.0	15.5	0.104	0.001	10.0	**9.0**

Hydrometer #: 932452	Graduate #: 4	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

Noelco



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-49-G10

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH49-G10

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

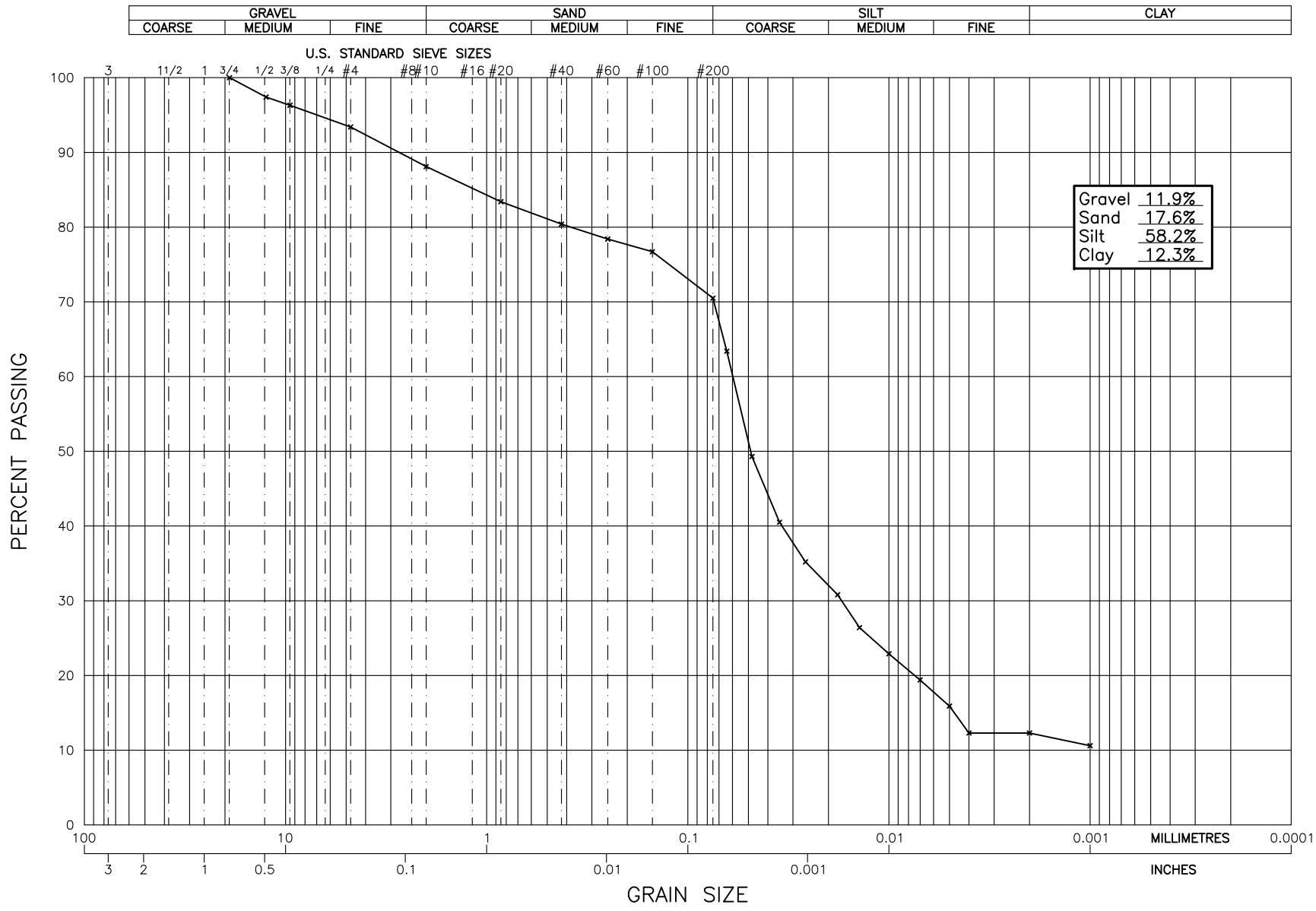
Client: BGC Engineering Inc.				Date: November 15, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel, silty and sandy, some clay
Sample #: **G10**	Test #:	**Hole #: BH-BGC11-49**	**Depth: 12.4 - 12.6m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.5, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.14, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		928.1	**100.0**	10		50.0	100.0	**67.7**
Wet Wt. & Tare	1240.8	25.4	38.8	889.3	**95.8**	20	5.6	44.4	88.8	**60.1**
Dry Wt. & Tare	1133.3	19.0	17.1	872.2	**94.0**	40	3.5	40.9	81.8	**55.3**
Water Wt.	107.5	12.5	51.0	821.2	**88.5**	60	2.5	38.4	76.8	**52.0**
Tare Wt.	205.2	9.5	35.3	785.9	**84.7**	100	2.4	36.0	72.0	**48.7**
Wt. Of Dry Soil	928.1	4.75	57.0	728.9	**78.5**	200	4.5	31.5	63.0	**42.6**
Moisture Content %	**11.6**	10	101.0	627.9	**67.7**	Pan	31.5			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	928.1			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.677	0.5	40.0	17.0	0.01417	31.0	11.2	4.729	0.067	62.0	**41.9**
50.0	0.677	1	36.0	17.0	0.01417	27.0	11.8	3.441	0.049	54.0	**36.5**
50.0	0.677	2	35.0	17.0	0.01417	26.0	12.0	2.450	0.035	52.0	**35.2**
50.0	0.677	4	32.0	17.0	0.01417	23.0	12.5	1.768	0.025	46.0	**31.1**
50.0	0.677	8	30.0	17.0	0.01417	21.0	12.8	1.266	0.018	42.0	**28.4**
50.0	0.677	15	28.5	17.0	0.01417	19.5	13.1	0.934	0.013	39.0	**26.4**
50.0	0.677	30	25.5	17.0	0.01417	16.5	13.6	0.673	0.010	33.0	**22.3**
50.0	0.677	60	24.0	17.0	0.01417	15.0	13.8	0.480	0.007	30.0	**20.3**
50.0	0.677	120	21.0	17.0	0.01417	12.0	14.3	0.345	0.005	24.0	**16.2**
50.0	0.677	240	19.0	17.0	0.01417	10.0	14.6	0.247	0.004	20.0	**13.5**
50.0	0.677	480	18.0	18.0	0.01399	10.0	14.6	0.175	0.002	20.0	**13.5**
50.0	0.677	1440	16.5	18.0	0.01399	8.5	14.9	0.102	0.001	17.0	**11.5**

Hydrometer #: 932452	Graduate #: 5	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-49-SPT2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH49-SPT2

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

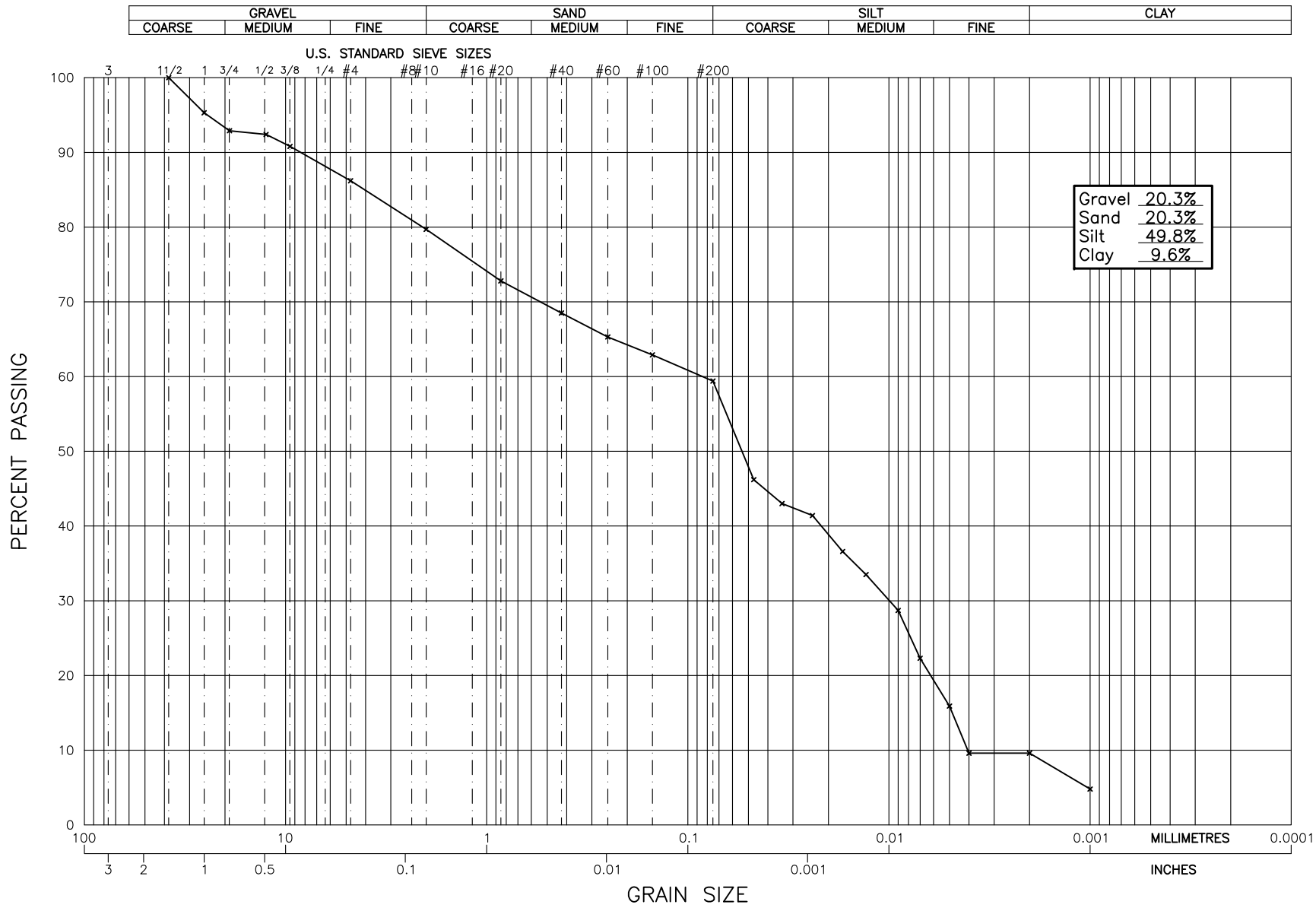
Client: BGC Engineering Inc.				Date: November 15, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt, some sand,clay and gravel
Sample #: **SPT2**	Test #:	**Hole #: BH-BGC11-49**	**Depth: 2.28 - 2.73m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.5, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.14, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**88.1**
Wet Wt. & Tare	855.1	25.4				20	2.7	47.3	94.6	**83.4**
Dry Wt. & Tare	742.8	19.0		550.0	**100.0**	40	1.7	45.6	91.2	**80.4**
Water Wt.	112.3	12.5	14.3	535.7	**97.4**	60	1.1	44.5	89.0	**78.4**
Tare Wt.	192.8	9.5	6.2	529.5	**96.3**	100	1.0	43.5	87.0	**76.7**
Wt. Of Dry Soil	550.0	4.75	15.7	513.8	**93.4**	200	3.5	40.0	80.0	**70.5**
Moisture Content %	**20.4**	10	29.2	484.6	**88.1**	Pan	40.0			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	550.0			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.881	0.5	45.0	17.0	0.01417	36.0	10.4	4.551	0.064	72.0	**63.4**
50.0	0.881	1	37.0	17.0	0.01417	28.0	11.7	3.417	0.048	56.0	**49.3**
50.0	0.881	2	32.0	17.0	0.01417	23.0	12.5	2.500	0.035	46.0	**40.5**
50.0	0.881	4	29.0	17.0	0.01417	20.0	13.0	1.802	0.026	40.0	**35.2**
50.0	0.881	8	26.5	17.0	0.01417	17.5	13.4	1.295	0.018	35.0	**30.8**
50.0	0.881	15	24.0	17.0	0.01417	15.0	13.8	0.960	0.014	30.0	**26.4**
50.0	0.881	30	22.0	17.0	0.01417	13.0	14.2	0.687	0.010	26.0	**22.9**
50.0	0.881	60	20.0	17.0	0.01417	11.0	14.5	0.491	0.007	22.0	**19.4**
50.0	0.881	120	18.0	17.0	0.01417	9.0	14.8	0.351	0.005	18.0	**15.9**
50.0	0.881	240	16.0	17.0	0.01417	7.0	15.1	0.251	0.004	14.0	**12.3**
50.0	0.881	480	15.0	18.0	0.01399	7.0	15.1	0.178	0.002	14.0	**12.3**
50.0	0.881	1440	14.0	18.0	0.01399	6.0	15.3	0.103	0.001	12.0	**10.6**

Hydrometer #: 932452	Graduate #: 6	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-51-G6

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH51-G6

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

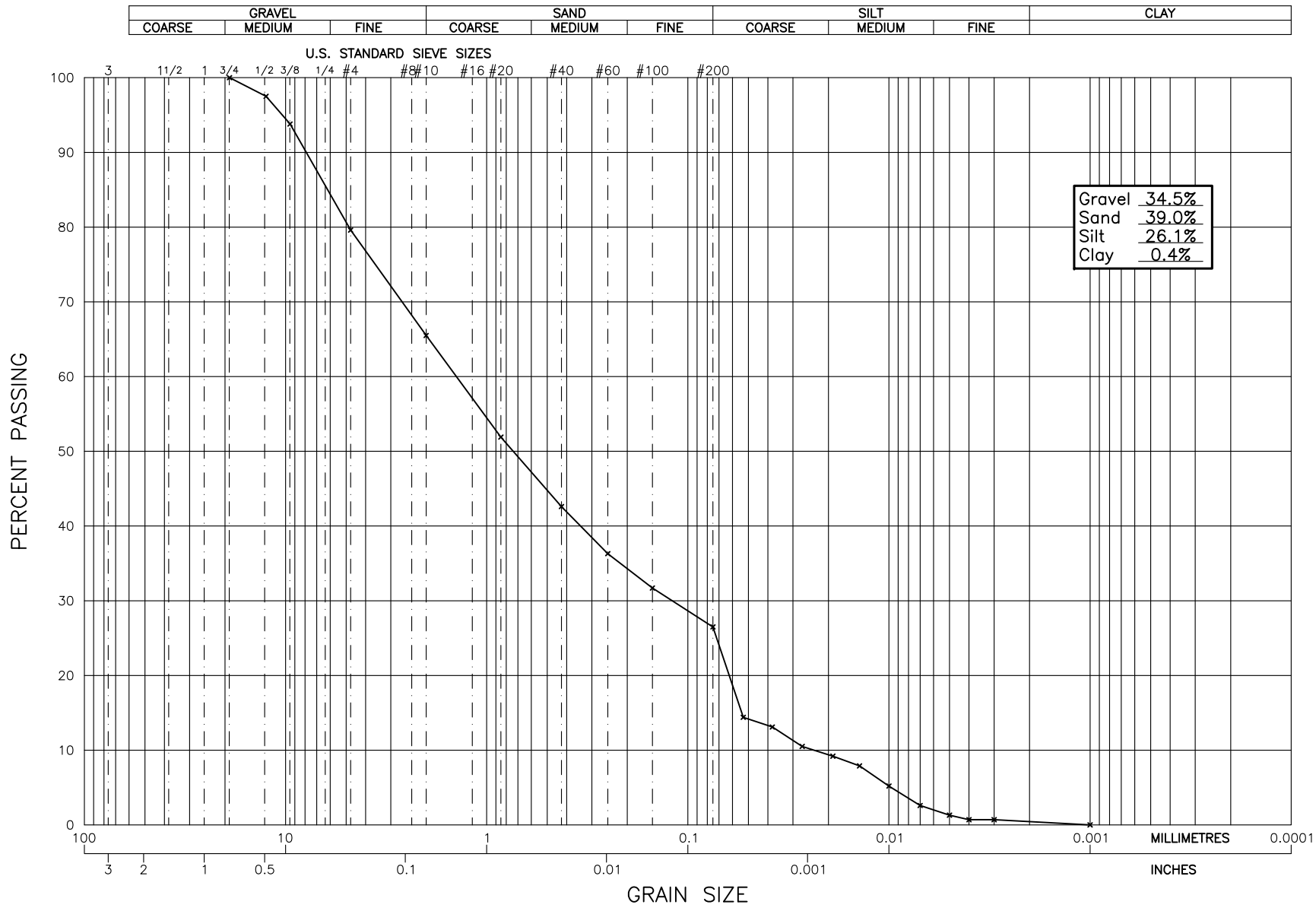
Client: BGC Engineering Inc.				Date: November 16, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt, gravelly and sandy
Sample #: **G6**	Test #:	**Hole #: BH-BGC11-51**	**Depth: 7.9 - 8.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.5, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.15, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		875.6	**100.0**	10		50.0	100.0	**79.7**
Wet Wt. & Tare	1208.8	25.4	41.1	834.5	**95.3**	20	4.3	45.7	91.4	**72.8**
Dry Wt. & Tare	1057.0	19.0	20.9	813.6	**92.9**	40	2.7	43.0	86.0	**68.5**
Water Wt.	151.8	12.5	4.8	808.8	**92.4**	60	2.0	41.0	82.0	**65.3**
Tare Wt.	181.4	9.5	13.7	795.1	**90.8**	100	1.5	39.5	79.0	**62.9**
Wt. Of Dry Soil	875.6	4.75	40.2	754.9	**86.2**	200	2.2	37.3	74.6	**59.4**
Moisture Content %	**17.3**	10	57.3	697.6	**79.7**	Pan	37.3			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	875.6			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.797	0.5	39.0	18.0	0.01399	31.0	11.2	4.729	0.066	62.0	**49.4**
50.0	0.797	1	37.0	18.0	0.01399	29.0	11.5	3.393	0.047	58.0	**46.2**
50.0	0.797	2	35.0	18.0	0.01399	27.0	11.8	2.433	0.034	54.0	**43.0**
50.0	0.797	4	34.0	18.0	0.01399	26.0	12.0	1.732	0.024	52.0	**41.4**
50.0	0.797	8	31.0	18.0	0.01399	23.0	12.5	1.250	0.017	46.0	**36.6**
50.0	0.797	15	29.0	18.0	0.01399	21.0	12.8	0.925	0.013	42.0	**33.5**
50.0	0.797	30	26.0	18.0	0.01399	18.0	13.3	0.666	0.009	36.0	**28.7**
50.0	0.797	60	22.0	18.0	0.01399	14.0	14.0	0.483	0.007	28.0	**22.3**
50.0	0.797	120	18.0	18.0	0.01399	10.0	14.6	0.349	0.005	20.0	**15.9**
50.0	0.797	240	14.0	18.0	0.01399	6.0	15.3	0.253	0.004	12.0	**9.6**
50.0	0.797	480	12.0	23.0	0.01317	6.0	15.3	0.179	0.002	12.0	**9.6**
50.0	0.797	1440	11.0	18.0	0.01399	3.0	15.8	0.105	0.001	6.0	**4.8**

Hydrometer #: 932452	Graduate #: 8	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-51-G10

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH51-G10

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

Client: BGC Engineering Inc.				Date: November 16, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand and Gravel, silty
Sample #: **G10**	Test #:	**Hole #: BH-BGC11-51**	**Depth: 13.9 - 14.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.6, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.15, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		948.8	**100.0**	10		**50.0**	100.0	**65.5**
Wet Wt. & Tare	1181.4	25.4		948.8	**100.0**	20	10.4	**39.6**	79.2	**51.9**
Dry Wt. & Tare	1080.3	19.0		948.8	**100.0**	40	7.1	**32.5**	65.0	**42.6**
Water Wt.	101.1	12.5	23.3	925.5	**97.5**	60	4.8	**27.7**	55.4	**36.3**
Tare Wt.	131.5	9.5	35.7	889.8	**93.8**	100	3.5	**24.2**	48.4	**31.7**
Wt. Of Dry Soil	948.8	4.75	134.9	754.9	**79.6**	200	4.0	**20.2**	40.4	**26.5**
Moisture Content %	**10.7**	10	133.3	621.6	**65.5**	Pan	20.2			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	948.8			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.655	0.5	22.0	18.0	0.01399	14.0	14.0	5.289	**0.074**	28.0	**18.3**
50.0	0.655	1	19.0	18.0	0.01399	11.0	14.5	3.805	**0.053**	22.0	**14.4**
50.0	0.655	2	18.0	18.0	0.01399	10.0	14.6	2.706	**0.038**	20.0	**13.1**
50.0	0.655	4	16.0	18.0	0.01399	8.0	15.0	1.935	**0.027**	16.0	**10.5**
50.0	0.655	8	15.0	18.0	0.01399	7.0	15.1	1.376	**0.019**	14.0	**9.2**
50.0	0.655	15	14.0	18.0	0.01399	6.0	15.3	1.010	**0.014**	12.0	**7.9**
50.0	0.655	30	12.0	18.0	0.01399	4.0	15.6	0.722	**0.010**	8.0	**5.2**
50.0	0.655	60	10.0	18.0	0.01399	2.0	16.0	0.516	**0.007**	4.0	**2.6**
50.0	0.655	120	9.0	18.0	0.01399	1.0	16.1	0.367	**0.005**	2.0	**1.3**
50.0	0.655	240	8.5	18.0	0.01399	0.5	16.2	0.260	**0.004**	1.0	**0.7**
50.0	0.655	480	7.5	20.0	0.01365	0.5	16.2	0.184	**0.003**	1.0	**0.7**
50.0	0.655	1440	7.0	20.0	0.01365	0.0	16.3	0.106	**0.001**	0.0	**0.0**

Hydrometer #: 932452	Graduate #: 7	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

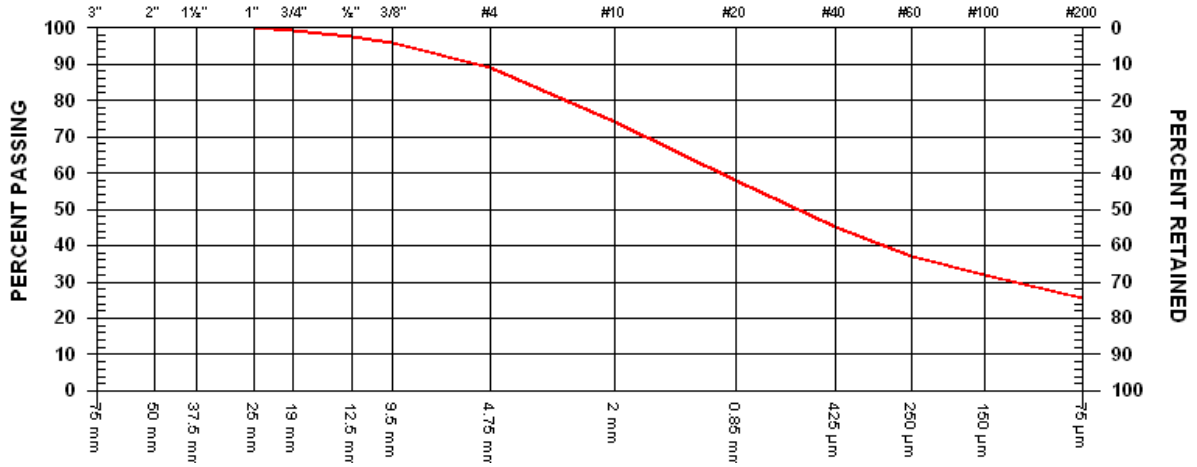
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 39 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.14 DATE SAMPLED 2011.Aug.06

SUPPLIER BH-BGC11-51
SOURCE G14 @ 20.1 - 20.3m
SPECIFICATION
MATERIAL TYPE Crush

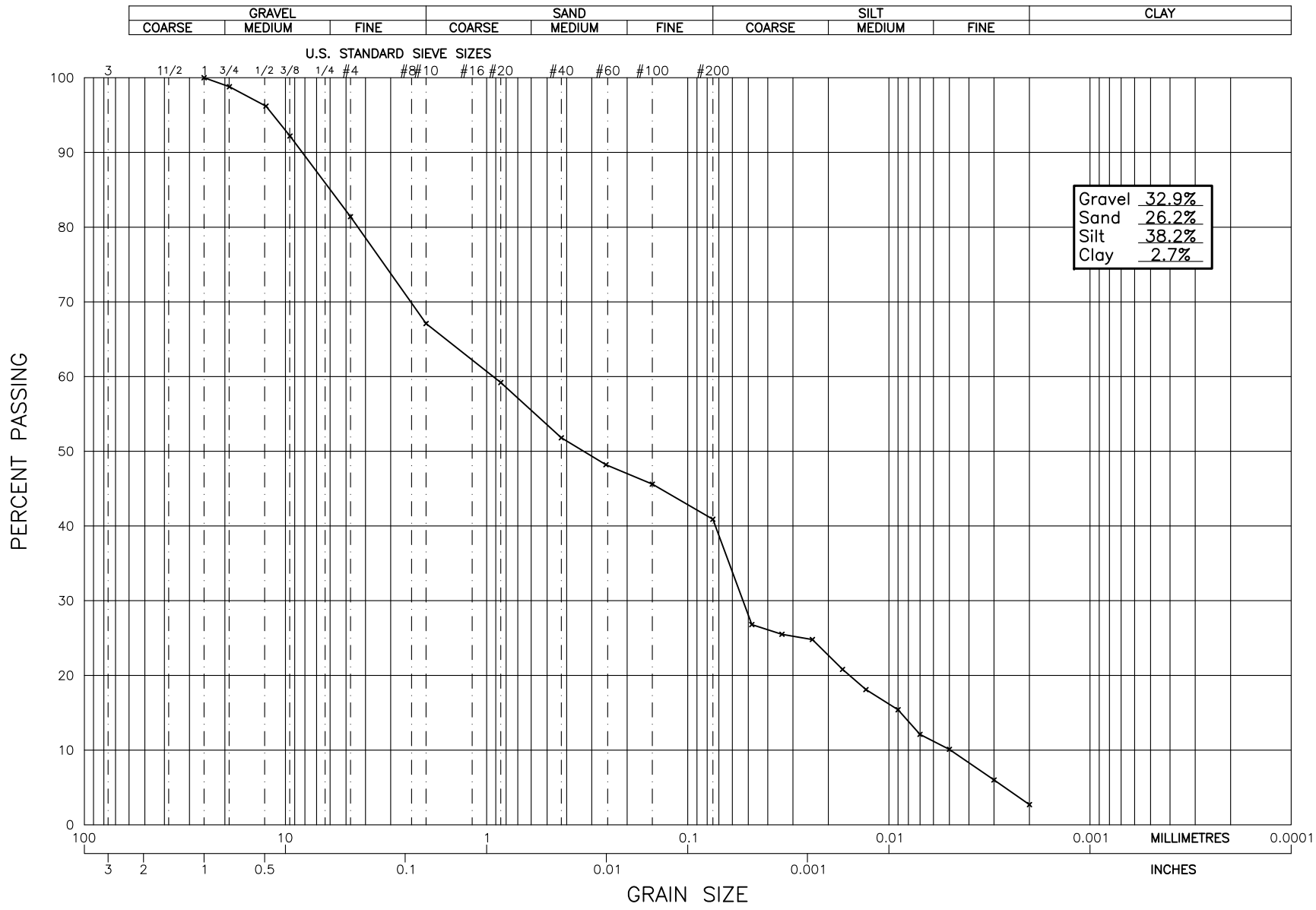
SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm	100.0	
3/4"	19 mm	99.3	
1/2"	12.5 mm	97.4	
3/8"	9.5 mm	95.7	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	88.8	
No. 10	2.00 mm	74.2	
No. 20	850 µm	57.8	
No. 40	425 µm	45.0	
No. 60	250 µm	37.1	
No. 100	150 µm	31.9	
No. 200	75 µm	25.7	

COMMENTS



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-53-G2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH53-G2

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

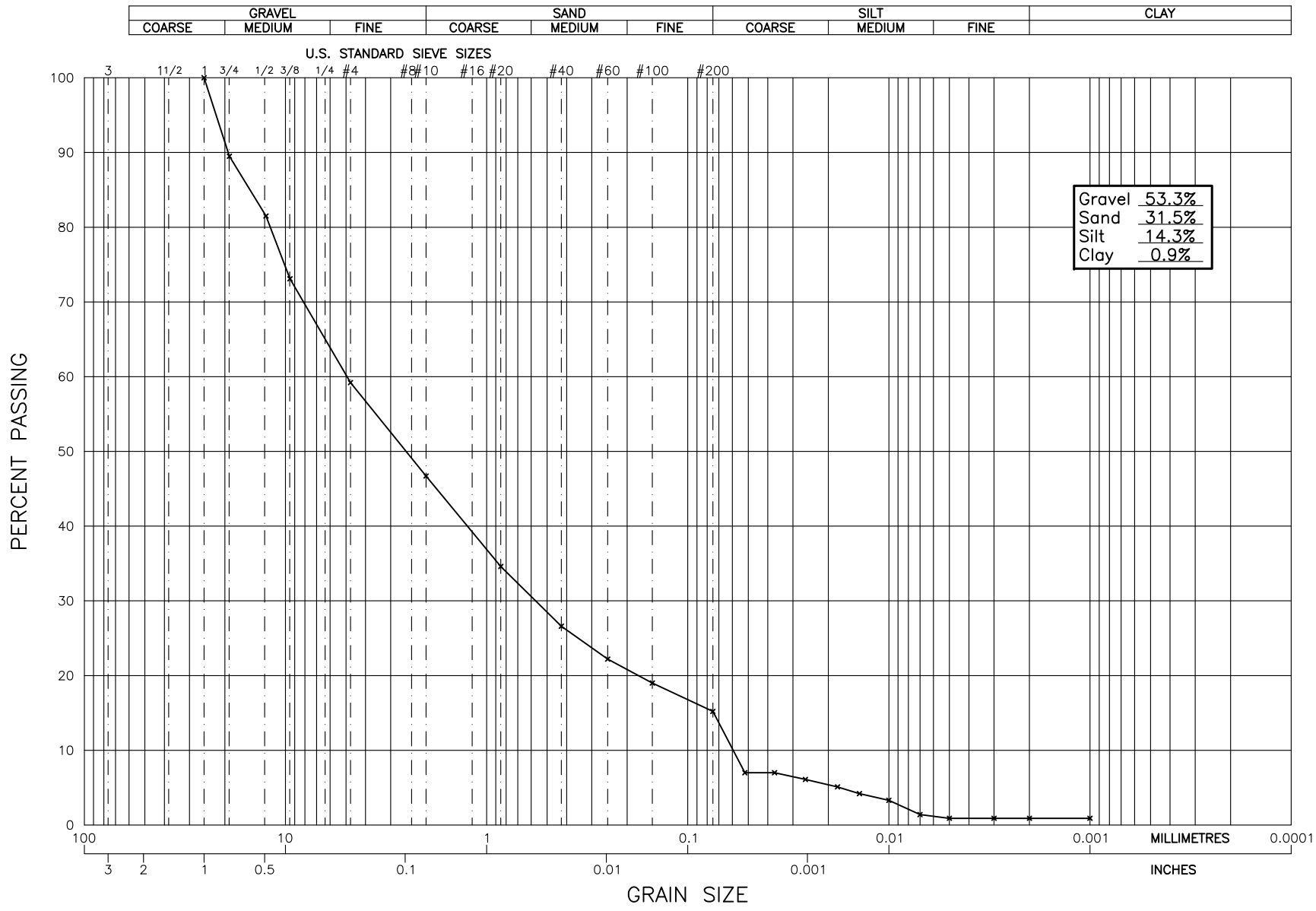
Client: BGC Engineering Inc.				Date: Sept.29, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt/Gravel,sandy
Sample #: **G2**	Test #:	**Hole #: BH-BGC11-53**	**Depth: 1.9 - 2.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 7, 2011	Date Received: September 13, 2011			Date Tested: Sept.28, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**67.1**
Wet Wt. & Tare	1347.3	25.4		1038.0	**100.0**	20	5.9	44.1	88.2	**59.2**
Dry Wt. & Tare	1229.1	19.0	12.1	1025.9	**98.8**	40	5.5	38.6	77.2	**51.8**
Water Wt.	118.2	12.5	27.8	998.1	**96.2**	60	2.7	35.9	71.8	**48.2**
Tare Wt.	191.1	9.5	41.0	957.1	**92.2**	100	1.9	34.0	68.0	**45.6**
Wt. Of Dry Soil	1038.0	4.75	112.0	845.1	**81.4**	200	3.5	30.5	61.0	**40.9**
Moisture Content %	**11.4**	10	148.9	696.2	**67.1**	Pan	30.5			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	1038.0			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.671	0.5	30.0	22.0	0.01332	23.5	12.4	4.983	0.066	47.0	**31.5**
50.0	0.671	1	26.5	22.0	0.01332	20.0	13.0	3.605	0.048	40.0	**26.8**
50.0	0.671	2	25.5	22.0	0.01332	19.0	13.2	2.565	0.034	38.0	**25.5**
50.0	0.671	4	25.0	22.0	0.01332	18.5	13.2	1.820	0.024	37.0	**24.8**
50.0	0.671	8	22.0	22.0	0.01332	15.5	13.7	1.310	0.017	31.0	**20.8**
50.0	0.671	15	20.0	22.0	0.01332	13.5	14.1	0.968	0.013	27.0	**18.1**
50.0	0.671	30	18.0	22.0	0.01332	11.5	14.4	0.693	0.009	23.0	**15.4**
50.0	0.671	60	15.5	22.0	0.01332	9.0	14.8	0.497	0.007	18.0	**12.1**
50.0	0.671	120	14.0	22.0	0.01332	7.5	15.1	0.354	0.005	15.0	**10.1**
50.0	0.671	240	10.5	24.0	0.01301	4.5	15.6	0.255	0.003	9.0	**6.0**
50.0	0.671	480	8.0	24.0	0.01301	2.0	16.0	0.182	0.002	4.0	**2.7**
50.0	0.671	1440	8.0	24.0	0.01301	2.0	16.0	0.105	0.001	4.0	**2.7**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

Noelco



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-53-G4

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH53-G4

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

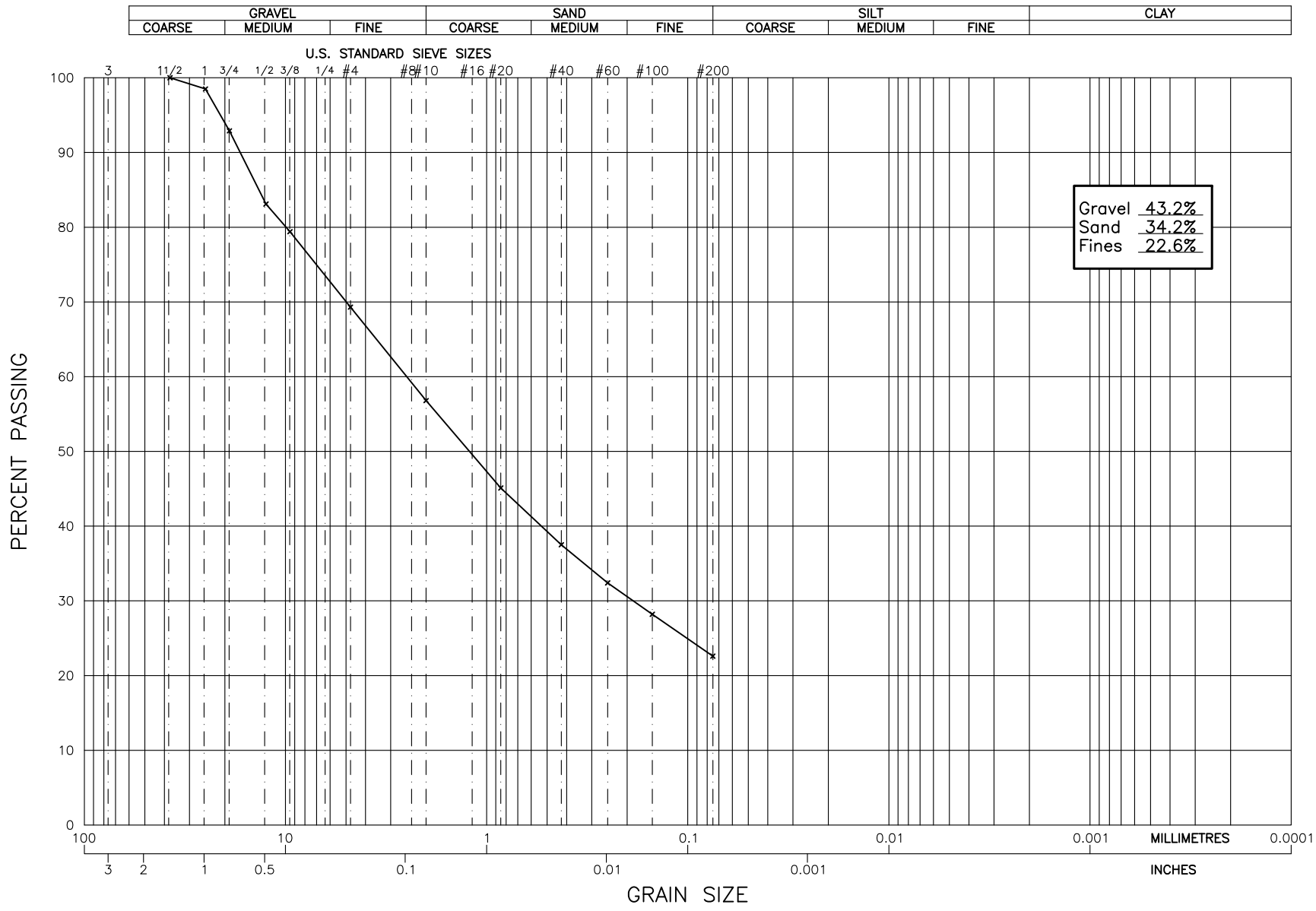
Client: BGC Engineering Inc.				Date: Sept.29, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel,sandy,some silt
Sample #: **G4**	Test #:	**Hole #: BH-BGC11-53**	**Depth: 4.9 - 5.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 7, 2011	Date Received: September 13, 2011			Date Tested: Sept.28, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**46.7**
Wet Wt. & Tare	1239.1	25.4		1016.0	**100.0**	20	13.0	37.0	74.0	**34.6**
Dry Wt. & Tare	1195.8	19.0	106.9	909.1	**89.5**	40	8.5	28.5	57.0	**26.6**
Water Wt.	43.3	12.5	81.0	828.1	**81.5**	60	4.7	23.8	47.6	**22.2**
Tare Wt.	179.8	9.5	85.6	742.5	**73.1**	100	3.5	20.3	40.6	**19.0**
Wt. Of Dry Soil	1016.0	4.75	140.8	601.7	**59.2**	200	4.0	16.3	32.6	**15.2**
Moisture Content %	**4.3**	10	127.0	474.7	**46.7**	Pan	16.3			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	1016.0			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.467	0.5	17.0	22.0	0.01332	10.5	14.6	5.397	0.072	21.0	**9.8**
50.0	0.467	1	14.0	22.0	0.01332	7.5	15.1	3.880	0.052	15.0	**7.0**
50.0	0.467	2	14.0	22.0	0.01332	7.5	15.1	2.744	0.037	15.0	**7.0**
50.0	0.467	4	13.0	22.0	0.01332	6.5	15.2	1.951	0.026	13.0	**6.1**
50.0	0.467	8	12.0	22.0	0.01332	5.5	15.4	1.387	0.018	11.0	**5.1**
50.0	0.467	15	11.0	22.0	0.01332	4.5	15.6	1.018	0.014	9.0	**4.2**
50.0	0.467	30	10.0	22.0	0.01332	3.5	15.7	0.724	0.010	7.0	**3.3**
50.0	0.467	60	8.0	22.0	0.01332	1.5	16.0	0.517	0.007	3.0	**1.4**
50.0	0.467	120	7.5	22.0	0.01332	1.0	16.1	0.367	0.005	2.0	**0.9**
50.0	0.467	240	7.0	24.0	0.01301	1.0	16.1	0.259	0.003	2.0	**0.9**
50.0	0.467	480	7.0	24.0	0.01301	1.0	16.1	0.183	0.002	2.0	**0.9**
50.0	0.467	1440	7.0	24.0	0.01301	1.0	16.1	0.106	0.001	2.0	**0.9**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

Noelco



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-53-G6

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH53-G6

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

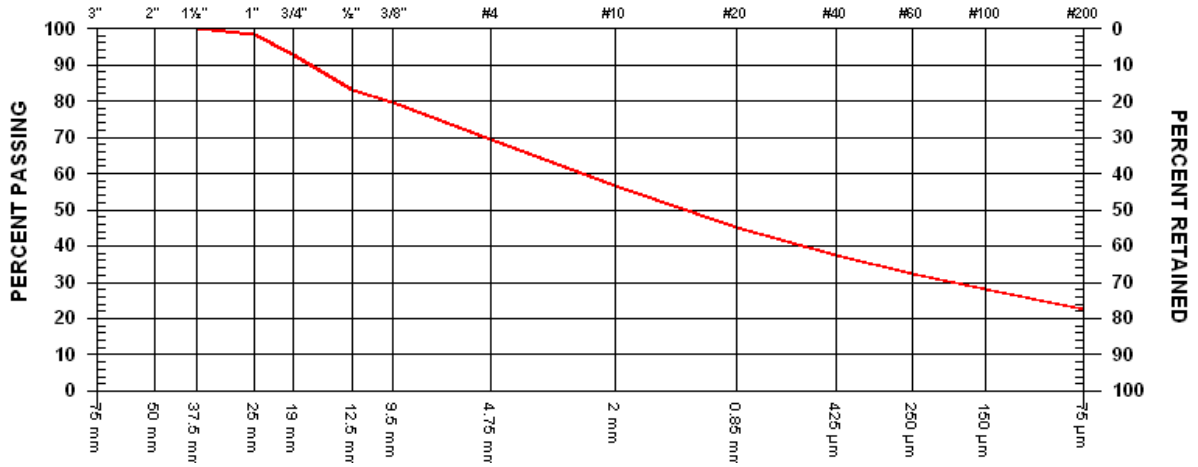
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 5 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Sep.29 DATE SAMPLED 2011.Aug.07

SUPPLIER BH-BGC11-53
SOURCE G6 @ 7.9 - 8.1m
SPECIFICATION
MATERIAL TYPE Gravel

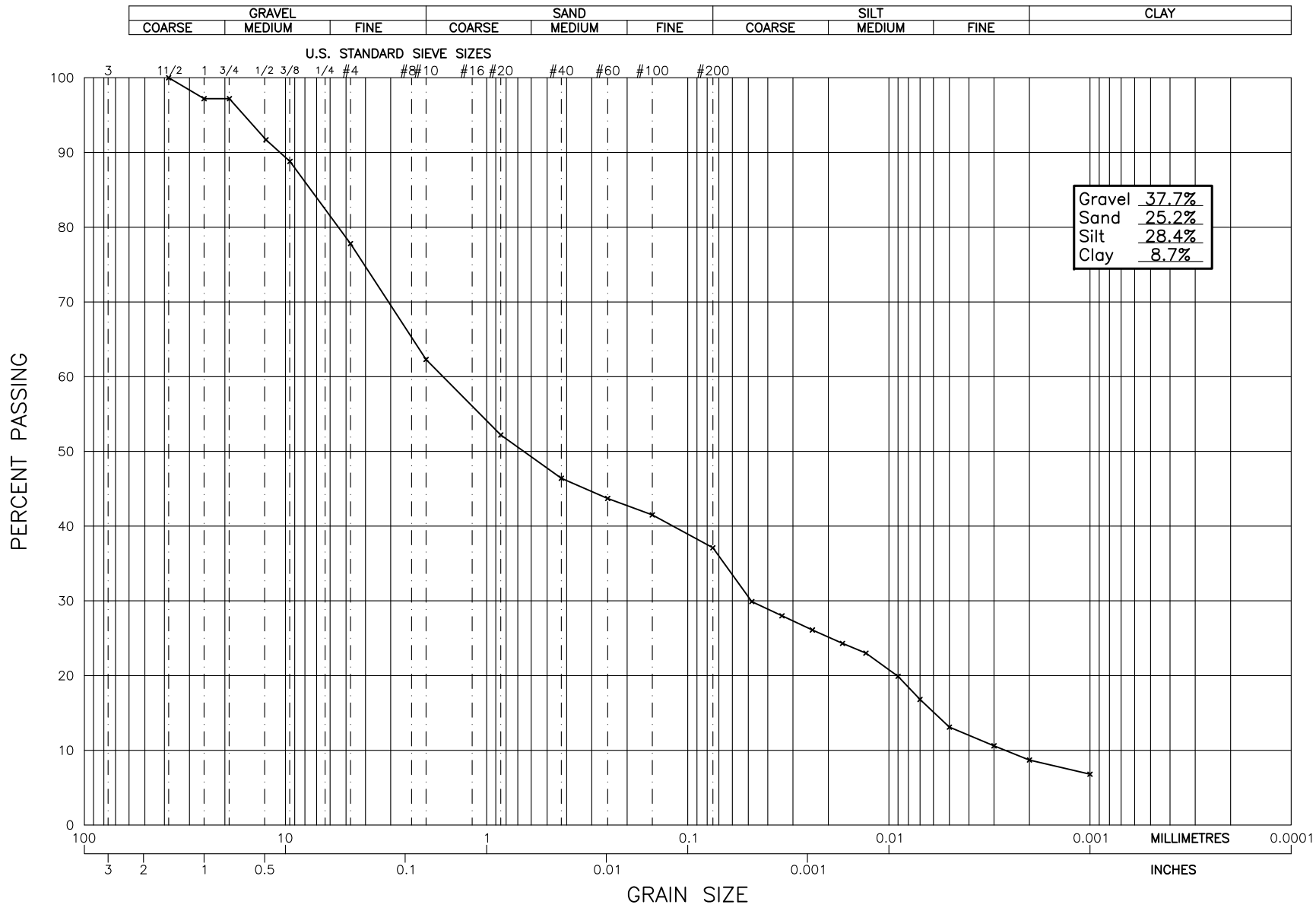
SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	98.5	
3/4"	19 mm	92.9	
1/2"	12.5 mm	83.1	
3/8"	9.5 mm	79.4	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	69.3	
No. 10	2.00 mm	56.8	
No. 20	850 µm	45.1	
No. 40	425 µm	37.5	
No. 60	250 µm	32.4	
No. 100	150 µm	28.2	
No. 200	75 µm	22.6	

COMMENTS



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-53-SPT2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH53-SPT2

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

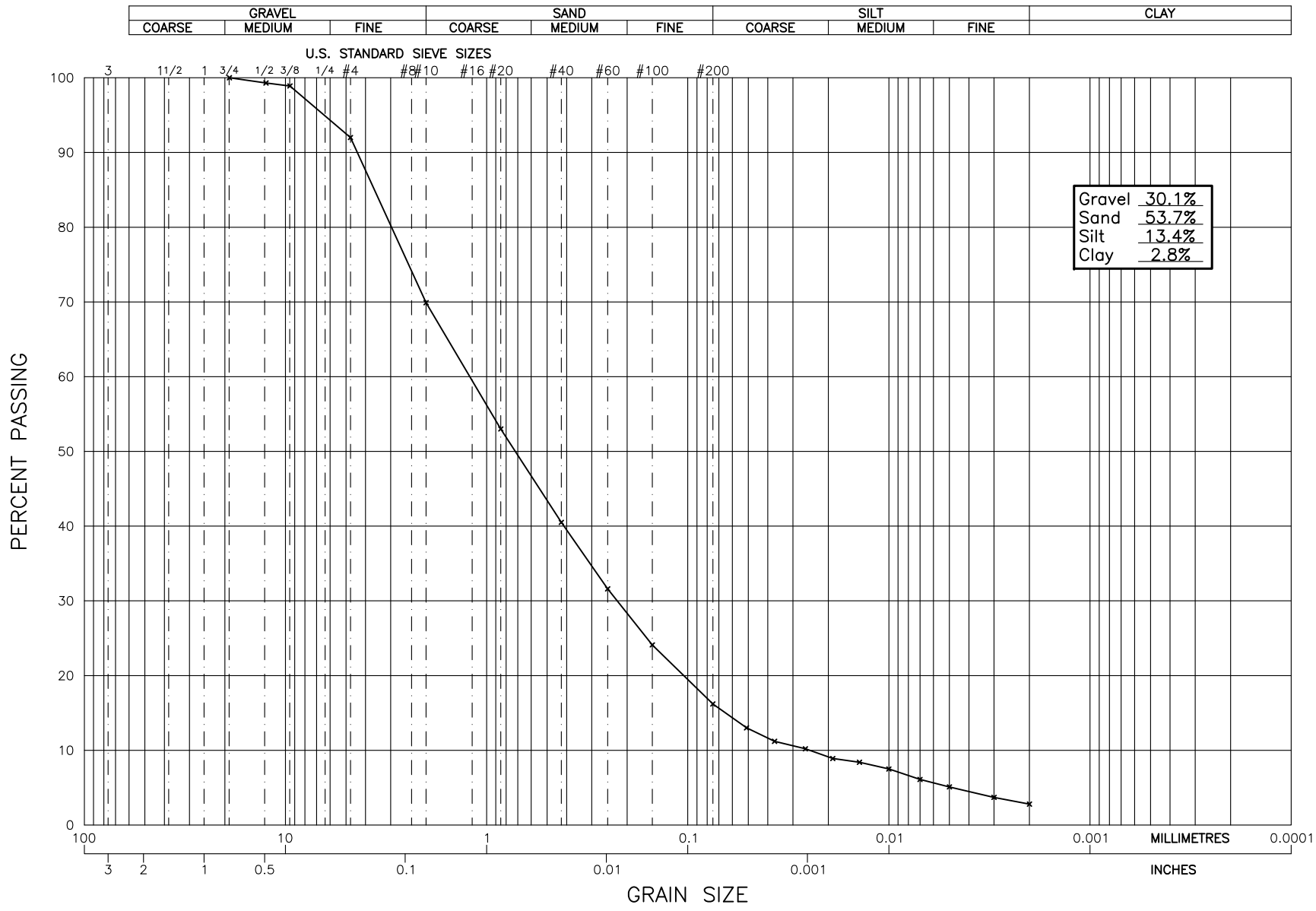
Client: BGC Engineering Inc.				Date: Oct.6, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel,silty,sandy
Sample #: **SPT2**	Test #:	**Hole #: BH-BGC11-53**	**Depth: 2.28 - 2.73m**	Time:
Sampled By: Client	Tested By: MM			Checked By: DJ
Date Sampled: August 7, 2011	Date Received: September 13, 2011			Date Tested: Oct.4, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		649.4	**100.0**	10		50.0	100.0	**62.3**
Wet Wt. & Tare	896.1	25.4	18.4	631.0	**97.2**	20	8.1	41.9	83.8	**52.2**
Dry Wt. & Tare	830.2	19.0	0.0	631.0	**97.2**	40	4.6	37.3	74.6	**46.4**
Water Wt.	65.9	12.5	35.7	595.3	**91.7**	60	2.2	35.1	70.2	**43.7**
Tare Wt.	180.8	9.5	18.9	576.4	**88.8**	100	1.8	33.3	66.6	**41.5**
Wt. Of Dry Soil	649.4	4.75	71.0	505.4	**77.8**	200	3.5	29.8	59.6	**37.1**
Moisture Content %	**10.1**	10	101.1	404.3	**62.3**	Pan	29.8			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	649.4			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.623	0.5	35.0	20.0	0.01365	28.0	11.7	4.832	0.066	56.0	**34.9**
50.0	0.623	1	31.0	20.0	0.01365	24.0	12.3	3.512	0.048	48.0	**29.9**
50.0	0.623	2	29.5	20.0	0.01365	22.5	12.6	2.508	0.034	45.0	**28.0**
50.0	0.623	4	28.0	20.0	0.01365	21.0	12.8	1.791	0.024	42.0	**26.1**
50.0	0.623	8	26.5	20.0	0.01365	19.5	13.1	1.279	0.017	39.0	**24.3**
50.0	0.623	15	25.5	20.0	0.01365	18.5	13.2	0.940	0.013	37.0	**23.0**
50.0	0.623	30	23.0	20.0	0.01365	16.0	13.7	0.675	0.009	32.0	**19.9**
50.0	0.623	60	20.5	20.0	0.01365	13.5	14.1	0.484	0.007	27.0	**16.8**
50.0	0.623	120	17.5	21.0	0.01348	10.5	14.6	0.348	0.005	21.0	**13.1**
50.0	0.623	240	15.5	21.0	0.01348	8.5	14.9	0.249	0.003	17.0	**10.6**
50.0	0.623	480	14.0	21.0	0.01348	7.0	15.1	0.178	0.002	14.0	**8.7**
50.0	0.623	1440	12.5	20.0	0.01365	5.5	15.4	0.103	0.001	11.0	**6.8**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-53-SPT4

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH53-SPT4

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

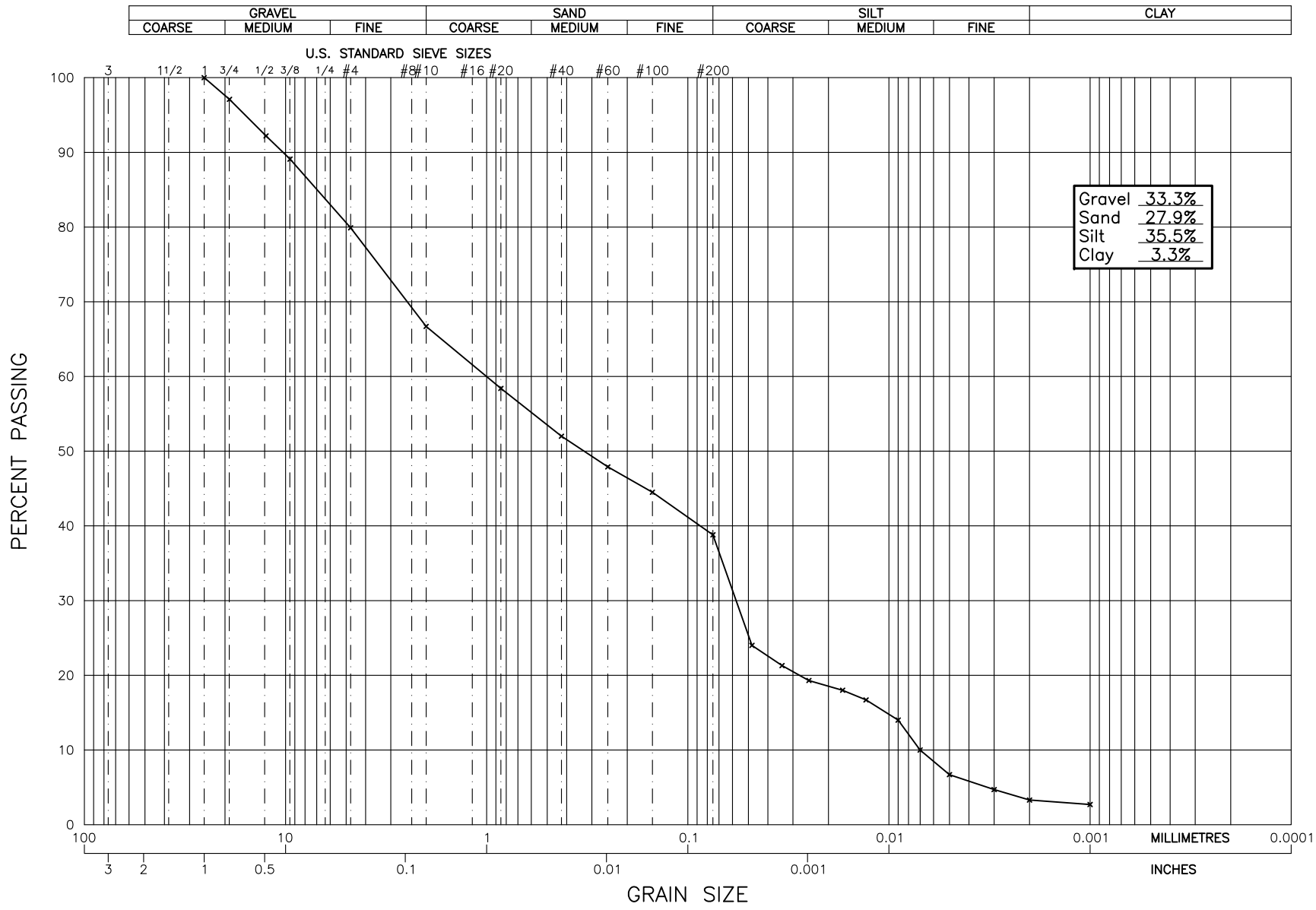
Client: BGC Engineering Inc.				Date: Oct. 6, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand,gravelly,some silt
Sample #: **SPT4**	Test #:	**Hole #: BH-BGC11-53**	**Depth: 6.85 - 7.30m**	Time:
Sampled By: Client	Tested By: MM			Checked By:
Date Sampled: August 7, 2011	Date Received: September 13, 2011			Date Tested: Oct.4, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		75.0	100.0	**69.9**
Wet Wt. & Tare	661.4	25.4				20	18.1	56.9	75.9	**53.0**
Dry Wt. & Tare	646.7	19.0		464.3	**100.0**	40	13.4	43.5	58.0	**40.5**
Water Wt.	14.7	12.5	3.2	461.1	**99.3**	60	9.6	33.9	45.2	**31.6**
Tare Wt.	182.4	9.5	2.1	459.0	**98.9**	100	8.0	25.9	34.5	**24.1**
Wt. Of Dry Soil	464.3	4.75	31.9	427.1	**92.0**	200	8.5	17.4	23.2	**16.2**
Moisture Content %	**3.2**	10	102.7	324.4	**69.9**	Pan	17.4			
Dry Wt. Of Sample from Initial Moisture						Total	75.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	464.3			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
75.0	0.699	0.5	24.0	20.0	0.01365	17.0	13.5	5.194	0.071	22.7	**15.8**
75.0	0.699	1	21.0	20.0	0.01365	14.0	14.0	3.740	0.051	18.7	**13.0**
75.0	0.699	2	19.0	20.0	0.01365	12.0	14.3	2.675	0.037	16.0	**11.2**
75.0	0.699	4	18.0	20.0	0.01365	11.0	14.5	1.903	0.026	14.7	**10.2**
75.0	0.699	8	16.5	20.0	0.01365	9.5	14.7	1.357	0.019	12.7	**8.9**
75.0	0.699	15	16.0	20.0	0.01365	9.0	14.8	0.994	0.014	12.0	**8.4**
75.0	0.699	30	15.0	20.0	0.01365	8.0	15.0	0.707	0.010	10.7	**7.5**
75.0	0.699	60	13.5	20.0	0.01365	6.5	15.2	0.504	0.007	8.7	**6.1**
75.0	0.699	120	12.5	21.0	0.01348	5.5	15.4	0.358	0.005	7.3	**5.1**
75.0	0.699	240	11.0	21.0	0.01348	4.0	15.6	0.255	0.003	5.3	**3.7**
75.0	0.699	480	10.0	21.0	0.01348	3.0	15.8	0.181	0.002	4.0	**2.8**
75.0	0.699	1440	10.0	20.0	0.01365	3.0	15.8	0.105	0.001	4.0	**2.8**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-55-G4

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH55-G4

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

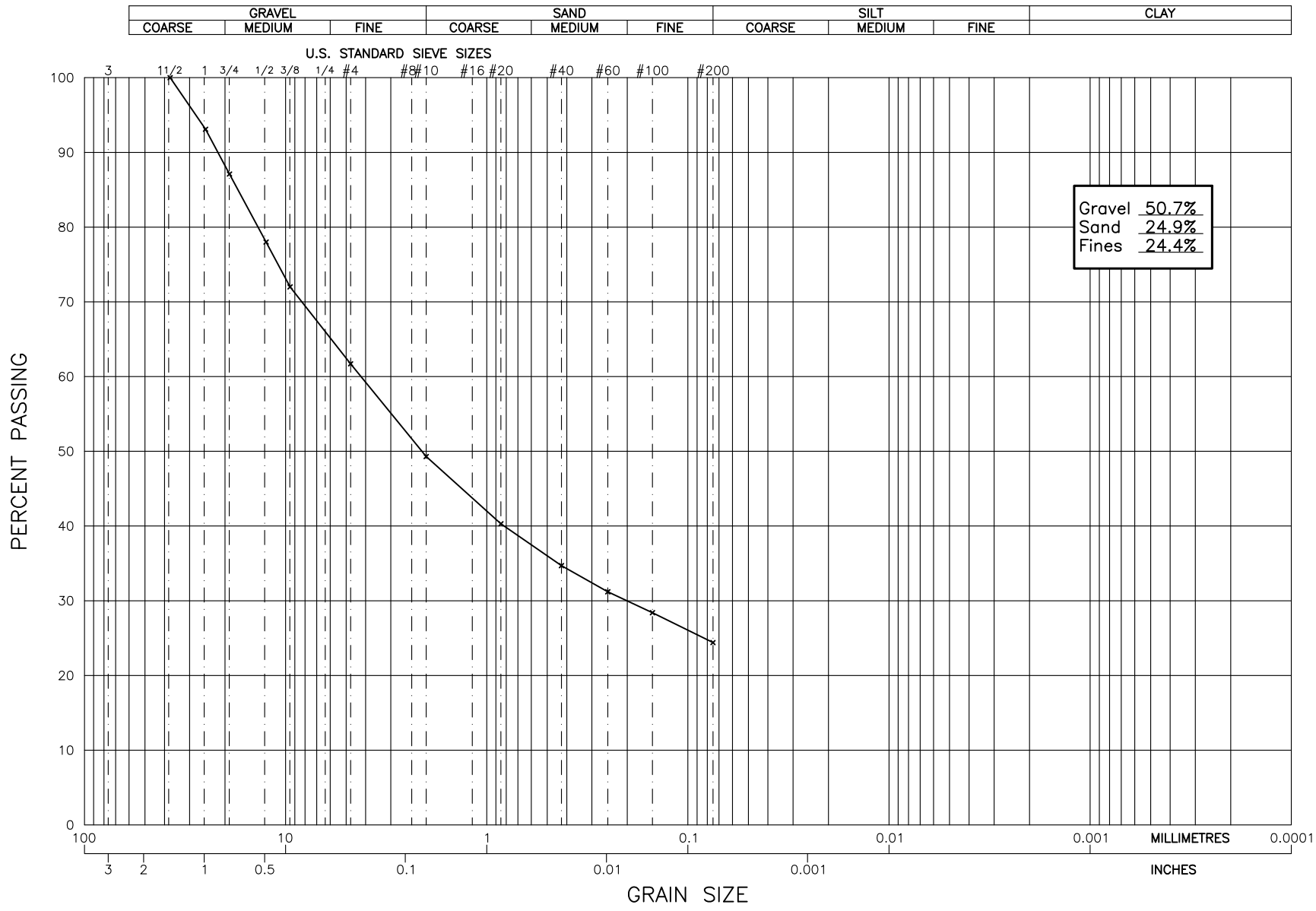
Client: BGC Engineering Ltd.				Date: Sept. 26, 2011
Project Name: Eagle Gold Soil and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt/Gravel/Sand
Sample #: **G4**	Test #:	**Hole #: BH-BGC11-55**	**Depth: 4.9 - 5.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 7, 2011	Date Received: September 13, 2011			Date Tested: Sept. 23, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**66.7**
Wet Wt. & Tare	1345.5	25.4		1054.1	**100.0**	20	6.2	43.8	87.6	**58.4**
Dry Wt. & Tare	1234.1	19.0	30.1	1024.0	**97.1**	40	4.8	39.0	78.0	**52.0**
Water Wt.	111.4	12.5	52.6	971.4	**92.2**	60	3.1	35.9	71.8	**47.9**
Tare Wt.	180.0	9.5	32.6	938.8	**89.1**	100	2.5	33.4	66.8	**44.5**
Wt. Of Dry Soil	1054.1	4.75	96.3	842.5	**79.9**	200	4.3	29.1	58.2	**38.8**
Moisture Content %	**10.6**	10	139.6	702.9	**66.7**	Pan	29.1			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	1054.1			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.667	0.5	29.0	23.0	0.01317	23.0	12.5	5.000	0.066	46.0	**30.7**
50.0	0.667	1	24.0	23.0	0.01317	18.0	13.3	3.650	0.048	36.0	**24.0**
50.0	0.667	2	22.0	23.0	0.01317	16.0	13.7	2.613	0.034	32.0	**21.3**
50.0	0.667	4	20.5	23.0	0.01317	14.5	13.9	1.864	0.025	29.0	**19.3**
50.0	0.667	8	19.5	23.0	0.01317	13.5	14.1	1.326	0.017	27.0	**18.0**
50.0	0.667	15	18.5	23.0	0.01317	12.5	14.2	0.974	0.013	25.0	**16.7**
50.0	0.667	30	16.5	23.0	0.01317	10.5	14.6	0.697	0.009	21.0	**14.0**
50.0	0.667	60	13.5	23.0	0.01317	7.5	15.1	0.501	0.007	15.0	**10.0**
50.0	0.667	120	11.0	23.0	0.01317	5.0	15.5	0.359	0.005	10.0	**6.7**
50.0	0.667	240	9.5	23.0	0.01317	3.5	15.7	0.256	0.003	7.0	**4.7**
50.0	0.667	480	8.5	23.0	0.01317	2.5	15.9	0.182	0.002	5.0	**3.3**
50.0	0.667	1450	8.0	23.0	0.01317	2.0	16.0	0.105	0.001	4.0	**2.7**

Hydrometer #: 932452	23	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-55-SPT1

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH55-SPT1

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 630 - 1718 Argyle Street
Halifax, Nova Scotia
B3J 3N6

ATTN: Peter Quinn

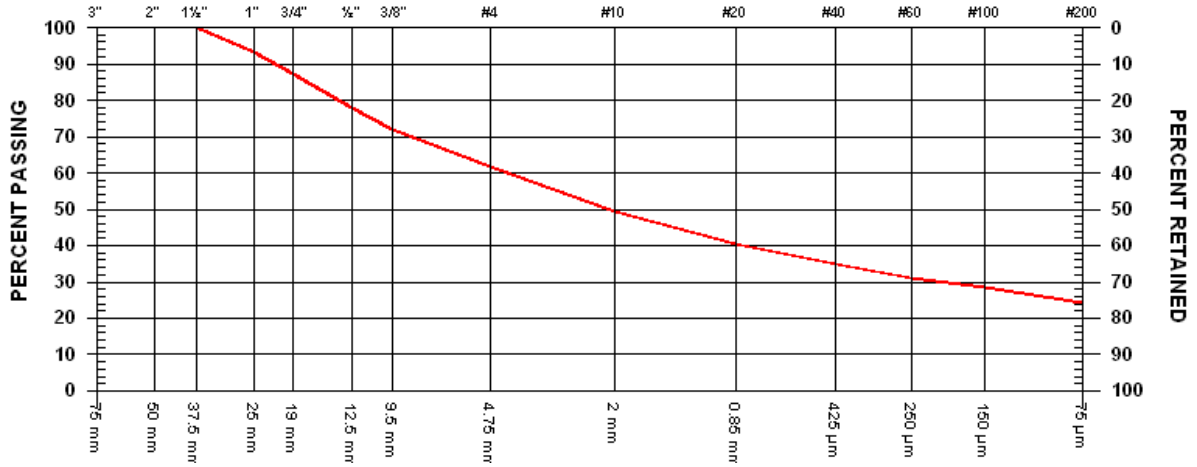
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 2 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Sep.21 DATE SAMPLED 2011.Aug.07

SUPPLIER BH-BGC11-55-SPT1
SOURCE 0.76 - 1.21m
SPECIFICATION
MATERIAL TYPE Gravel

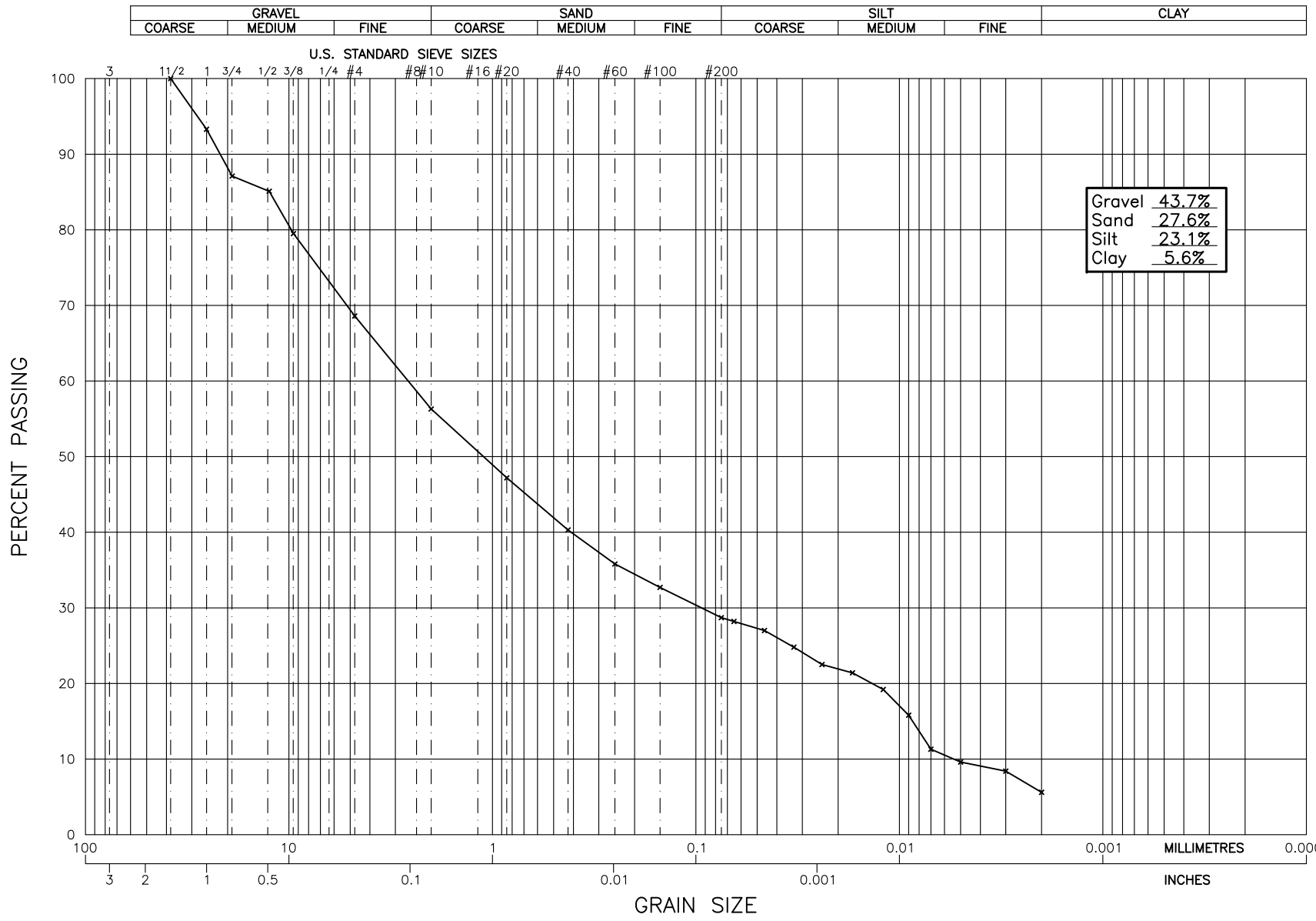
SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	93.1	
3/4"	19 mm	87.1	
1/2"	12.5 mm	78.0	
3/8"	9.5 mm	72.0	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	61.7	
No. 10	2.00 mm	49.3	
No. 20	850 µm	40.3	
No. 40	425 µm	34.7	
No. 60	250 µm	31.2	
No. 100	150 µm	28.4	
No. 200	75 µm	24.4	

COMMENTS



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-55-SPT6

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH55-SPT6

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

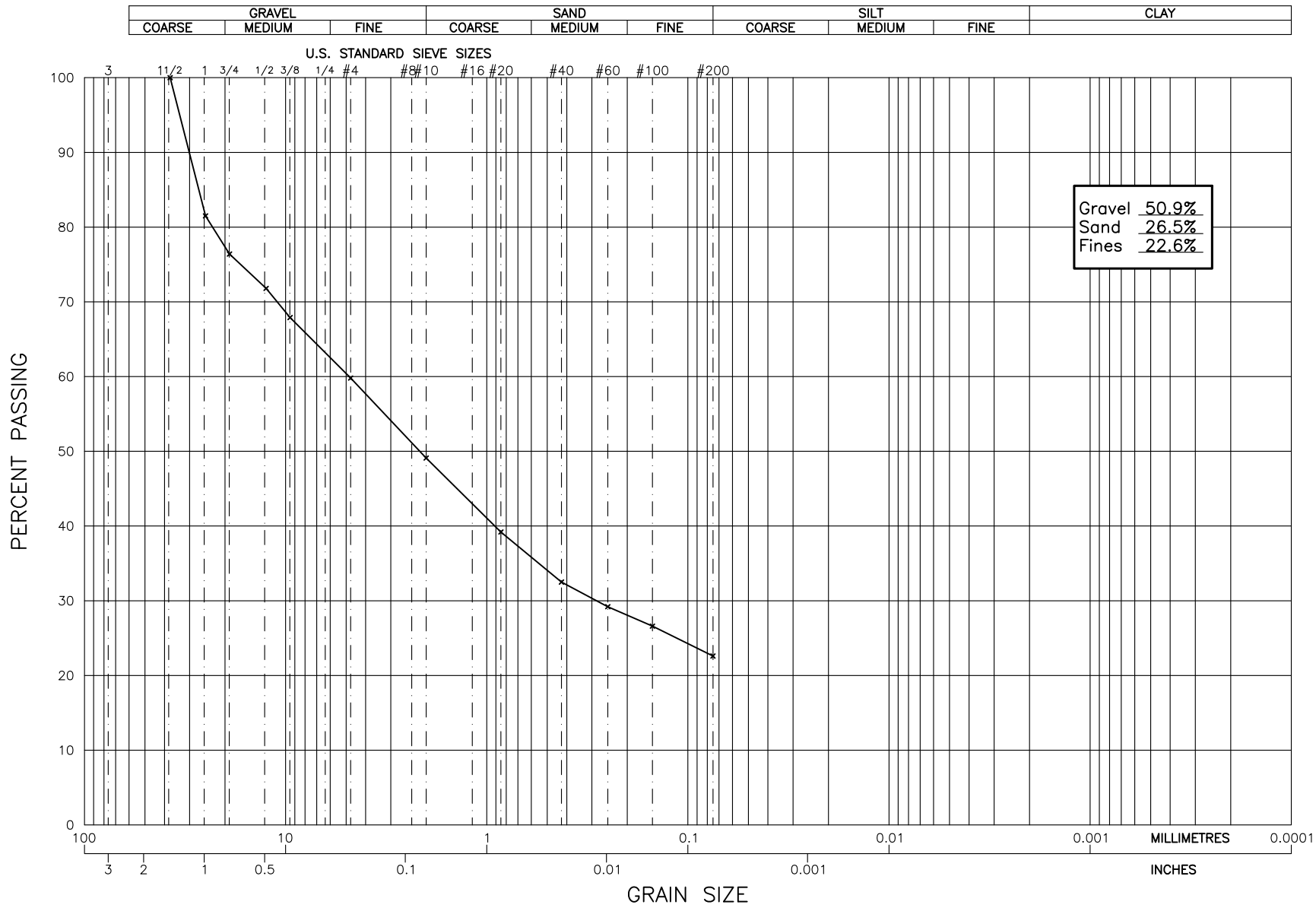
Client: BGC Engineering Ltd.				Date: Sept. 26, 2011
Project Name: Eagle Gold soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel,sandy/silty
Sample #: **SPT 6**	Test #:	**Hole #: BH-BGC11-55**	**Depth: 8.38 - 8.83m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 7, 2011	Date Received: September 13, 2011			Date Tested: Sept. 21, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		407.6	**100.0**	10		50.0	100.0	**56.3**
Wet Wt. & Tare	613.9	25.4	27.3	380.3	**93.3**	20	8.1	41.9	83.8	**47.2**
Dry Wt. & Tare	587.3	19.0	25.4	354.9	**87.1**	40	6.1	35.8	71.6	**40.3**
Water Wt.	26.6	12.5	8.1	346.8	**85.1**	60	4.0	31.8	63.6	**35.8**
Tare Wt.	179.7	9.5	22.7	324.1	**79.5**	100	2.8	29.0	58.0	**32.7**
Wt. Of Dry Soil	407.6	4.75	44.3	279.8	**68.6**	200	3.5	25.5	51.0	**28.7**
Moisture Content %	**6.5**	10	50.2	229.6	**56.3**	Pan	25.5			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	407.6			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.563	0.5	31.0	23.0	0.01317	25.0	12.2	4.934	0.065	50.0	**28.2**
50.0	0.563	1	30.0	23.0	0.01317	24.0	12.3	3.512	0.046	48.0	**27.0**
50.0	0.563	2	28.0	23.0	0.01317	22.0	12.7	2.516	0.033	44.0	**24.8**
50.0	0.563	4	26.0	23.0	0.01317	20.0	13.0	1.802	0.024	40.0	**22.5**
50.0	0.563	8	25.0	23.0	0.01317	19.0	13.2	1.283	0.017	38.0	**21.4**
50.0	0.563	15	23.0	23.0	0.01317	17.0	13.5	0.948	0.012	34.0	**19.2**
50.0	0.563	30	20.0	23.0	0.01317	14.0	14.0	0.683	0.009	28.0	**15.8**
50.0	0.563	60	16.0	23.0	0.01317	10.0	14.6	0.494	0.007	20.0	**11.3**
50.0	0.563	120	15.0	22.0	0.01332	8.5	14.9	0.352	0.005	17.0	**9.6**
50.0	0.563	240	14.0	22.0	0.01332	7.5	15.1	0.250	0.003	15.0	**8.4**
50.0	0.563	480	12.0	21.0	0.01348	5.0	15.5	0.180	0.002	10.0	**5.6**
50.0	0.563	1440	11.0	23.0	0.01317	5.0	15.5	0.104	0.001	10.0	**5.6**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-56-G2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH56-G2

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

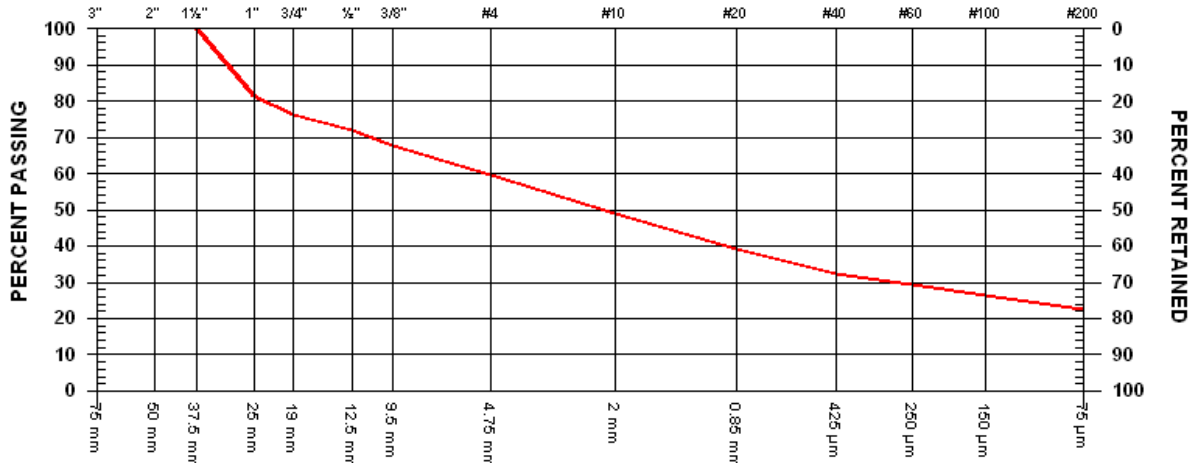
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 7 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Sep.30 DATE SAMPLED 2011.Aug.08

SUPPLIER BH-BGC11-56
SOURCE G2 @ 1.9 - 2.1m
SPECIFICATION
MATERIAL TYPE Gravel

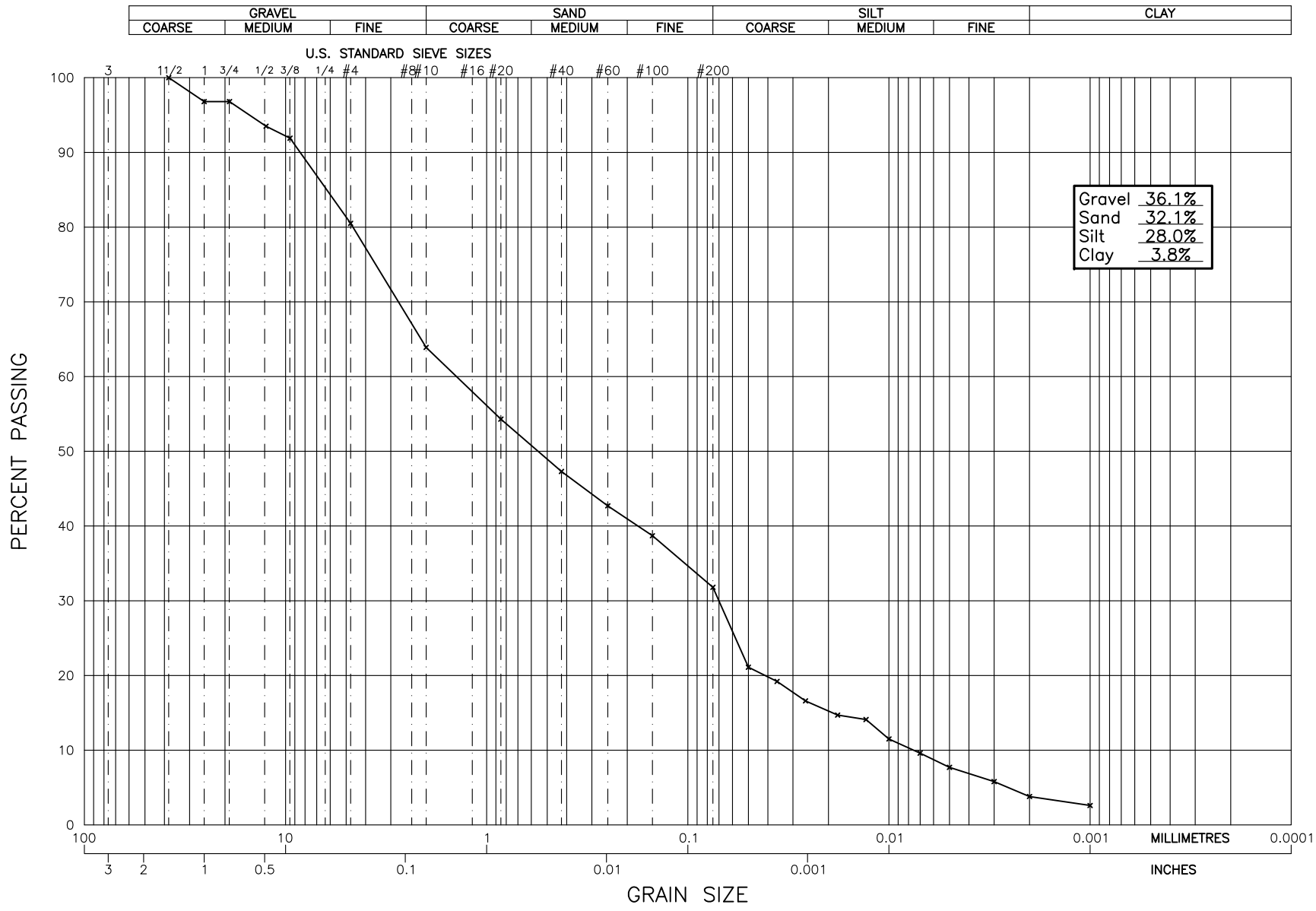
SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	81.5	
3/4"	19 mm	76.4	
1/2"	12.5 mm	71.8	
3/8"	9.5 mm	67.9	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	59.8	
No. 10	2.00 mm	49.1	
No. 20	850 µm	39.2	
No. 40	425 µm	32.5	
No. 60	250 µm	29.2	
No. 100	150 µm	26.6	
No. 200	75 µm	22.6	

COMMENTS



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-57-SPT2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH57-SPT2

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

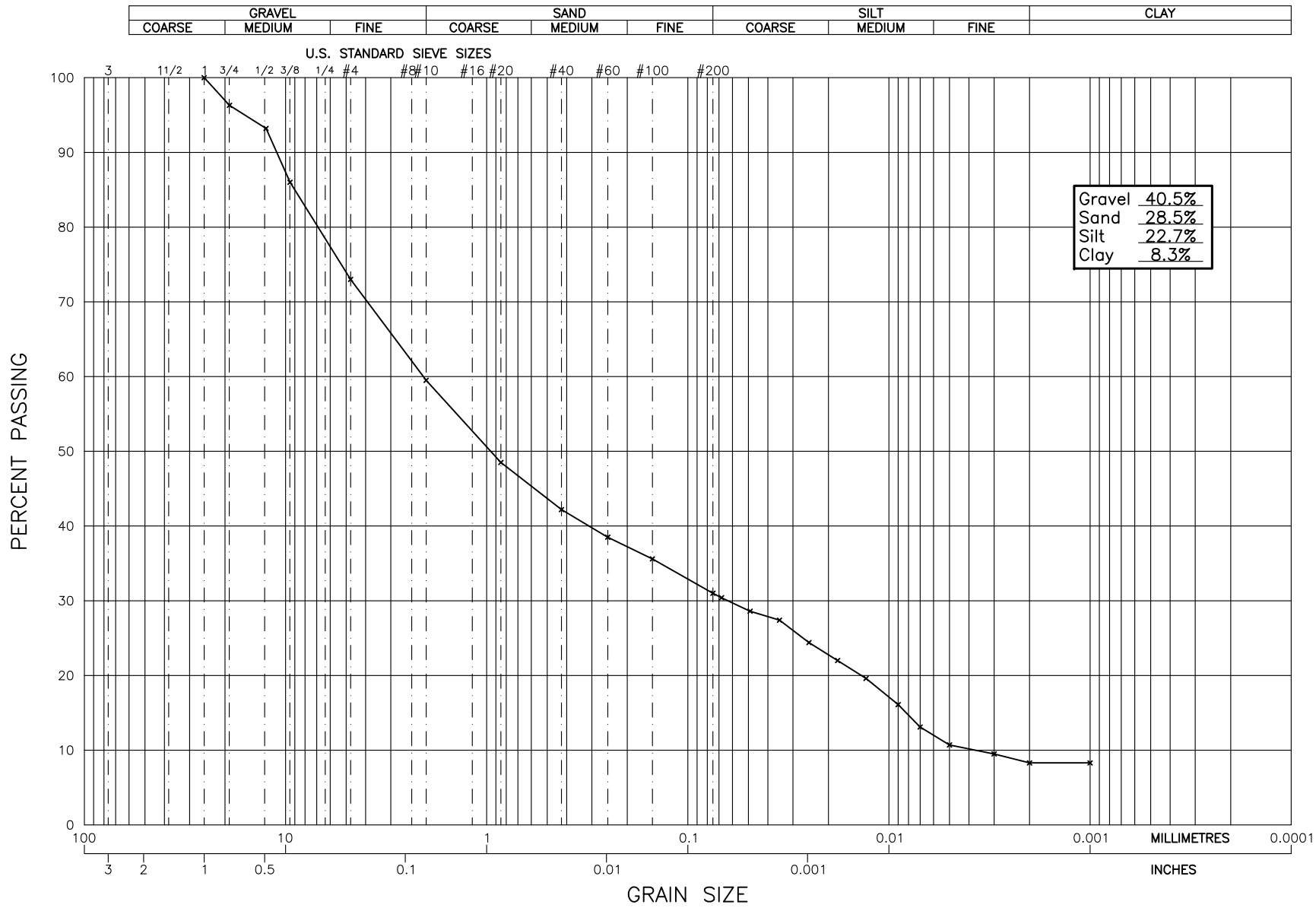
Client: BGC Engineering Inc.				Date: Oct.11, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type:
Sample #: **SPT2**	Test #:	**Hole #: BH-BGC11-57**	**Depth: 3.8 - 4.25m**	Time:
Sampled By: Client	Tested By: MM			Checked By: DJ
Date Sampled: August 9, 2011	Date Received: September 13, 2011			Date Tested: Oct.4, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		839.7	**100.0**	10		50.0	100.0	**63.9**
Wet Wt. & Tare	1100.1	25.4	26.7	813.0	**96.8**	20	7.5	42.5	85.0	**54.3**
Dry Wt. & Tare	1020.9	19.0	0.0	813.0	**96.8**	40	5.5	37.0	74.0	**47.3**
Water Wt.	79.2	12.5	28.1	784.9	**93.5**	60	3.6	33.4	66.8	**42.7**
Tare Wt.	181.2	9.5	13.6	771.3	**91.9**	100	3.1	30.3	60.6	**38.7**
Wt. Of Dry Soil	839.7	4.75	95.5	675.8	**80.5**	200	5.4	24.9	49.8	**31.8**
Moisture Content %	**9.4**	10	139.0	536.8	**63.9**	Pan	24.9			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	839.7			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.639	0.5	29.0	20.0	0.01365	22.0	12.7	5.033	0.069	44.0	**28.1**
50.0	0.639	1	23.5	20.0	0.01365	16.5	13.6	3.684	0.050	33.0	**21.1**
50.0	0.639	2	22.0	20.0	0.01365	15.0	13.8	2.629	0.036	30.0	**19.2**
50.0	0.639	4	20.0	20.0	0.01365	13.0	14.2	1.881	0.026	26.0	**16.6**
50.0	0.639	8	18.5	20.0	0.01365	11.5	14.4	1.342	0.018	23.0	**14.7**
50.0	0.639	15	18.0	20.0	0.01365	11.0	14.5	0.983	0.013	22.0	**14.1**
50.0	0.639	30	16.0	20.0	0.01365	9.0	14.8	0.703	0.010	18.0	**11.5**
50.0	0.639	60	14.5	20.0	0.01365	7.5	15.1	0.501	0.007	15.0	**9.6**
50.0	0.639	120	13.0	21.0	0.01348	6.0	15.3	0.357	0.005	12.0	**7.7**
50.0	0.639	240	11.5	21.0	0.01348	4.5	15.6	0.255	0.003	9.0	**5.8**
50.0	0.639	480	10.0	21.0	0.01348	3.0	15.8	0.181	0.002	6.0	**3.8**
50.0	0.639	1440	9.0	20.0	0.01365	2.0	16.0	0.105	0.001	4.0	**2.6**

Hydrometer #: 932452	Graduate #: 6	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

Noelco



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-57-SPT4

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH57-SPT4

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

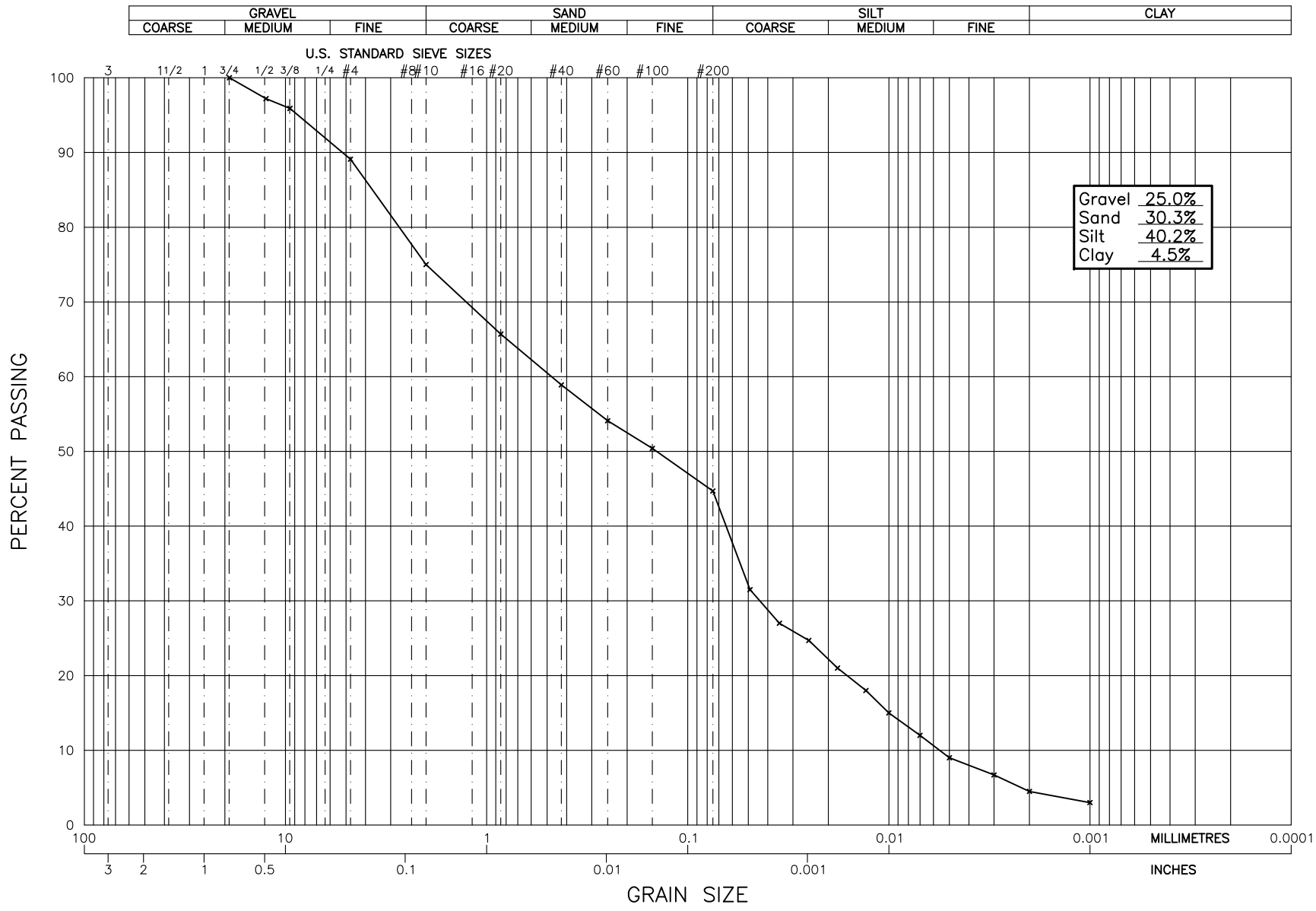
Client: BGC Engineering Inc.				Date: Oct.12, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type:
Sample #: **SPT4**	Test #:	**Hole #: BH-BGC11-57**	**Depth: 6.85 - 7.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: August 9, 2011	Date Received: September 13, 2011			Date Tested: Oct.11, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**59.5**
Wet Wt. & Tare	687.8	25.4		456.5	**100.0**	20	9.3	40.7	81.4	**48.5**
Dry Wt. & Tare	649.4	19.0	16.8	439.7	**96.3**	40	5.3	35.4	70.8	**42.2**
Water Wt.	38.4	12.5	14.3	425.4	**93.2**	60	3.1	32.3	64.6	**38.5**
Tare Wt.	192.9	9.5	32.8	392.6	**86.0**	100	2.4	29.9	59.8	**35.6**
Wt. Of Dry Soil	456.5	4.75	59.2	333.4	**73.0**	200	3.9	26.0	52.0	**31.0**
Moisture Content %	**8.4**	10	61.6	271.8	**59.5**	Pan	26.0			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	456.5			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.595	0.5	33.5	19.0	0.01382	25.5	12.1	4.917	0.068	51.0	**30.4**
50.0	0.595	1	32.0	19.0	0.01382	24.0	12.3	3.512	0.049	48.0	**28.6**
50.0	0.595	2	31.0	19.0	0.01382	23.0	12.5	2.500	0.035	46.0	**27.4**
50.0	0.595	4	28.5	19.0	0.01382	20.5	12.9	1.797	0.025	41.0	**24.4**
50.0	0.595	8	26.5	19.0	0.01382	18.5	13.2	1.287	0.018	37.0	**22.0**
50.0	0.595	15	24.5	19.0	0.01382	16.5	13.6	0.951	0.013	33.0	**19.6**
50.0	0.595	30	21.5	19.0	0.01382	13.5	14.1	0.685	0.009	27.0	**16.1**
50.0	0.595	60	19.0	19.0	0.01382	11.0	14.5	0.491	0.007	22.0	**13.1**
50.0	0.595	120	17.0	19.0	0.01382	9.0	14.8	0.351	0.005	18.0	**10.7**
50.0	0.595	240	15.0	20.0	0.01365	8.0	15.0	0.250	0.003	16.0	**9.5**
50.0	0.595	480	14.0	20.0	0.01365	7.0	15.1	0.178	0.002	14.0	**8.3**
50.0	0.595	1440	14.0	20.0	0.01365	7.0	15.1	0.103	0.001	14.0	**8.3**

Hydrometer #: 932452	Graduate #: 2	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-58-G2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH58-G2

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

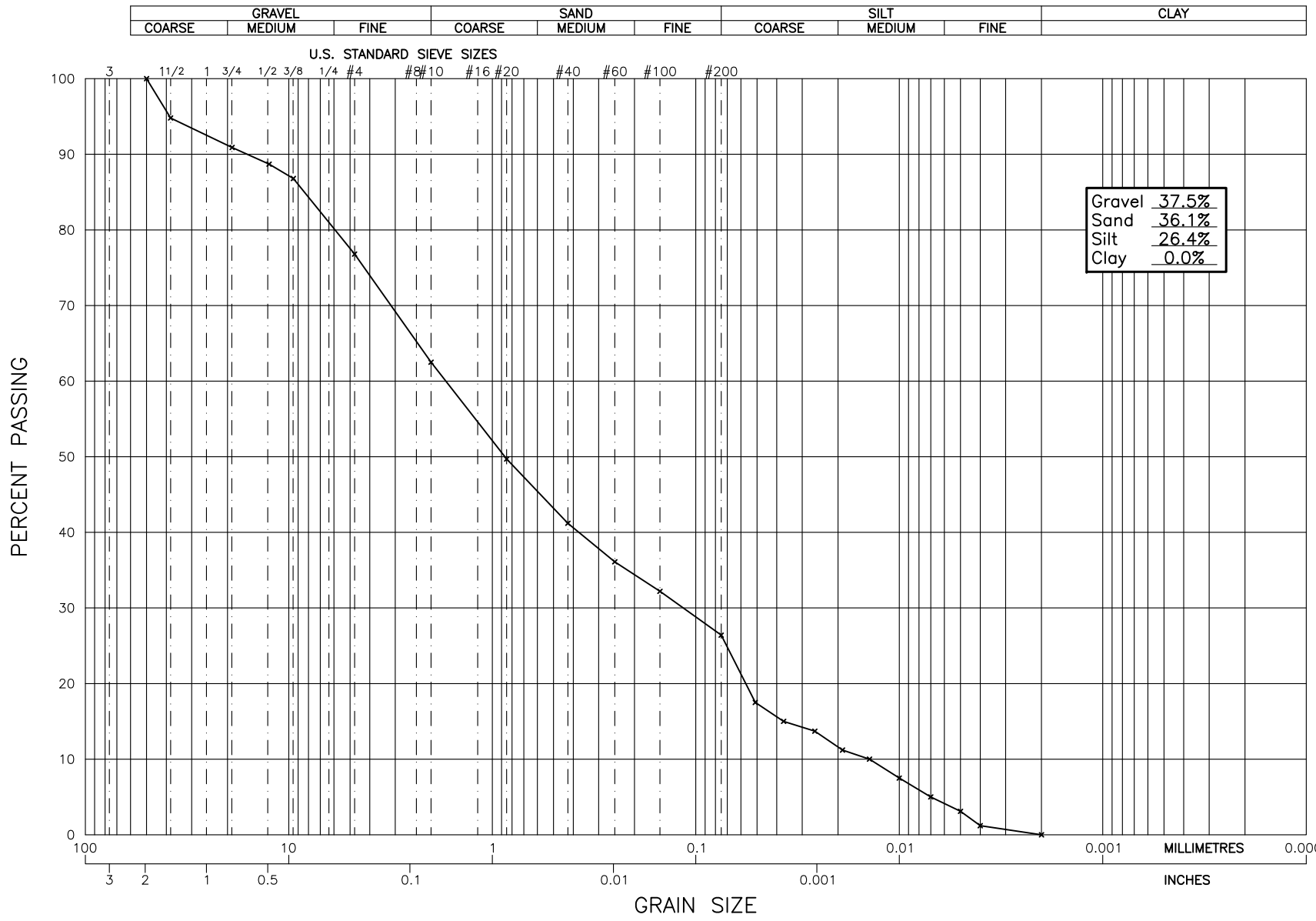
Client: BGC Engineering Ltd.				Date: November 10, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt,sandy
Sample #: **G2**	Test #:	**Hole #: BH-BGC11-58**	**Depth: 1.9-2.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.10, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.9, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**75.0**
Wet Wt. & Tare	1615.8	25.4				20	6.2	43.8	87.6	**65.7**
Dry Wt. & Tare	1404.2	19.0		1221.7	**100.0**	40	4.5	39.3	78.6	**58.9**
Water Wt.	211.6	12.5	34.3	1187.4	**97.2**	60	3.2	36.1	72.2	**54.1**
Tare Wt.	182.5	9.5	15.2	1172.2	**95.9**	100	2.5	33.6	67.2	**50.4**
Wt. Of Dry Soil	1221.7	4.75	83.3	1088.9	**89.1**	200	3.8	29.8	59.6	**44.7**
Moisture Content %	**17.3**	10	173.1	915.8	**75.0**	Pan	29.8			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	1221.7			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.750	0.5	32.0	20.0	0.01365	25.0	12.2	4.934	0.067	50.0	**37.5**
50.0	0.750	1	28.0	20.0	0.01365	21.0	12.8	3.582	0.049	42.0	**31.5**
50.0	0.750	2	25.0	20.0	0.01365	18.0	13.3	2.581	0.035	36.0	**27.0**
50.0	0.750	4	23.5	20.0	0.01365	16.5	13.6	1.842	0.025	33.0	**24.7**
50.0	0.750	8	21.0	20.0	0.01365	14.0	14.0	1.322	0.018	28.0	**21.0**
50.0	0.750	15	19.0	20.0	0.01365	12.0	14.3	0.977	0.013	24.0	**18.0**
50.0	0.750	30	17.0	20.0	0.01365	10.0	14.6	0.699	0.010	20.0	**15.0**
50.0	0.750	60	15.0	20.0	0.01365	8.0	15.0	0.500	0.007	16.0	**12.0**
50.0	0.750	120	13.0	20.0	0.01365	6.0	15.3	0.357	0.005	12.0	**9.0**
50.0	0.750	240	11.5	20.0	0.01365	4.5	15.6	0.255	0.003	9.0	**6.7**
50.0	0.750	480	10.0	21.0	0.01348	3.0	15.8	0.181	0.002	6.0	**4.5**
50.0	0.750	1440	10.0	18.0	0.01399	2.0	16.0	0.105	0.001	4.0	**3.0**

Hydrometer #: 932452	Graduate #: 7	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-58-G4

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH58-G4

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

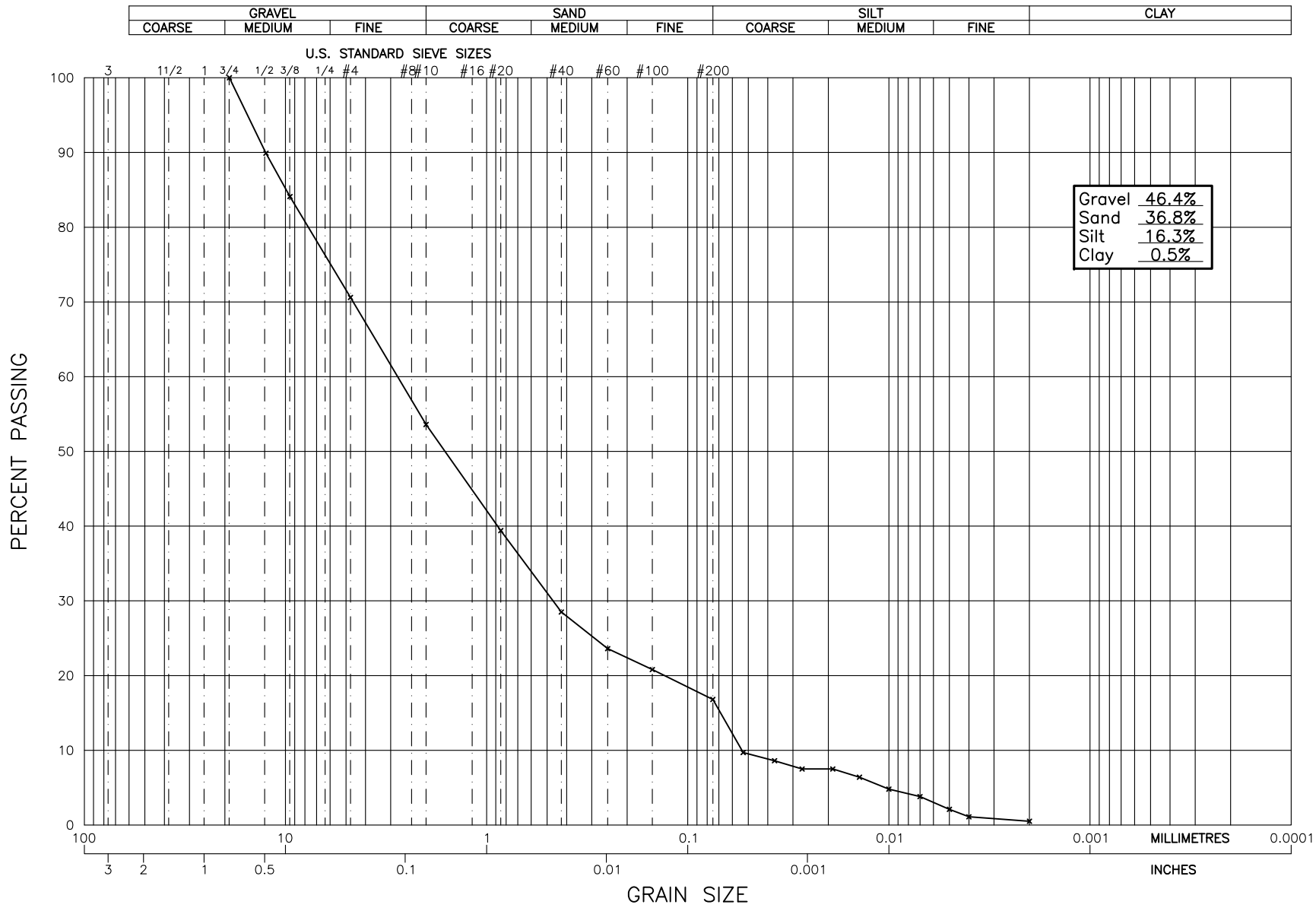
Client: BGC Engineering Ltd.				Date: November 10, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel and Sand, silty
Sample #: **G4**	Test #:	**Hole #: BH-BGC11-58**	**Depth: 3.2-3.6m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.10, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.9, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1	78.8	1442.7	**94.8**	10		50.0	100.0	**62.5**
Wet Wt. & Tare	1822.2	25.4	0.0	1442.7	**94.8**	20	10.2	39.8	79.6	**49.7**
Dry Wt. & Tare	1653.0	19.0	59.7	1383.0	**90.9**	40	6.8	33.0	66.0	**41.2**
Water Wt.	169.2	12.5	33.2	1349.8	**88.7**	60	4.1	28.9	57.8	**36.1**
Tare Wt.	131.5	9.5	28.8	1321.0	**86.8**	100	3.1	25.8	51.6	**32.2**
Wt. Of Dry Soil	1521.5	4.75	152.9	1168.1	**76.8**	200	4.7	21.1	42.2	**26.4**
Moisture Content %	**11.1**	10	217.7	950.4	**62.5**	Pan	21.1			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	1521.5			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.625	0.5	23.0	20.0	0.01365	16.0	13.7	5.226	0.071	32.0	**20.0**
50.0	0.625	1	21.0	20.0	0.01365	14.0	14.0	3.740	0.051	28.0	**17.5**
50.0	0.625	2	19.0	20.0	0.01365	12.0	14.3	2.675	0.037	24.0	**15.0**
50.0	0.625	4	18.0	20.0	0.01365	11.0	14.5	1.903	0.026	22.0	**13.7**
50.0	0.625	8	16.0	20.0	0.01365	9.0	14.8	1.361	0.019	18.0	**11.2**
50.0	0.625	15	15.0	20.0	0.01365	8.0	15.0	0.999	0.014	16.0	**10.0**
50.0	0.625	30	13.0	20.0	0.01365	6.0	15.3	0.714	0.010	12.0	**7.5**
50.0	0.625	60	11.0	20.0	0.01365	4.0	15.6	0.510	0.007	8.0	**5.0**
50.0	0.625	120	9.5	20.0	0.01365	2.5	15.9	0.364	0.005	5.0	**3.1**
50.0	0.625	240	8.0	20.0	0.01365	1.0	16.1	0.259	0.004	2.0	**1.2**
50.0	0.625	480	7.0	21.0	0.01348	0.0	16.3	0.184	0.002	0.0	**0.0**
50.0	0.625	1440	7.0	20.0	0.01365	0.0	16.3	0.106	0.001	0.0	**0.0**

Hydrometer #: 932452	Graduate #: 8	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-58-G6

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH58-G6

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

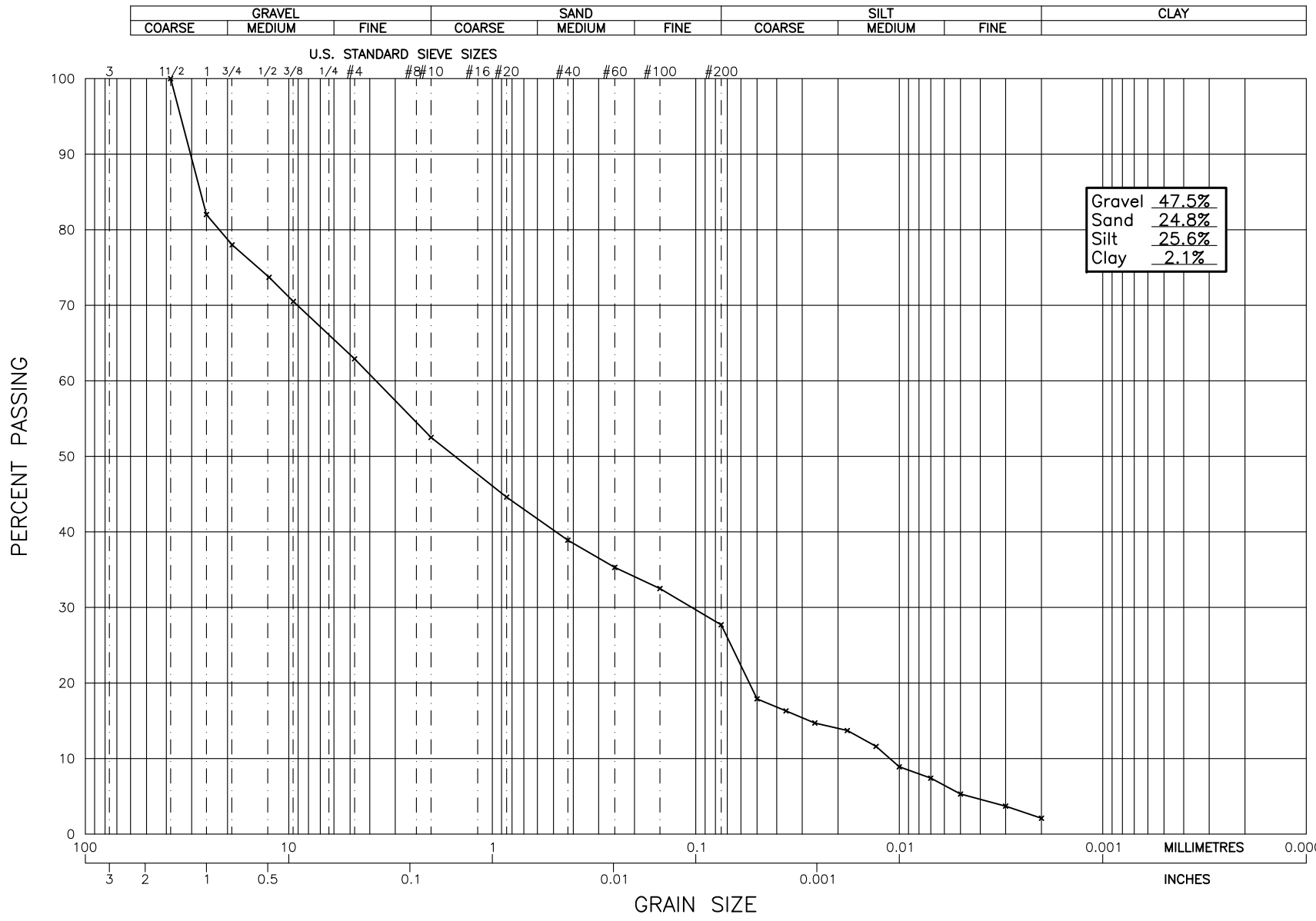
Client: BGC Engineering Ltd.				Date: November 10, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel/Sand,some silt
Sample #: **G6**	Test #:	**Hole #: BH-BGC11-58**	**Depth: 4.4 - 4.6m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.10, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.9, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**53.6**
Wet Wt. & Tare	1566.8	25.4				20	13.3	36.7	73.4	**39.4**
Dry Wt. & Tare	1426.7	19.0		1246.8	**100.0**	40	10.1	26.6	53.2	**28.5**
Water Wt.	140.1	12.5	125.9	1120.9	**89.9**	60	4.6	22.0	44.0	**23.6**
Tare Wt.	179.9	9.5	72.0	1048.9	**84.1**	100	2.6	19.4	38.8	**20.8**
Wt. Of Dry Soil	1246.8	4.75	168.7	880.2	**70.6**	200	3.7	15.7	31.4	**16.8**
Moisture Content %	**11.2**	10	211.3	668.9	**53.6**	Pan	15.7			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	1246.8			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.536	0.5	19.0	20.0	0.01365	12.0	14.3	5.351	0.073	24.0	**12.9**
50.0	0.536	1	16.0	20.0	0.01365	9.0	14.8	3.848	0.053	18.0	**9.7**
50.0	0.536	2	15.0	20.0	0.01365	8.0	15.0	2.736	0.037	16.0	**8.6**
50.0	0.536	4	14.0	20.0	0.01365	7.0	15.1	1.946	0.027	14.0	**7.5**
50.0	0.536	8	14.0	20.0	0.01365	7.0	15.1	1.376	0.019	14.0	**7.5**
50.0	0.536	15	13.0	20.0	0.01365	6.0	15.3	1.010	0.014	12.0	**6.4**
50.0	0.536	30	11.5	20.0	0.01365	4.5	15.6	0.720	0.010	9.0	**4.8**
50.0	0.536	60	10.5	20.0	0.01365	3.5	15.7	0.512	0.007	7.0	**3.8**
50.0	0.536	120	9.0	20.0	0.01365	2.0	16.0	0.365	0.005	4.0	**2.1**
50.0	0.536	240	8.0	20.0	0.01365	1.0	16.1	0.259	0.004	2.0	**1.1**
50.0	0.536	480	7.5	21.0	0.01348	0.5	16.2	0.184	0.002	1.0	**0.5**
50.0	0.536	1440	7.5	20.0	0.01365	0.5	16.2	0.106	0.001	1.0	**0.5**

Hydrometer #: 932452	Graduate #: 2	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-58-G8

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH58-G8

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

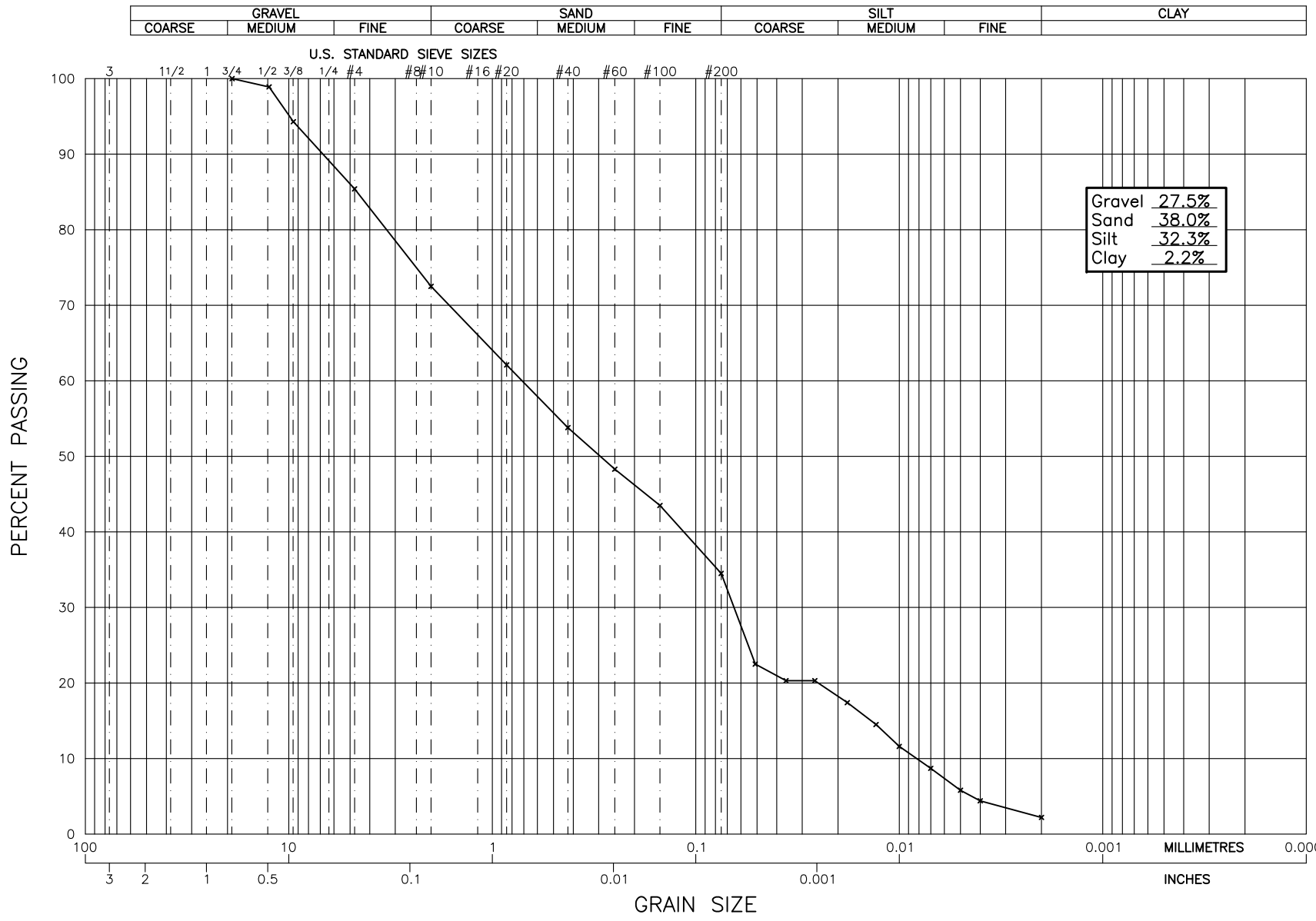
Client: BGC Engineering Ltd.				Date: November 10, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Gravel,sandy,silty
Sample #: **G8**	Test #:	**Hole #: BH-BGC11-58**	**Depth: 5.4 - 5.5m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.10, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.9, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1		830.1	**100.0**	10		50.0	100.0	**52.5**
Wet Wt. & Tare	1065.0	25.4	149.5	680.6	**82.0**	20	7.6	42.4	84.8	**44.6**
Dry Wt. & Tare	1011.5	19.0	33.5	647.1	**78.0**	40	5.4	37.0	74.0	**38.9**
Water Wt.	53.5	12.5	35.3	611.8	**73.7**	60	3.4	33.6	67.2	**35.3**
Tare Wt.	181.4	9.5	26.5	585.3	**70.5**	100	2.7	30.9	61.8	**32.5**
Wt. Of Dry Soil	830.1	4.75	62.9	522.4	**62.9**	200	4.5	26.4	52.8	**27.7**
Moisture Content %	**6.4**	10	86.2	436.2	**52.5**	Pan	26.4			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	830.1			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.525	0.5	28.0	20.0	0.01365	21.0	12.8	5.066	0.069	42.0	**22.1**
50.0	0.525	1	24.0	20.0	0.01365	17.0	13.5	3.673	0.050	34.0	**17.9**
50.0	0.525	2	22.5	20.0	0.01365	15.5	13.7	2.621	0.036	31.0	**16.3**
50.0	0.525	4	21.0	20.0	0.01365	14.0	14.0	1.870	0.026	28.0	**14.7**
50.0	0.525	8	20.0	20.0	0.01365	13.0	14.2	1.330	0.018	26.0	**13.7**
50.0	0.525	15	18.0	20.0	0.01365	11.0	14.5	0.983	0.013	22.0	**11.6**
50.0	0.525	30	15.5	20.0	0.01365	8.5	14.9	0.705	0.010	17.0	**8.9**
50.0	0.525	60	14.0	20.0	0.01365	7.0	15.1	0.502	0.007	14.0	**7.4**
50.0	0.525	120	12.0	20.0	0.01365	5.0	15.5	0.359	0.005	10.0	**5.3**
50.0	0.525	240	10.5	20.0	0.01365	3.5	15.7	0.256	0.003	7.0	**3.7**
50.0	0.525	480	9.0	21.0	0.01348	2.0	16.0	0.182	0.002	4.0	**2.1**
50.0	0.525	1440	9.0	20.0	0.01365	2.0	16.0	0.105	0.001	4.0	**2.1**

Hydrometer #: 932452	Graduate #: 3	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

Noelco



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-58-G10

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH58-G10

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

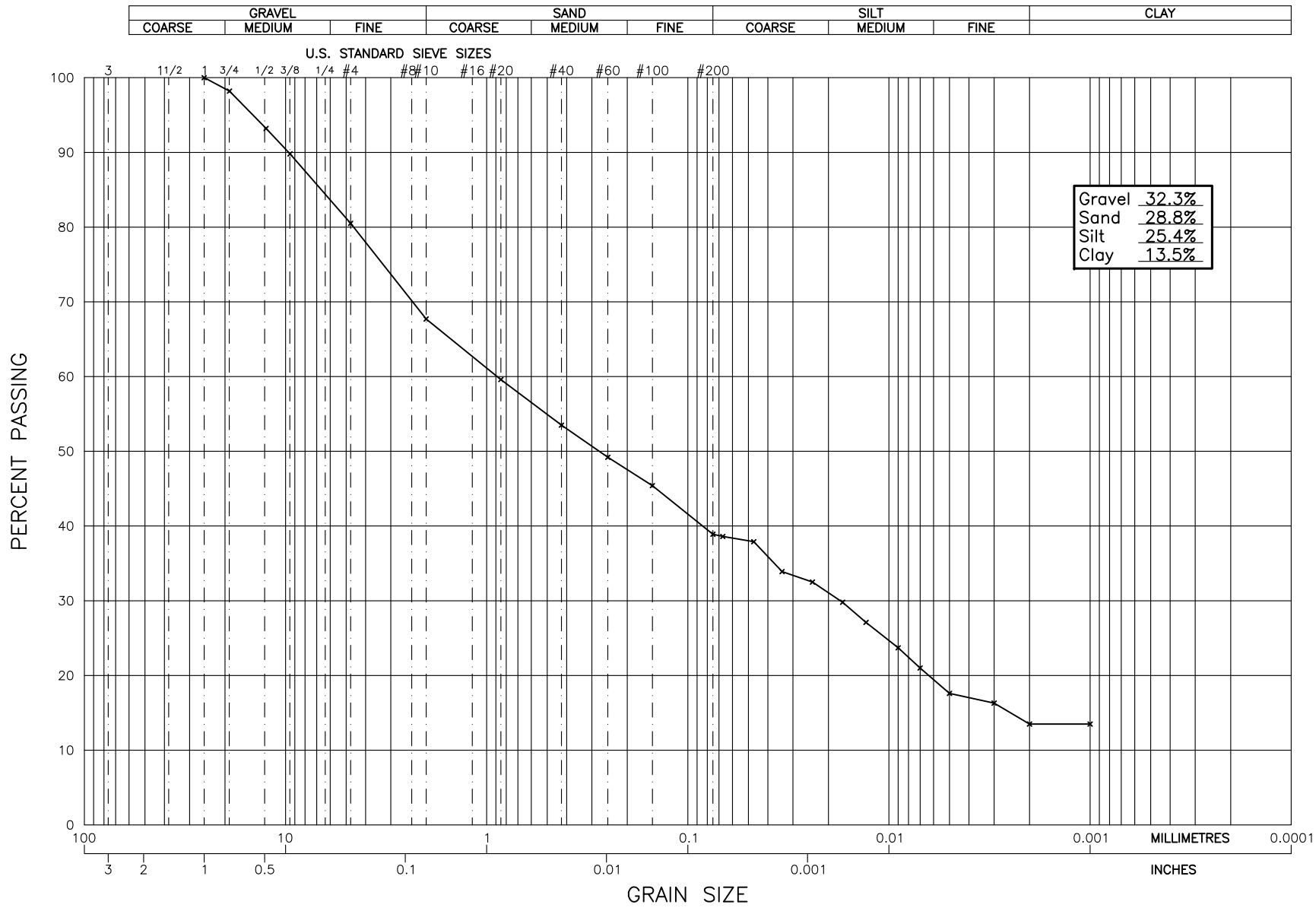
Client: BGC Engineering Ltd.				Date: November 10, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand and Silt, gravelly
Sample #: **G10**	Test #:	**Hole #: BH-BGC11-58**	**Depth: 7.9 - 8.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.10, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.9, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**72.5**
Wet Wt. & Tare	837.6	25.4				20	7.2	42.8	85.6	**62.1**
Dry Wt. & Tare	785.5	19.0		605.0	**100.0**	40	5.7	37.1	74.2	**53.8**
Water Wt.	52.1	12.5	6.6	598.4	**98.9**	60	3.8	33.3	66.6	**48.3**
Tare Wt.	180.5	9.5	27.9	570.5	**94.3**	100	3.3	30.0	60.0	**43.5**
Wt. Of Dry Soil	605.0	4.75	53.7	516.8	**85.4**	200	6.2	23.8	47.6	**34.5**
Moisture Content %	**8.6**	10	78.0	438.8	**72.5**	Pan	23.8			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	605.0			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.725	0.5	27.0	20.0	0.01365	20.0	13.0	5.098	0.070	40.0	**29.0**
50.0	0.725	1	22.5	20.0	0.01365	15.5	13.7	3.706	0.051	31.0	**22.5**
50.0	0.725	2	21.0	20.0	0.01365	14.0	14.0	2.644	0.036	28.0	**20.3**
50.0	0.725	4	21.0	20.0	0.01365	14.0	14.0	1.870	0.026	28.0	**20.3**
50.0	0.725	8	19.0	20.0	0.01365	12.0	14.3	1.338	0.018	24.0	**17.4**
50.0	0.725	15	17.0	20.0	0.01365	10.0	14.6	0.988	0.013	20.0	**14.5**
50.0	0.725	30	15.0	20.0	0.01365	8.0	15.0	0.707	0.010	16.0	**11.6**
50.0	0.725	60	13.0	20.0	0.01365	6.0	15.3	0.505	0.007	12.0	**8.7**
50.0	0.725	120	11.0	20.0	0.01365	4.0	15.6	0.361	0.005	8.0	**5.8**
50.0	0.725	240	10.0	20.0	0.01365	3.0	15.8	0.257	0.004	6.0	**4.4**
50.0	0.725	480	8.5	21.0	0.01348	1.5	16.0	0.183	0.002	3.0	**2.2**
50.0	0.725	1440	8.5	20.0	0.01365	1.5	16.0	0.106	0.001	3.0	**2.2**

Hydrometer #: 932452	Graduate #: 4	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-60-G3

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH60-G3

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

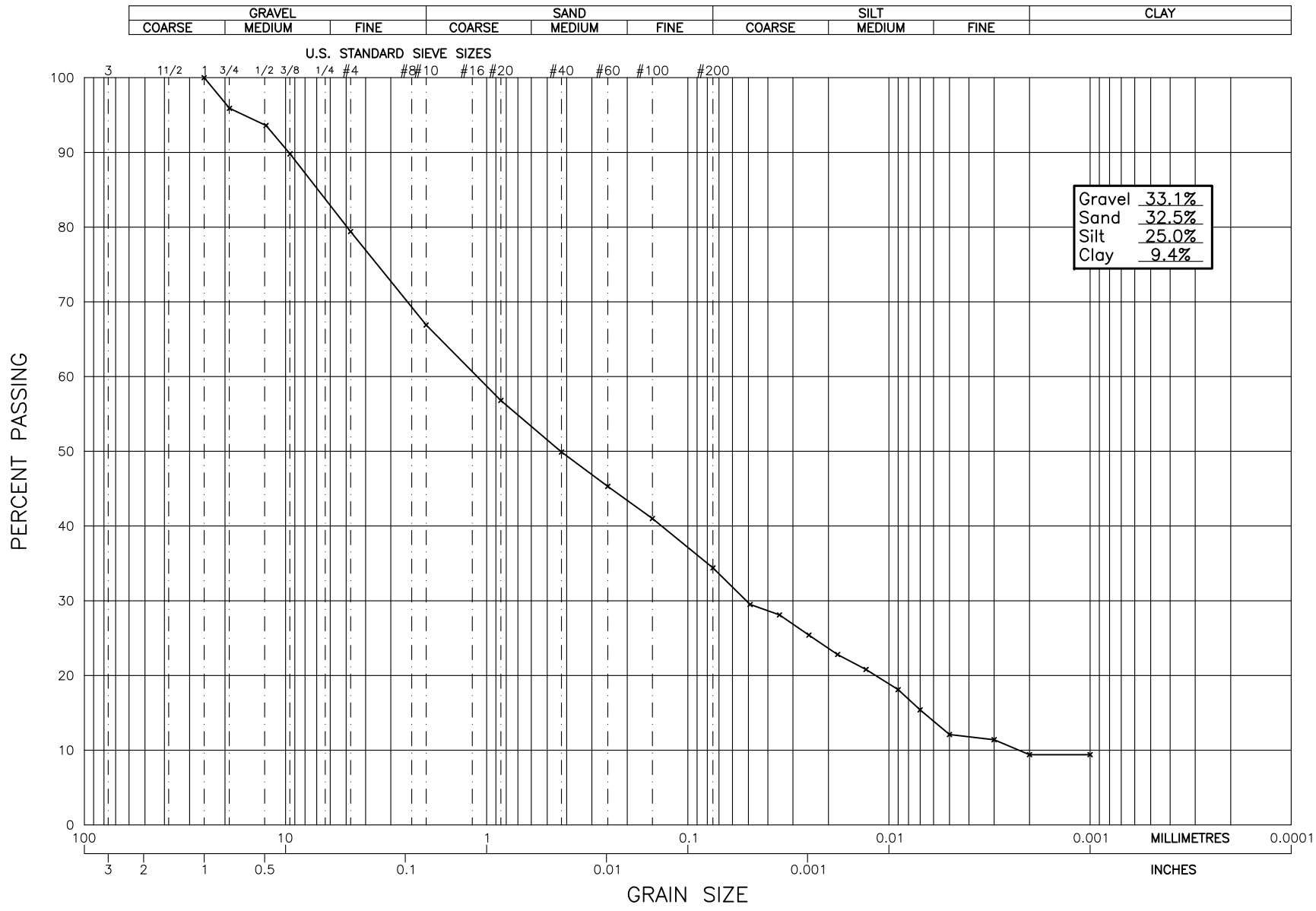
Client: BGC Engineering Inc.				Date: Oct.12, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type:
Sample #: **G3**	Test #:	**Hole #: BH-BGC11-60**	**Depth: 2.7 - 2.8m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: August 10, 2011	Date Received: September 13, 2011			Date Tested: Oct.11, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**67.7**
Wet Wt. & Tare	897.0	25.4		654.4	**100.0**	20	6.0	44.0	88.0	**59.6**
Dry Wt. & Tare	834.2	19.0	11.9	642.5	**98.2**	40	4.5	39.5	79.0	**53.5**
Water Wt.	62.8	12.5	32.6	609.9	**93.2**	60	3.2	36.3	72.6	**49.2**
Tare Wt.	179.8	9.5	22.4	587.5	**89.8**	100	2.8	33.5	67.0	**45.4**
Wt. Of Dry Soil	654.4	4.75	60.8	526.7	**80.5**	200	4.8	28.7	57.4	**38.9**
Moisture Content %	**9.6**	10	83.6	443.1	**67.7**	Pan	28.7			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	654.4			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.677	0.5	36.5	19.0	0.01382	28.5	11.6	4.815	0.067	57.0	**38.6**
50.0	0.677	1	36.0	19.0	0.01382	28.0	11.7	3.417	0.047	56.0	**37.9**
50.0	0.677	2	33.0	19.0	0.01382	25.0	12.2	2.467	0.034	50.0	**33.9**
50.0	0.677	4	32.0	19.0	0.01382	24.0	12.3	1.756	0.024	48.0	**32.5**
50.0	0.677	8	30.0	19.0	0.01382	22.0	12.7	1.258	0.017	44.0	**29.8**
50.0	0.677	15	28.0	19.0	0.01382	20.0	13.0	0.931	0.013	40.0	**27.1**
50.0	0.677	30	25.5	19.0	0.01382	17.5	13.4	0.669	0.009	35.0	**23.7**
50.0	0.677	60	23.5	19.0	0.01382	15.5	13.7	0.478	0.007	31.0	**21.0**
50.0	0.677	120	21.0	19.0	0.01382	13.0	14.2	0.343	0.005	26.0	**17.6**
50.0	0.677	240	19.0	20.0	0.01365	12.0	14.3	0.244	0.003	24.0	**16.3**
50.0	0.677	480	17.0	20.0	0.01365	10.0	14.6	0.175	0.002	20.0	**13.5**
50.0	0.677	1440	17.0	20.0	0.01365	10.0	14.6	0.101	0.001	20.0	**13.5**

Hydrometer #: 932452	Graduate #: 3	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

Noelco



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-60-G5

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH60-G5

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

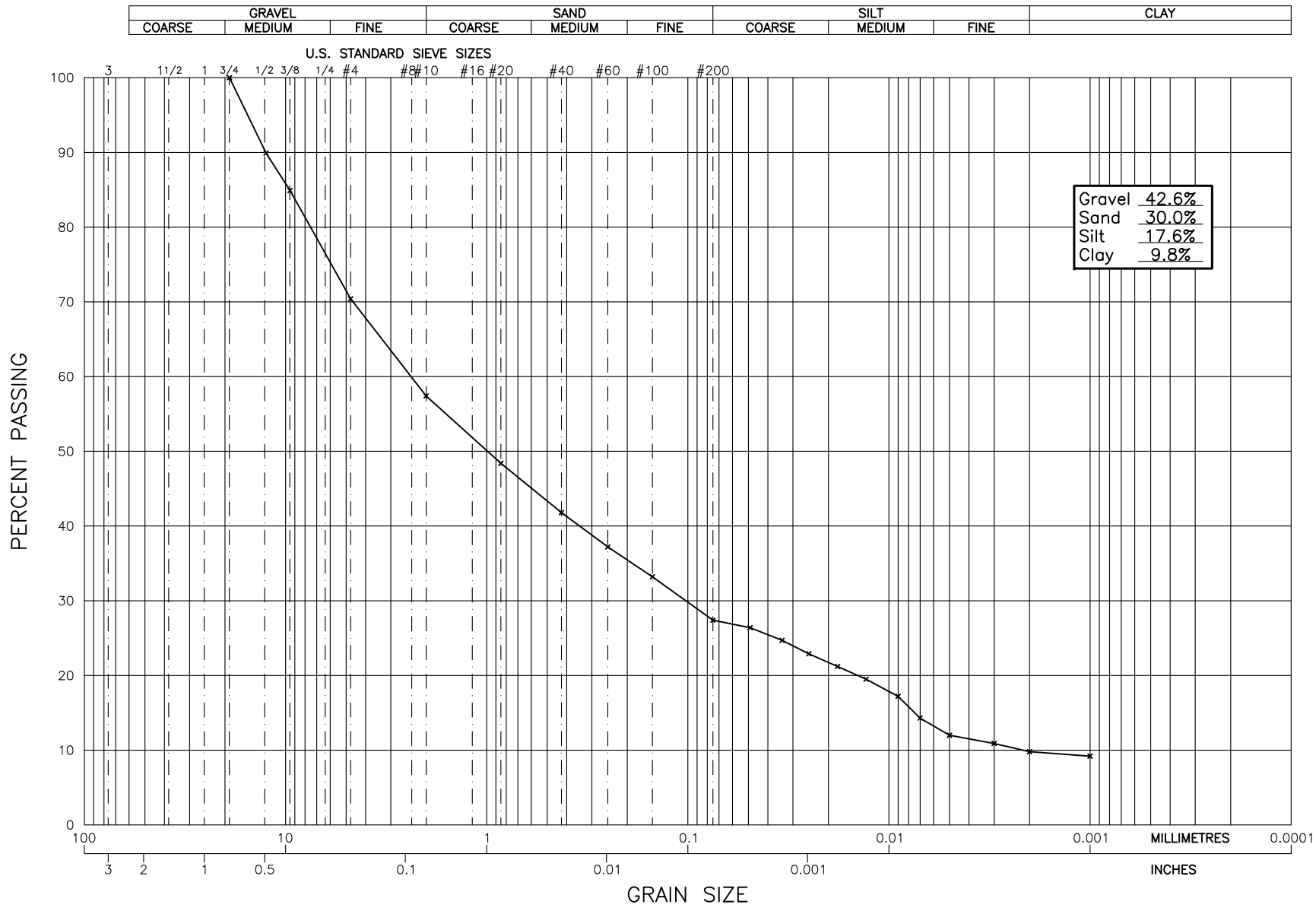
Client: BGC Engineering Inc.				Date: Oct.12, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type:
Sample #: **G5**	Test #:	**Hole #: BH-BGC11-60**	**Depth: 3.7 - 3.8m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: August 10, 2011	Date Received: September 13, 2011			Date Tested: Oct.11, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**66.9**
Wet Wt. & Tare	1032.3	25.4		771.5	**100.0**	20	7.6	42.4	84.8	**56.8**
Dry Wt. & Tare	963.2	19.0	31.6	739.9	**95.9**	40	5.1	37.3	74.6	**49.9**
Water Wt.	69.1	12.5	18.0	721.9	**93.6**	60	3.5	33.8	67.6	**45.3**
Tare Wt.	191.7	9.5	29.1	692.8	**89.8**	100	3.2	30.6	61.2	**41.0**
Wt. Of Dry Soil	771.5	4.75	80.3	612.5	**79.4**	200	4.9	25.7	51.4	**34.4**
Moisture Content %	**9.0**	10	96.0	516.5	**66.9**	Pan				
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	771.5			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.669	0.5	33.5	19.0	0.01382	25.5	12.1	4.917	0.068	51.0	**34.1**
50.0	0.669	1	30.0	19.0	0.01382	22.0	12.7	3.559	0.049	44.0	**29.5**
50.0	0.669	2	29.0	19.0	0.01382	21.0	12.8	2.533	0.035	42.0	**28.1**
50.0	0.669	4	27.0	19.0	0.01382	19.0	13.2	1.814	0.025	38.0	**25.4**
50.0	0.669	8	25.0	19.0	0.01382	17.0	13.5	1.299	0.018	34.0	**22.8**
50.0	0.669	15	23.5	19.0	0.01382	15.5	13.7	0.957	0.013	31.0	**20.8**
50.0	0.669	30	21.5	19.0	0.01382	13.5	14.1	0.685	0.009	27.0	**18.1**
50.0	0.669	60	19.5	19.0	0.01382	11.5	14.4	0.490	0.007	23.0	**15.4**
50.0	0.669	120	17.0	19.0	0.01382	9.0	14.8	0.351	0.005	18.0	**12.1**
50.0	0.669	240	15.5	20.0	0.01365	8.5	14.9	0.249	0.003	17.0	**11.4**
50.0	0.669	480	14.0	20.0	0.01365	7.0	15.1	0.178	0.002	14.0	**9.4**
50.0	0.669	1440	14.0	20.0	0.01365	7.0	15.1	0.103	0.001	14.0	**9.4**

Hydrometer #: 932452	Graduate #: 4	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

Noelco



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-60-G7

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH60-G7

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

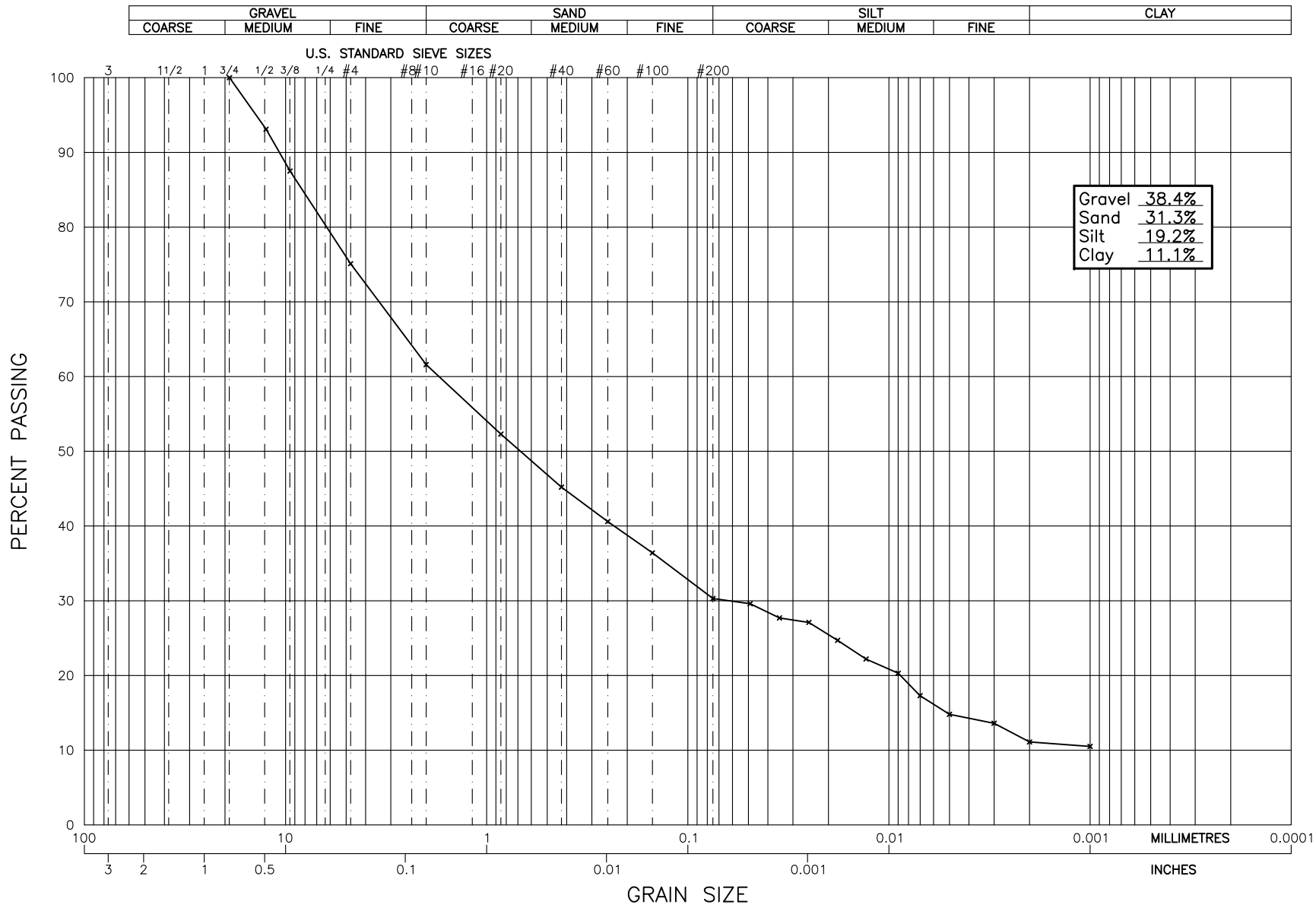
Client: BGC Engineering Inc.				Date: Oct.12, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type:
Sample #: **G7**	Test #:	**Hole #: BH-BGC11-60**	**Depth: 6.3 - 6.6m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: August 10, 2011	Date Received: September 13, 2011			Date Tested: Oct.11, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**57.4**
Wet Wt. & Tare	941.7	25.4				20	7.8	42.2	84.4	**48.4**
Dry Wt. & Tare	895.0	19.0		689.4	**100.0**	40	5.8	36.4	72.8	**41.8**
Water Wt.	46.7	12.5	69.5	619.9	**89.9**	60	4.0	32.4	64.8	**37.2**
Tare Wt.	205.6	9.5	34.7	585.2	**84.9**	100	3.5	28.9	57.8	**33.2**
Wt. Of Dry Soil	689.4	4.75	99.7	485.5	**70.4**	200	5.0	23.9	47.8	**27.4**
Moisture Content %	**6.8**	10	90.0	395.5	**57.4**	Pan	23.9			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	689.4			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.574	0.5	31.5	19.0	0.01382	23.5	12.4	4.983	0.069	47.0	**27.0**
50.0	0.574	1	31.0	19.0	0.01382	23.0	12.5	3.536	0.049	46.0	**26.4**
50.0	0.574	2	29.5	19.0	0.01382	21.5	12.7	2.525	0.035	43.0	**24.7**
50.0	0.574	4	28.0	19.0	0.01382	20.0	13.0	1.802	0.025	40.0	**22.9**
50.0	0.574	8	26.5	19.0	0.01382	18.5	13.2	1.287	0.018	37.0	**21.2**
50.0	0.574	15	25.0	19.0	0.01382	17.0	13.5	0.948	0.013	34.0	**19.5**
50.0	0.574	30	23.0	19.0	0.01382	15.0	13.8	0.679	0.009	30.0	**17.2**
50.0	0.574	60	20.5	19.0	0.01382	12.5	14.2	0.487	0.007	25.0	**14.3**
50.0	0.574	120	18.5	19.0	0.01382	10.5	14.6	0.348	0.005	21.0	**12.0**
50.0	0.574	240	16.5	20.0	0.01365	9.5	14.7	0.248	0.003	19.0	**10.9**
50.0	0.574	480	15.5	20.0	0.01365	8.5	14.9	0.176	0.002	17.0	**9.8**
50.0	0.574	1440	15.0	20.0	0.01365	8.0	15.0	0.102	0.001	16.0	**9.2**

Hydrometer #: 932452	Graduate #: 5	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-60-SPT2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH60-SPT2

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

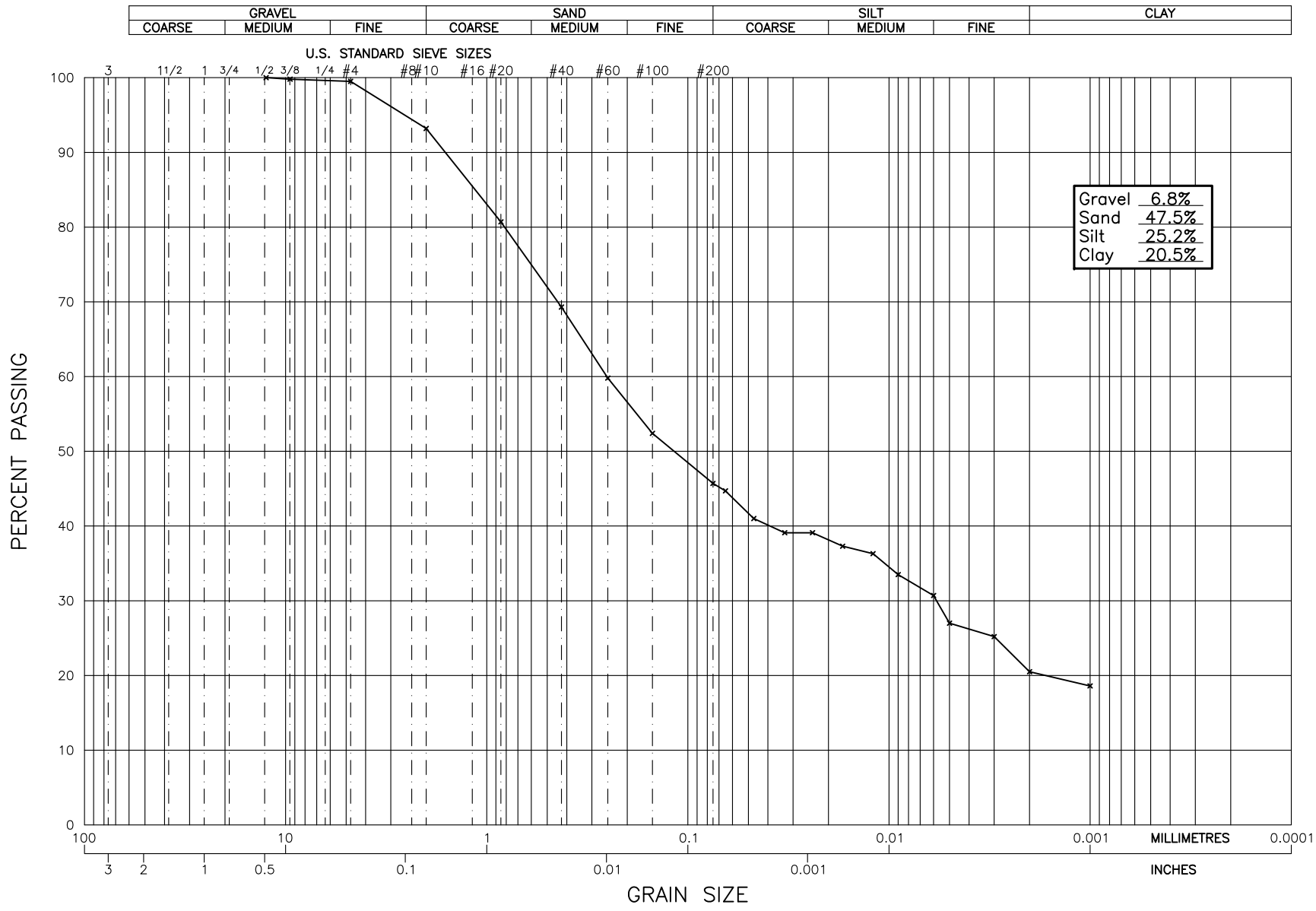
Client: BGC Engineering Inc.				Date: Oct.12, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type:
Sample #: **SPT2**	Test #:	**Hole #: BH-BGC11-60**	**Depth: 6.85 - 7.0**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: August 10, 2011	Date Received: September 13, 2011			Date Tested: Oct.11, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**61.6**
Wet Wt. & Tare	312.9	25.4				20	7.6	42.4	84.8	**52.3**
Dry Wt. & Tare	302.1	19.0		181.2	**100.0**	40	5.7	36.7	73.4	**45.2**
Water Wt.	10.8	12.5	12.5	168.7	**93.1**	60	3.8	32.9	65.8	**40.6**
Tare Wt.	120.9	9.5	10.2	158.5	**87.5**	100	3.4	29.5	59.0	**36.4**
Wt. Of Dry Soil	181.2	4.75	22.5	136.0	**75.1**	200	4.9	24.6	49.2	**30.3**
Moisture Content %	**6.0**	10	24.3	111.7	**61.6**	Pan	24.6			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	181.2			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.616	0.5	32.5	19.0	0.01382	24.5	12.3	4.950	0.068	49.0	**30.2**
50.0	0.616	1	32.0	19.0	0.01382	24.0	12.3	3.512	0.049	48.0	**29.6**
50.0	0.616	2	30.5	19.0	0.01382	22.5	12.6	2.508	0.035	45.0	**27.7**
50.0	0.616	4	30.0	19.0	0.01382	22.0	12.7	1.779	0.025	44.0	**27.1**
50.0	0.616	8	28.0	19.0	0.01382	20.0	13.0	1.275	0.018	40.0	**24.7**
50.0	0.616	15	26.0	19.0	0.01382	18.0	13.3	0.943	0.013	36.0	**22.2**
50.0	0.616	30	24.5	19.0	0.01382	16.5	13.6	0.673	0.009	33.0	**20.3**
50.0	0.616	60	22.0	19.0	0.01382	14.0	14.0	0.483	0.007	28.0	**17.3**
50.0	0.616	120	20.0	19.0	0.01382	12.0	14.3	0.345	0.005	24.0	**14.8**
50.0	0.616	240	18.0	20.0	0.01365	11.0	14.5	0.246	0.003	22.0	**13.6**
50.0	0.616	480	16.0	20.0	0.01365	9.0	14.8	0.176	0.002	18.0	**11.1**
50.0	0.616	1440	15.5	20.0	0.01365	8.5	14.9	0.102	0.001	17.0	**10.5**

Hydrometer #: 932452	Graduate #: 6	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-63-G2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH63-G2

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

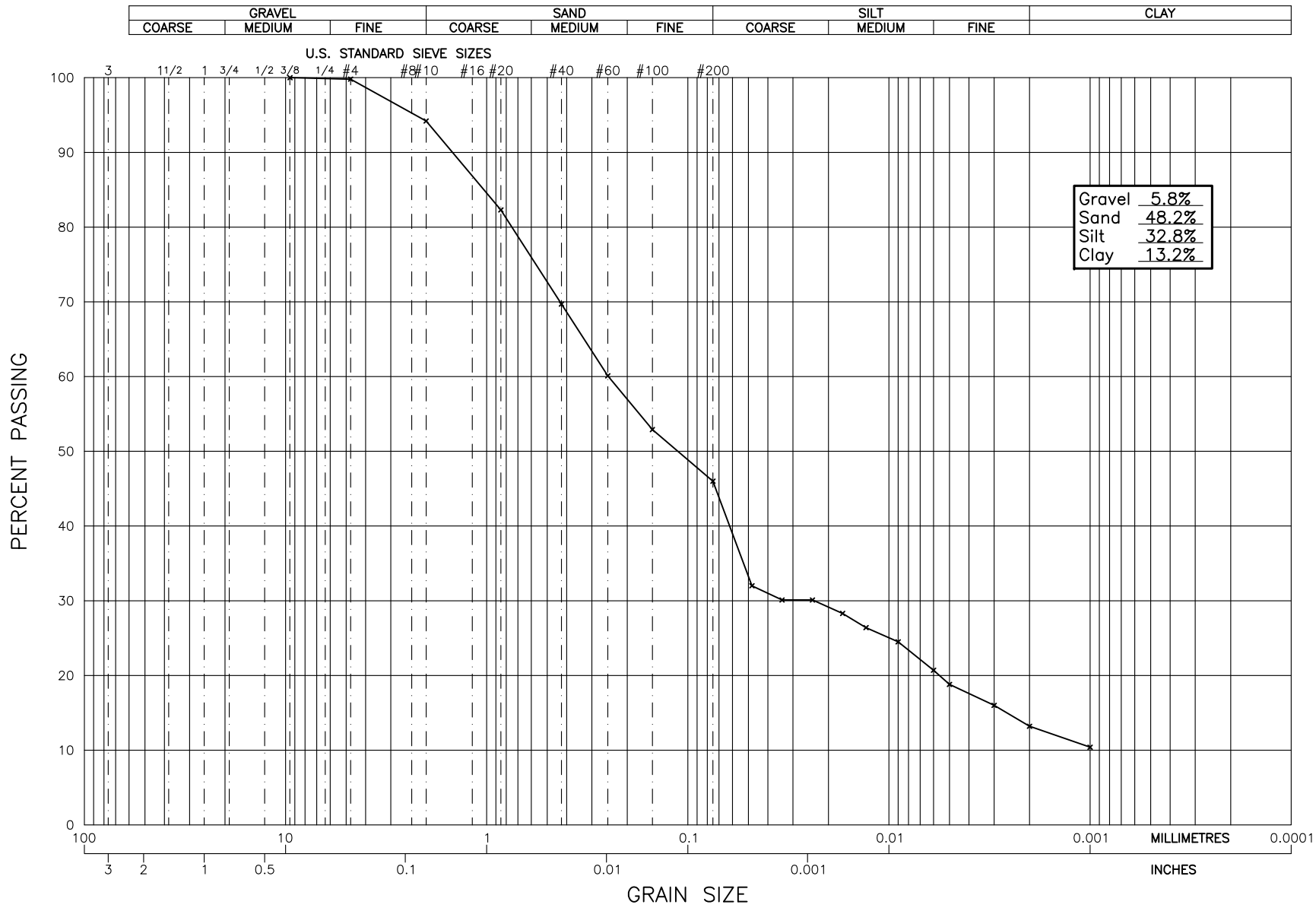
Client: BGC Engineering Ltd.				Date: Sept. 26, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand,silty/clayey
Sample #: **G2**	Test #:	**Hole #: BH-BGC11-63**	**Depth: 1.9 - 2.1m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 11, 2011	Date Received: September 13, 2011			Date Tested: Sept.21, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**93.2**
Wet Wt. & Tare	860.5	25.4				20	6.7	43.3	86.6	**80.7**
Dry Wt. & Tare	725.4	19.0				40	6.1	37.2	74.4	**69.3**
Water Wt.	135.1	12.5		546.2	**100.0**	60	5.1	32.1	64.2	**59.8**
Tare Wt.	179.2	9.5	1.3	544.9	**99.8**	100	4.0	28.1	56.2	**52.4**
Wt. Of Dry Soil	546.2	4.75	1.5	543.4	**99.5**	200	3.6	24.5	49.0	**45.7**
Moisture Content %	**24.7**	10	34.5	508.9	**93.2**	Pan	24.5			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	546.2			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.932	0.5	30.0	23.0	0.01317	24.0	12.3	4.967	0.065	48.0	**44.7**
50.0	0.932	1	28.0	23.0	0.01317	22.0	12.7	3.559	0.047	44.0	**41.0**
50.0	0.932	2	27.0	23.0	0.01317	21.0	12.8	2.533	0.033	42.0	**39.1**
50.0	0.932	4	27.0	23.0	0.01317	21.0	12.8	1.791	0.024	42.0	**39.1**
50.0	0.932	8	26.0	23.0	0.01317	20.0	13.0	1.275	0.017	40.0	**37.3**
50.0	0.932	15	25.5	23.0	0.01317	19.5	13.1	0.934	0.012	39.0	**36.3**
50.0	0.932	30	24.0	23.0	0.01317	18.0	13.3	0.666	0.009	36.0	**33.5**
50.0	0.932	60	22.5	23.0	0.01317	16.5	13.6	0.476	0.006	33.0	**30.7**
50.0	0.932	120	21.0	22.0	0.01332	14.5	13.9	0.340	0.005	29.0	**27.0**
50.0	0.932	240	20.0	22.0	0.01332	13.5	14.1	0.242	0.003	27.0	**25.2**
50.0	0.932	480	18.0	21.0	0.01348	11.0	14.5	0.174	0.002	22.0	**20.5**
50.0	0.932	1440	16.0	23.0	0.01317	10.0	14.6	0.101	0.001	20.0	**18.6**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-63-G5

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH63-G5

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

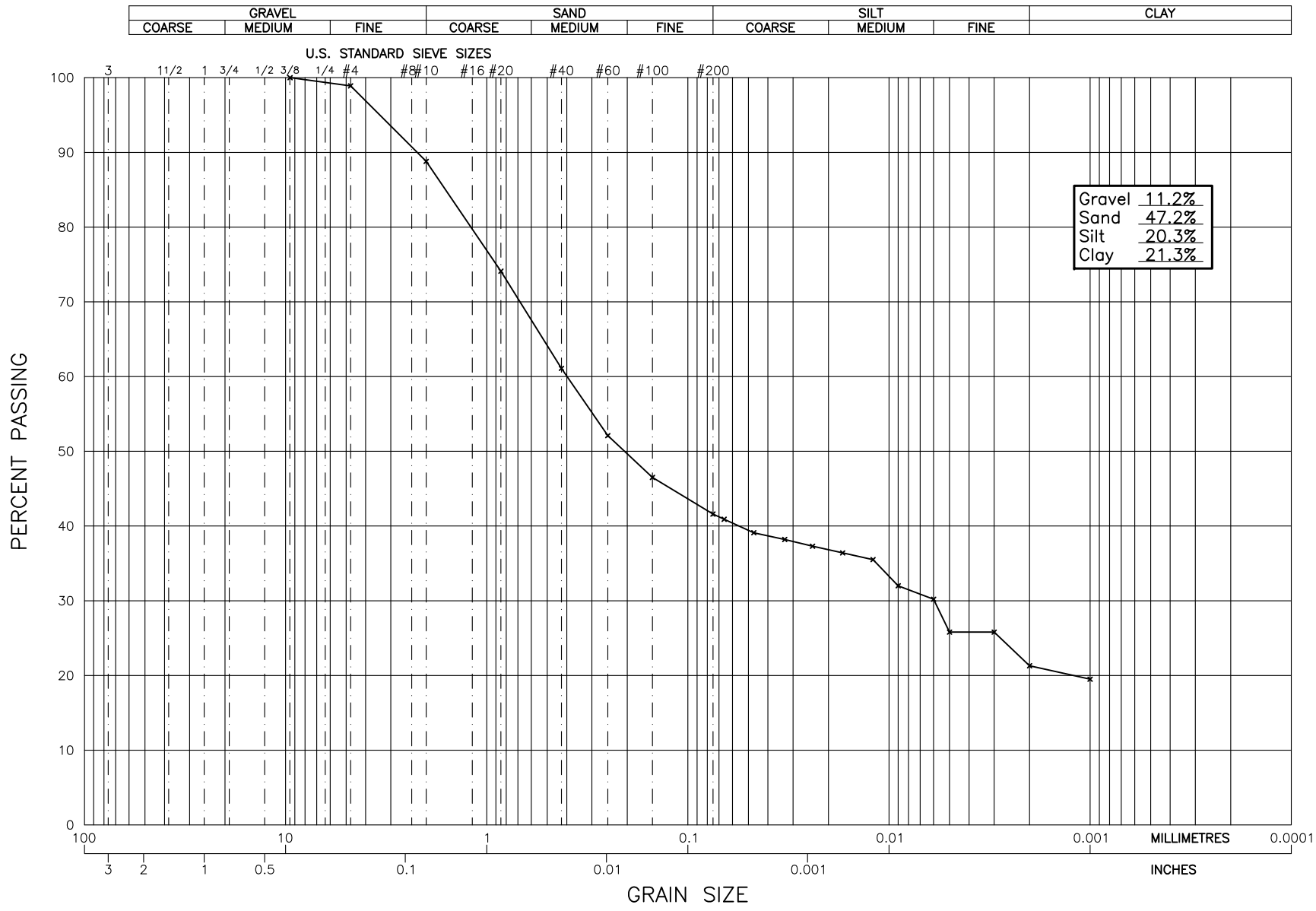
Client: BGC Engineering Ltd.				Date: Sept. 26, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand,silty some clay
Sample #: **G5**	Test #:	**Hole #: BH-BGC11-63**	**Depth: 3.9 - 4.0m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 11, 2011	Date Received: September 13, 2011			Date Tested: Sept.21, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**94.2**
Wet Wt. & Tare	867.8	25.4				20	6.3	43.7	87.4	**82.3**
Dry Wt. & Tare	711.3	19.0				40	6.7	37.0	74.0	**69.7**
Water Wt.	156.5	12.5				60	5.1	31.9	63.8	**60.1**
Tare Wt.	131.6	9.5		579.7	**100.0**	100	3.8	28.1	56.2	**52.9**
Wt. Of Dry Soil	579.7	4.75	1.3	578.4	**99.8**	200	3.7	24.4	48.8	**46.0**
Moisture Content %	**27.0**	10	32.5	545.9	**94.2**	Pan	24.4			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	579.7			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.942	0.5	24.0	23.0	0.01317	18.0	13.3	5.162	0.068	36.0	**33.9**
50.0	0.942	1	23.0	23.0	0.01317	17.0	13.5	3.673	0.048	34.0	**32.0**
50.0	0.942	2	22.0	23.0	0.01317	16.0	13.7	2.613	0.034	32.0	**30.1**
50.0	0.942	4	22.0	23.0	0.01317	16.0	13.7	1.848	0.024	32.0	**30.1**
50.0	0.942	8	21.0	23.0	0.01317	15.0	13.8	1.314	0.017	30.0	**28.3**
50.0	0.942	15	20.0	23.0	0.01317	14.0	14.0	0.966	0.013	28.0	**26.4**
50.0	0.942	30	19.0	23.0	0.01317	13.0	14.2	0.687	0.009	26.0	**24.5**
50.0	0.942	60	17.0	23.0	0.01317	11.0	14.5	0.491	0.006	22.0	**20.7**
50.0	0.942	120	16.5	22.0	0.01332	10.0	14.6	0.349	0.005	20.0	**18.8**
50.0	0.942	240	15.0	22.0	0.01332	8.5	14.9	0.249	0.003	17.0	**16.0**
50.0	0.942	480	14.0	21.0	0.01348	7.0	15.1	0.178	0.002	14.0	**13.2**
50.0	0.942	1440	11.5	23.0	0.01317	5.5	15.4	0.103	0.001	11.0	**10.4**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-63-G9

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH63-G9

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

Client: BGC Engineering Ltd.				Date: Sept. 26, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand, silty/clayey some gravel
Sample #: **G9**	Test #:	**Hole #: BH-BGC11-63**	**Depth: 10.15 - 10.25m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 11, 2011	Date Received: September 13, 2011			Date Tested: Sept. 21, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**88.8**
Wet Wt. & Tare	688.9	25.4				20	8.3	41.7	83.4	**74.1**
Dry Wt. & Tare	576.3	19.0				40	7.3	34.4	68.8	**61.1**
Water Wt.	112.6	12.5				60	5.1	29.3	58.6	**52.1**
Tare Wt.	182.5	9.5		393.8	**100.0**	100	3.1	26.2	52.4	**46.5**
Wt. Of Dry Soil	393.8	4.75	4.5	389.3	**98.9**	200	2.8	23.4	46.8	**41.6**
Moisture Content %	**28.6**	10	39.5	349.8	**88.8**	Pan	23.4			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	393.8			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.888	0.5	29.0	23.0	0.01317	23.0	12.5	5.000	0.066	46.0	**40.9**
50.0	0.888	1	28.0	23.0	0.01317	22.0	12.7	3.559	0.047	44.0	**39.1**
50.0	0.888	2	27.5	23.0	0.01317	21.5	12.7	2.525	0.033	43.0	**38.2**
50.0	0.888	4	27.0	23.0	0.01317	21.0	12.8	1.791	0.024	42.0	**37.3**
50.0	0.888	8	26.5	23.0	0.01317	20.5	12.9	1.270	0.017	41.0	**36.4**
50.0	0.888	15	26.0	23.0	0.01317	20.0	13.0	0.931	0.012	40.0	**35.5**
50.0	0.888	30	24.0	23.0	0.01317	18.0	13.3	0.666	0.009	36.0	**32.0**
50.0	0.888	60	23.0	23.0	0.01317	17.0	13.5	0.474	0.006	34.0	**30.2**
50.0	0.888	120	21.0	22.0	0.01332	14.5	13.9	0.340	0.005	29.0	**25.8**
50.0	0.888	240	21.0	22.0	0.01332	14.5	13.9	0.241	0.003	29.0	**25.8**
50.0	0.888	480	19.0	21.0	0.01348	12.0	14.3	0.173	0.002	24.0	**21.3**
50.0	0.888	1440	17.0	23.0	0.01317	11.0	14.5	0.100	0.001	22.0	**19.5**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

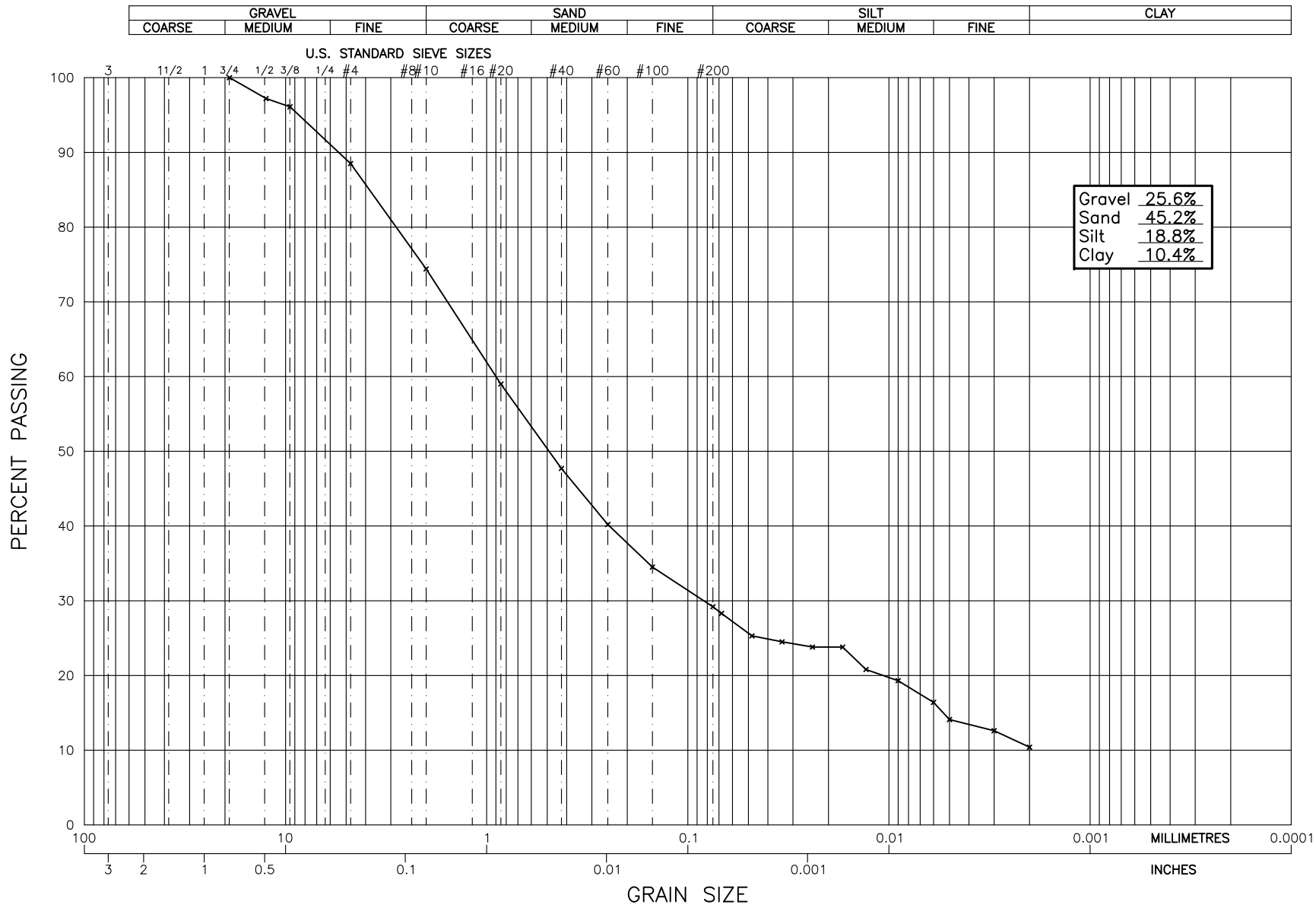
Client: BGC Engineering Ltd.				Date: Sept. 26, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #:K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Sand, gravelly some silt and clay
Sample #: G12	Test #:	**Hole #: BH-BGC11-63**	**Depth: 16.2 - 16.3m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 11, 2011	Date Received: September 13, 2011			Date Tested: Sept. 21, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**74.4**
Wet Wt. & Tare	985.9	25.4				20	10.3	39.7	79.4	**59.0**
Dry Wt. & Tare	825.8	19.0		646.1	**100.0**	40	7.6	32.1	64.2	**47.7**
Water Wt.	160.1	12.5	17.9	628.2	**97.2**	60	5.1	27.0	54.0	**40.2**
Tare Wt.	179.7	9.5	7.0	621.2	**96.1**	100	3.8	23.2	46.4	**34.5**
Wt. Of Dry Soil	646.1	4.75	49.6	571.6	**88.5**	200	3.6	19.6	39.2	**29.2**
Moisture Content %	**24.8**	10	91.1	480.5	**74.4**	Pan	19.6			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	646.1			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.744	0.5	25.0	23.0	0.01317	19.0	13.2	5.130	0.068	38.0	**28.3**
50.0	0.744	1	23.0	23.0	0.01317	17.0	13.5	3.673	0.048	34.0	**25.3**
50.0	0.744	2	22.5	23.0	0.01317	16.5	13.6	2.605	0.034	33.0	**24.5**
50.0	0.744	4	22.0	23.0	0.01317	16.0	13.7	1.848	0.024	32.0	**23.8**
50.0	0.744	8	22.0	23.0	0.01317	16.0	13.7	1.306	0.017	32.0	**23.8**
50.0	0.744	15	20.0	23.0	0.01317	14.0	14.0	0.966	0.013	28.0	**20.8**
50.0	0.744	30	19.0	23.0	0.01317	13.0	14.2	0.687	0.009	26.0	**19.3**
50.0	0.744	60	17.0	23.0	0.01317	11.0	14.5	0.491	0.006	22.0	**16.4**
50.0	0.744	120	16.0	22.0	0.01332	9.5	14.7	0.350	0.005	19.0	**14.1**
50.0	0.744	240	15.0	22.0	0.01332	8.5	14.9	0.249	0.003	17.0	**12.6**
50.0	0.744	480	14.0	21.0	0.01348	7.0	15.1	0.178	0.002	14.0	**10.4**
50.0	0.744	1440	13.0	23.0	0.01317	7.0	15.1	0.103	0.001	14.0	**10.4**

Hydrometer #: 932452	Graduate #:	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-63-G12

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH63-G12

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

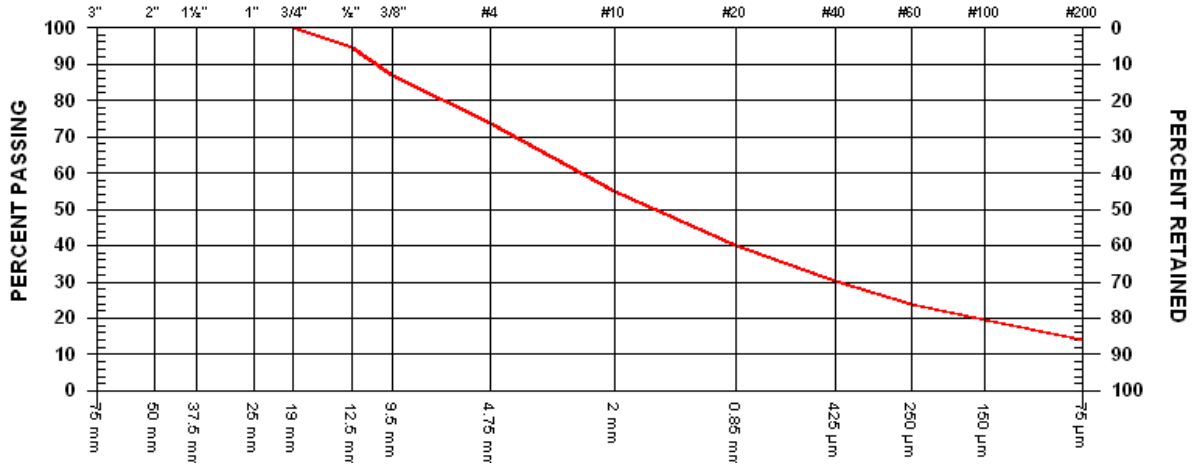
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 11 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.04 DATE SAMPLED 2011.Aug.14

SUPPLIER BH-BGC11-65
SOURCE SPT 1 @ 0.76 - 1.21m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm	100.0	
1/2"	12.5 mm	94.4	
3/8"	9.5 mm	86.9	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	73.7	
No. 10	2.00 mm	55.0	
No. 20	850 µm	40.0	
No. 40	425 µm	30.1	
No. 60	250 µm	23.8	
No. 100	150 µm	19.4	
No. 200	75 µm	14.1	

COMMENTS

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

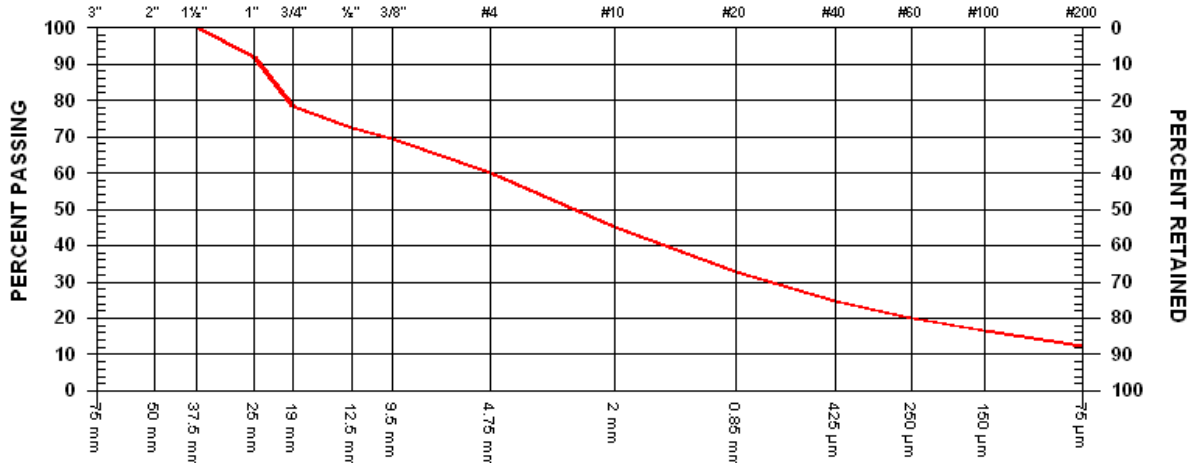
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 12 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.04 DATE SAMPLED 2011.Aug.14

SUPPLIER BH-BGC11-65
SOURCE SPT 2 @ 1.52 - 1.97m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	92.1	
3/4"	19 mm	78.2	
1/2"	12.5 mm	72.5	
3/8"	9.5 mm	69.4	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	60.2	
No. 10	2.00 mm	45.0	
No. 20	850 µm	32.6	
No. 40	425 µm	24.8	
No. 60	250 µm	19.9	
No. 100	150 µm	16.4	
No. 200	75 µm	12.2	

COMMENTS

 2011.Nov.09 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

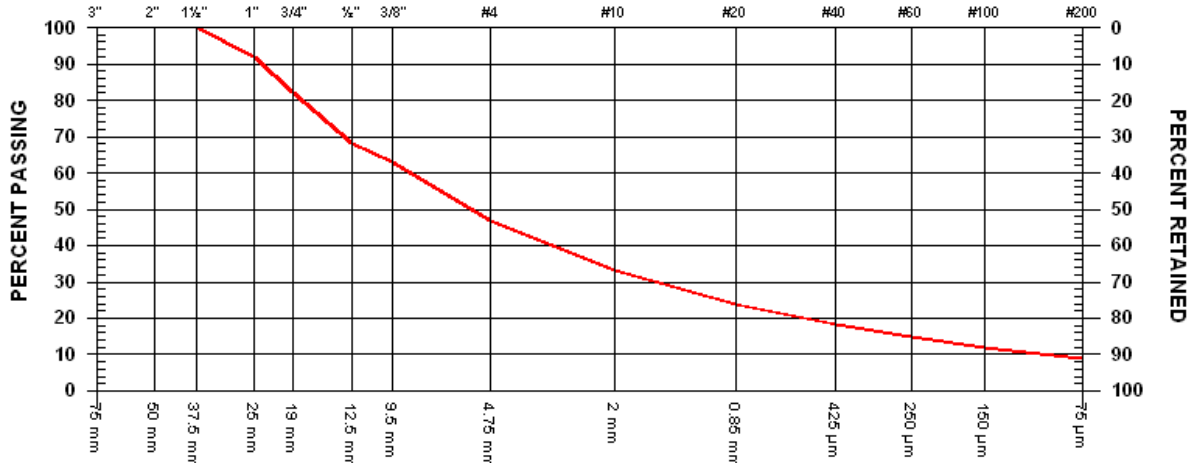
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 13 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.04 DATE SAMPLED 2011.Aug.14

SUPPLIER BH-BGC11-65
SOURCE SPT 3 @ 2.28 - 2.73m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	92.1	
3/4"	19 mm	82.2	
1/2"	12.5 mm	68.0	
3/8"	9.5 mm	63.1	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	47.0	
No. 10	2.00 mm	33.1	
No. 20	850 µm	24.0	
No. 40	425 µm	18.3	
No. 60	250 µm	14.7	
No. 100	150 µm	12.0	
No. 200	75 µm	8.9	

COMMENTS

 2011.Nov.09 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

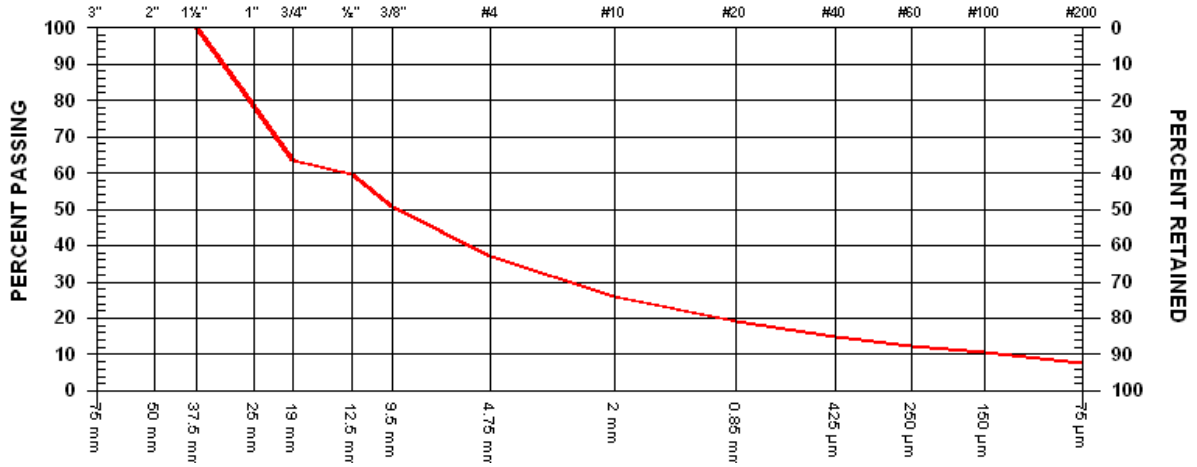
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 14 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.04 DATE SAMPLED 2011.Aug.14

SUPPLIER BH-BGC11-65
SOURCE SPT 4 @ 3.04 - 3.49m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	78.5	
3/4"	19 mm	63.3	
1/2"	12.5 mm	59.6	
3/8"	9.5 mm	50.7	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	36.9	
No. 10	2.00 mm	26.1	
No. 20	850 µm	19.2	
No. 40	425 µm	15.1	
No. 60	250 µm	12.5	
No. 100	150 µm	10.5	
No. 200	75 µm	7.8	

COMMENTS

 2011.Nov.09 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

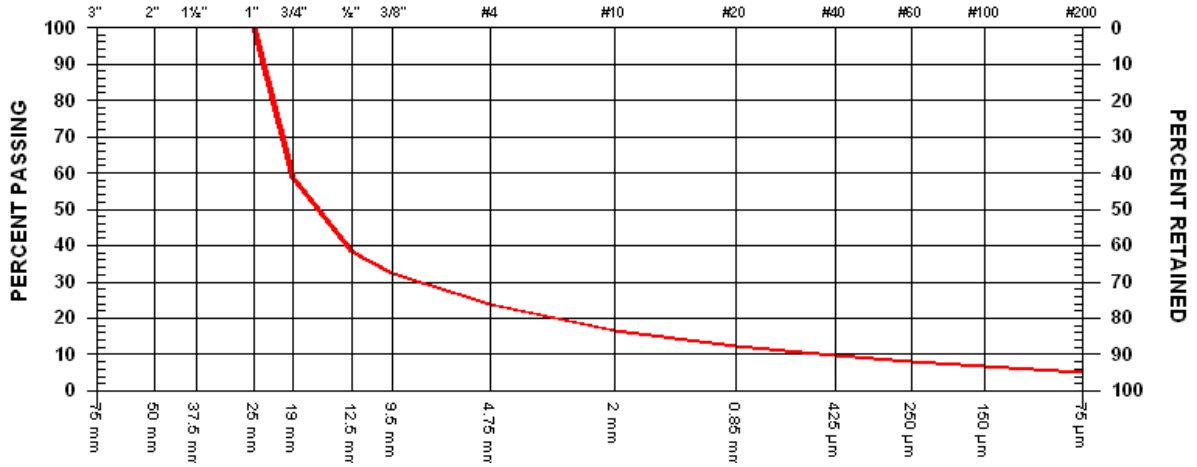
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 15 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.04 DATE SAMPLED 2011.Aug.14

SUPPLIER BH-BGC11-65
SOURCE SPT 5 @ 3.80 - 4.25m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm	100.0	
3/4"	19 mm	58.9	
1/2"	12.5 mm	38.5	
3/8"	9.5 mm	32.5	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	24.0	
No. 10	2.00 mm	16.7	
No. 20	850 µm	12.2	
No. 40	425 µm	9.6	
No. 60	250 µm	8.0	
No. 100	150 µm	6.7	
No. 200	75 µm	5.2	

COMMENTS

 2011.Nov.09 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

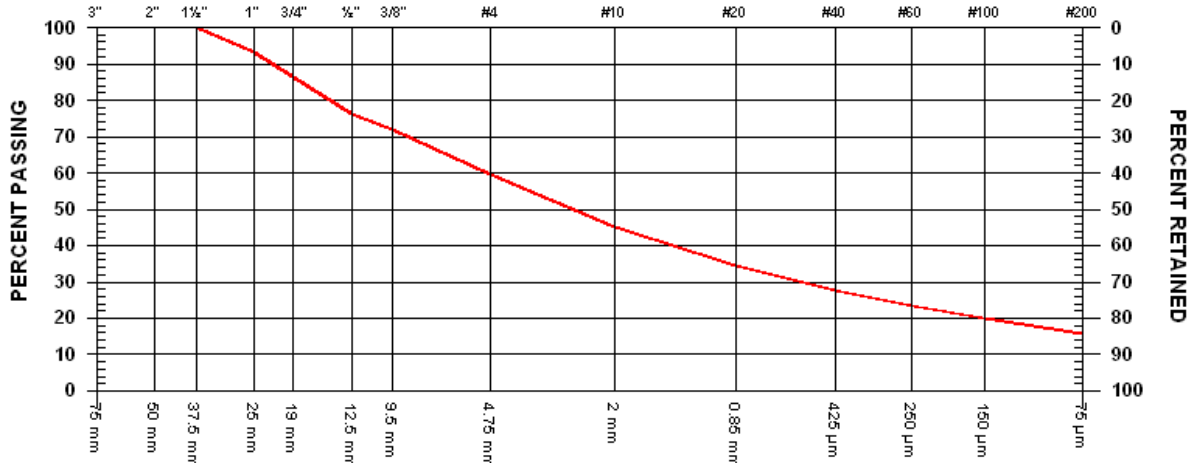
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 16 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.04 DATE SAMPLED 2011.Aug.14

SUPPLIER BH-BGC11-65
SOURCE SPT 6 @ 4.56 - 5.01m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	93.3	
3/4"	19 mm	86.4	
1/2"	12.5 mm	76.3	
3/8"	9.5 mm	72.0	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	59.5	
No. 10	2.00 mm	45.1	
No. 20	850 µm	34.3	
No. 40	425 µm	27.6	
No. 60	250 µm	23.3	
No. 100	150 µm	20.2	
No. 200	75 µm	15.9	

COMMENTS

 2011.Nov.09 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

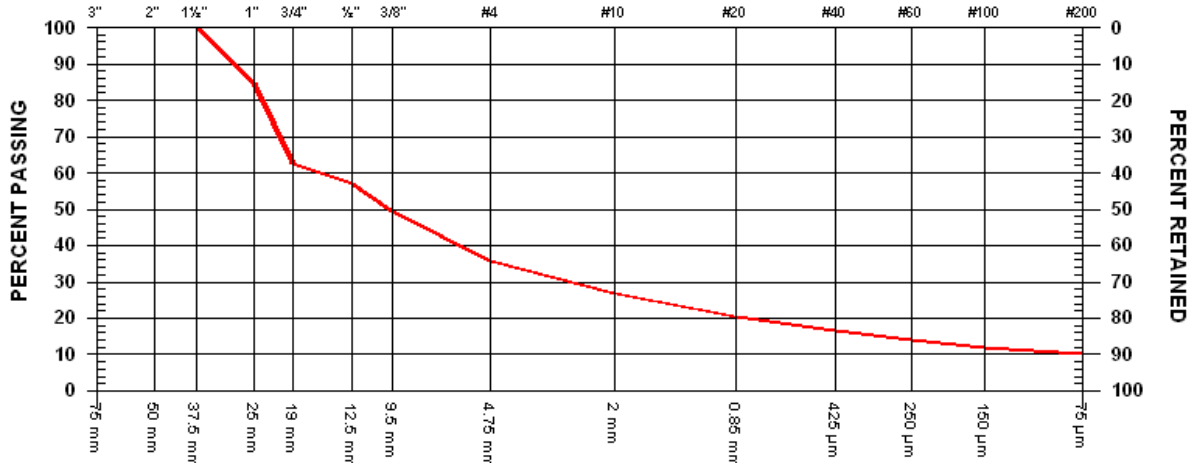
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 17 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.04 DATE SAMPLED 2011.Aug.14

SUPPLIER BH-BGC11-65
SOURCE SPT 7 @ 5.33 - 5.78m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	84.7	
3/4"	19 mm	62.4	
1/2"	12.5 mm	57.2	
3/8"	9.5 mm	49.6	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	35.9	
No. 10	2.00 mm	26.9	
No. 20	850 µm	20.6	
No. 40	425 µm	16.5	
No. 60	250 µm	13.9	
No. 100	150 µm	12.1	
No. 200	75 µm	10.0	

COMMENTS

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

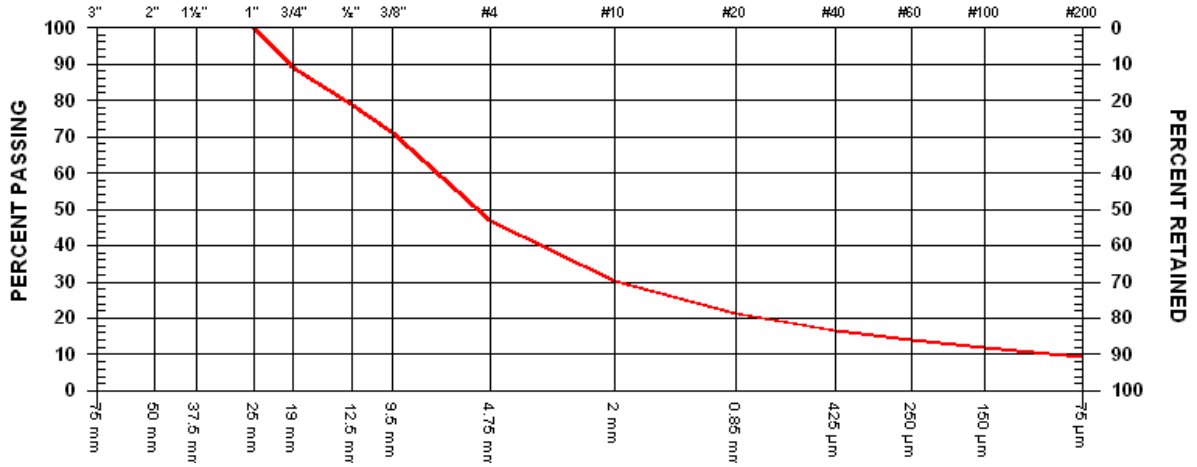
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 18 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.04 DATE SAMPLED 2011.Aug.14

SUPPLIER BH-BGC11-65
SOURCE SPT 8 @ 6.09 - 6.54m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm	100.0	
3/4"	19 mm	89.0	
1/2"	12.5 mm	78.6	
3/8"	9.5 mm	70.9	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	47.0	
No. 10	2.00 mm	30.4	
No. 20	850 µm	21.4	
No. 40	425 µm	16.7	
No. 60	250 µm	14.0	
No. 100	150 µm	12.0	
No. 200	75 µm	9.5	

COMMENTS

 2011.Nov.09 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

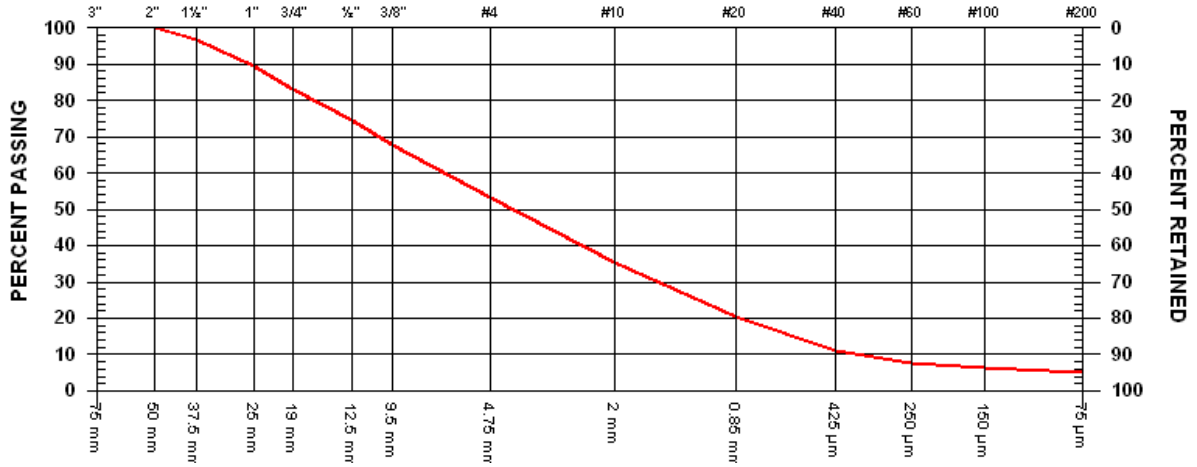
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 37 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.10 DATE SAMPLED 2011.Aug.05

SUPPLIER TP-BGC11-103
SOURCE G1 @ 4.5m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm	100.0	
1 1/2"	37.5 mm	96.6	
1"	25 mm	89.6	
3/4"	19 mm	83.1	
1/2"	12.5 mm	74.7	
3/8"	9.5 mm	67.5	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	53.2	
No. 10	2.00 mm	35.4	
No. 20	850 µm	20.6	
No. 40	425 µm	11.0	
No. 60	250 µm	7.7	
No. 100	150 µm	6.4	
No. 200	75 µm	5.3	

COMMENTS

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

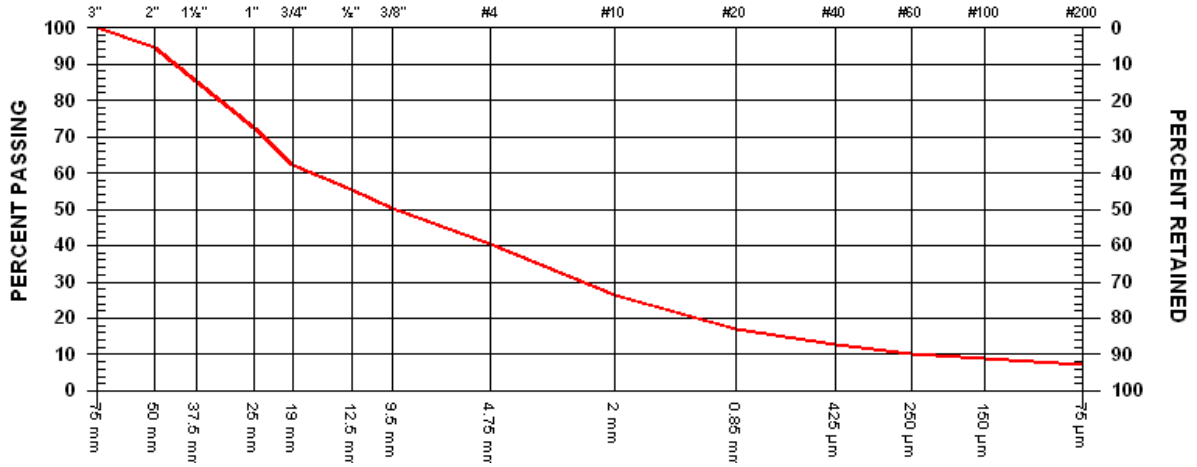
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 21 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.08 DATE SAMPLED 2011.Aug.23

SUPPLIER TP-BGC11-104
SOURCE G1 @ 1.2-1.6m
SPECIFICATION
MATERIAL TYPE Gravel

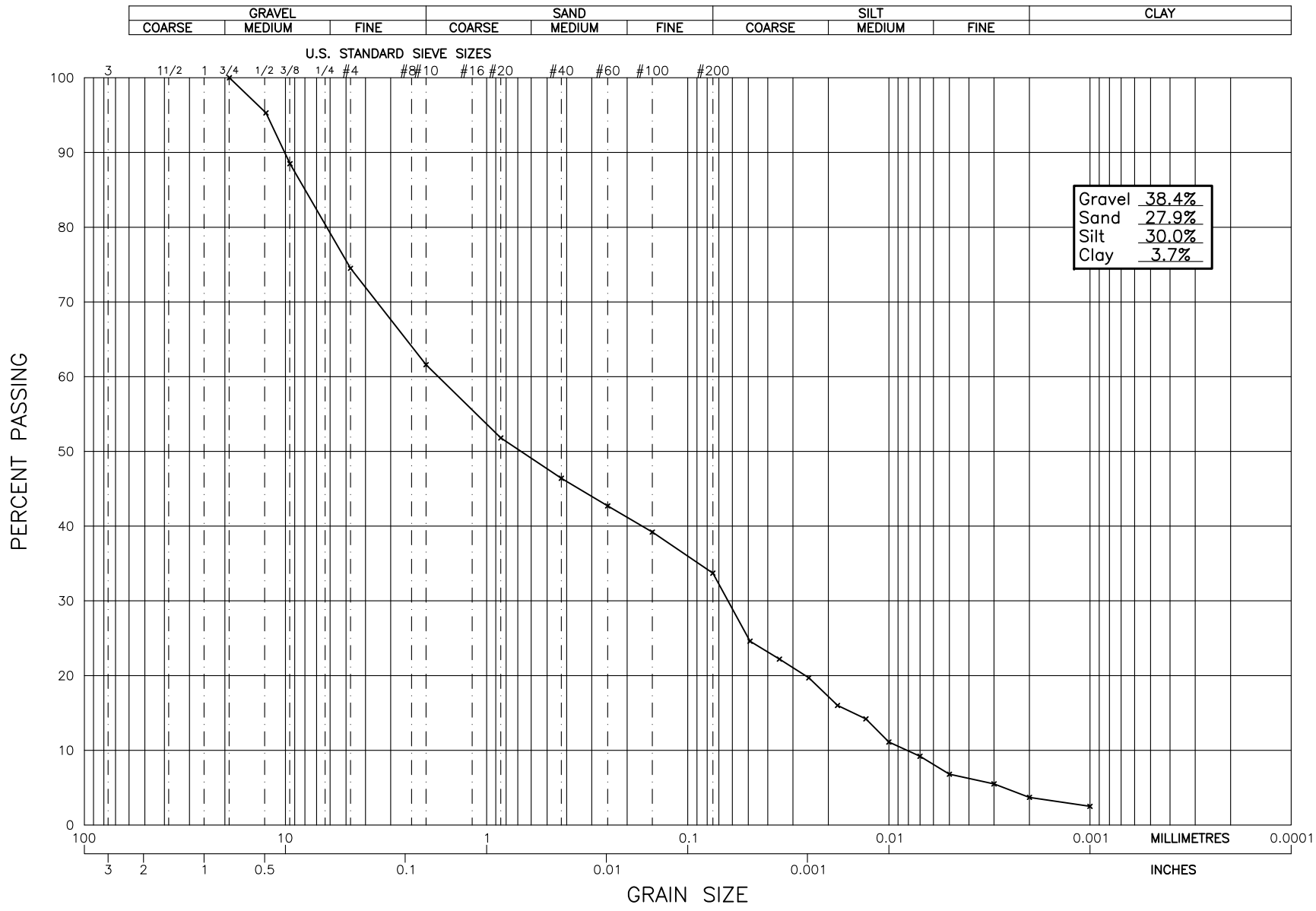
SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm	100.0	
2"	50 mm	94.7	
1 1/2"	37.5 mm	85.2	
1"	25 mm	72.2	
3/4"	19 mm	62.2	
1/2"	12.5 mm	55.4	
3/8"	9.5 mm	50.3	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	40.4	
No. 10	2.00 mm	26.5	
No. 20	850 µm	17.1	
No. 40	425 µm	12.9	
No. 60	250 µm	10.4	
No. 100	150 µm	8.9	
No. 200	75 µm	7.3	

COMMENTS



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF TP-BGC11-107-G1

PROJECT NO.
K-3300

PLATE NO.
3300-GS-TP107-G1

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

Client: BGC Engineering Ltd.				Date: November 10, 2011
Project Name: Eagle Gold Soils and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Gravel, silty and sandy
Sample #: **G1**	Test #:	**Hole #: TP-BGC11-107**	**Depth: 2.8 - 3.0m**	Time:
Sampled By: Client	Tested By: DJ			Checked By: DJ
Date Sampled: Aug.16, 2011	Date Received: Sept.13, 2011			Date Tested: Nov.9, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**61.6**
Wet Wt. & Tare	1009.0	25.4				20	7.9	42.1	84.2	**51.8**
Dry Wt. & Tare	889.5	19.0		709.8	**100.0**	40	4.4	37.7	75.4	**46.4**
Water Wt.	119.5	12.5	33.6	676.2	**95.3**	60	3.0	34.7	69.4	**42.7**
Tare Wt.	179.7	9.5	48.0	628.2	**88.5**	100	2.9	31.8	63.6	**39.2**
Wt. Of Dry Soil	709.8	4.75	99.7	528.5	**74.5**	200	4.4	27.4	54.8	**33.7**
Moisture Content %	**16.8**	10	91.5	437.0	**61.6**	Pan	27.4			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	709.8			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.616	0.5	28.5	20.0	0.01365	21.5	12.7	5.049	0.069	43.0	**26.5**
50.0	0.616	1	27.0	20.0	0.01365	20.0	13.0	3.605	0.049	40.0	**24.6**
50.0	0.616	2	25.0	20.0	0.01365	18.0	13.3	2.581	0.035	36.0	**22.2**
50.0	0.616	4	23.0	20.0	0.01365	16.0	13.7	1.848	0.025	32.0	**19.7**
50.0	0.616	8	20.0	20.0	0.01365	13.0	14.2	1.330	0.018	26.0	**16.0**
50.0	0.616	15	18.5	20.0	0.01365	11.5	14.4	0.980	0.013	23.0	**14.2**
50.0	0.616	30	16.0	20.0	0.01365	9.0	14.8	0.703	0.010	18.0	**11.1**
50.0	0.616	60	14.5	20.0	0.01365	7.5	15.1	0.501	0.007	15.0	**9.2**
50.0	0.616	120	12.5	20.0	0.01365	5.5	15.4	0.358	0.005	11.0	**6.8**
50.0	0.616	240	11.5	20.0	0.01365	4.5	15.6	0.255	0.003	9.0	**5.5**
50.0	0.616	480	10.0	21.0	0.01348	3.0	15.8	0.181	0.002	6.0	**3.7**
50.0	0.616	1440	10.0	19.0	0.01382	2.0	16.0	0.105	0.001	4.0	**2.5**

Hydrometer #: 932452	Graduate #: 6	Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

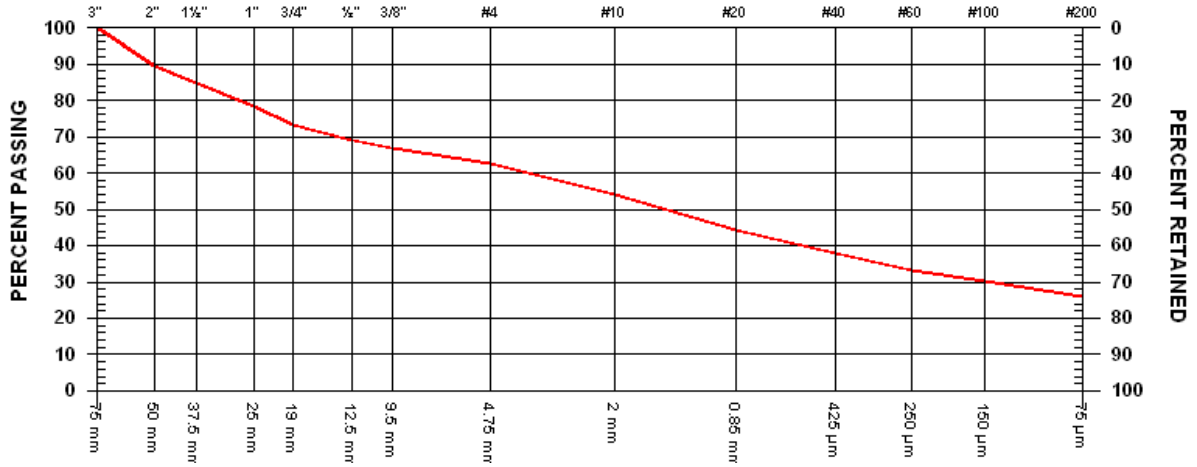
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 22 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.08 DATE SAMPLED 2011.Sep.08

SUPPLIER TP-BGC11-108
SOURCE G1 @ 0.9-1.15m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm	100.0	
2"	50 mm	89.3	
1 1/2"	37.5 mm	84.9	
1"	25 mm	78.2	
3/4"	19 mm	73.1	
1/2"	12.5 mm	69.1	
3/8"	9.5 mm	67.0	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	62.6	
No. 10	2.00 mm	54.2	
No. 20	850 µm	44.2	
No. 40	425 µm	37.8	
No. 60	250 µm	33.4	
No. 100	150 µm	30.1	
No. 200	75 µm	25.9	

COMMENTS

 2011.Nov.09 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

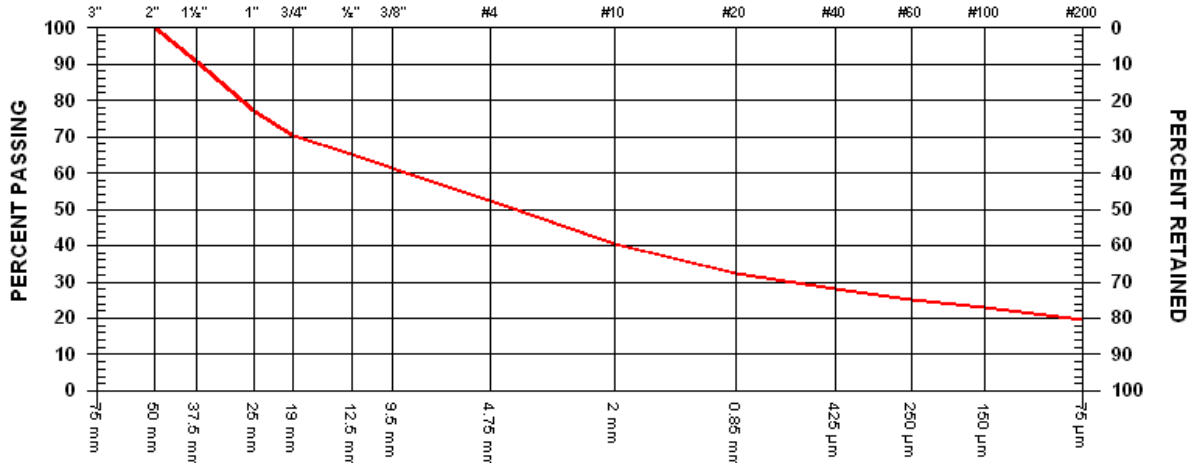
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 23 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.08 DATE SAMPLED 2011.Aug.17

SUPPLIER TP-BGC11-112
SOURCE G1 @ 1.3-1.4m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED

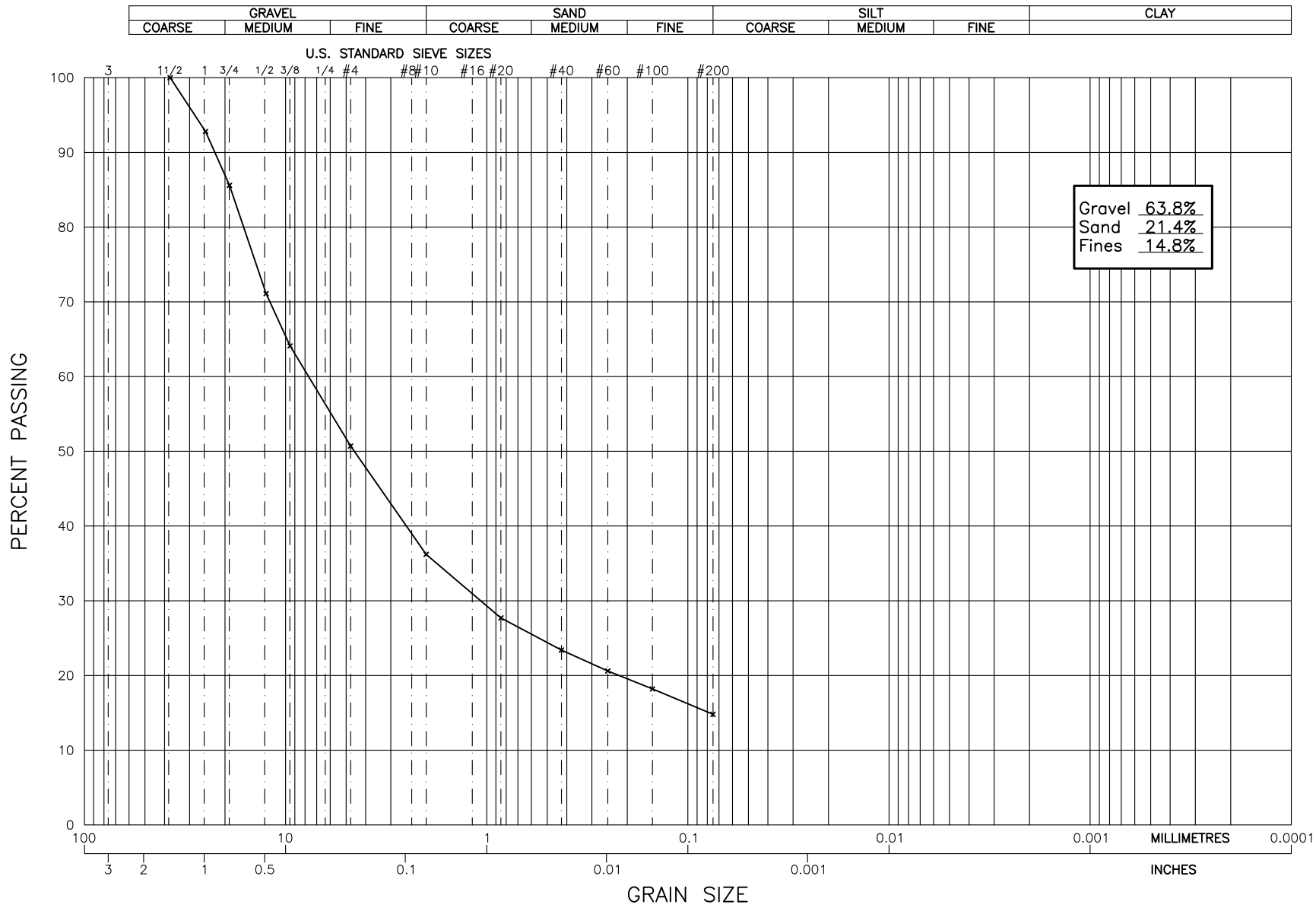


GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm	100.0	
1 1/2"	37.5 mm	90.7	
1"	25 mm	77.1	
3/4"	19 mm	70.3	
1/2"	12.5 mm	65.3	
3/8"	9.5 mm	61.5	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	52.2	
No. 10	2.00 mm	40.5	
No. 20	850 µm	32.3	
No. 40	425 µm	27.9	
No. 60	250 µm	25.1	
No. 100	150 µm	22.8	
No. 200	75 µm	19.5	

COMMENTS

Report System Software Registered to: GeoNorth Engineering, Prince George



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF BH-BGC11-116-G2

PROJECT NO.
K-3300

PLATE NO.
3300-GS-BH116-G2

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

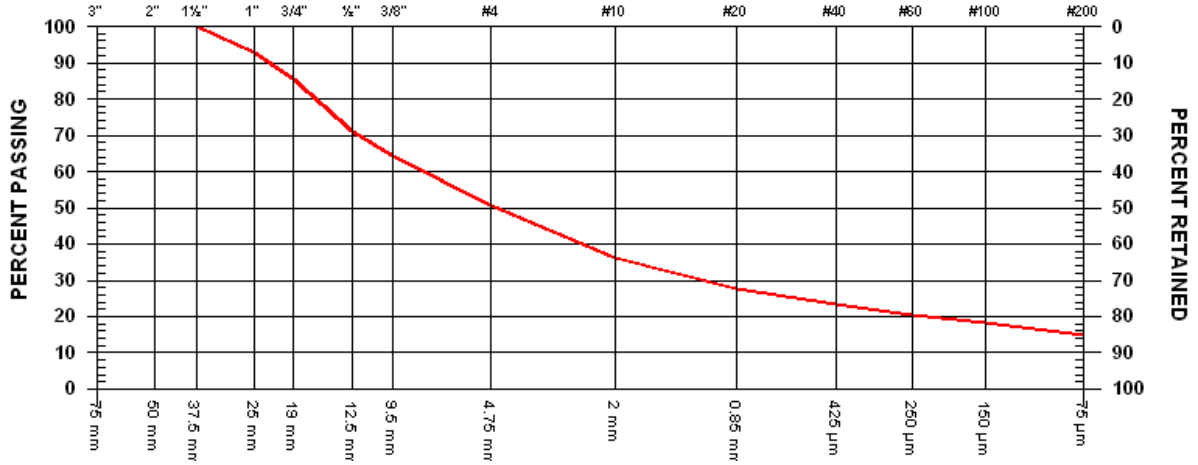
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 6 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Sep.30 DATE SAMPLED 2011.Aug.18

SUPPLIER TP-BGC11-116
SOURCE G2 @ 2.2 - 2.3m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	92.8	
3/4"	19 mm	85.6	
1/2"	12.5 mm	71.1	
3/8"	9.5 mm	64.1	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	50.7	
No. 10	2.00 mm	36.2	
No. 20	850 µm	27.7	
No. 40	425 µm	23.4	
No. 60	250 µm	20.6	
No. 100	150 µm	18.2	
No. 200	75 µm	14.8	

COMMENTS

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
8 16 30 50 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

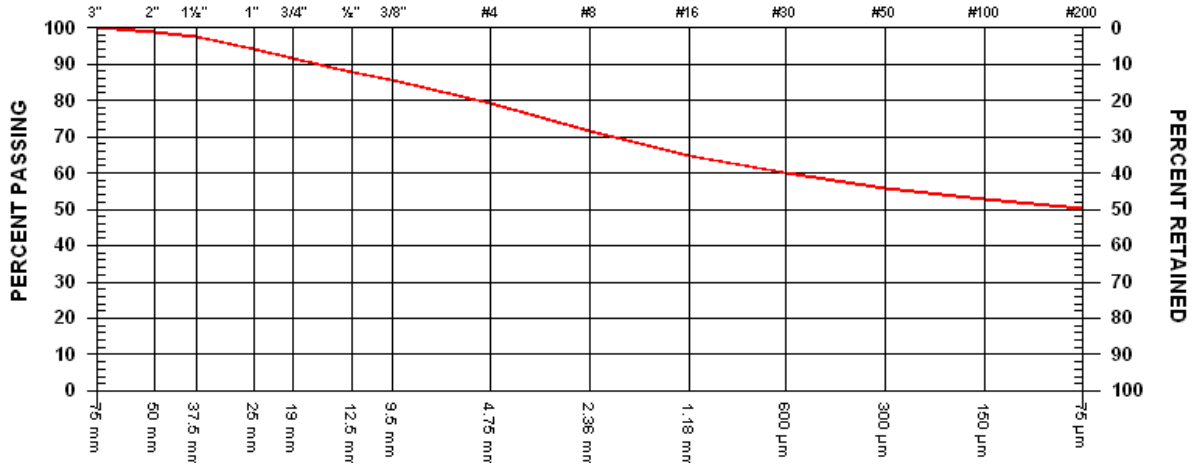
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 41 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.14 DATE SAMPLED 2011.Aug.19

SUPPLIER TP-BGC11-124
SOURCE G1 @ 6.2 - 6.4m
SPECIFICATION
MATERIAL TYPE Silt,sandy

SAMPLED BY Client
TESTED BY RO
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm	100.0	
2"	50 mm	98.8	
1 1/2"	37.5 mm	97.4	
1"	25 mm	94.1	
3/4"	19 mm	91.5	
1/2"	12.5 mm	87.5	
3/8"	9.5 mm	85.6	

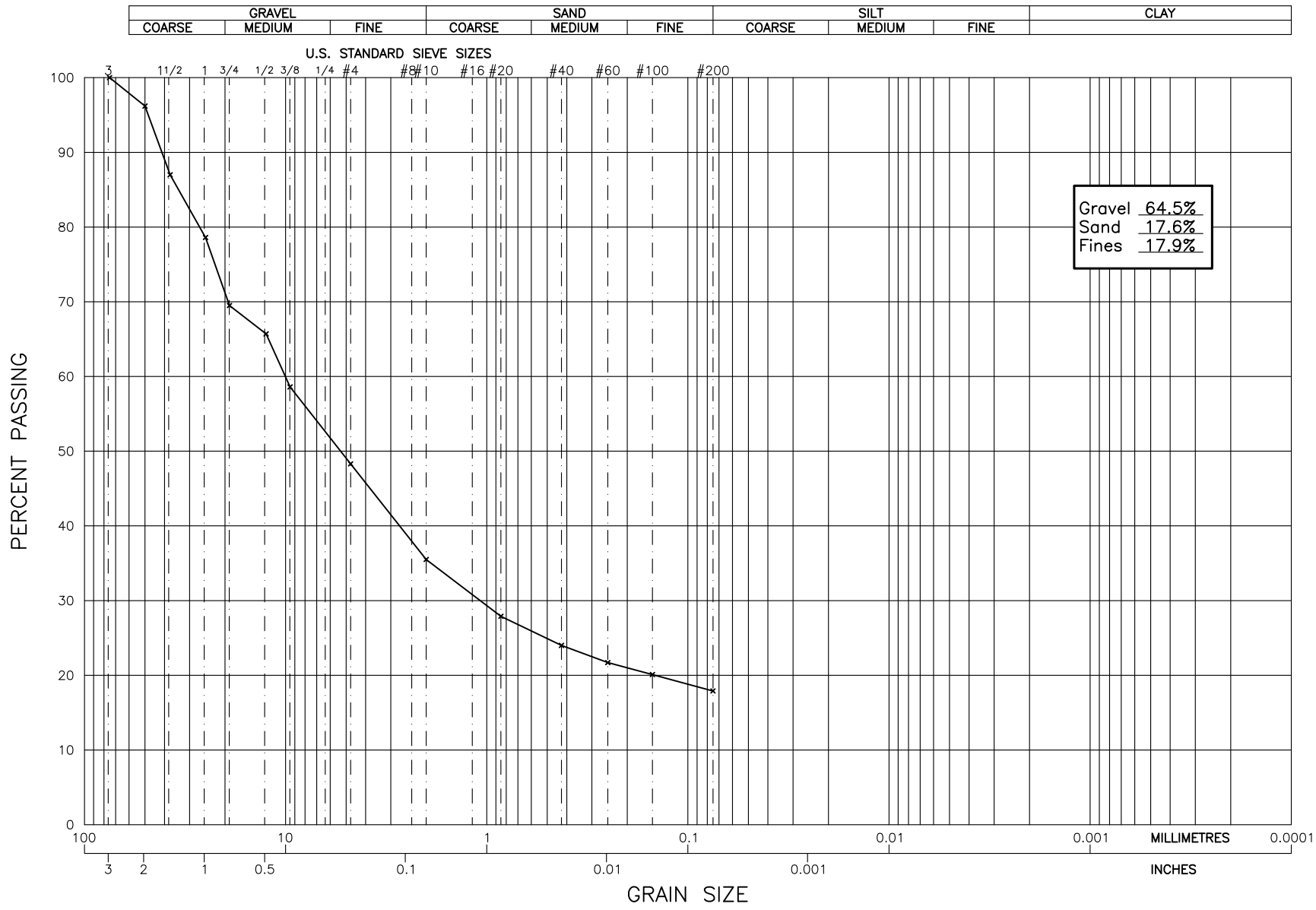
SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	79.0	
No. 8	2.36 mm	71.5	
No. 16	1.18 mm	64.8	
No. 30	600 µm	59.9	
No. 50	300 µm	55.8	
No. 100	150 µm	52.9	
No. 200	75 µm	50.3	

MOISTURE CONTENT 23.7%

COMMENTS

 2011.Nov.15 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF TP-BGC11-126

PROJECT NO.
K-3300

PLATE NO.
3300-GS-TP126

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 630 - 1718 Argyle Street
Halifax, Nova Scotia
B3J 3N6

ATTN: Peter Quinn

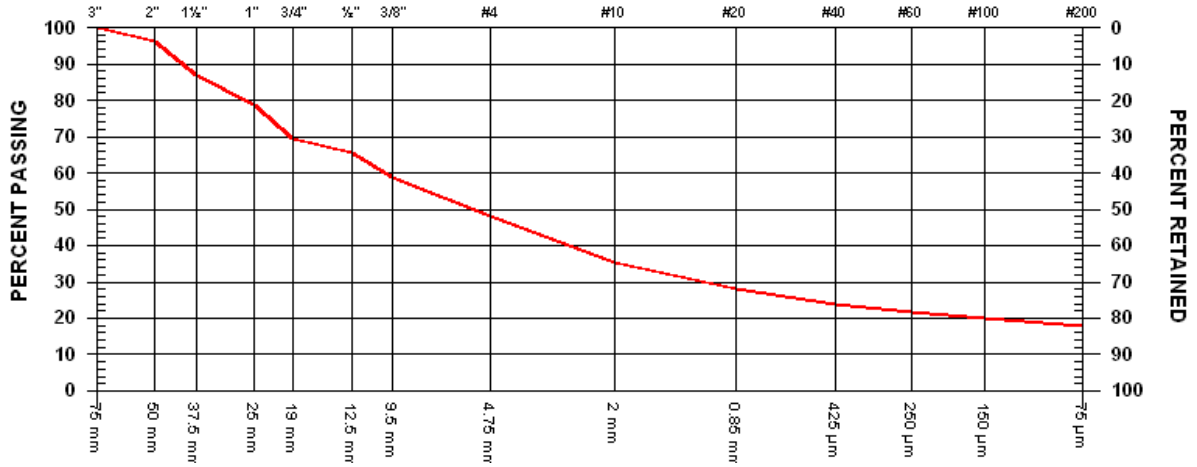
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 1 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Sep.21 DATE SAMPLED 2011.Aug.19

SUPPLIER TP-BGC11-126
SOURCE 1.7m - 2.2m
SPECIFICATION
MATERIAL TYPE Gravel

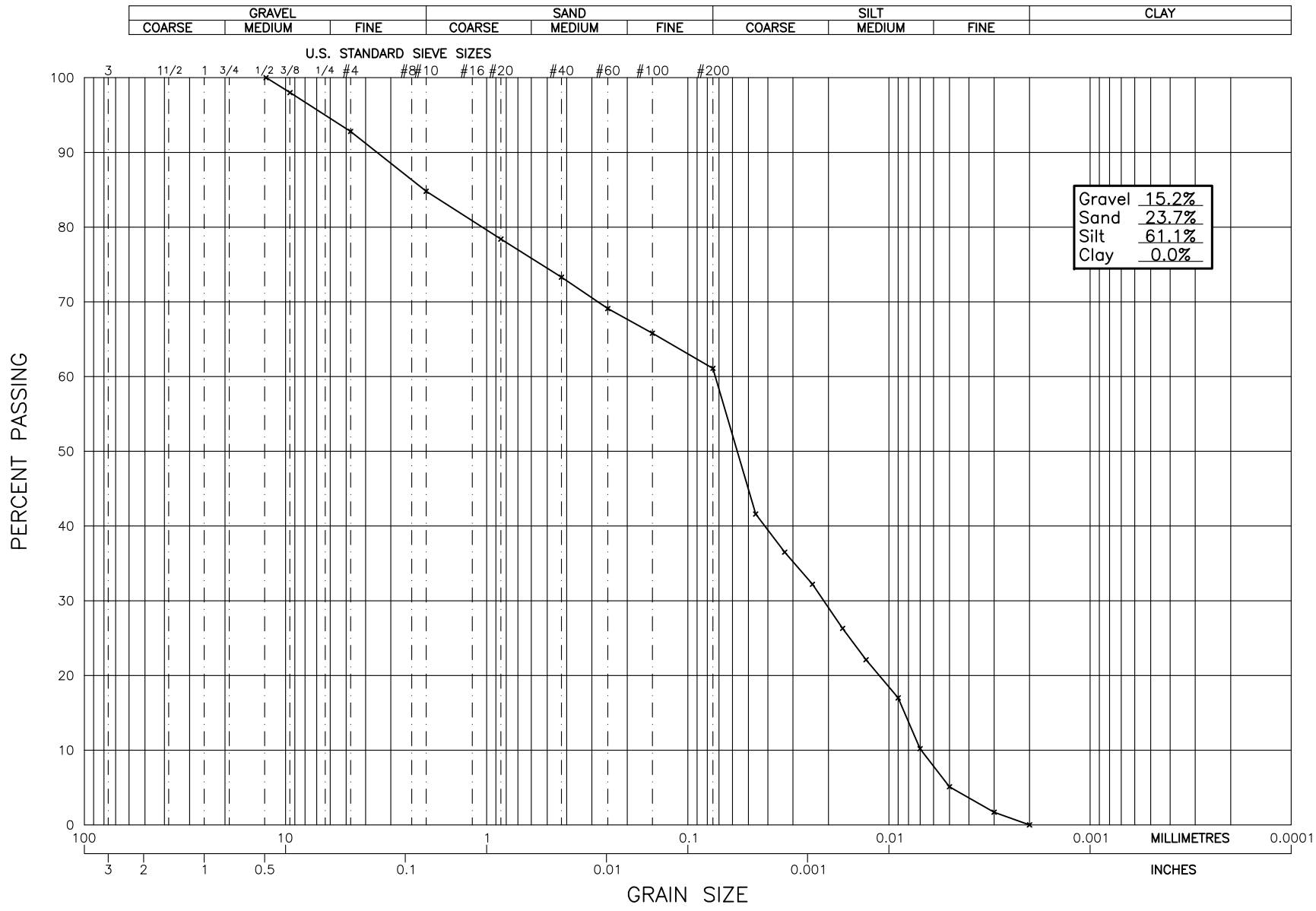
SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm	100.0	
2"	50 mm	96.2	
1 1/2"	37.5 mm	87.0	
1"	25 mm	78.6	
3/4"	19 mm	69.5	
1/2"	12.5 mm	65.7	
3/8"	9.5 mm	58.6	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	48.3	
No. 10	2.00 mm	35.5	
No. 20	850 µm	27.9	
No. 40	425 µm	24.0	
No. 60	250 µm	21.7	
No. 100	150 µm	20.1	
No. 200	75 µm	17.9	

COMMENTS



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF TP-BGC11-128-G1

PROJECT NO.
K-3300

PLATE NO.
3300-GS-TP128-G1

GeoNorth Engineering

Hydrometer Analysis

Test Designation: ASTM D-422

Client: BGC Engineering Ltd.				Date: Sept.26, 2011
Project Name: Eagle Gold Soil and Aggregate Testing				**Project #: K-3300**
Source/Location: Dublin Gulch, Yukon				Type: Silt,sandy
Sample #: **G1**	Test #:	**Hole #: TP-BGC11-128**	**Depth: 2.5 - 3.0m**	Time:
Sampled By: Client	Tested By: DJ			Checked By:
Date Sampled: August 19, 2011	Date Received: September 13, 2011			Date Tested: Sept. 23, 2011

Initial Moisture Content		**Sieve Analysis**				**Hydrometer Sieve Analysis**				
		Sieve No.	**Weight Retained**	**Total Wt. Passing**	**% Finer Than Orig. Samp.**	**Sieve No.**	**Weight Retained**	**Total Wt. Finer Than**	**% Finer Than**	**% Finer Than Orig Samp.**
Tare No.		38.1				10		50.0	100.0	**84.8**
Wet Wt. & Tare	879.4	25.4				20	3.8	46.2	92.4	**78.4**
Dry Wt. & Tare	726.5	19.0				40	3.0	43.2	86.4	**73.3**
Water Wt.	152.9	12.5		545.8	**100.0**	60	2.5	40.7	81.4	**69.1**
Tare Wt.	180.7	9.5	11.0	534.8	**98.0**	100	1.9	38.8	77.6	**65.8**
Wt. Of Dry Soil	545.8	4.75	28.2	506.6	**92.8**	200	2.8	36.0	72.0	**61.1**
Moisture Content %	**28.0**	10	43.5	463.1	**84.8**	Pan	36.0			
Dry Wt. Of Sample from Initial Moisture						Total	50.0			
=(100xWet Soil Wt.)/(100 + Initial Moisture) =						Unwashed Wt.=				
		Total	545.8			Tare		Wt. Passing #200 = _____		

Starting Wt. (g)	**% - #10**	**Elapsed Time (min)**	**Reading R**	**Temp (0C)**	**K**	**Corr. Reading R`**	**Zr (cm)**	**SQRT(Zr)/T (min)**	**D (mm)**	**N (%)**	**N*(%-#10)**
50.0	0.848	0.5	36.0	23.0	0.01317	30.0	11.3	4.763	0.063	60.0	**50.9**
50.0	0.848	1	30.5	23.0	0.01317	24.5	12.3	3.500	0.046	49.0	**41.6**
50.0	0.848	2	27.5	23.0	0.01317	21.5	12.7	2.525	0.033	43.0	**36.5**
50.0	0.848	4	25.0	23.0	0.01317	19.0	13.2	1.814	0.024	38.0	**32.2**
50.0	0.848	8	21.5	23.0	0.01317	15.5	13.7	1.310	0.017	31.0	**26.3**
50.0	0.848	15	19.0	23.0	0.01317	13.0	14.2	0.971	0.013	26.0	**22.1**
50.0	0.848	30	16.0	23.0	0.01317	10.0	14.6	0.699	0.009	20.0	**17.0**
50.0	0.848	60	12.0	23.0	0.01317	6.0	15.3	0.505	0.007	12.0	**10.2**
50.0	0.848	120	9.0	23.0	0.01317	3.0	15.8	0.363	0.005	6.0	**5.1**
50.0	0.848	240	7.0	23.0	0.01317	1.0	16.1	0.259	0.003	2.0	**1.7**
50.0	0.848	480	6.0	23.0	0.01317	0.0	16.3	0.184	0.002	0.0	**0.0**
50.0	0.848	1446	6.0	23.0	0.01317	0.0	16.3	0.106	0.001	0.0	**0.0**

Hydrometer #: 932452		Dispersing Agent: Sodium Hex	Amount: 125ml
Density of Solids:			
Description of Sample:			

NOELCO

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
8 16 30 50 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

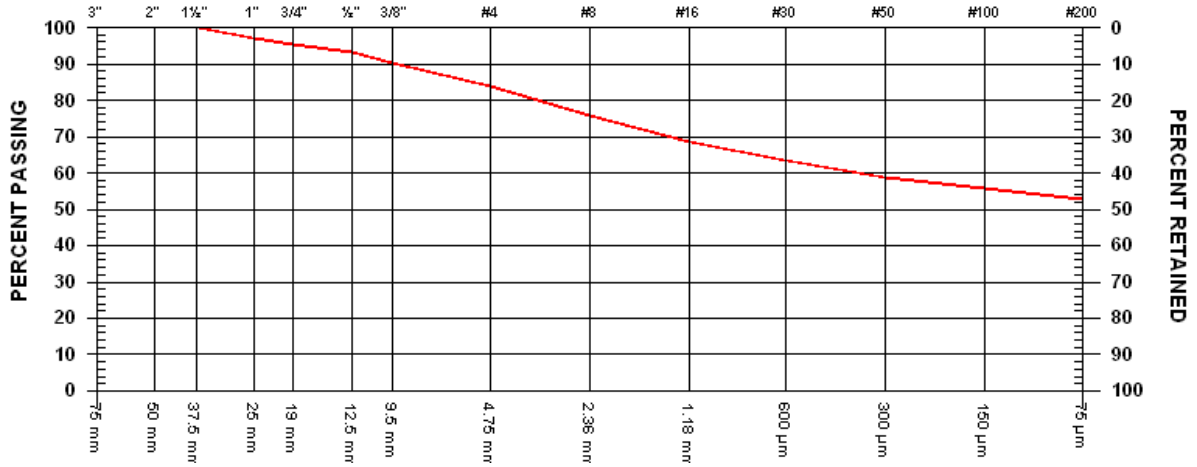
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 40 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.14 DATE SAMPLED 2011.Aug.20

SUPPLIER TP-BGC11-129
SOURCE G1 @ 6.6 - 6.8m
SPECIFICATION
MATERIAL TYPE Silt some sand

SAMPLED BY Client
TESTED BY RO
TEST METHOD WASHED



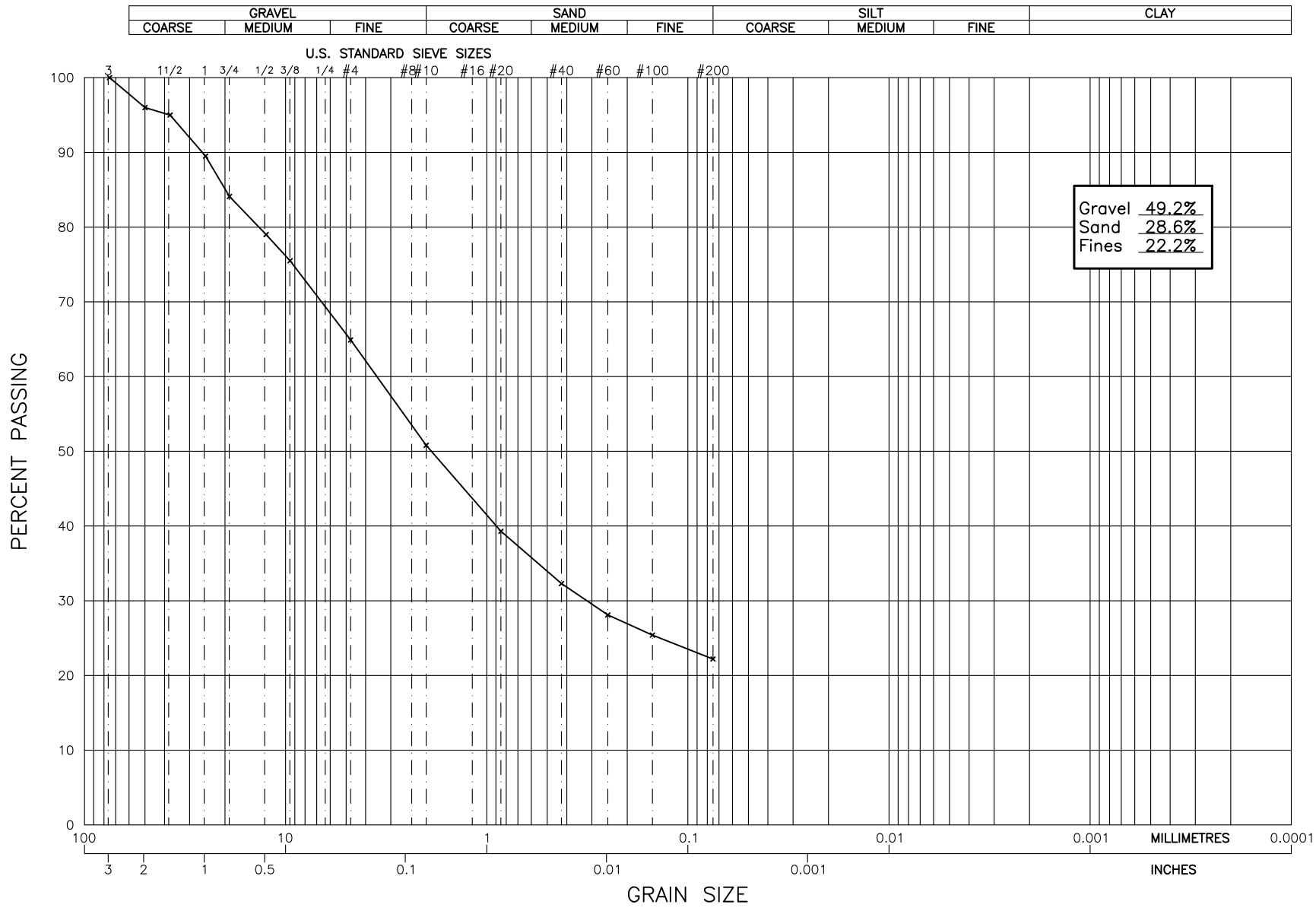
GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	97.1	
3/4"	19 mm	95.4	
1/2"	12.5 mm	93.2	
3/8"	9.5 mm	90.2	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	83.9	
No. 8	2.36 mm	75.9	
No. 16	1.18 mm	68.6	
No. 30	600 µm	63.4	
No. 50	300 µm	58.8	
No. 100	150 µm	55.7	
No. 200	75 µm	52.7	

MOISTURE CONTENT 18.2%

COMMENTS

 2011.Nov.15 GeoNorth Engineering Ltd. PER. _____



GEONORTH ENGINEERING LTD.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
GRAIN SIZE ANALYSIS OF TP-BGC11-130-G1

PROJECT NO.
K-3300

PLATE NO.
3300-GS-TP130-G1

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 630 - 1718 Argyle Street
Halifax, Nova Scotia
B3J 3N6

ATTN: Peter Quinn

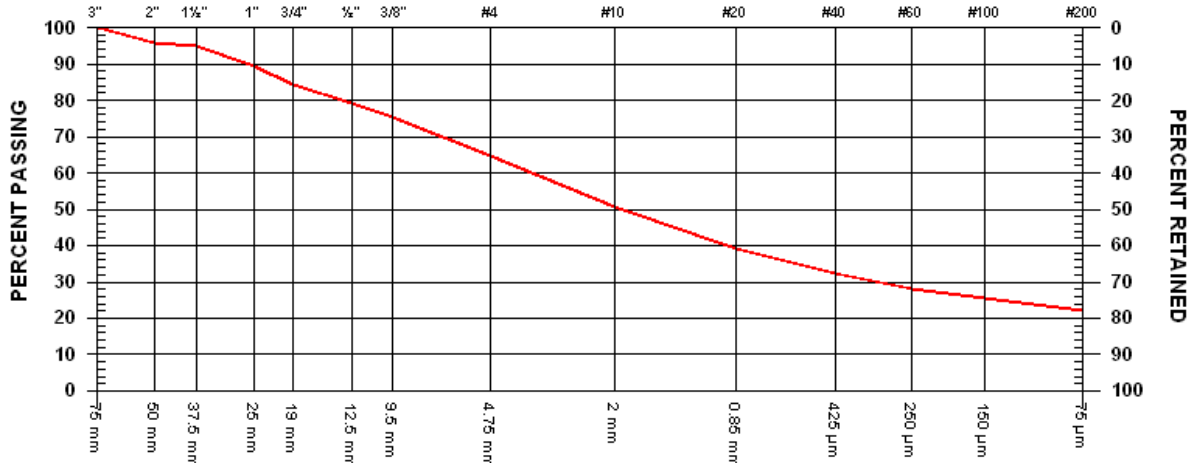
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 4 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Sep.21 DATE SAMPLED 2011.Aug.20

SUPPLIER TP-BGC11-130-G1
SOURCE 5.8 - 6.0m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY MM
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm	100.0	
2"	50 mm	96.0	
1 1/2"	37.5 mm	95.0	
1"	25 mm	89.5	
3/4"	19 mm	84.1	
1/2"	12.5 mm	79.0	
3/8"	9.5 mm	75.5	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	64.9	
No. 10	2.00 mm	50.8	
No. 20	850 µm	39.3	
No. 40	425 µm	32.3	
No. 60	250 µm	28.1	
No. 100	150 µm	25.4	
No. 200	75 µm	22.2	

COMMENTS

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

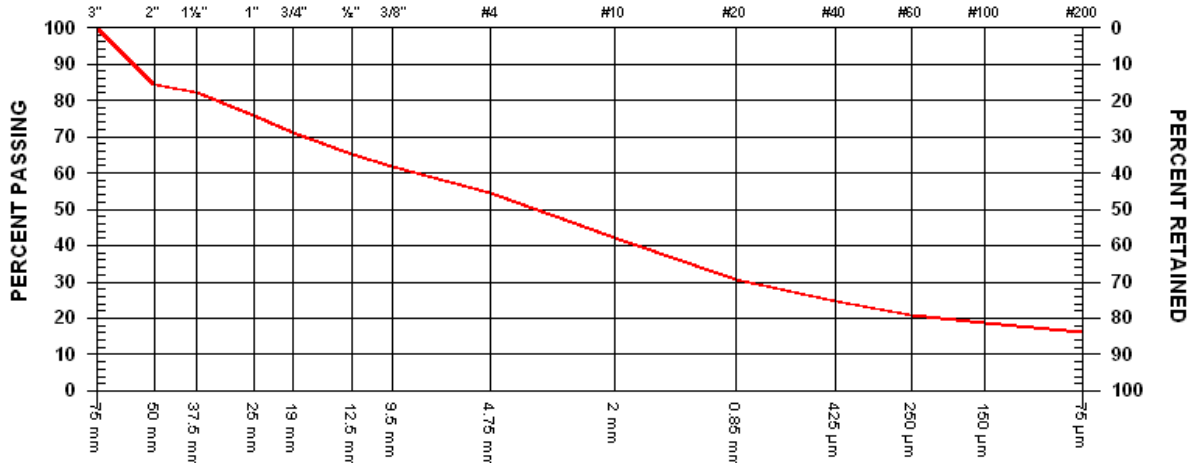
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 24 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.08 DATE SAMPLED 2011.Aug.20

SUPPLIER TP-BGC11-131
SOURCE G1 @ 3.2-3.5m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm	100.0	
2"	50 mm	84.1	
1 1/2"	37.5 mm	82.0	
1"	25 mm	76.0	
3/4"	19 mm	70.9	
1/2"	12.5 mm	65.2	
3/8"	9.5 mm	61.8	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	54.5	
No. 10	2.00 mm	42.2	
No. 20	850 µm	30.8	
No. 40	425 µm	24.6	
No. 60	250 µm	21.0	
No. 100	150 µm	18.7	
No. 200	75 µm	16.0	

COMMENTS

 2011.Nov.09 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
10 20 40 60 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

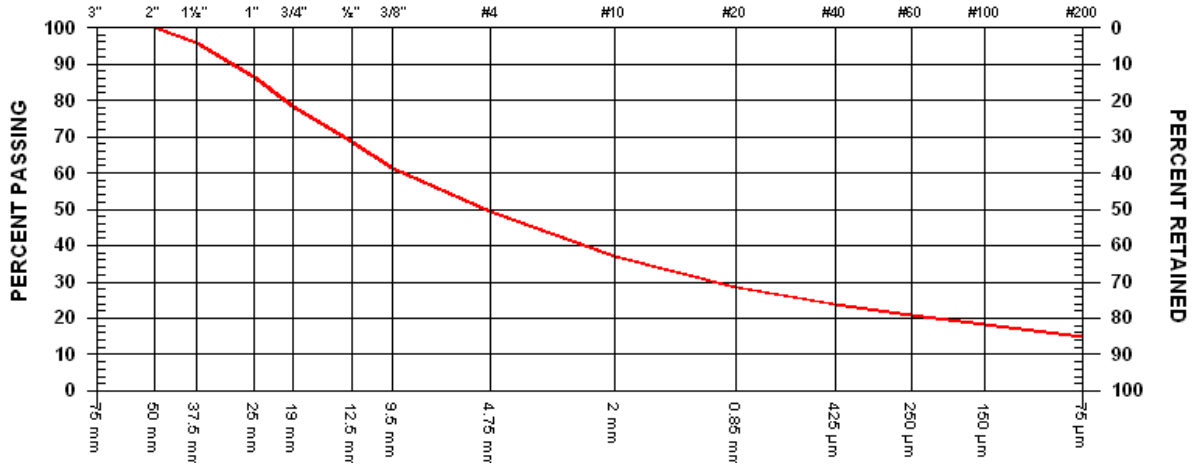
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 25 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.08 DATE SAMPLED 2011.Aug.21

SUPPLIER TP-BGC11-133
SOURCE G1 @ 4.3-4.4m
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY DJ
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm	100.0	
1 1/2"	37.5 mm	95.6	
1"	25 mm	86.6	
3/4"	19 mm	78.5	
1/2"	12.5 mm	68.4	
3/8"	9.5 mm	61.2	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	49.3	
No. 10	2.00 mm	36.9	
No. 20	850 µm	28.6	
No. 40	425 µm	23.8	
No. 60	250 µm	20.8	
No. 100	150 µm	18.5	
No. 200	75 µm	15.1	

COMMENTS

 2011.Nov.09 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
8 16 30 50 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

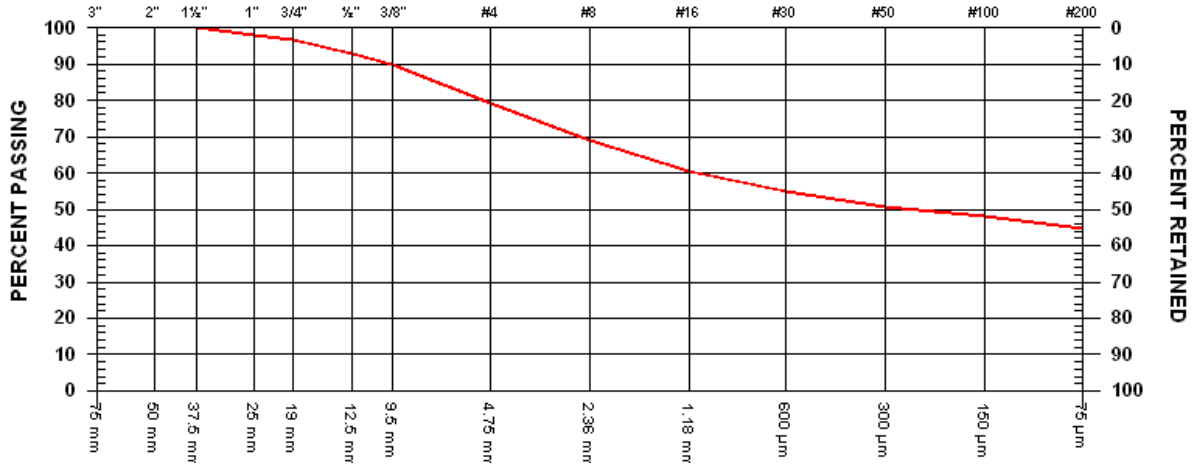
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 42 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.14 DATE SAMPLED 2011.Aug.24

SUPPLIER TP-BGC11-140
SOURCE G1 @ 1 - 1.2m
SPECIFICATION
MATERIAL TYPE Sand,silty

SAMPLED BY Client
TESTED BY RO
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm	100.0	
1"	25 mm	98.1	
3/4"	19 mm	96.5	
1/2"	12.5 mm	92.8	
3/8"	9.5 mm	89.7	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	79.2	
No. 8	2.36 mm	68.8	
No. 16	1.18 mm	60.4	
No. 30	600 µm	54.9	
No. 50	300 µm	50.8	
No. 100	150 µm	48.2	
No. 200	75 µm	44.8	

MOISTURE CONTENT 67.3%

COMMENTS

 2011.Nov.15 GeoNorth Engineering Ltd. PER. _____

Report System Software Registered to: GeoNorth Engineering, Prince George

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

SIEVE ANALYSIS REPORT
8 16 30 50 SERIES

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

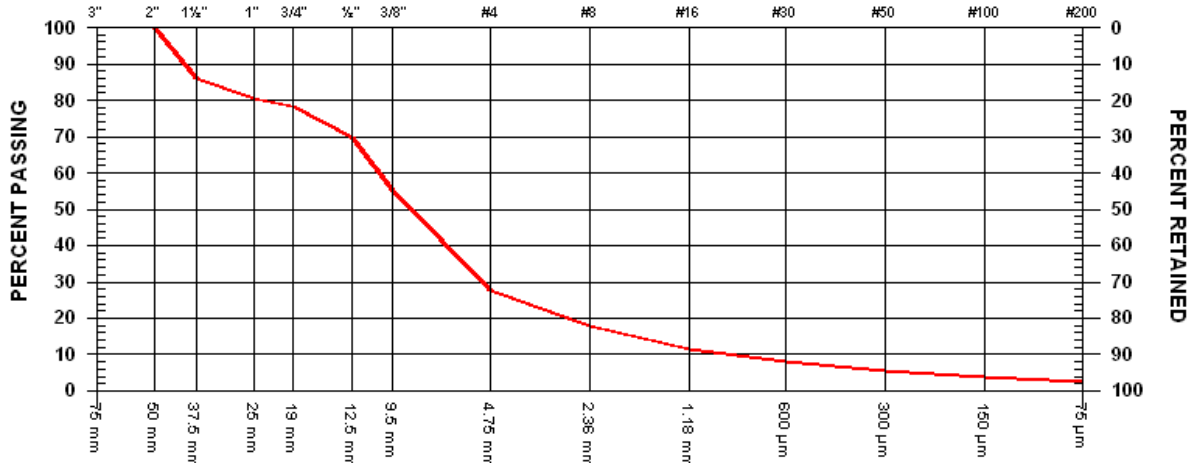
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

SIEVE TEST NO. 38 DATE RECEIVED 2011.Sep.13 DATE TESTED 2011.Nov.11 DATE SAMPLED 2011.Jul.22

SUPPLIER BGC11-Stiener-01
SOURCE Stiener Outcrop
SPECIFICATION
MATERIAL TYPE Gravel

SAMPLED BY Client
TESTED BY LT
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm	100.0	
1 1/2"	37.5 mm	86.0	
1"	25 mm	80.3	
3/4"	19 mm	78.2	
1/2"	12.5 mm	70.0	
3/8"	9.5 mm	55.2	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	27.7	
No. 8	2.36 mm	17.7	
No. 16	1.18 mm	11.5	
No. 30	600 µm	7.9	
No. 50	300 µm	5.4	
No. 100	150 µm	3.8	
No. 200	75 µm	2.6	

COMMENTS

WATER CONTENT DETERMINATION

Reference(s)
ASTM D 4959

Client:	BGC (Proj 0792-006-04)	**Project No.:** 11-1415-0029 **Phase:** 7000	
Project:	Eagle Gold Mine Site Infra FS SI	**Lab Schedule No.:** 141	
Location:	Dublin Gulch, Yukon		

Sample Location	Sample No.	Sample Interval		Water Content (%)
		Depth (m)	Bottom (m)	
TP-BGC11-50	**1**	2.80	3.00	**6.1**
TP-BGC11-50	**2**	3.30	3.60	**7.3**
TP-BGC11-51	**1**	0.20	1.44	**12.8**
TP-BGC11-51	**2**	2.40	2.80	**7.3**
TP-BGC11-51	**3**	4.20	4.50	**4.2**
TP-BGC11-52	**1**	3.30	3.50	**3.2**
TP-BGC11-53	**1**	2.00	2.20	**5.8**
TP-BGC11-54	**1**	0.40	0.60	**9.5**
TP-BGC11-55	**1**	0.40	0.60	**7.2**
TP-BGC11-55	**2**	1.90	2.00	**5.7**
TP-BGC11-57	**1**	0.90	1.10	**8.5**
TP-BGC11-58	**1**	0.70	0.70	**9.5**
TP-BGC11-58	**2**	1.90	1.90	**6.5**
TP-BGC11-59	**1**	0.40	0.60	**7.3**
TP-BGC11-60	**1**	0.70	0.90	**24.8**
TP-BGC11-60	**2**	1.70	1.90	**20.5**
TP-BGC11-61	**1**	0.80	0.90	**11.8**
TP-BGC11-62	**1**	0.90	1.00	**10.5**
TP-BGC11-62	**2**	3.50	3.70	**8.8**
TP-BGC11-63	**1**	0.40	0.60	**7.4**
TP-BGC11-64	**1**	1.50	1.60	**4.7**
TP-BGC11-65	**1**	0.40	0.50	**6.5**
TP-BGC11-66	**1**	1.30	1.30	**11.5**
TP-BGC11-66	**2**	1.80	1.80	**16.7**
TP-BGC11-67	**1**	0.70	0.90	**6.5**
TP-BGC11-68	**1**	1.60	1.80	**8.5**
TP-BGC11-69	**1**	1.50	1.70	**30.5**
TP-BGC11-69	**2**	2.80	2.90	**6.8**
TP-BGC11-71	**1**	1.30	1.60	**13.8**
TP-BGC11-72	**2**	0.80	1.00	**13.7**
TP-BGC11-72	**1**	2.40	2.60	**5.4**
TP-BGC11-73	**1**	0.80	1.00	**8.5**
TP-BGC11-74	**1**	1.20	1.40	**11.8**
TP-BGC11-74	**2**	3.00	3.00	**35.9**

LP	18/10/2011
Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_WATER CONTENT (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

WATER CONTENT DETERMINATION

Reference(s)
ASTM D 4959

Client:	BGC (Proj 0792-006-04)	**Project No.:** 11-1415-0029 **Phase:** 7000	
Project:	Eagle Gold Mine Site Infra FS SI	**Lab Schedule No.:** 141	
Location:	Dublin Gulch, Yukon		

Sample Location	Sample No.	Sample Interval		Water Content (%)
		Depth (m)	Bottom (m)	
TP-BGC11-74	**3**	4.50	4.50	**15.0**
TP-BGC11-76	**1**	0.40	0.60	**16.1**
TP-BGC11-77	**1**	0.40	0.50	**26.6**
TP-BGC11-79	**1**	0.40	0.60	**10.1**
TP-BGC11-79	**2**	1.20	1.30	**15.7**
TP-BGC11-81	**1**	0.70	1.00	**16.6**
TP-BGC11-82	**M4**	0.70	1.10	**28.6**
TP-BGC11-82	**M5**	1.90	2.10	**27.3**
TP-BGC11-82	**M2**	3.00	3.30	**10.3**
TP-BGC11-82	**M1**	4.70	4.90	**12.4**
TP-BGC11-82	**M3**	6.70	7.00	**40.1**
TP-BGC11-83	**1**	0.60	0.80	**20.1**
TP-BGC11-84	**1**	0.40	0.60	**17.9**
TP-BGC11-84	**2**	2.50	2.50	**28.5**
TP-BGC11-85	**1**	0.60	0.80	**16.6**
TP-BGC11-87	**1**	0.60	0.80	**10.5**
TP-BGC11-88	**1**	1.50	1.80	**12.7**
TP-BGC11-89	**1**	0.40	0.60	**2.0**
TP-BGC11-89	**2**	1.30	1.50	**14.3**
TP-BGC11-90	**1**	0.80	1.00	**13.2**
TP-BGC11-90	**2**	3.50	3.60	**23.3**
TP-BGC11-91	**1**	0.80	1.00	**49.5**
TP-BGC11-91	**2**	1.60	1.80	**6.1**
TP-BGC11-92	**1**	0.60	0.80	**63.6**
TP-BGC11-94	**1**	1.20	1.30	**16.4**
TP-BGC11-94	**2**	2.30	2.50	**11.4**

	LP	18/10/2011
	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_WATER CONTENT (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

WATER CONTENT DETERMINATION

Reference(s)
ASTM D 4959

Client:	BGC (Proj 0792-006-04)	**Project No.:** 11-1415-0029 **Phase:** 7000	
Project:	Eagle Gold Mine Site Infra FS SI	**Lab Schedule No.:** 141	
Location:	Dublin Gulch, Yukon		

Sample Location	Sample No.	Sample Interval		Water Content (%)
		Depth (m)	Bottom (m)	
TP-BGC11-95	**1**	0.90	1.10	**13.1**
TP-BGC11-95	**2**	2.00	3.00	**22.4**
TP-BGC11-96	**1**	0.70	0.90	**7.9**
TP-BGC11-96	**2**	1.30	1.50	**19.8**
TP-BGC11-96	**3**	1.80	2.00	**9.3**

LP	04/11/2011
Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_WATER CONTENT (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

GEONORTH ENGINEERING LTD. **MOISTURE / % PASSING WORKSHEET**

Client: **BGC Engineering Ltd.** **File No.** **K-3300**

Project Name: **Eagle Gold Soils and Aggregate Testing** **Date:** **11-Nov-11**

Hole Number	BBGC11-39								
Depth	1.15-1.60m	1.60-2.05m	2.28-2.73m	2.75-3.20m	4.6-5.05m	5.53-5.98m	6.22-6.67m	7.16-7.61m	7.75-8.20m
Sample No.	**SPT1**	**SPT2**	**SPT3**	**SPT4**	**SPT5**	**SPT6**	**SPT7**	**SPT8**	**SPT9**
Wet Weight and Tare	894.2	711.6	812.3	559.7	531.8	638.3	789.9	763.8	783.1
Dry Weight and Tare	714.6	591.0	723.9	544.5	524.6	622.4	752.4	723.2	760.3
Washed Weight and Tare									
Weight of Tare	183.1	196.7	191.0	179.0	179.6	179.8	180.5	131.5	181.4
Weight of Water	179.6	120.6	88.4	15.2	7.2	15.9	37.5	40.6	22.8
Weight of minus #200									
Dry Weight	531.5	394.3	532.9	365.5	345.0	442.6	571.9	591.7	578.9
Percent Moisture	**33.8**	**30.6**	**16.6**	**4.2**	**2.1**	**3.6**	**6.6**	**6.9**	**3.9**
Percent minus #200									
Comments									

Hole Number	BH-BGC11-39		TP-103	BH-BGC11-49			
Depth	8.71-9.16m	9.25-9.70m	4.5m	3.4-3.6m	6.4-6.6m	9.4-9.6m	12.4-12.6m
Sample No.	**SPT10**	**SPT11**	**G1**	**G4**	**G6**	**G8**	**G10**
Wet Weight and Tare	1008.0	1104.0	2709.5	1798.8	1241.4	1302.8	1240.8
Dry Weight and Tare	898.4	972.3	2637.0	1630.5	1118.7	1072.7	1133.3
Washed Weight and Tare							
Weight of Tare	179.6	181.1	365.3	181.5	180.4	180.8	205.2
Weight of Water	109.6	131.7	72.5	168.3	122.7	230.1	107.5
Weight of minus #200							
Dry Weight	718.8	791.2	2271.7	1449.0	938.3	891.9	928.1
Percent Moisture	**15.2**	**16.6**	**3.2**	**11.6**	**13.1**	**25.8**	**11.6**
Percent minus #200							
Comments							

Hole Number	BH-BGC11-49	
Depth	0.76-1.21	2.28-2.73m
Sample No.	**SPT1**	**SPT2**
Wet Weight and Tare	353.0	855.1
Dry Weight and Tare	339.2	742.8
Washed Weight and Tare		
Weight of Tare	211.9	192.8
Weight of Water	13.8	112.3
Weight of minus #200		
Dry Weight	127.3	550.0
Percent Moisture	**10.8**	**20.4**
Percent minus #200		
Comments		

Hole Number
Depth
Tare Number
Wet Weight and Tare
Dry Weight and Tare
Washed Weight and Tare
Weight of Tare
Weight of Water
Weight of minus #200
Dry Weight
Percent Moisture
Percent minus #200
Comments

GEONORTH ENGINEERING LTD. **MOISTURE / % PASSING WORKSHEET**

Client: **BGC Engineering Inc.** **File No.** **K-3300**

Project Name: **Eagle Gold Soils and Aggregate Testing, Dublin Gulch, Yukon** **Date:** **11-Oct-11**

Hole Number	BH-40A	BH-54	TP-111	TP-116		BH-57		
Depth	18.78-18.83m	29.97-30.04m	.9-1.1m	2.2-2.3m	2.28-2.65m	3.8-4.25m	5.33-5.78m	6.85-7.1m
Sample Number	1	G1	G1	G2	SPT1	SPT2	SPT3	SPT4
Wet Weight and Tare	250.0	556.9	384.9	1098.2	353.0	1100.1	340.3	687.8
Dry Weight and Tare	238.5	528.3	351.3	1027.6	334.3	1020.9	322.8	649.4
Washed Weight and Tare								
Weight of Tare	147.9	181.5	151.9	180.7	148.1	181.2	151.9	192.9
Weight of Water	11.5	28.6	33.6	70.6	18.7	79.2	17.5	38.4
Weight of minus #200								
Dry Weight	90.6	346.8	199.4	846.9	186.2	839.7	170.9	456.5
Percent Moisture	**12.7**	**8.2**	**16.9**	**8.3**	**10.0**	**9.4**	**10.2**	**8.4**
Percent minus #200								
Comments								

Hole Number			BH-56		
Depth	0.76-1.21m	1.9-2.1m	3.8-4.25m	5.33-5.53m	6.85-7.15m
Sample Number	SPT1	G2	SPT3	SPT4	SPT5
Wet Weight and Tare	307.7	2069.1	495.9	536.3	365.0
Dry Weight and Tare	299.6	1988.8	469.0	515.0	354.3
Washed Weight and Tare					
Weight of Tare	151.9	679.6	179.8	191.1	147.9
Weight of Water	8.1	80.3	26.9	21.3	10.7
Weight of minus #200					
Dry Weight	147.7	1309.2	289.2	323.9	206.4
Percent Moisture	**5.5**	**6.1**	**9.3**	**6.6**	**5.2**
Percent minus #200					
Comments					

Hole Number			BH-60		
Depth	2.7-2.8m	3.7-3.8m	4.9-5.1m	6.3-6.6m	6.85-7.0m
Sample Number	G3	G5	G6	G7	SPT2
Wet Weight and Tare	897.0	1032.3	352.3	941.7	312.9
Dry Weight and Tare	834.2	963.2	339.5	895.0	302.1
Washed Weight and Tare					
Weight of Tare	179.8	191.7	148.6	205.6	120.9
Weight of Water	62.8	69.1	12.8	46.7	10.8
Weight of minus #200					
Dry Weight	654.4	771.5	190.9	689.4	181.2
Percent Moisture	**9.6**	**9.0**	**6.7**	**6.8**	**6.0**
Percent minus #200					
Comments					

Hole Number	
Depth	
Tare Number	
Wet Weight and Tare	
Dry Weight and Tare	
Washed Weight and Tare	
Weight of Tare	
Weight of Water	
Weight of minus #200	
Dry Weight	
Percent Moisture	
Percent minus #200	
Comments	

GEONORTH ENGINEERING LTD. **MOISTURE / % PASSING WORKSHEET**

Client: **BGC Engineering Ltd.** **File No.** **K-3300**

Project Name: **Eagle Gold Soils and Aggregate Testing** **Date:** **8-Nov-11**

Hole Number	BH-BGC11-42								
Depth	1.8 - 2.27m	5.0 - 5.32m	6.4 - 6.84m	9.4 - 9.88m	10.6-11.0m	13.3-13.65m	15.25-15.4m	15.6-15.8m	19.7-20.0m
Sample No.	**SA#2**	**SA#4**	**SA#5**	**SA#7**	**SA#8**	**SA#12**	**SA#15**	**SA#16**	**SA#20**
Wet Weight and Tare	1350.5	304.4	1265.1	1568.2	243.4	2585.1	246.4	259.9	597.3
Dry Weight and Tare	1180.8	283.4	1136.5	1436.3	228.7	2355.6	239.4	249.8	532.7
Washed Weight and Tare									
Weight of Tare	196.8	137.1	191.1	367.0	136.9	366.4	136.9	136.9	179.2
Weight of Water	169.7	21.0	128.6	131.9	14.7	229.5	7.0	10.1	64.6
Weight of minus #200									
Dry Weight	984.0	146.3	945.4	1069.3	91.8	1989.2	102.5	112.9	353.5
Percent Moisture	**17.2**	**14.4**	**13.6**	**12.3**	**16.0**	**11.5**	**6.8**	**8.9**	**18.3**
Percent minus #200									
Comments									

Hole Number	BH-BGC11-42			BH-BGC11-65				
Depth	21.55-21.9m	23.0-23.4m	27.6-28.0m	0.76-1.21m	1.52-1.97m	2.28-2.73m	3.04-3.49m	3.8-4.25m
Sample No.	**SA#22**	**SA#23**	**SA#26**	**SPT 1**	**SPT 2**	**SPT 3**	**SPT 4**	**SPT 5**
Wet Weight and Tare	653.2	292.3	2312.3	970.9	805.7	456.4	548.9	355.7
Dry Weight and Tare	576.8	271.7	2067.5	951.3	792.4	450.4	539.8	354.5
Washed Weight and Tare								
Weight of Tare	181.2	138.3	380.4	365.0	368.0	179.7	131.6	180.6
Weight of Water	76.4	20.6	244.8	19.6	13.3	6.0	9.1	1.2
Weight of minus #200								
Dry Weight	395.6	133.4	1687.1	586.3	424.4	270.7	408.2	173.9
Percent Moisture	**19.3**	**15.4**	**14.5**	**3.3**	**3.1**	**2.2**	**2.2**	**0.7**
Percent minus #200								
Comments								

Hole Number	BH-BGC11-65		
Depth	4.56-5.01m	5.33-5.78m	6.09-6.54m
Sample No.	**SPT 6**	**SPT 7**	**SPT 8**
Wet Weight and Tare	908.0	433.8	378.6
Dry Weight and Tare	882.9	421.4	363.1
Washed Weight and Tare			
Weight of Tare	361.5	179.7	181.5
Weight of Water	25.1	12.4	15.5
Weight of minus #200			
Dry Weight	521.4	241.7	181.6
Percent Moisture	**4.8**	**5.1**	**8.5**
Percent minus #200			
Comments			

Hole Number
Depth
Sample No.
Wet Weight and Tare
Dry Weight and Tare
Washed Weight and Tare
Weight of Tare
Weight of Water
Weight of minus #200
Dry Weight
Percent Moisture
Percent minus #200
Comments

GEONORTH ENGINEERING LTD. **MOISTURE / % PASSING WORKSHEET**

Client: **BGC Engineering Inc.** **File No.** **K-3300**

Project Name: **Eagle Gold Soils and Aggregate Testing, Dublin Gulch, Yukon** **Date:** **29-Sep-11**

Hole Number	BH-BGC11-44								
Depth	0.2 - 0.4m	1.6 - 2.0m	4.8 - 5.1m	6.3 - 6.6m	9.6 - 9.9m	2.27-2.72m	3.79-4.24m	8.35-8.85m	12.97-13.42m
Sample Number	S1	S3	S5	S7	S11	SPT1	SPT2	SPT5	SPT10
Wet Weight and Tare	976.4	1044.3	1634.4	1543.7	1079.5	266.0	887.5	339.5	962.3
Dry Weight and Tare	876.8	885.5	1461.3	1280.7	950.9	211.7	748.9	312.1	878.3
Washed Weight and Tare									
Weight of Tare	180.5	205.1	192.9	191.5	179.7	147.9	196.8	151.9	179.2
Weight of Water	99.6	158.8	173.1	263.0	128.6	54.3	138.6	27.4	84.0
Weight of minus #200									
Dry Weight	696.3	680.4	1268.4	1089.2	771.2	63.8	552.1	160.2	699.1
Percent Moisture	**14.3**	**23.3**	**13.6**	**24.1**	**16.7**	**85.1**	**25.1**	**17.1**	**12.0**
Percent minus #200									
Comments									

Hole Number	BH-BGC11-44	BH-BGC11-53						
Depth	14.49-14.79m	0.76-1.21m	2.28-2.73m	3.8-4.25m	6.85-7.3m	9.9-10.35m	1.9-2.1m	3.2-3.5m
Sample Number	SPT11	SPT1	SPT2	SPT3	SPT4	SPT5	G2	G3
Wet Weight and Tare	591.0	264.1	896.1	242.8	661.4	304.5	1347.3	295.7
Dry Weight and Tare	534.6	252.2	830.1	238.4	646.7	297.4	1229.1	282.1
Washed Weight and Tare								
Weight of Tare	131.7	151.8	180.8	136.6	182.4	152.1	191.1	118.2
Weight of Water	56.4	11.9	66.0	4.4	14.7	7.1	118.2	13.6
Weight of minus #200								
Dry Weight	402.9	100.4	649.3	101.8	464.3	145.3	1038.0	163.9
Percent Moisture	**14.0**	**11.9**	**10.2**	**4.3**	**3.2**	**4.9**	**11.4**	**8.3**
Percent minus #200								
Comments								

Hole Number	BH-BGC11-53		
Depth	4.9-5.1m	7.9-8.1m	10.9-11.1m
Sample Number	G4	G6	G8
Wet Weight and Tare	1239.1	1948.0	389.3
Dry Weight and Tare	1195.8	1896.1	382.1
Washed Weight and Tare			
Weight of Tare	179.8	667.3	151.9
Weight of Water	43.3	51.9	7.2
Weight of minus #200			
Dry Weight	1016.0	1228.8	230.2
Percent Moisture	**4.3**	**4.2**	**3.1**
Percent minus #200			
Comments			

Hole Number	
Depth	
Tare Number	
Wet Weight and Tare	
Dry Weight and Tare	
Washed Weight and Tare	
Weight of Tare	
Weight of Water	
Weight of minus #200	
Dry Weight	
Percent Moisture	
Percent minus #200	
Comments	

GEONORTH ENGINEERING LTD. **MOISTURE / % PASSING WORKSHEET**

Client: **BGC Engineering Inc.** **File No.** **K-3300**

Project Name: **Eagle Gold Soilsand Aggregate Testing** **Date:** **15-Nov-11**

Hole Number	BH-BGC11-51					
Depth	7.9 - 8.1m	10.9-11.1m	13.9-14.1m	17.0-17.2m	20.1-20.3m	24.7-24.9m
Sample No.	G6	G8	G10	G12	G14	G17
Wet Weight and Tare	1208.8	254.9	1181.4	241.6	1977.7	223.2
Dry Weight and Tare	1057.0	240.3	1080.3	231.4	1845.3	217.6
Washed Weight and Tare						
Weight of Tare	181.4	137.1	131.5	136.6	595.8	136.7
Weight of Water	151.8	14.6	101.1	10.2	132.4	5.6
Weight of minus #200						
Dry Weight	875.6	103.2	948.8	94.8	1249.5	80.9
Percent Moisture	**17.3**	**14.1**	**10.7**	**10.8**	**10.6**	**6.9**
Percent minus #200						
Comments						

Hole Number	BH-BGC11-51				
Depth	0.76-1.21m	2.28-2.73m	3.8-4.25m	5.33-5.78m	9.9-10.25m
Sample No.	SPT1	SPT2	SPT3	SPT4	SPT5
Wet Weight and Tare	630.5	225.8	831.1	253.7	257.1
Dry Weight and Tare	580.8	217.8	683.6	244.6	236.8
Washed Weight and Tare					
Weight of Tare	179.6	138.4	180.4	137.2	136.9
Weight of Water	49.7	8.0	147.5	9.1	20.3
Weight of minus #200					
Dry Weight	401.2	79.4	503.2	107.4	99.9
Percent Moisture	**12.4**	**10.1**	**29.3**	**8.5**	**20.3**
Percent minus #200					
Comments					

Hole Number	TP124	TP129	TP140
Depth	6.2-6.4m	6.6-6.8m	1.0-1.2m
Sample No.	G1	G1	G1
Wet Weight and Tare	1315.7	1148.1	2131.5
Dry Weight and Tare	1116.8	969.8	1865.3
Washed Weight and Tare			
Weight of Tare	179.7	179.2	179.9
Weight of Water	198.9	178.3	266.2
Weight of minus #200			
Dry Weight	937.1	790.6	1685.4
Percent Moisture	**21.2**	**22.6**	**15.8**
Percent minus #200			
Comments			

Hole Number	
Depth	
Tare Number	
Wet Weight and Tare	
Dry Weight and Tare	
Washed Weight and Tare	
Weight of Tare	
Weight of Water	
Weight of minus #200	
Dry Weight	
Percent Moisture	
Percent minus #200	
Comments	

GEONORTH ENGINEERING LTD. **MOISTURE / % PASSING WORKSHEET**

Client: **BGC Engineering Ltd.** **File No.** **K-3300**

Project Name: **Eagle Gold Soils and Aggregate Testing** **Date:** **9-Nov-11**

Hole Number	BH-BGC11-58				
Depth	**1.9-2.1m**	**3.2-3.6m**	**4.4-4.6m**	**5.4-5.5m**	**7.9-8.1m**
Sample No.	**G2**	**G4**	**G6**	**G8**	**G10**
Wet Weight and Tare	1615.8	1822.2	1566.8	1065.0	837.6
Dry Weight and Tare	1404.2	1653.0	1426.7	1011.5	785.5
Washed Weight and Tare					
Weight of Tare	182.5	131.5	179.9	181.4	180.5
Weight of Water	211.6	169.2	140.1	53.5	52.1
Weight of minus #200					
Dry Weight	1221.7	1521.5	1246.8	830.1	605.0
Percent Moisture	**17.3**	**11.1**	**11.2**	**6.4**	**8.6**
Percent minus #200					
Comments					

Hole Number	**TP-104**	**TP-107**	**TP-108**	**TP-112**	**TP-119**
Depth	**1.2-1.6m**	**2.8-3.0m**	**0.9-1.15m**	**1.3-1.4m**	**0.9-1.1m**
Sample No.	**G1**	**G1**	**G1**	**G1**	**G1**
Wet Weight and Tare	2228.9	1009.0	2015.0	2883.2	942.7
Dry Weight and Tare	2112.5	889.5	1865.1	2607.7	770.5
Washed Weight and Tare					
Weight of Tare	358.8	179.7	366.1	679.3	180.5
Weight of Water	116.4	119.5	149.9	275.5	172.2
Weight of minus #200					
Dry Weight	1753.7	709.8	1499.0	1928.4	590.0
Percent Moisture	**6.6**	**16.8**	**10.0**	**14.3**	**29.2**
Percent minus #200					
Comments	**Sieve**		**Sieve**	**Sieve**	

Hole Number	**TP-120**	**TP-121**	**TP-122**	**TP-131**	**TP-133**
Depth	**3.8-4.0m**	**2.9-3.1m**	**5.4-5.8m**	**3.2-3.5m**	**4.3-4.4m**
Sample No.	**G1**	**G1**	**G1**	**G1**	**G1**
Wet Weight and Tare	1840.4	1154.5	985.7	8663.5	5033.5
Dry Weight and Tare	1509.9	964.4	856.8	8105.4	4644.0
Washed Weight and Tare					
Weight of Tare	361.5	191.8	180.2	1263.6	365.0
Weight of Water	330.5	190.1	128.9	558.1	389.5
Weight of minus #200					
Dry Weight	1148.4	772.6	676.6	6841.8	4279.0
Percent Moisture	**28.8**	**24.6**	**19.1**	**8.2**	**9.1**
Percent minus #200					
Comments				**Sieve**	**Sieve**

Hole Number	
Depth	
Sample No.	
Wet Weight and Tare	
Dry Weight and Tare	
Washed Weight and Tare	
Weight of Tare	
Weight of Water	
Weight of minus #200	
Dry Weight	
Percent Moisture	
Percent minus #200	
Comments	

GEONORTH ENGINEERING LTD. **MOISTURE / % PASSING WORKSHEET**

Client: **BGC Engineering Ltd.** **File No.** **K-3300**

Project Name: **Eagle Gold Soils and Aggregate Testing** **Date:** **26-Sep-11**

Hole Number	**TP-126**	**TP-106**	**TP-128**	**TP-130**	**BH-55**	**BH-55**	**BH-55**	**BH-55**	**BH-55**
Depth	**1.7 - 2.2m**	**0.8 - 1.5m**	**2.5 - 3.0m**	**5.8 - 6.0m**	**0.76-1.21m**	**2.28-2.73m**	**4.9-5.1m**	**6.3-6.5m**	**8.38-8.83m**
Tare Number									
Wet Weight and Tare	365.6	379.9	349.1	1492.8	680.7	294.5	1345.5	278.8	613.9
Dry Weight and Tare	342.6	356.5	307.4	1404.7	641.0	280.0	1234.1	263.9	587.3
Washed Weight and Tare									
Weight of Tare	148.0	151.9	152.2	181.5	191.6	136.9	180.0	136.6	179.7
Weight of Water	23.0	23.4	41.7	88.1	39.7	14.5	111.4	14.9	26.6
Weight of minus #200									
Dry Weight	194.6	204.6	155.2	1223.2	449.4	143.1	1054.1	127.3	407.6
Percent Moisture	**11.8**	**11.4**	**26.9**	**7.2**	**8.8**	**10.1**	**10.6**	**11.7**	**6.5**
Percent minus #200									
Comments									

Hole Number	**BH-63**	**BH-63**	**BH-63**	**BH-63**	**BH-63**	**BH-63**	**BH-63**
Depth	**1.9-2.1m**	**2.9-3.0m**	**3.9-4.0m**	**5.9-6.1m**	**10.15-10.25m**	**11.6-11.7m**	**16.2-16.3m**
Tare Number							
Wet Weight and Tare	860.5	291.6	867.8	294.4	688.9	333.5	985.9
Dry Weight and Tare	725.4	267.0	711.3	261.3	576.3	307.2	825.8
Washed Weight and Tare							
Weight of Tare	179.2	138.2	131.6	138.3	182.5	148.5	179.7
Weight of Water	135.1	24.6	156.5	33.1	112.6	26.3	160.1
Weight of minus #200							
Dry Weight	546.2	128.8	579.7	123.0	393.8	158.7	646.1
Percent Moisture	**24.7**	**19.1**	**27.0**	**26.9**	**28.6**	**16.6**	**24.8**
Percent minus #200							
Comments							

Hole Number	**BH-47**	**BH-47**	**BH-47**	**BH-47**	**BH-47**	**BH-47**	**BH-47**
Depth	**0.75-1.2m**	**2.0-2.27m**	**2.8-2.95m**	**5.33-5.88m**	**6.85-7.3m**	**8.38-8.58m**	**11.8-12.1m**
Tare Number							
Wet Weight and Tare	894.6	924.7	306.4	712.3	259.8	583.9	1089.1
Dry Weight and Tare	747.3	764.9	298.3	663.4	245.4	542.7	995.9
Washed Weight and Tare							
Weight of Tare	180.4	181.1	138.3	180.5	136.8	192.9	181.5
Weight of Water	147.3	159.8	8.1	48.9	14.4	41.2	93.2
Weight of minus #200							
Dry Weight	566.9	583.8	160.0	482.9	108.6	349.8	814.4
Percent Moisture	**26.0**	**27.4**	**5.1**	**10.1**	**13.3**	**11.8**	**11.4**
Percent minus #200							
Comments							

Hole Number
Depth
Tare Number
Wet Weight and Tare
Dry Weight and Tare
Washed Weight and Tare
Weight of Tare
Weight of Water
Weight of minus #200
Dry Weight
Percent Moisture
Percent minus #200
Comments

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

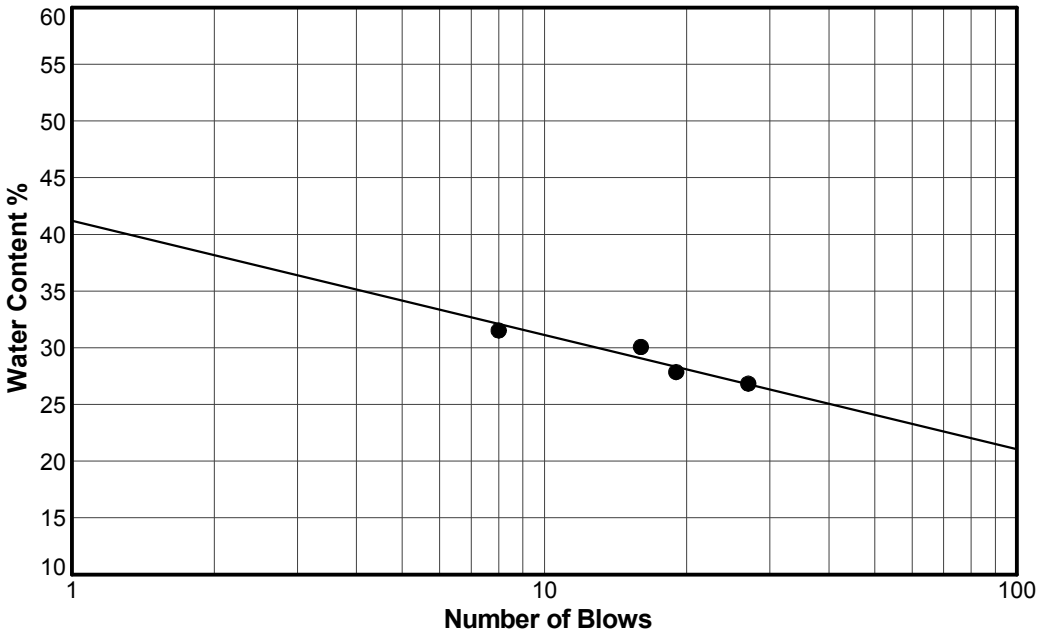
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-51**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.20 to 1.44	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**52**
Liquid Limit	**27**
Plastic Limit	**22**
Plasticity Index	**5**
Natural Water Content (%)	**12.8**
Liquidity Index	**-1.8**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

TM	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

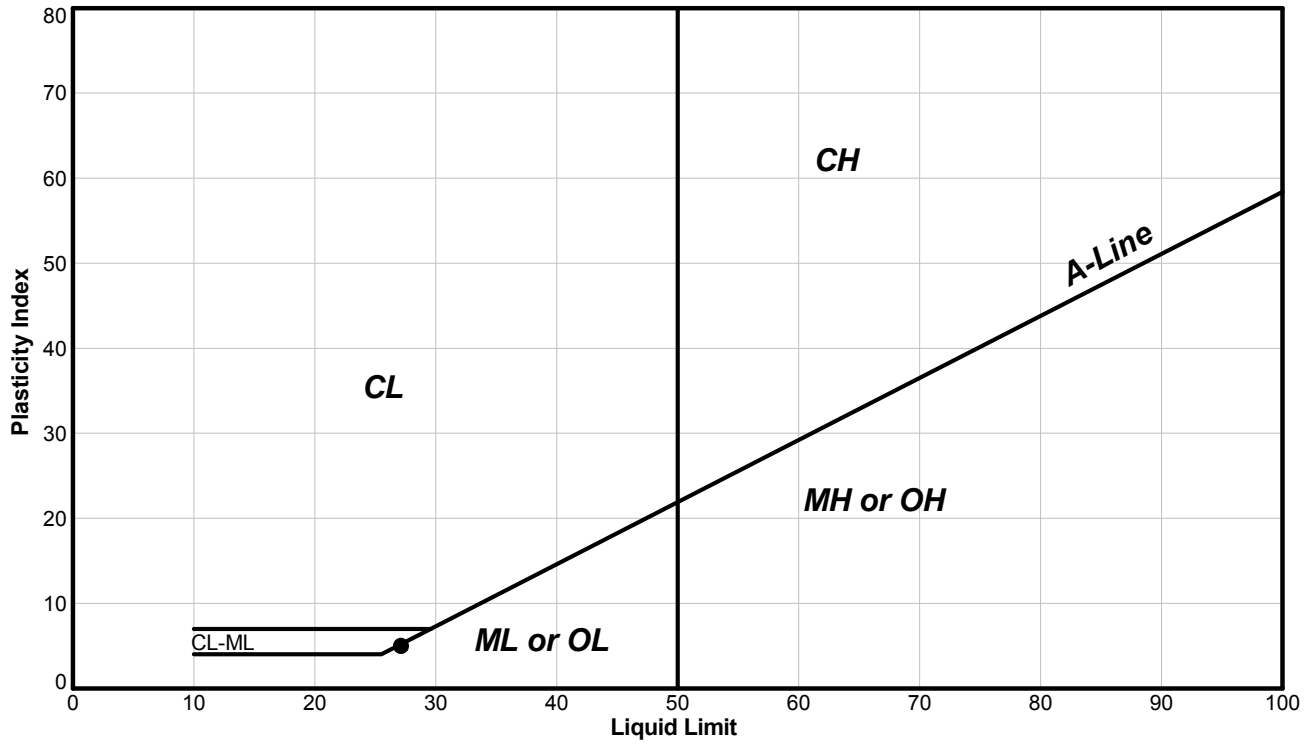
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-51**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.20 to 1.44
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-51	1	0.20	1.44	52	27	22	5	12.8	-1.8

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

TM	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

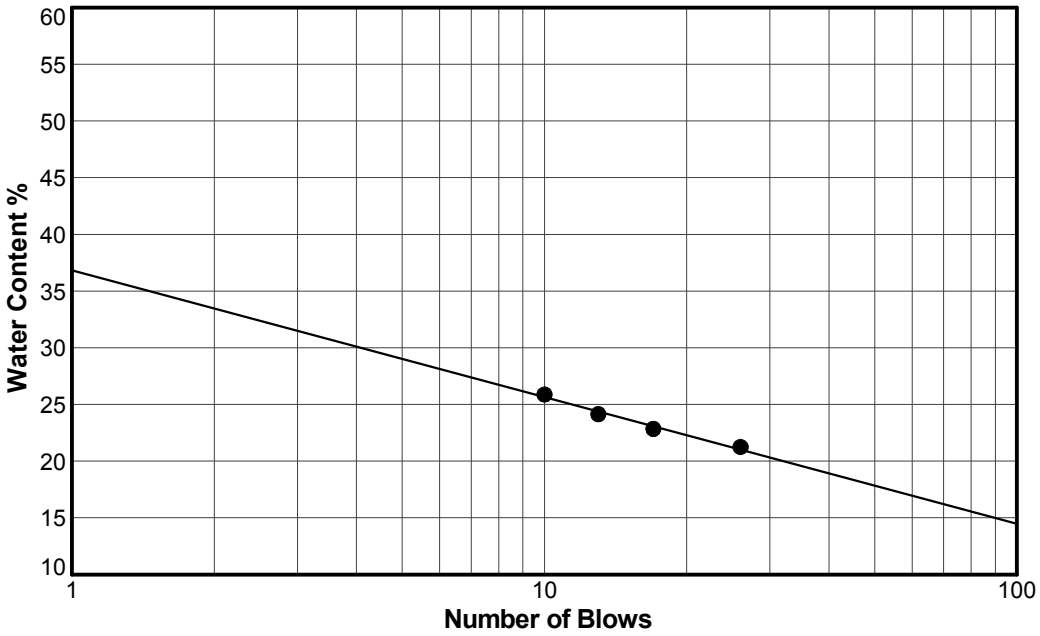
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-54**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**32**
Liquid Limit	**21**
Plastic Limit	**20**
Plasticity Index	**1**
Natural Water Content (%)	**9.5**
Liquidity Index	**-10.5**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

		LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

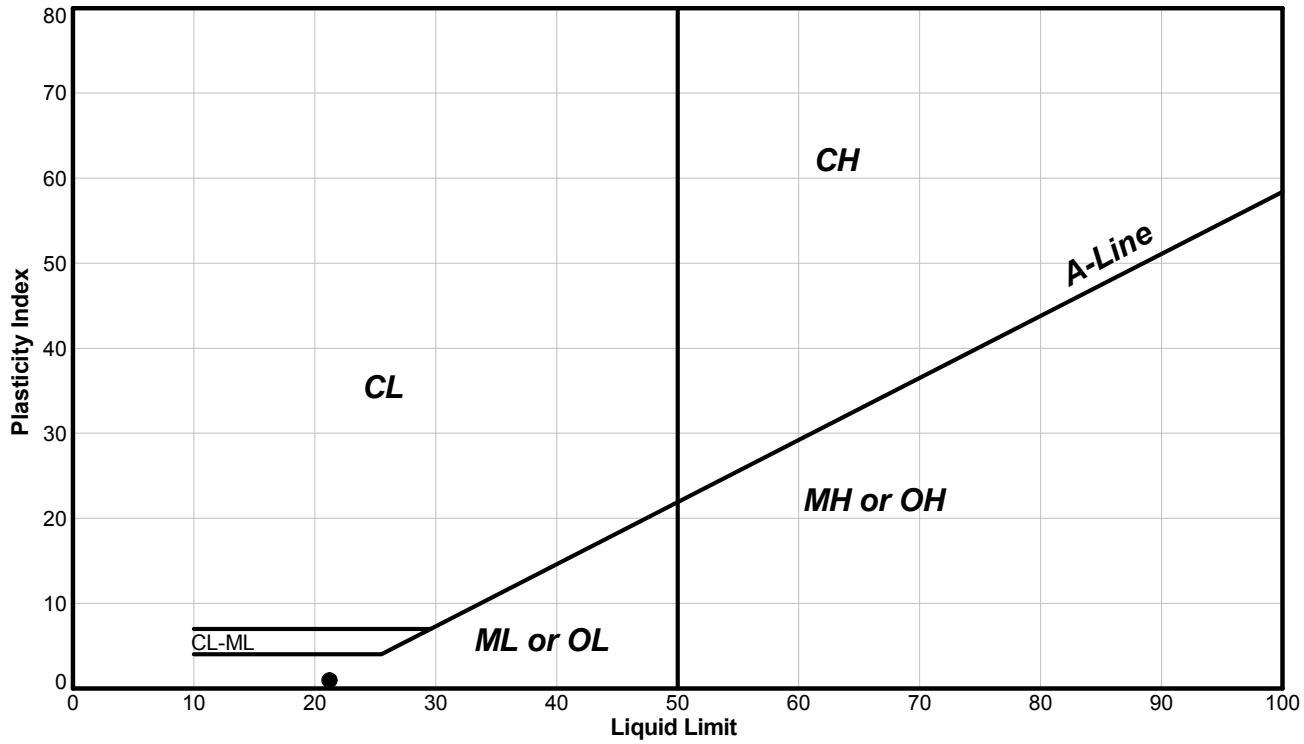
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-54**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-54	1	0.40	0.60	32	21	20	1	9.5	-10.5

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

		LP	**15/10/2011**
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

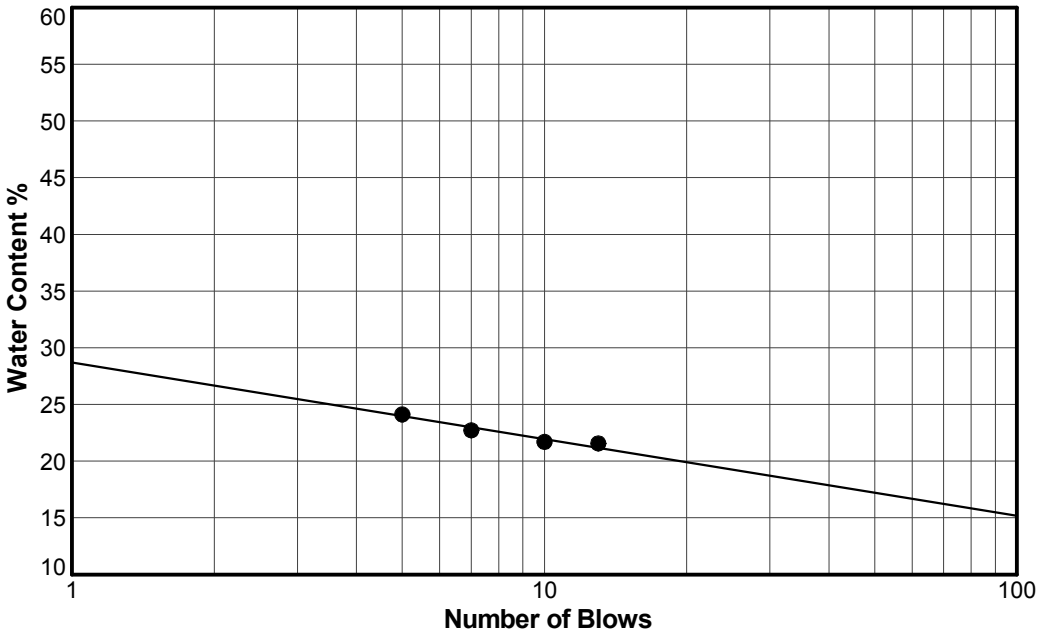
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-55**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**28**
Liquid Limit	**NP**
Plastic Limit	**NP**
Plasticity Index	**NP**
Natural Water Content (%)	**7.2**
Liquidity Index	**NP**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	23/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

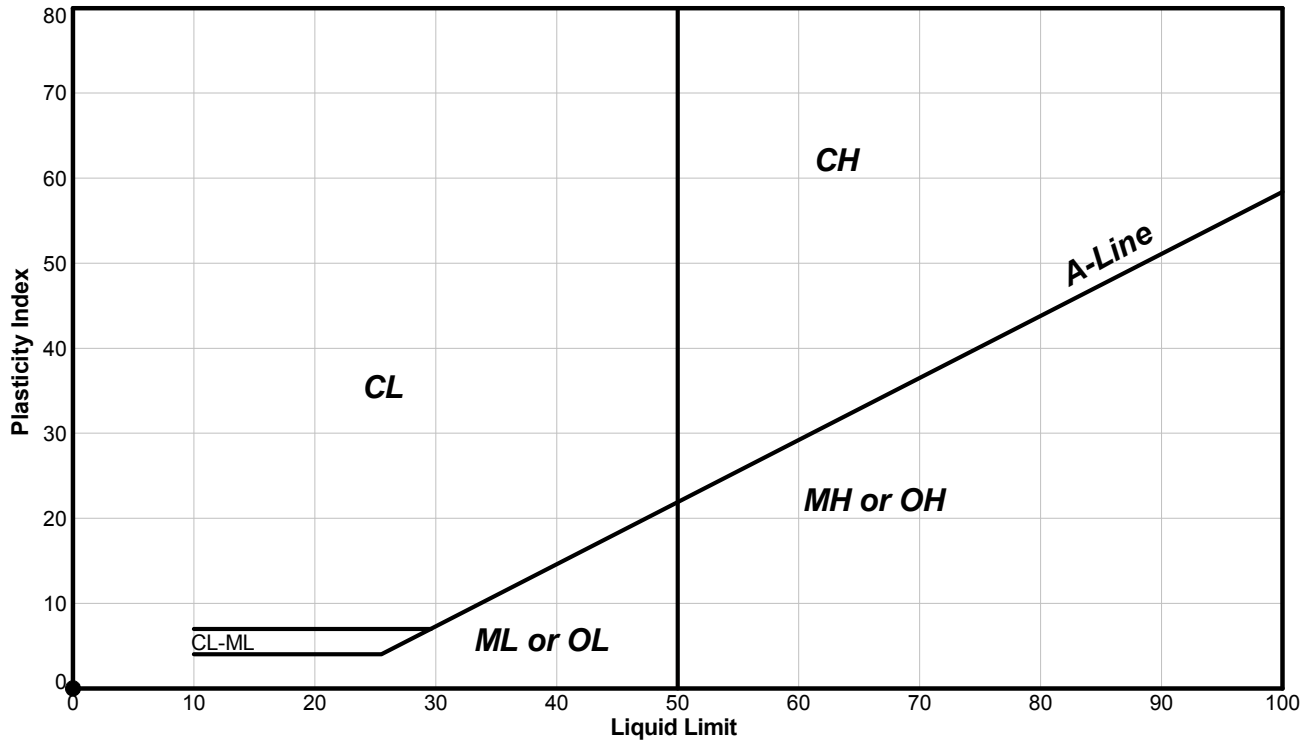
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-55**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-55	1	0.40	0.60	28	NP	NP	NP	7.2	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	23/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

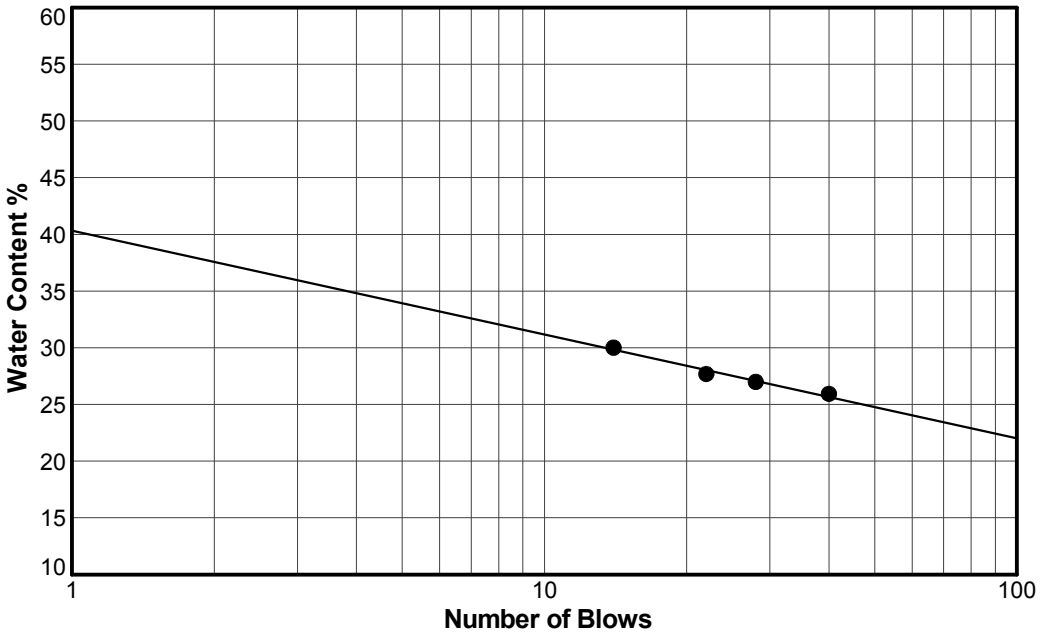
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-57**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.90 to 1.10	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**38**
Liquid Limit	**28**
Plastic Limit	**23**
Plasticity Index	**5**
Natural Water Content (%)	**8.5**
Liquidity Index	**-2.9**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	16/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

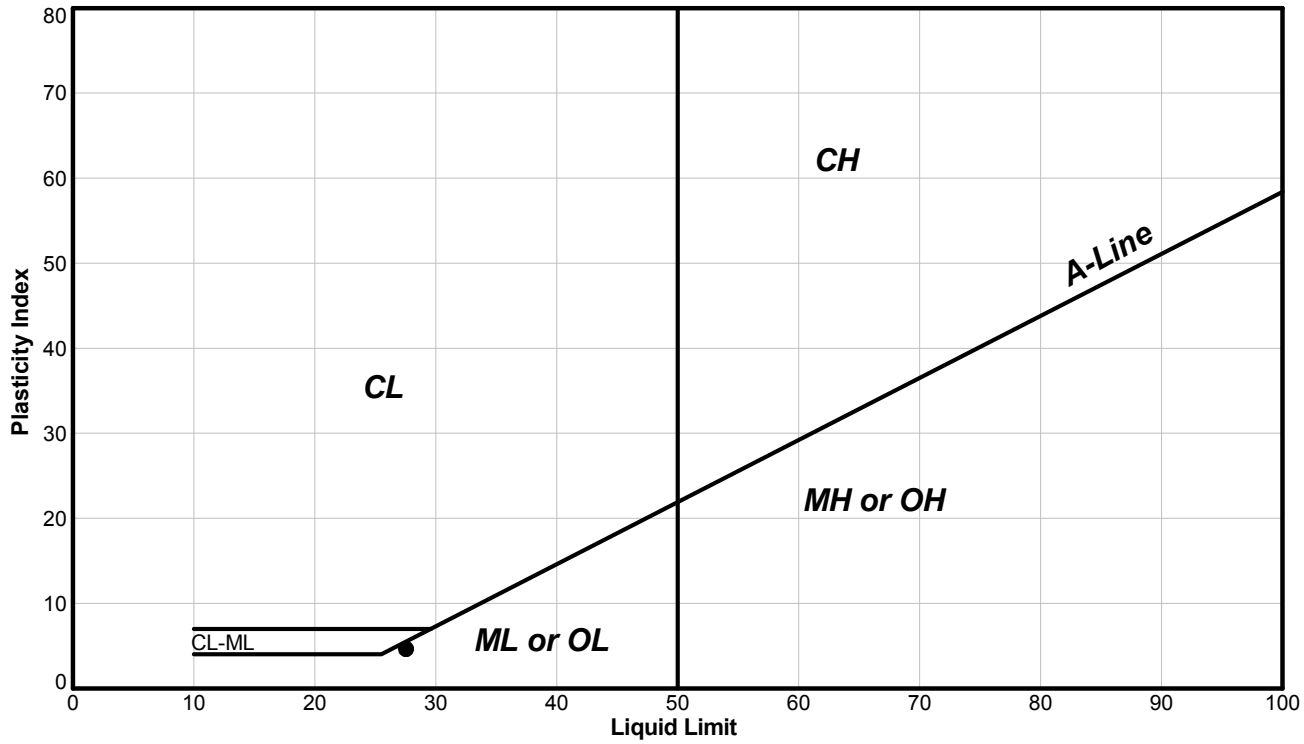
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-57**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.90 to 1.10
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-57	1	0.90	1.10	38	28	23	5	8.5	-2.9

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	16/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

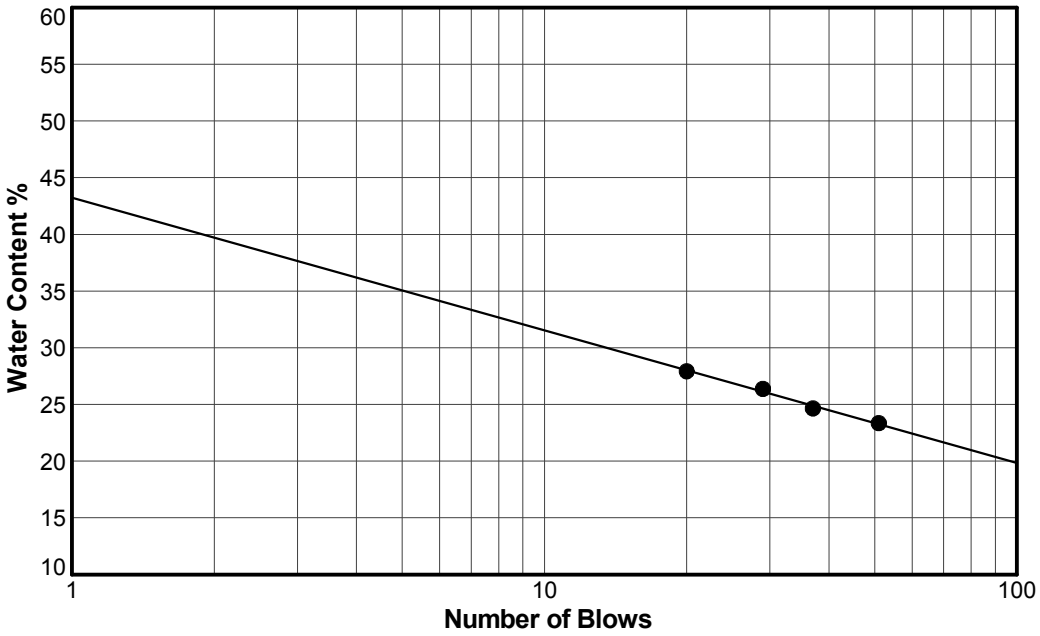
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-58**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 0.70	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**35**
Liquid Limit	**27**
Plastic Limit	**23**
Plasticity Index	**4**
Natural Water Content (%)	**9.5**
Liquidity Index	**-3.4**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	16/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

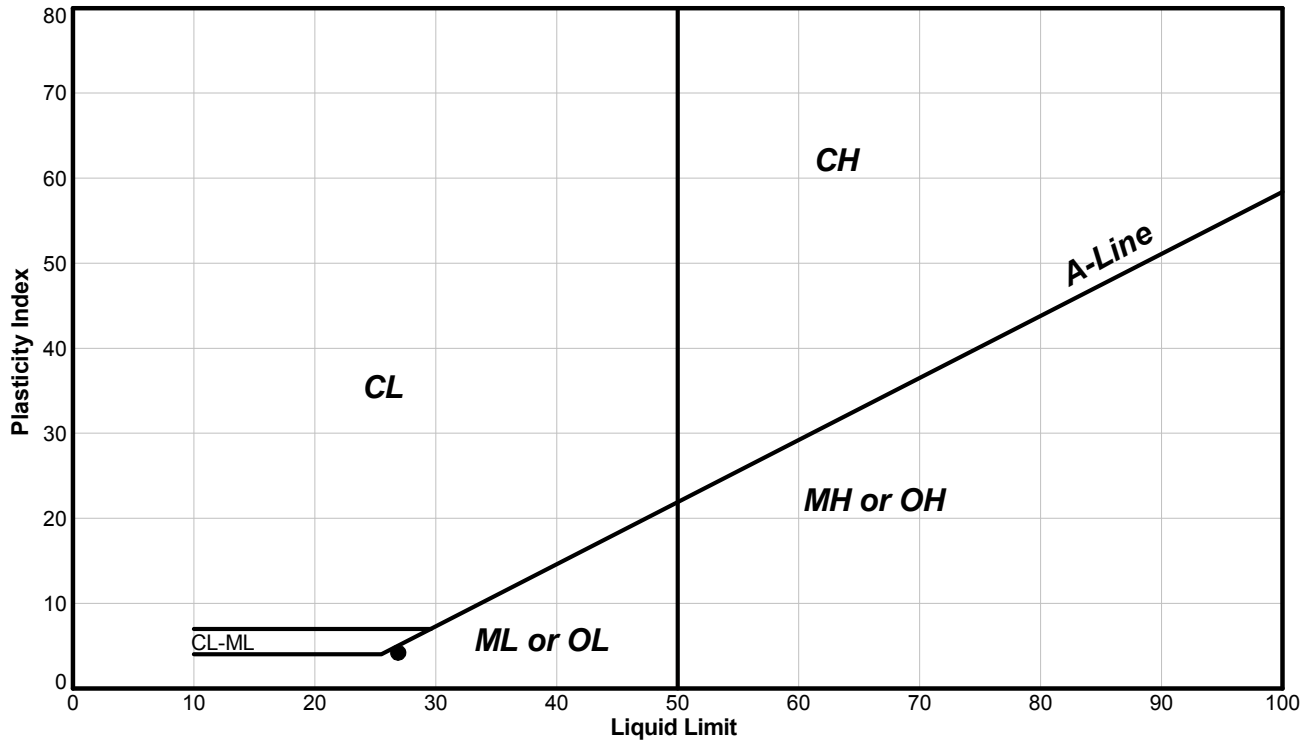
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-58**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 0.70
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-58	1	0.70	0.70	35	27	23	4	9.5	-3.4

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	16/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-59**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**17**
Liquid Limit	**24**
Plastic Limit	**23**
Plasticity Index	**1**
Natural Water Content (%)	**7.3**
Liquidity Index	**-15.7**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	04/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

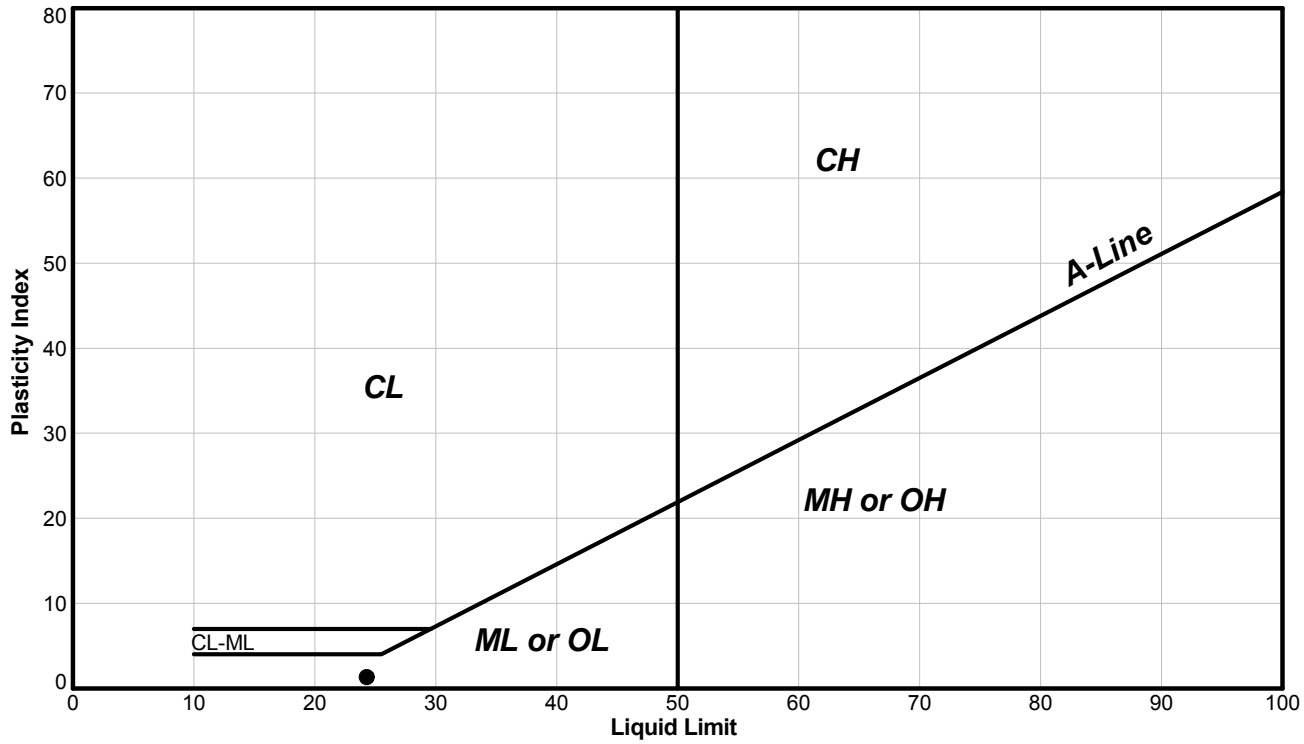
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-59**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-59	1	0.40	0.60	17	24	23	1	7.3	-15.7

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	04/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-60**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 0.90	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**66**
Liquid Limit	**27**
Plastic Limit	**26**
Plasticity Index	**1**
Natural Water Content (%)	**24.8**
Liquidity Index	**-1.2**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	07/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

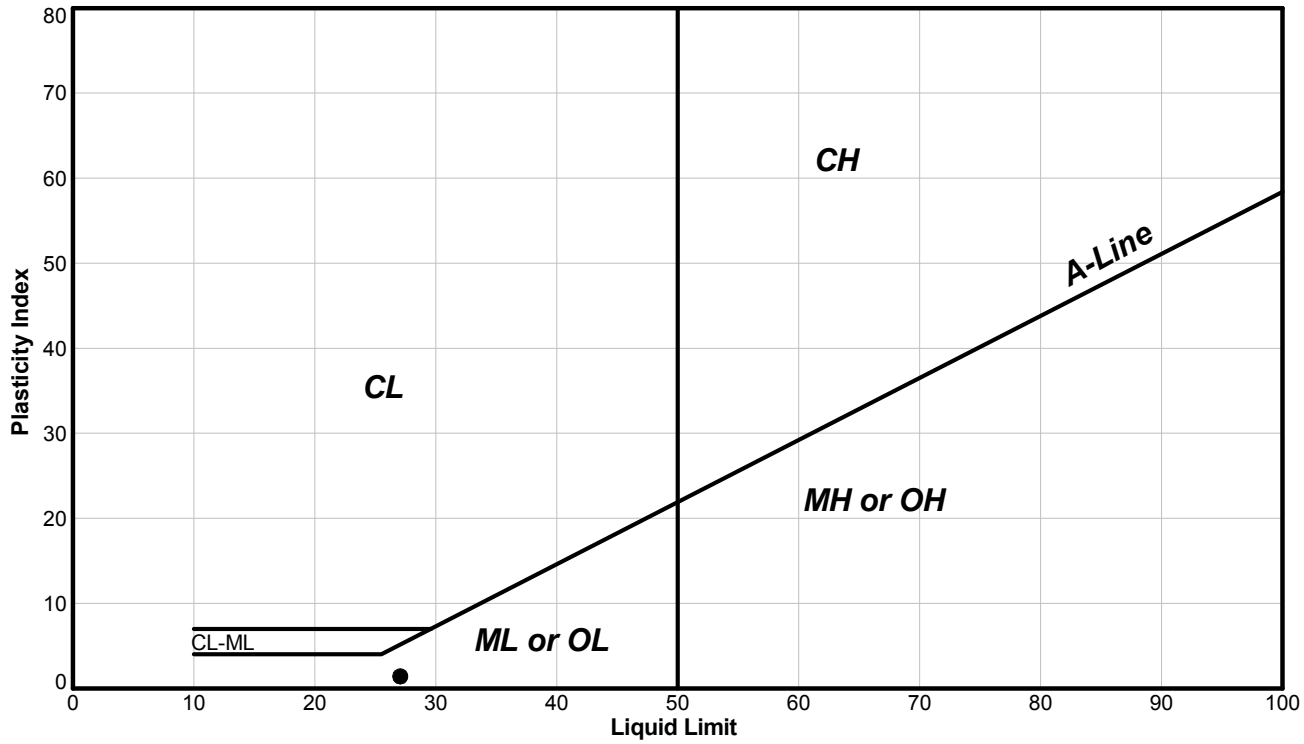
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-60**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 0.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-60	1	0.70	0.90	66	27	26	1	24.8	-1.2

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	07/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

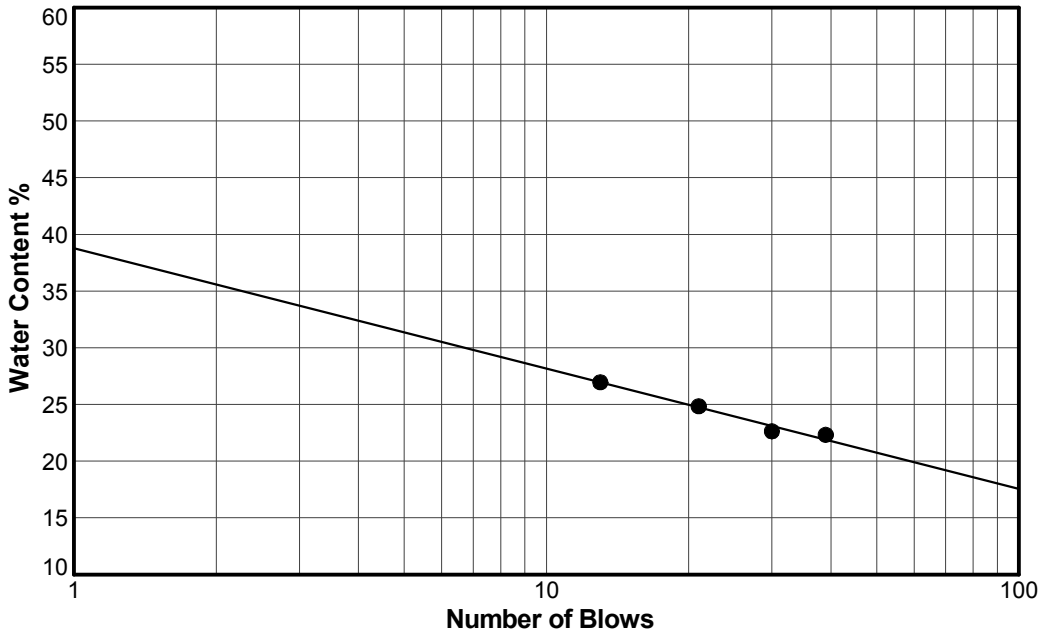
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-61**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 0.90	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**49**
Liquid Limit	**24**
Plastic Limit	**21**
Plasticity Index	**3**
Natural Water Content (%)	**11.8**
Liquidity Index	**-3.1**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

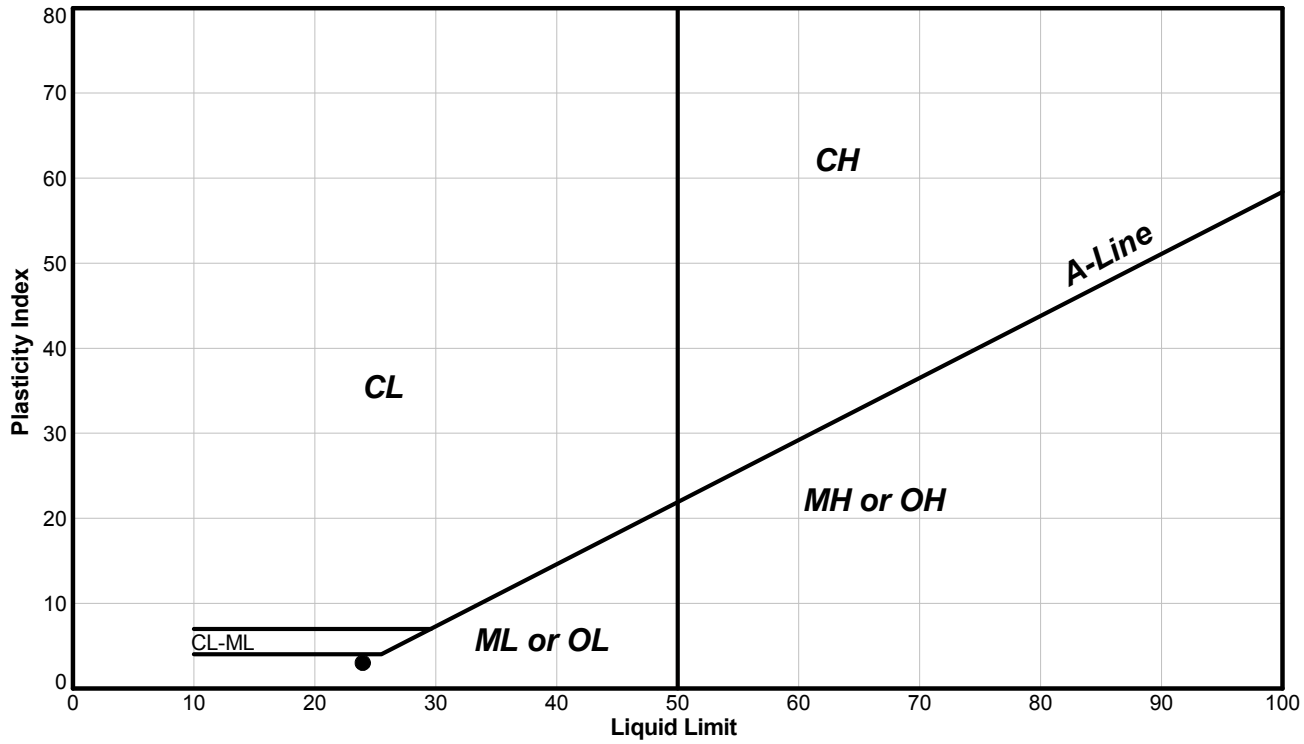
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-61**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 0.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-61	1	0.80	0.90	49	24	21	3	11.8	-3.1

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

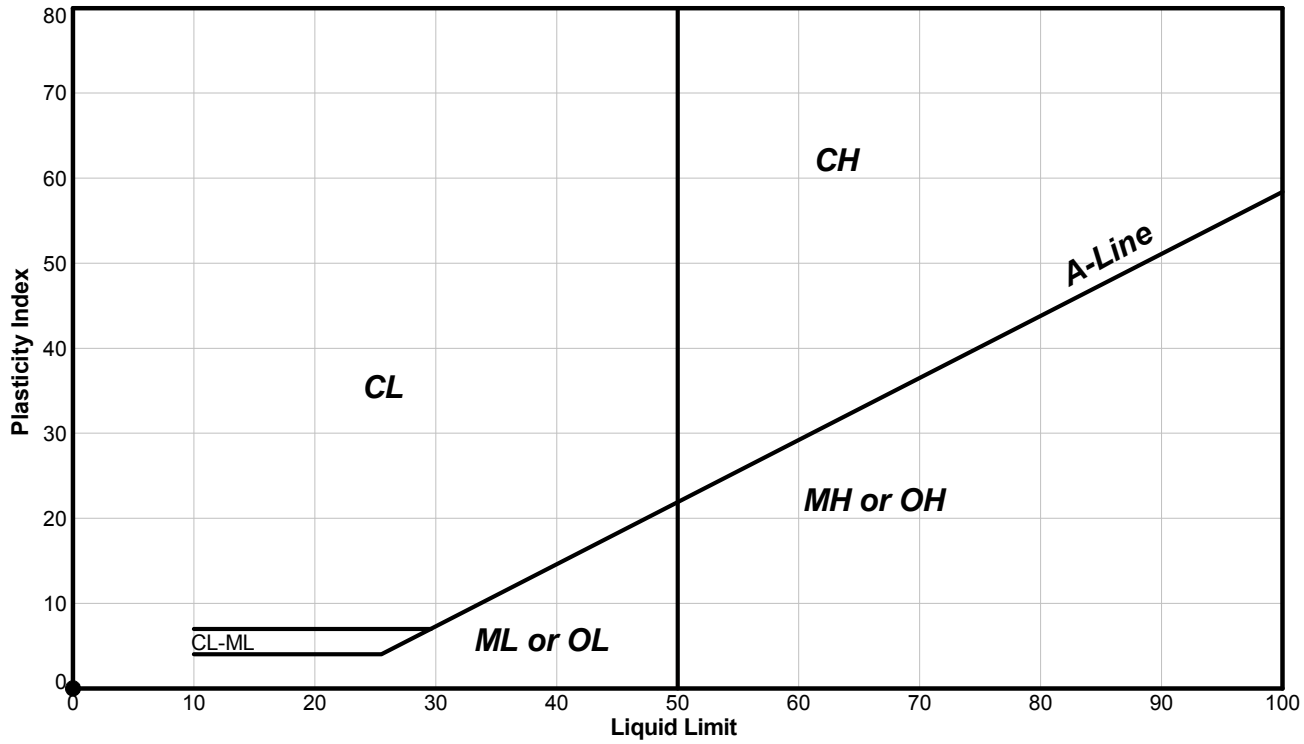
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-62**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.90 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-62	1	0.90	1.00	49	NP	NP	NP	10.5	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	14/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

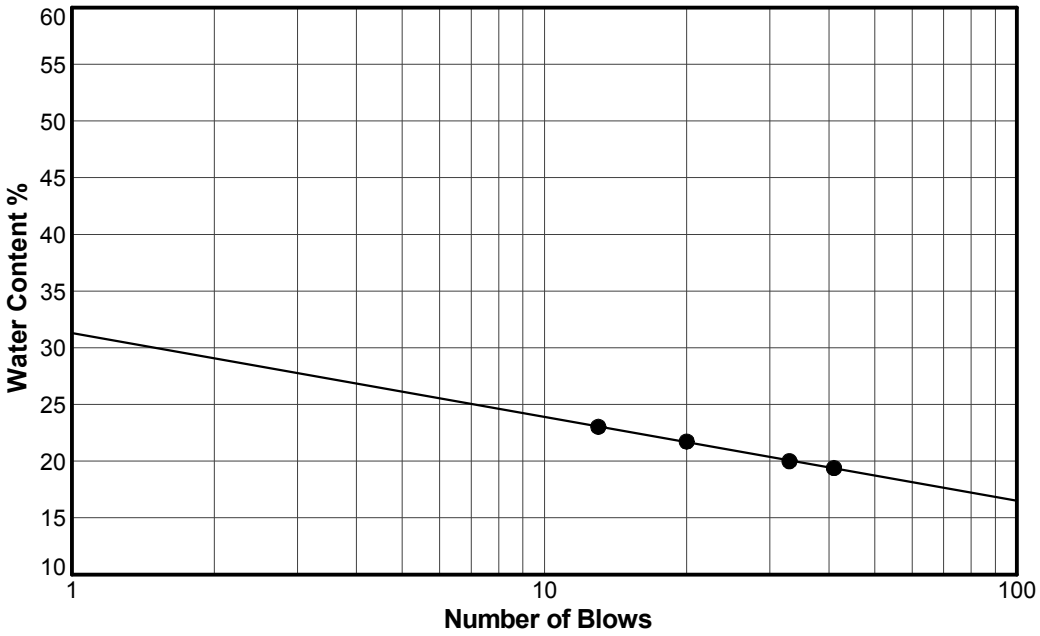
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-62**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 3.50 to 3.70	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**41**
Liquid Limit	**21**
Plastic Limit	**16**
Plasticity Index	**5**
Natural Water Content (%)	**8.8**
Liquidity Index	**-1.4**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	14/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

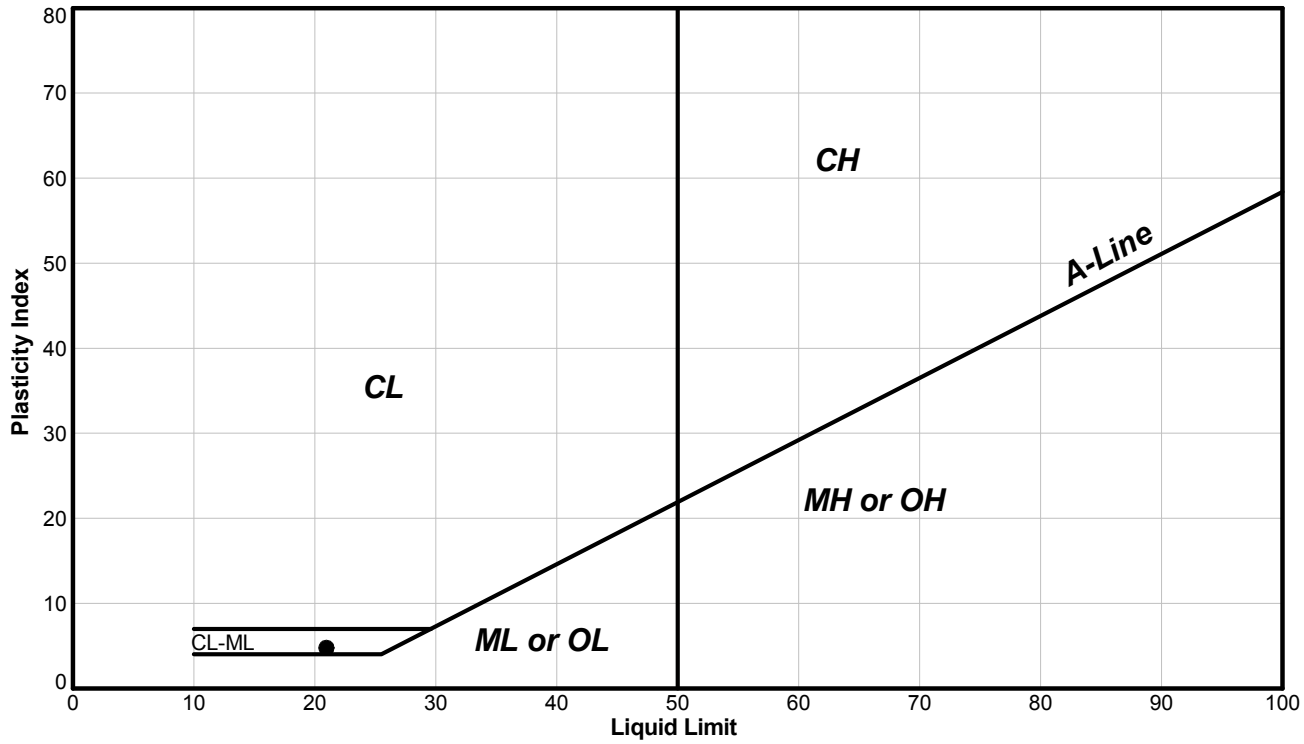
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-62**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.50 to 3.70
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-62	2	3.50	3.70	41	21	16	5	8.8	-1.4

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	14/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

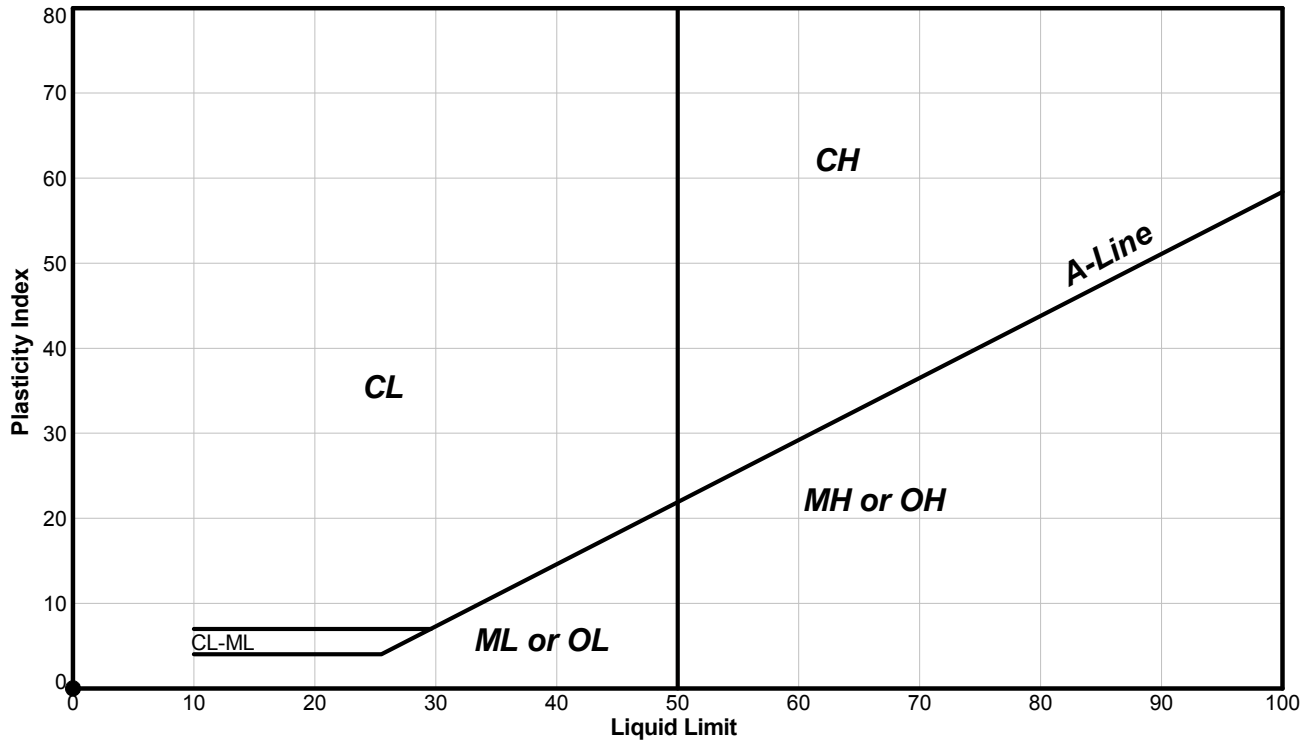
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-63**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-63	1	0.40	0.60	31	NP	NP	NP	7.4	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	16/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

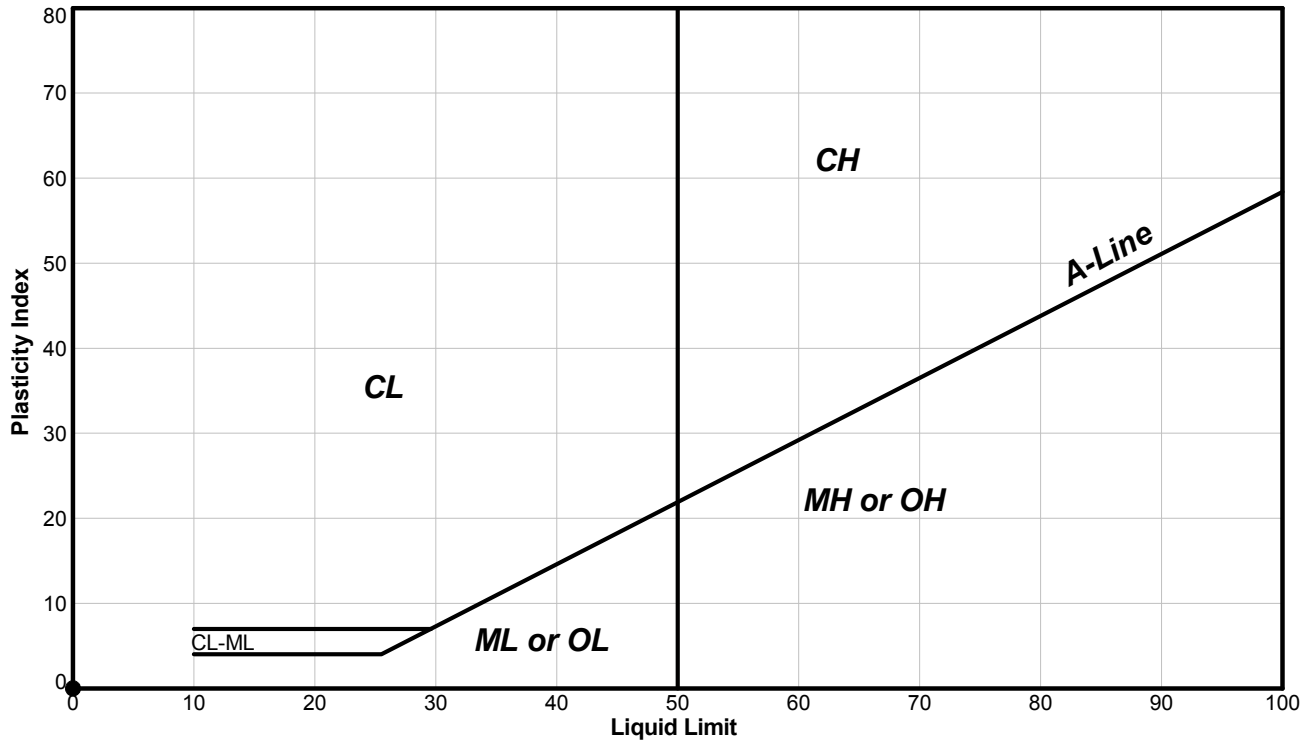
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-64**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.50 to 1.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-64	1	1.50	1.60	41	NP	NP	NP	4.7	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	02/11/2011	LP	03/11/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-66**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.80 to 1.80	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: CL - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**84**
Liquid Limit	**29**
Plastic Limit	**19**
Plasticity Index	**10**
Natural Water Content (%)	**16.7**
Liquidity Index	**-0.2**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	21/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

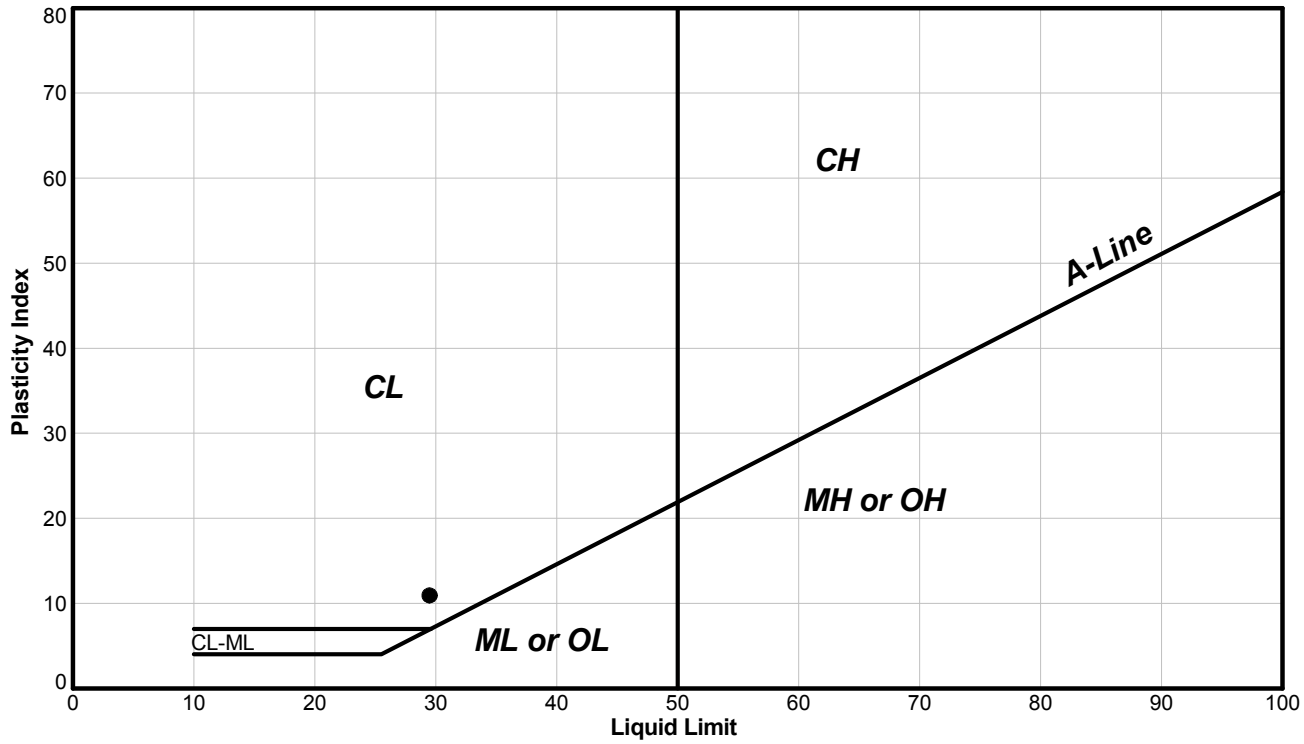
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-66**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.80 to 1.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: CL - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-66	2	1.80	1.80	84	29	19	10	16.7	-0.2

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	21/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

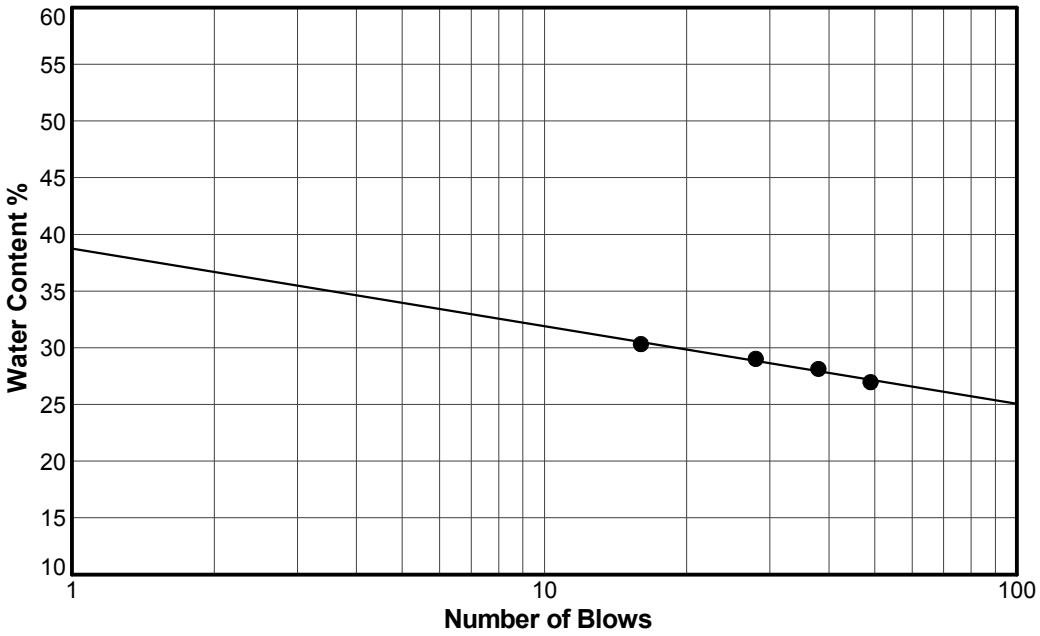
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-69**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.50 to 1.70	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**97**
Liquid Limit	**NP**
Plastic Limit	**NP**
Plasticity Index	**NP**
Natural Water Content (%)	**30.5**
Liquidity Index	**NP**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	07/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

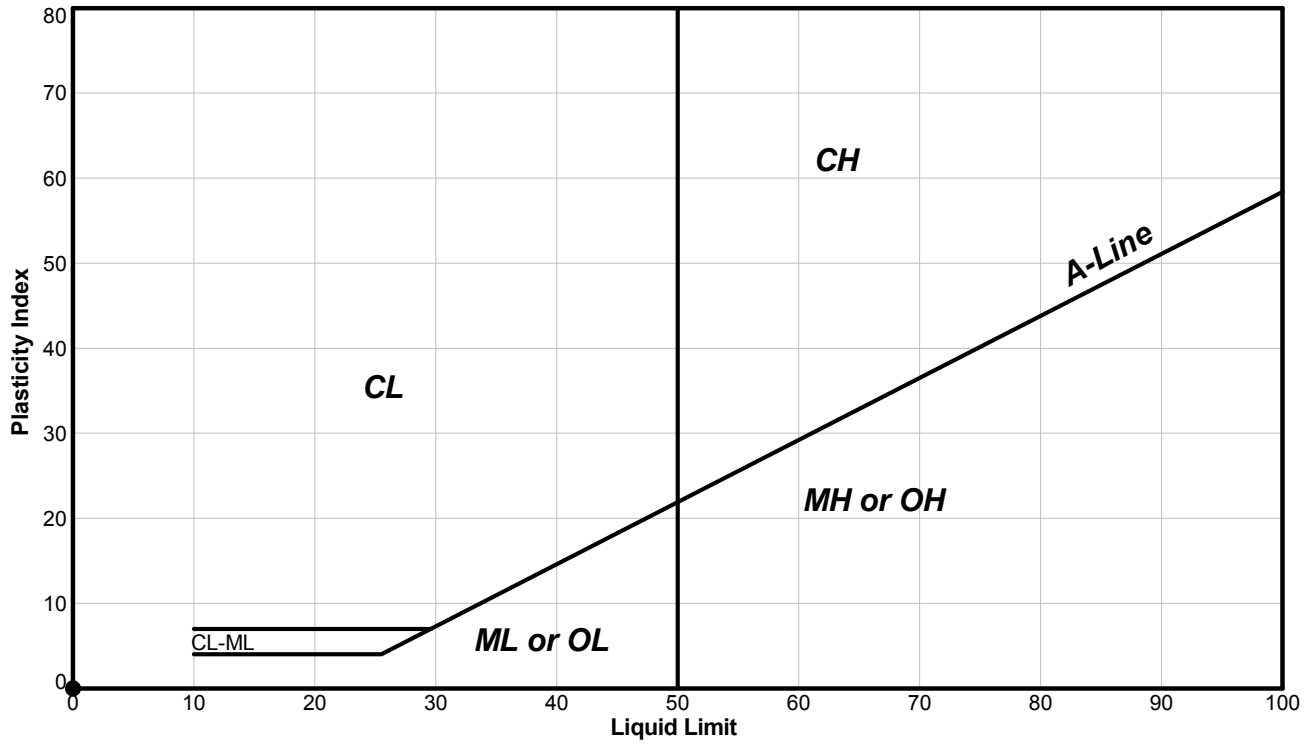
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-69**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.50 to 1.70
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-69	1	1.50	1.70	97	NP	NP	NP	30.5	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	07/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

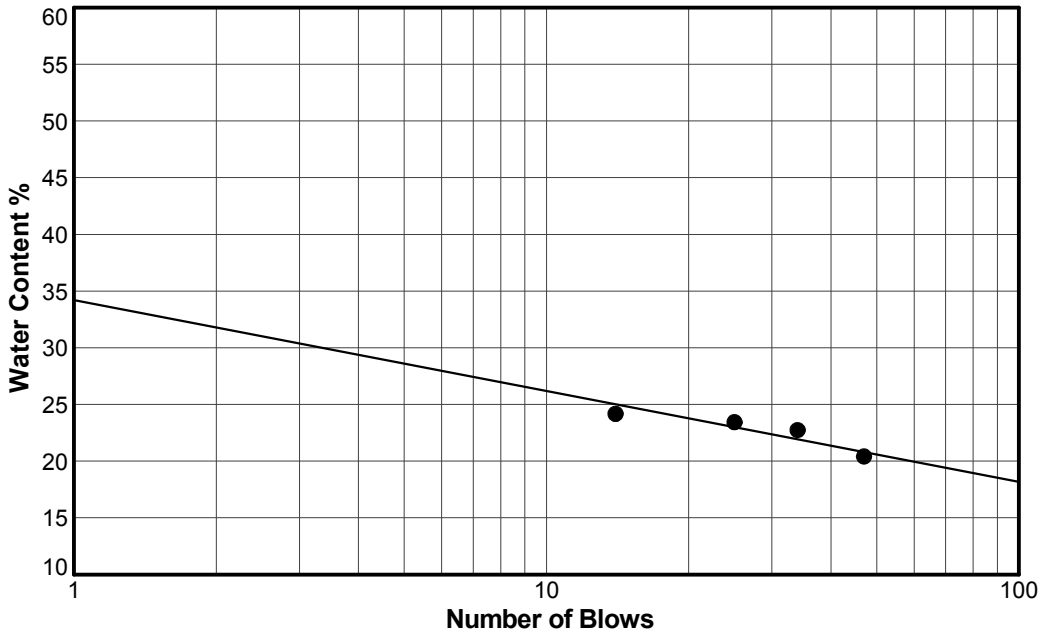
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-69**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 2.80 to 2.90	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**31**
Liquid Limit	**23**
Plastic Limit	**17**
Plasticity Index	**6**
Natural Water Content (%)	**6.8**
Liquidity Index	**-1.7**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	14/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

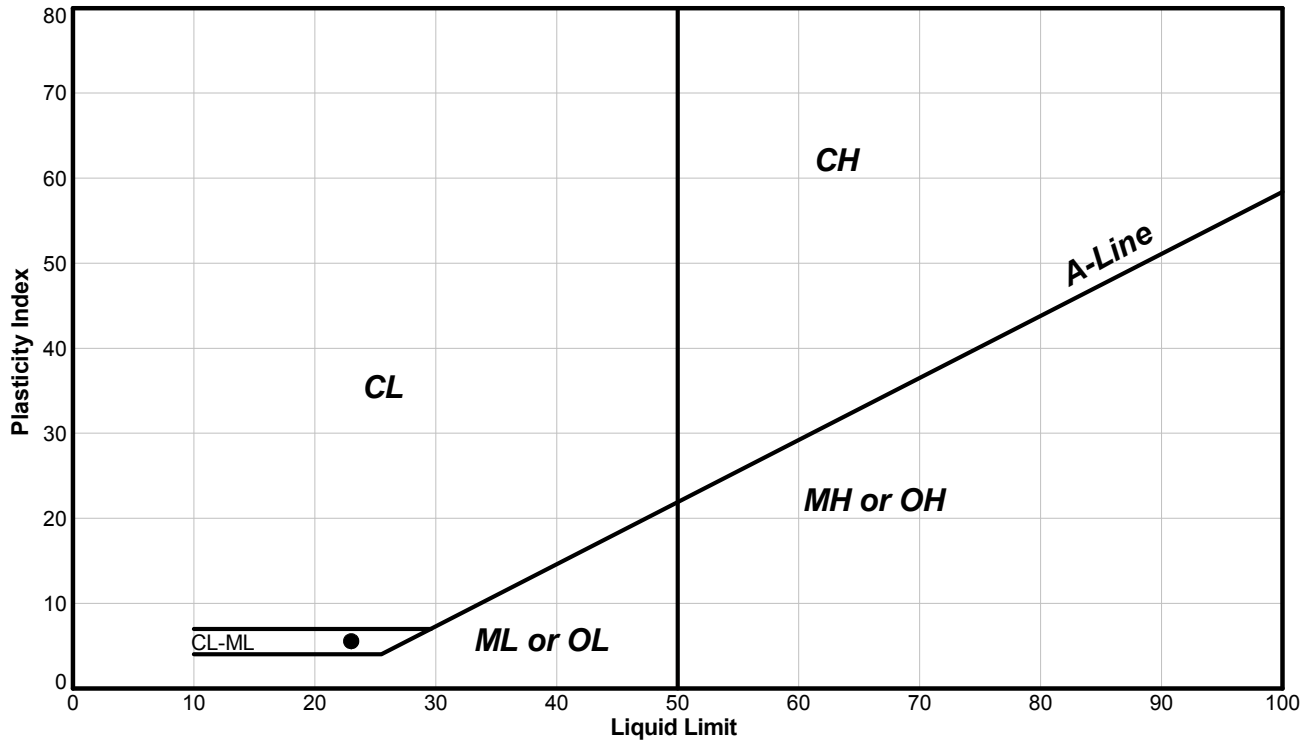
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-69**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.80 to 2.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-69	2	2.80	2.90	31	23	17	6	6.8	-1.7

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	14/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

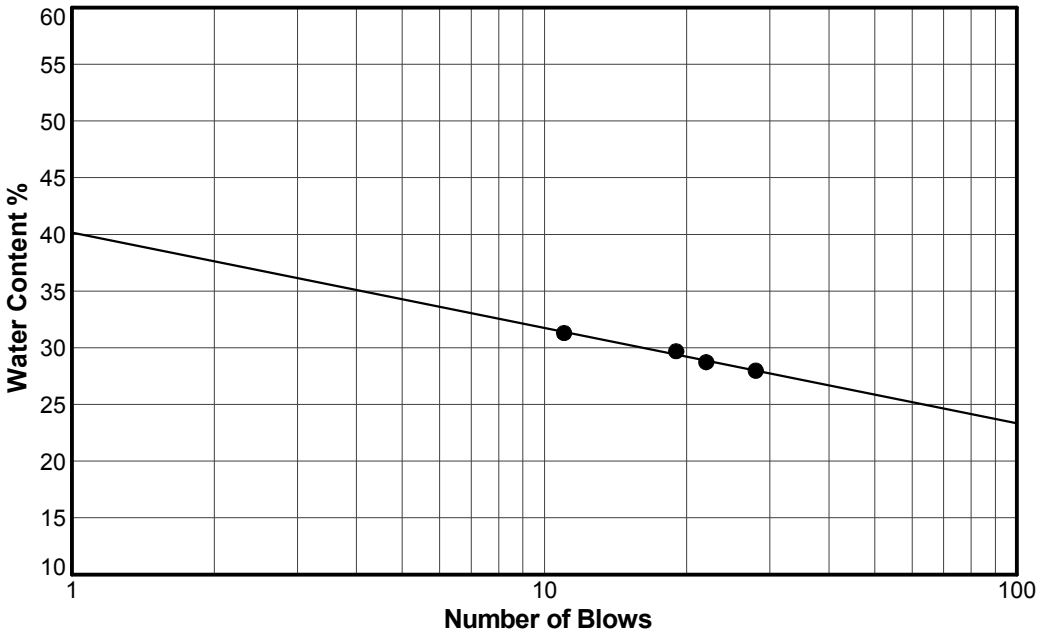
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-71**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.60	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**42**
Liquid Limit	**28**
Plastic Limit	**22**
Plasticity Index	**6**
Natural Water Content (%)	**13.8**
Liquidity Index	**-1.4**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

		LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

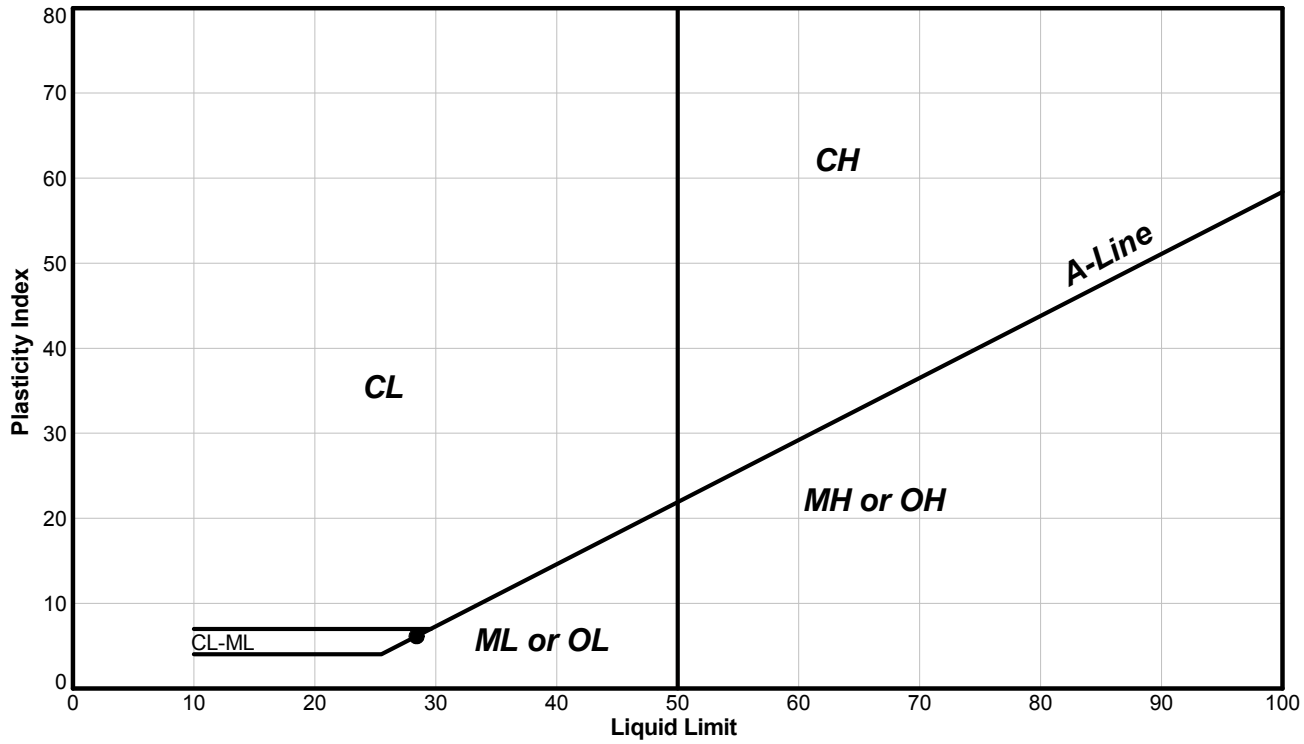
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-71**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-71	1	1.30	1.60	42	28	22	6	13.8	-1.4

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

		LP	**15/10/2011**
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

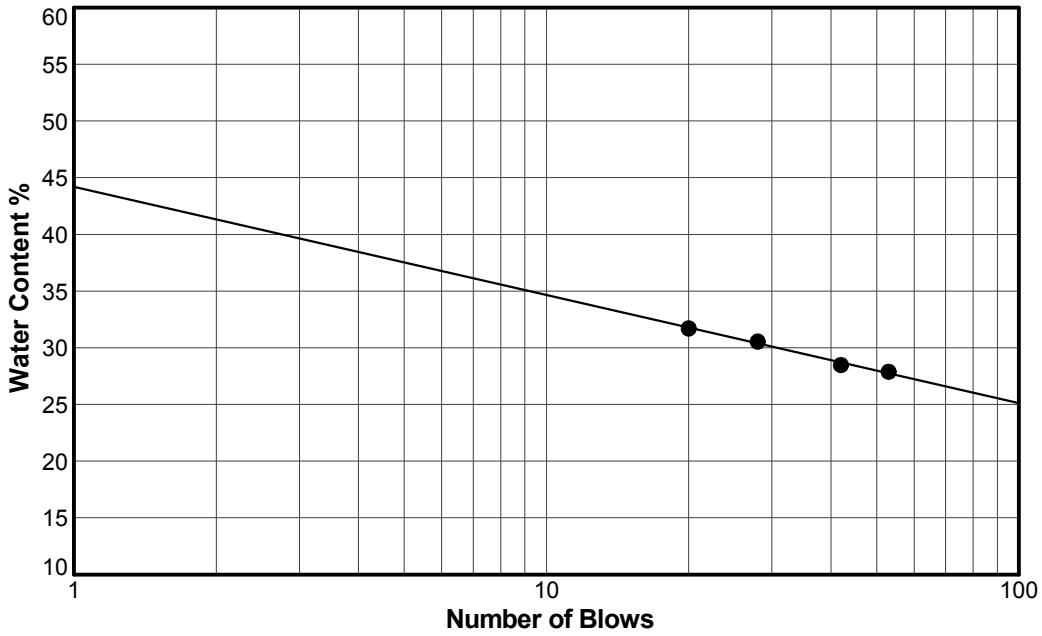
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-72**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 1.00	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**26**
Liquid Limit	**31**
Plastic Limit	**24**
Plasticity Index	**7**
Natural Water Content (%)	**13.7**
Liquidity Index	**-1.5**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	16/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

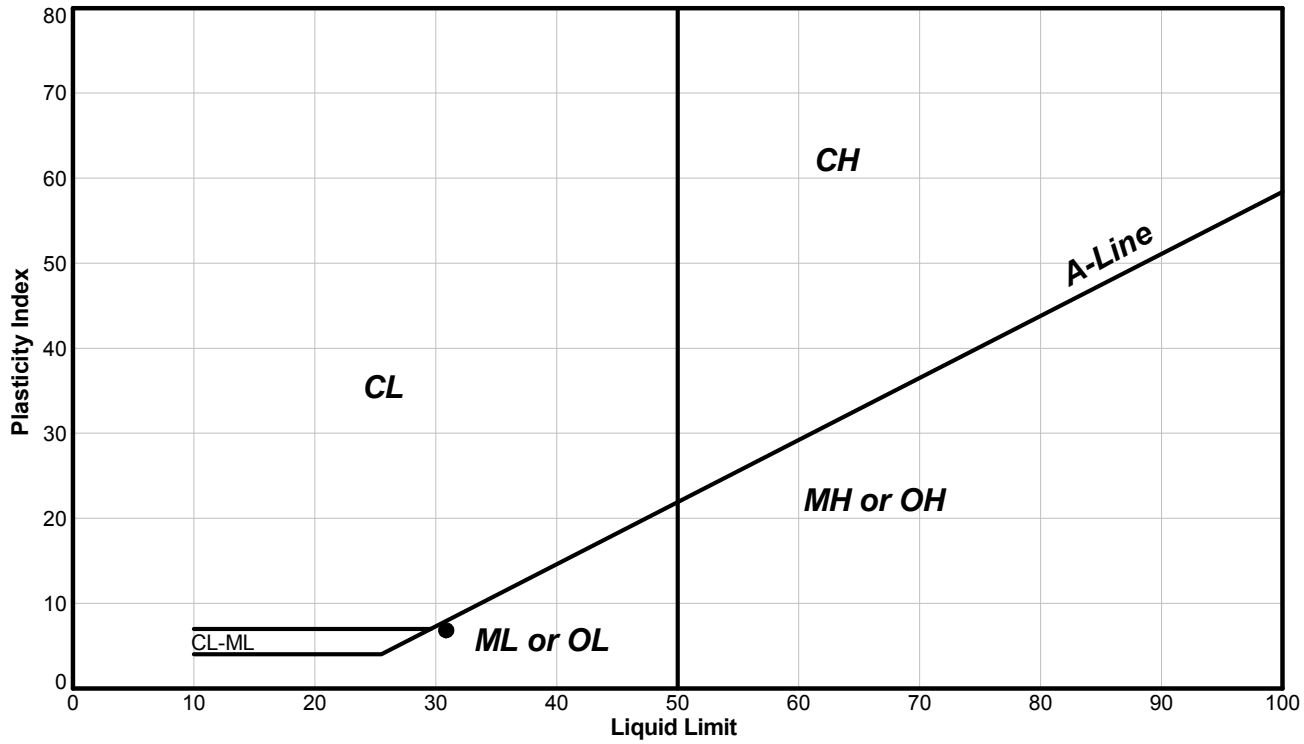
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-72**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-72	2	0.80	1.00	26	31	24	7	13.7	-1.5

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	16/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

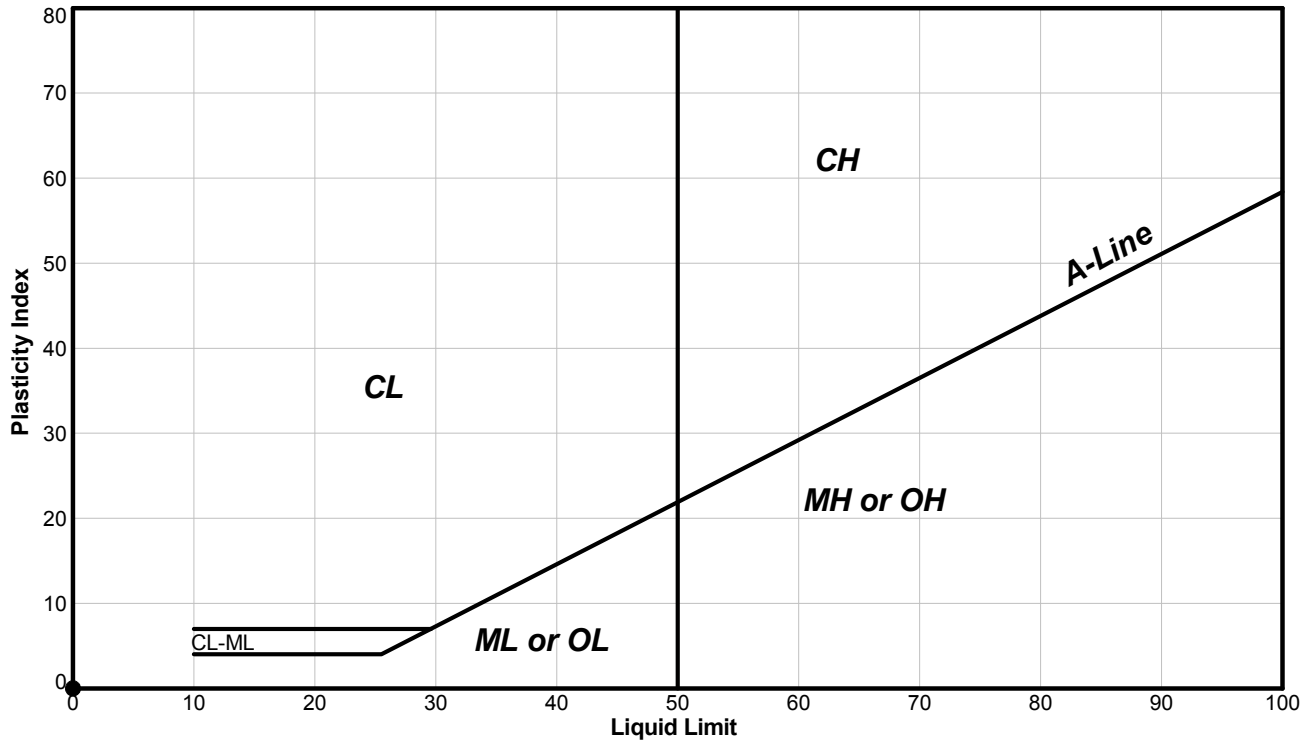
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-73**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-73	1	0.80	1.00	45	NP	NP	NP	8.5	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	19/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

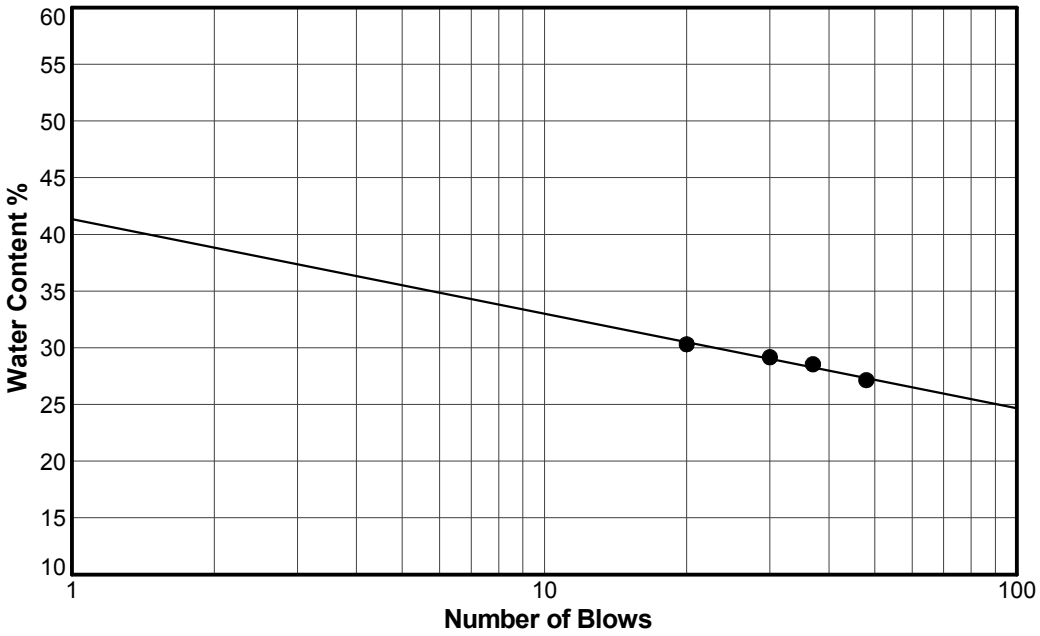
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-74**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.20 to 1.40	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**44**
Liquid Limit	**30**
Plastic Limit	**25**
Plasticity Index	**5**
Natural Water Content (%)	**11.8**
Liquidity Index	**-2.6**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

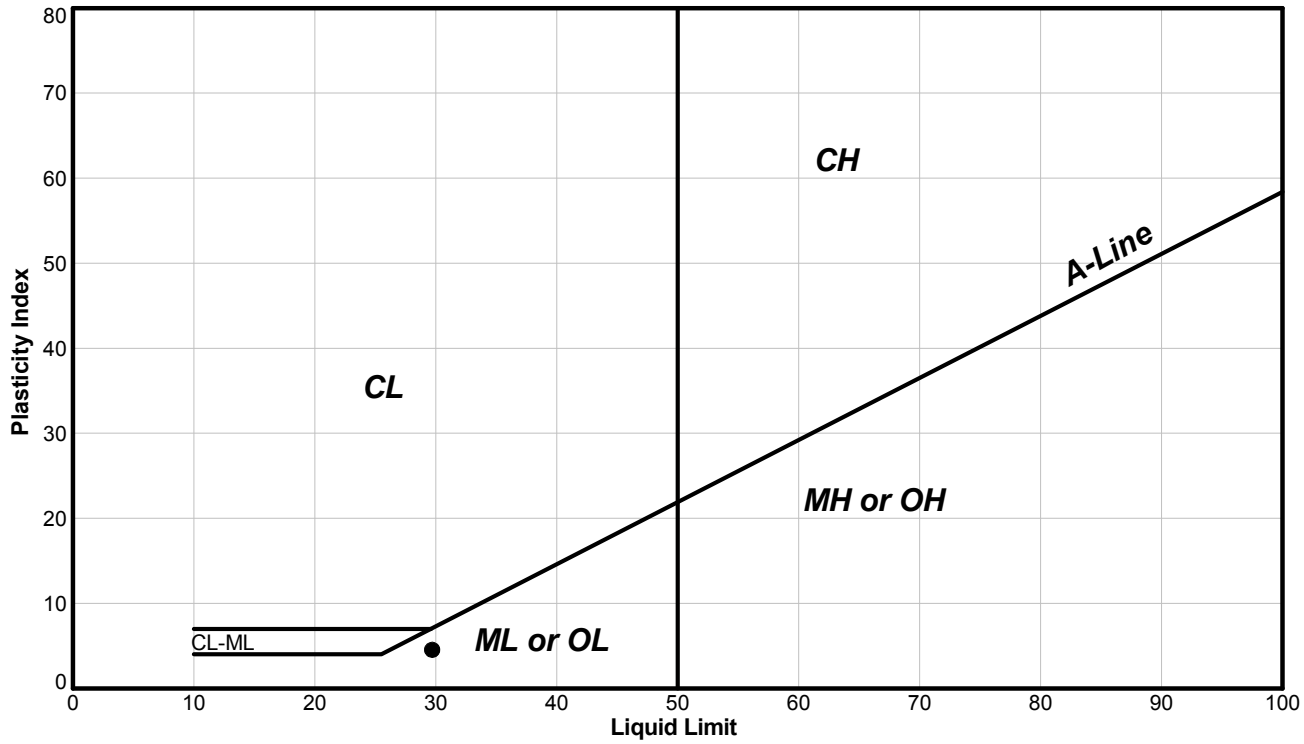
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-74**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.20 to 1.40
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-74	1	1.20	1.40	44	30	25	5	11.8	-2.6

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	13/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

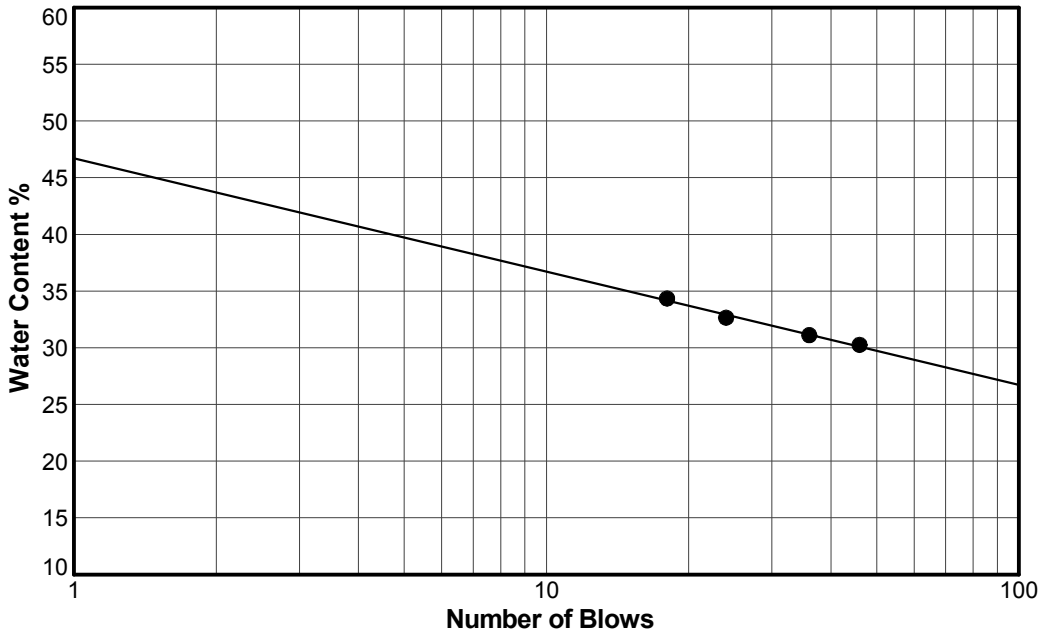
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-74**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 3.00 to 3.00	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**99**
Liquid Limit	**33**
Plastic Limit	**30**
Plasticity Index	**3**
Natural Water Content (%)	**35.9**
Liquidity Index	**2.0**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

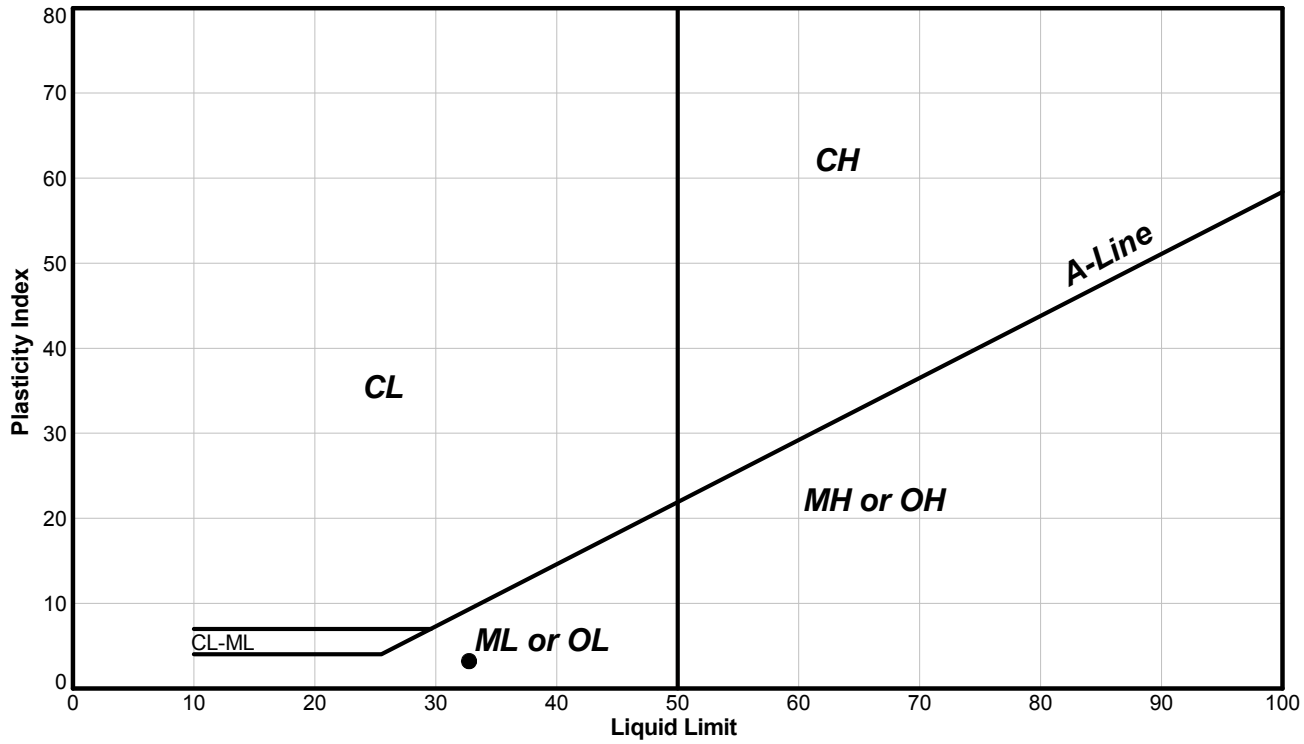
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-74**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.00 to 3.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-74	2	3.00	3.00	99	33	30	3	35.9	2.0

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	12/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

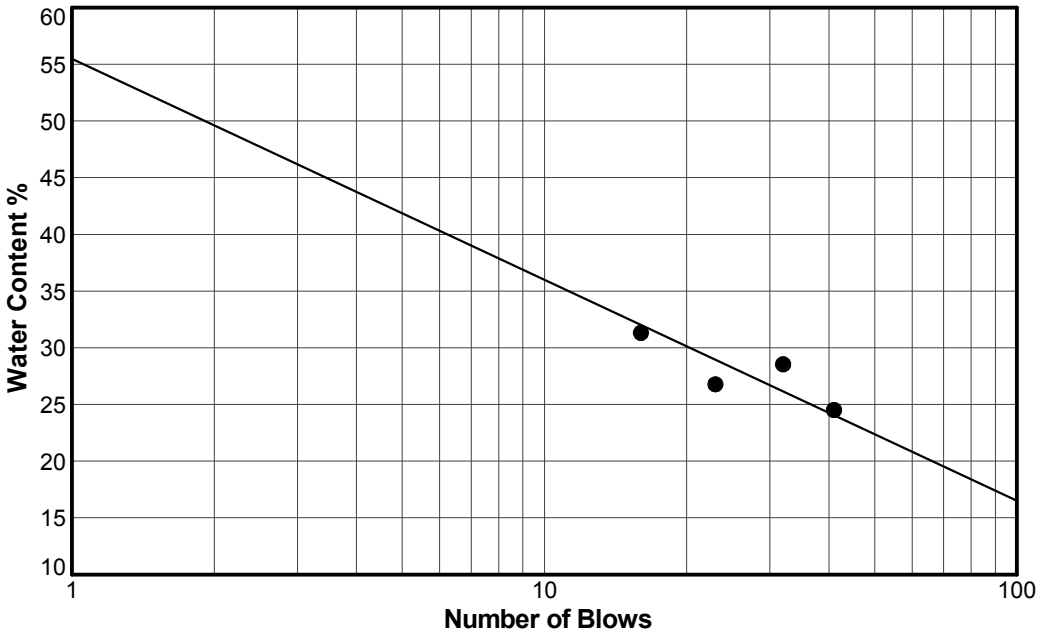
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-74**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 3**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 4.50 to 4.50	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**57**
Liquid Limit	**28**
Plastic Limit	**22**
Plasticity Index	**6**
Natural Water Content (%)	**15.0**
Liquidity Index	**-1.2**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	19/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

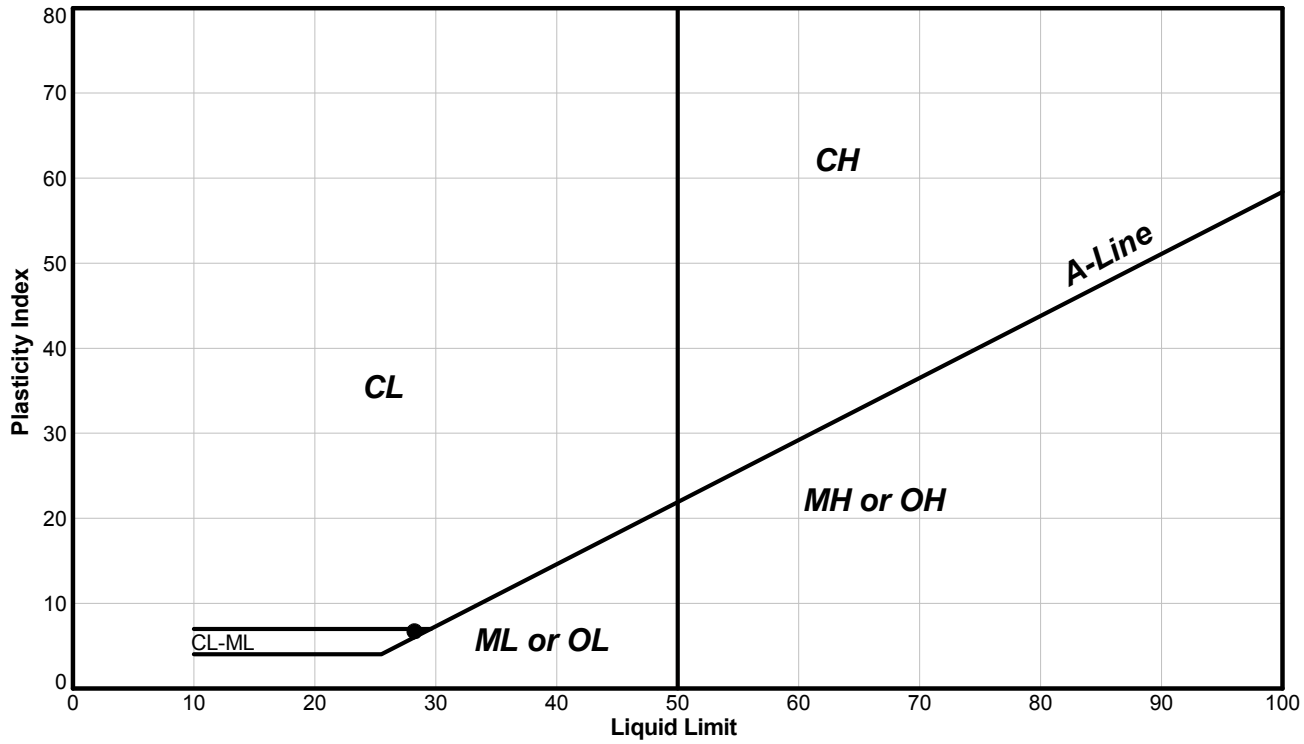
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-74**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 3**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 4.50 to 4.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-74	3	4.50	4.50	57	28	22	6	15.0	-1.2

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	19/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

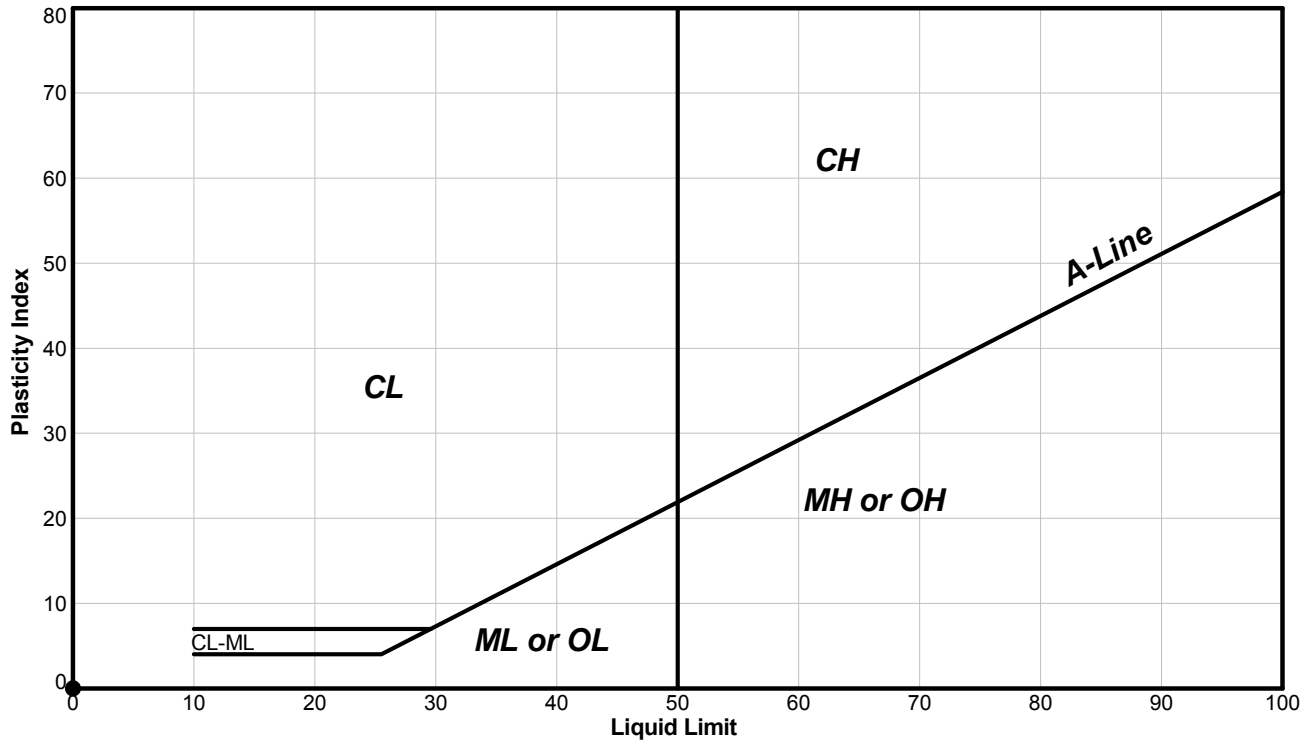
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-76**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-76	1	0.40	0.60	68	NP	NP	NP	16.1	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	22/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

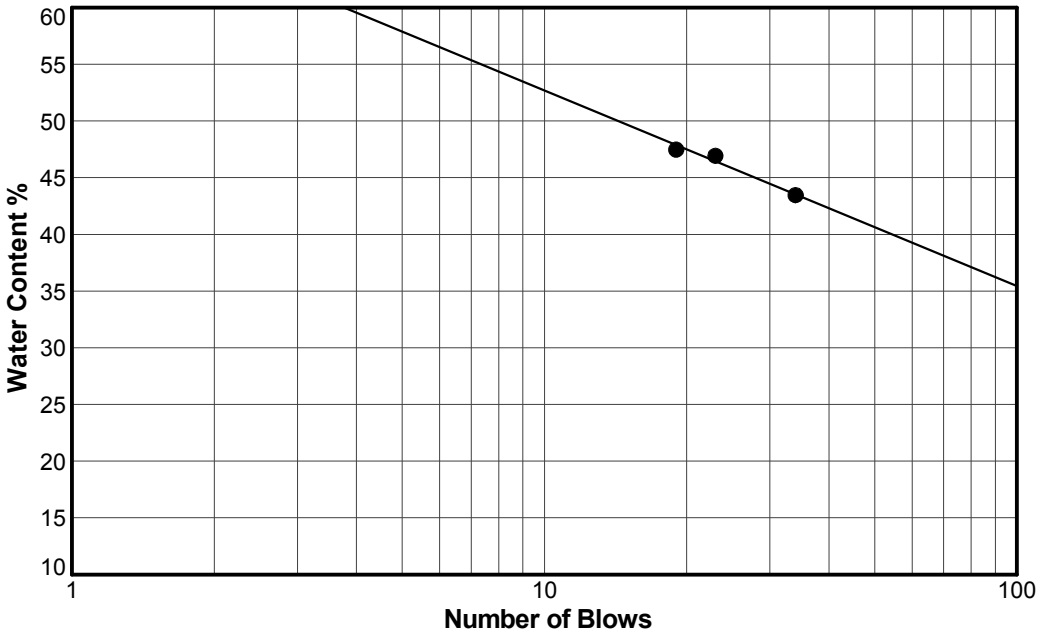
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-77**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.50	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**57**
Liquid Limit	**46**
Plastic Limit	**29**
Plasticity Index	**17**
Natural Water Content (%)	**26.6**
Liquidity Index	**-0.1**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

		LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

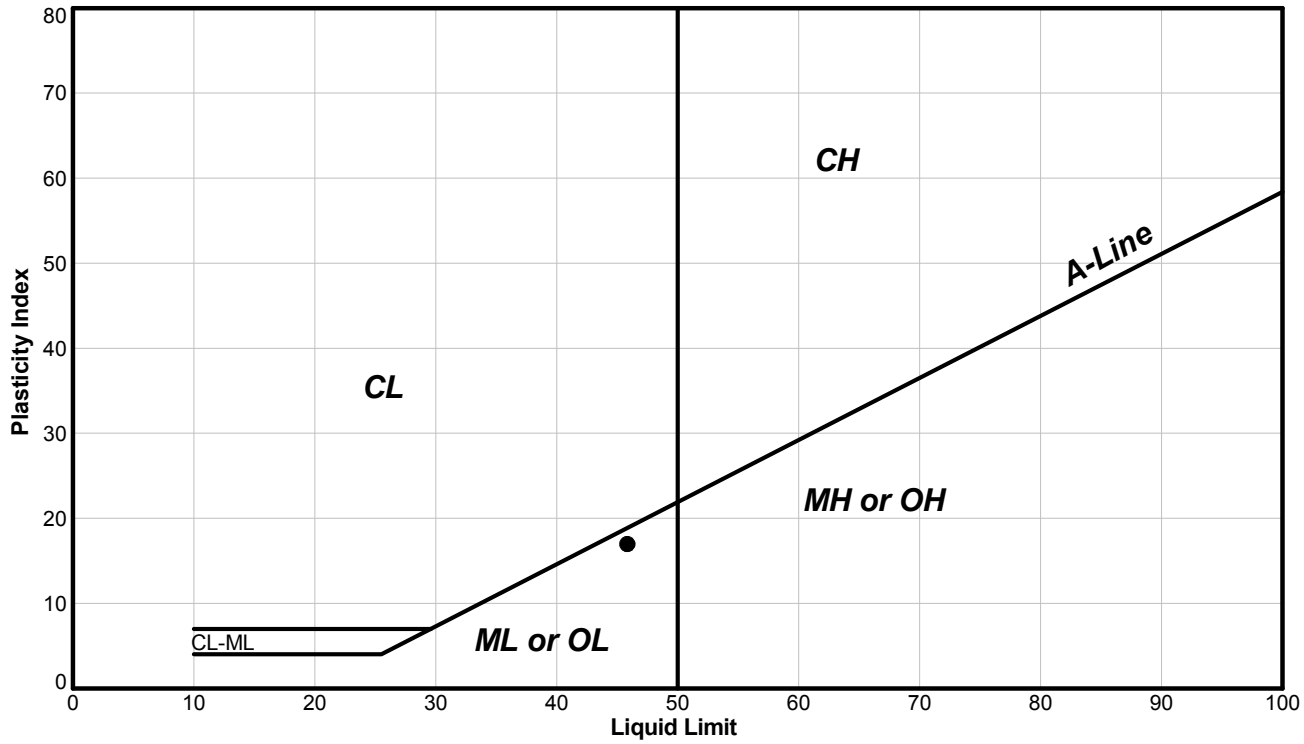
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-77**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-77	1	0.40	0.50	57	46	29	17	26.6	-0.1

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

		LP	**15/10/2011**
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

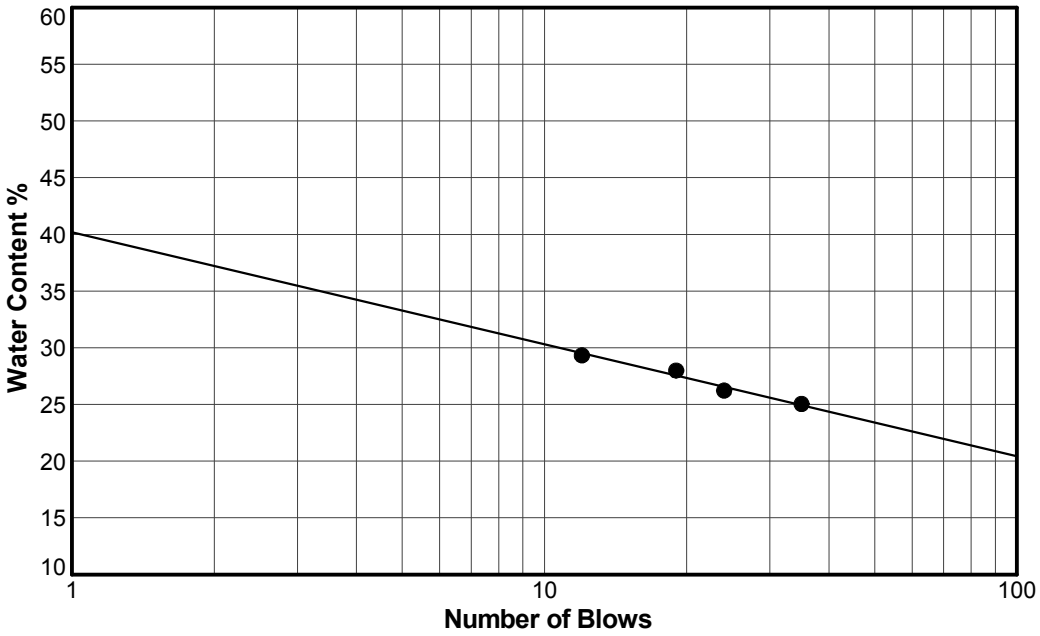
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-79**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**18**
Liquid Limit	**26**
Plastic Limit	**25**
Plasticity Index	**1**
Natural Water Content (%)	**10.1**
Liquidity Index	**-14.9**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	27/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

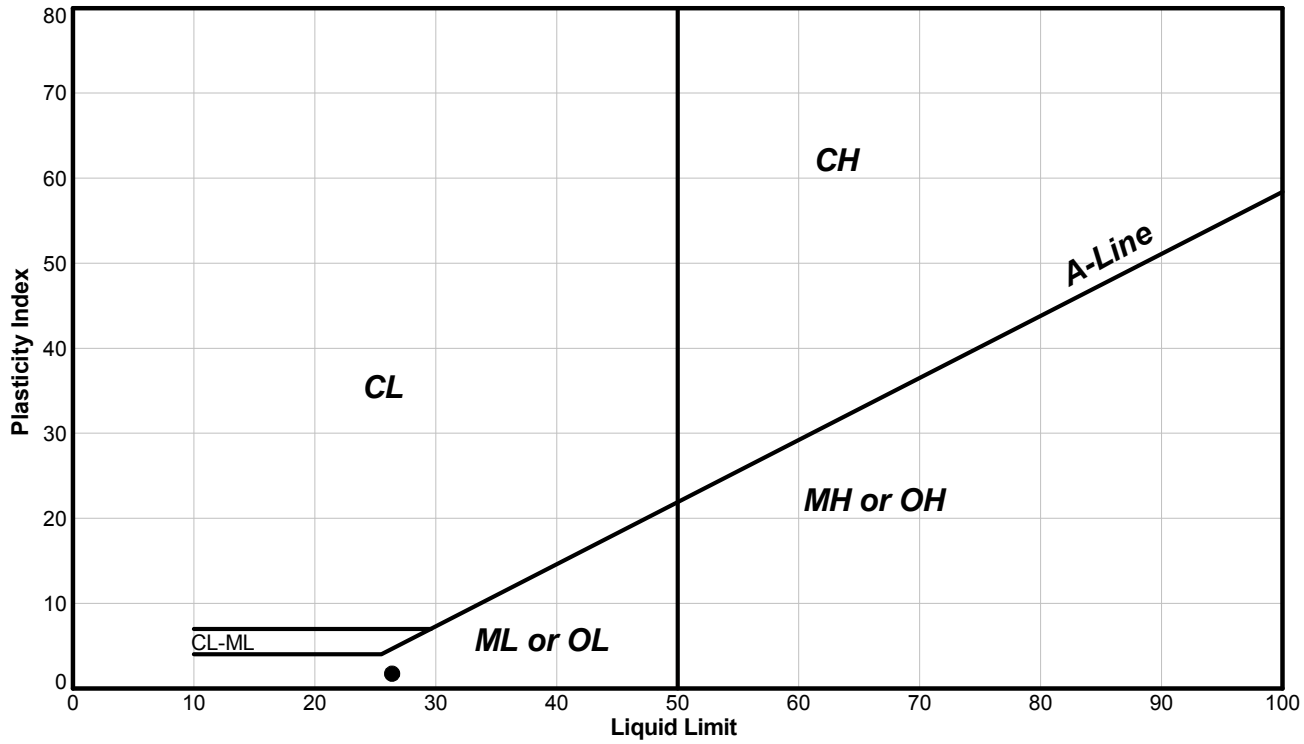
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-79**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.40 to 0.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-79	1	0.40	0.60	18	26	25	1	10.1	-14.9

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	27/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

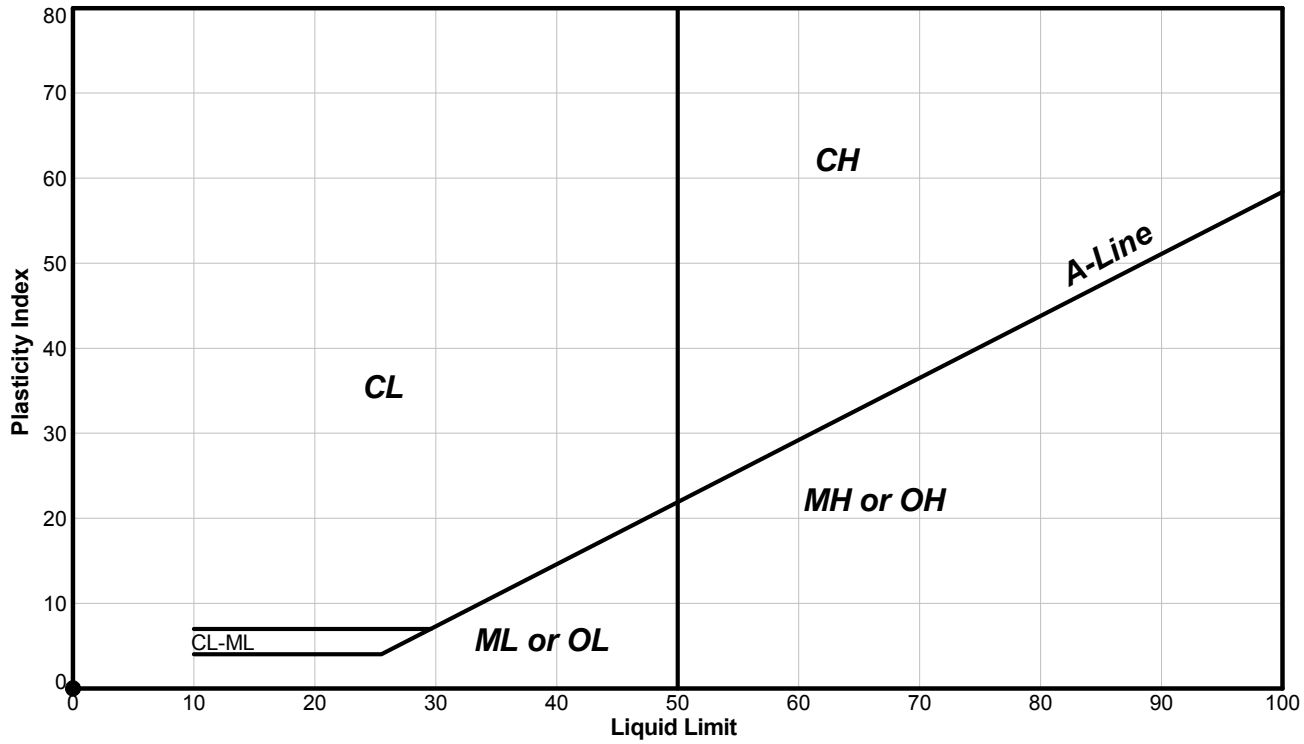
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-81**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-81	1	0.70	1.00	17	NP	NP	NP	16.6	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	27/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

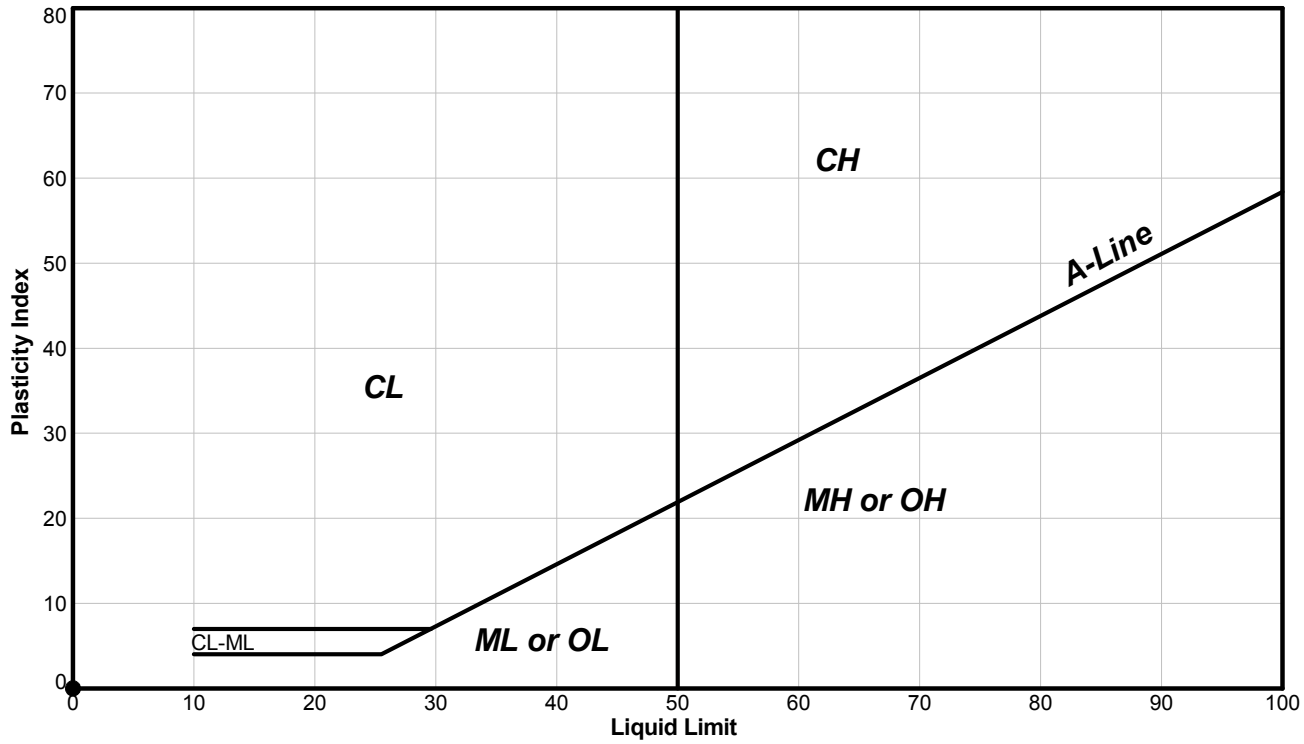
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 4.70 to 4.90
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-82	M1	4.70	4.90	100	NP	NP	NP	12.4	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	28/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

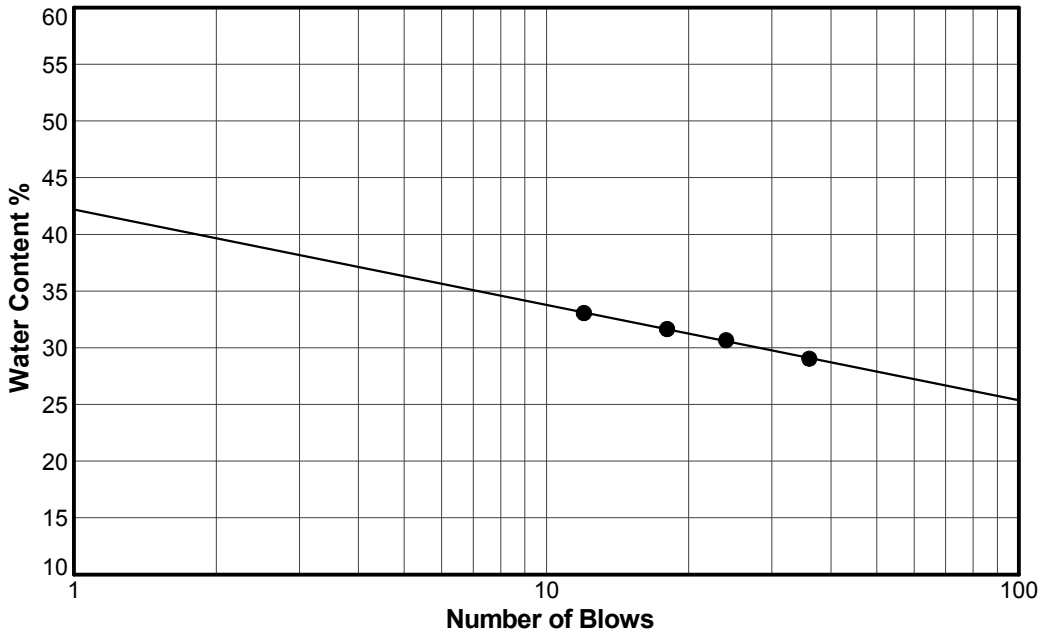
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: M2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 3.00 to 3.30	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**84**
Liquid Limit	**30**
Plastic Limit	**27**
Plasticity Index	**3**
Natural Water Content (%)	**10.3**
Liquidity Index	**-5.6**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	23/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

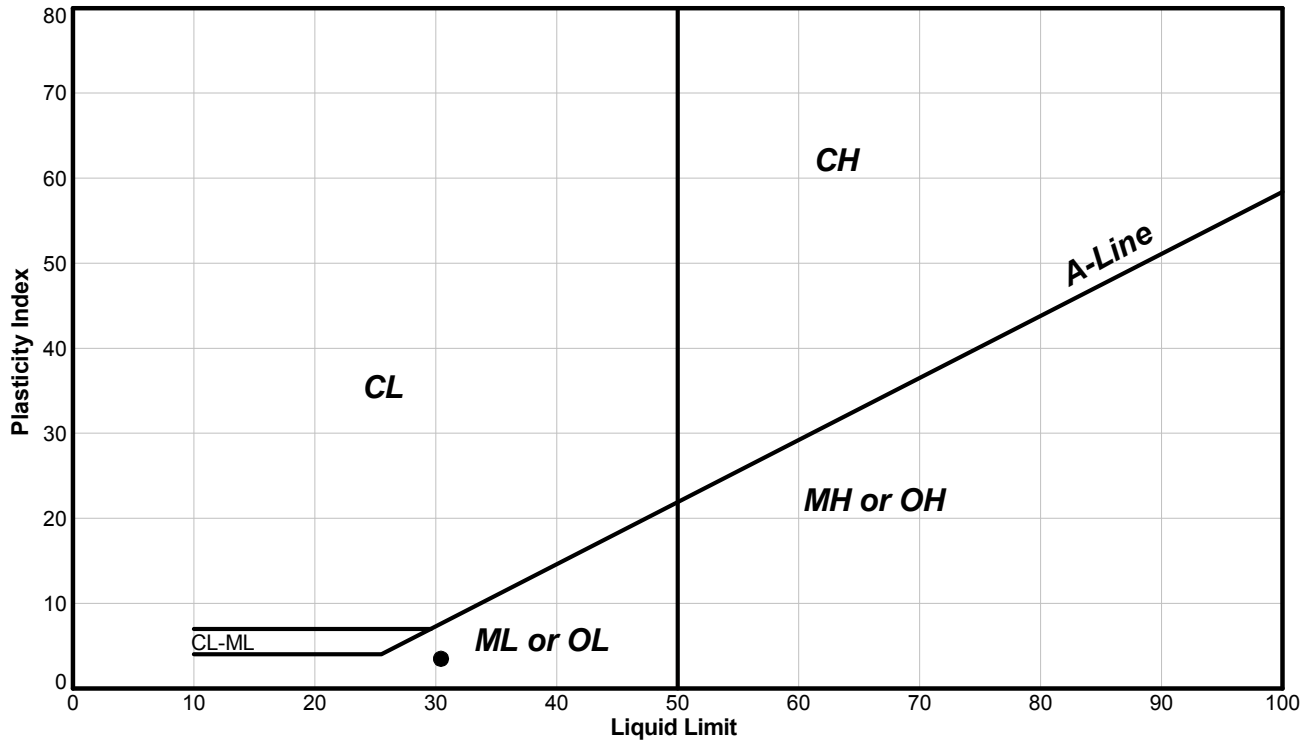
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.00 to 3.30
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-82	M2	3.00	3.30	84	30	27	3	10.3	-5.6

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	23/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

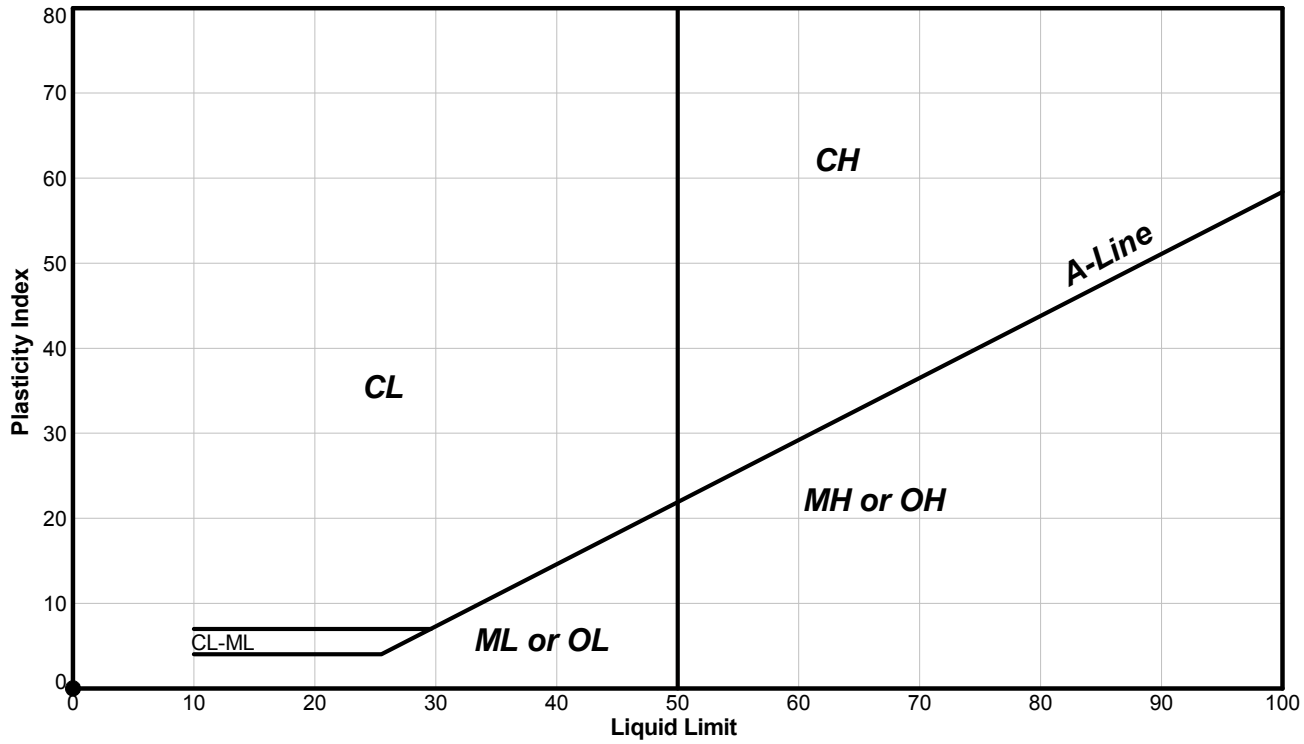
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M3**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 6.70 to 7.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-82	M3	6.70	7.00	89	NP	NP	NP	40.1	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	23/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

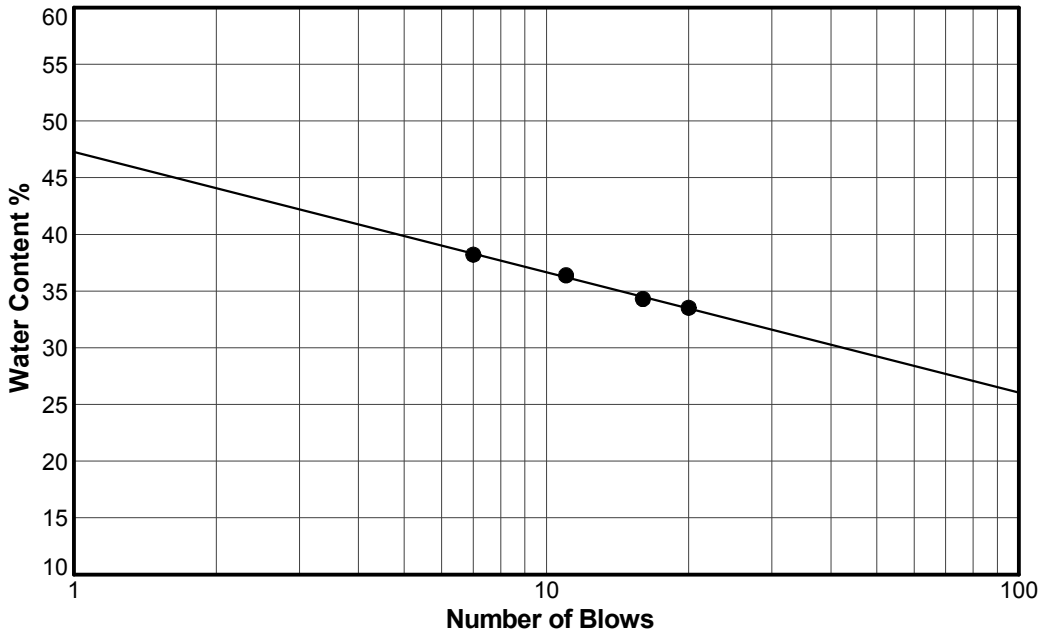
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: M4**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 1.10	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**94**
Liquid Limit	**32**
Plastic Limit	**28**
Plasticity Index	**4**
Natural Water Content (%)	**28.6**
Liquidity Index	**0.2**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	26/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

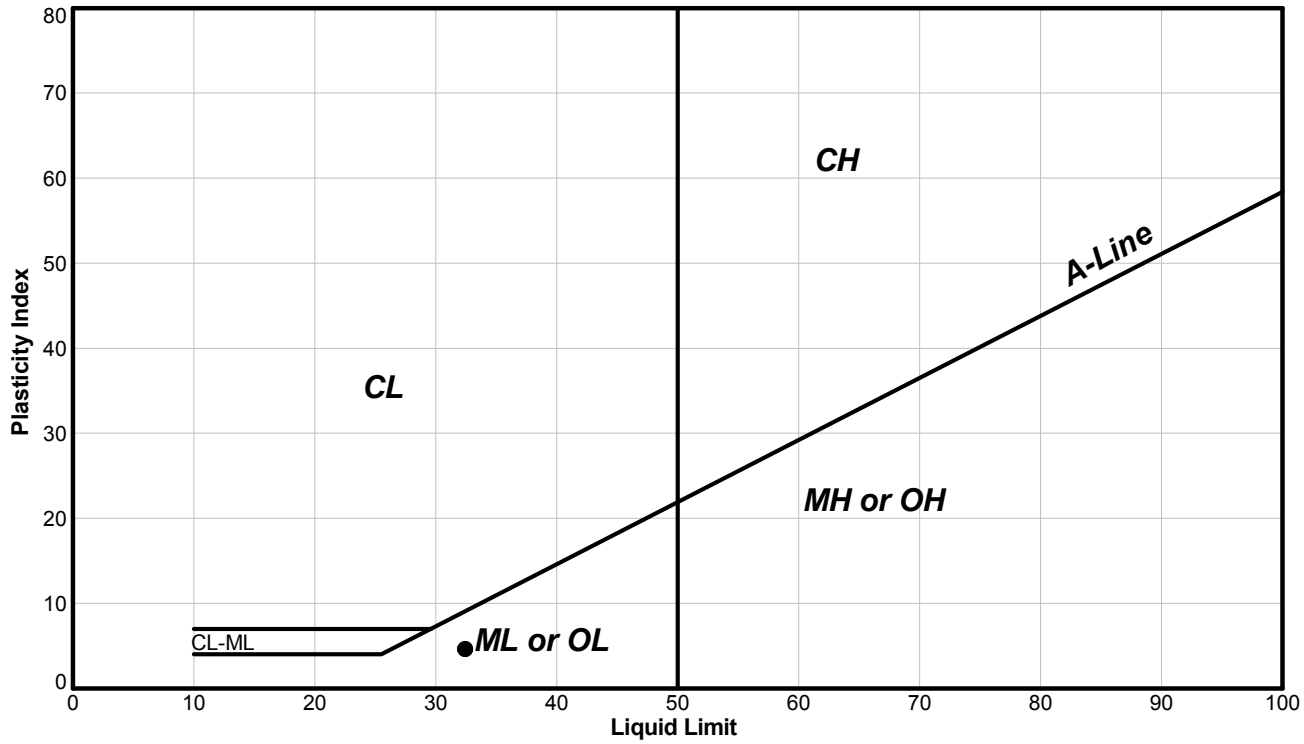
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M4**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.70 to 1.10
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-82	M4	0.70	1.10	94	32	28	4	28.6	0.2

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	26/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

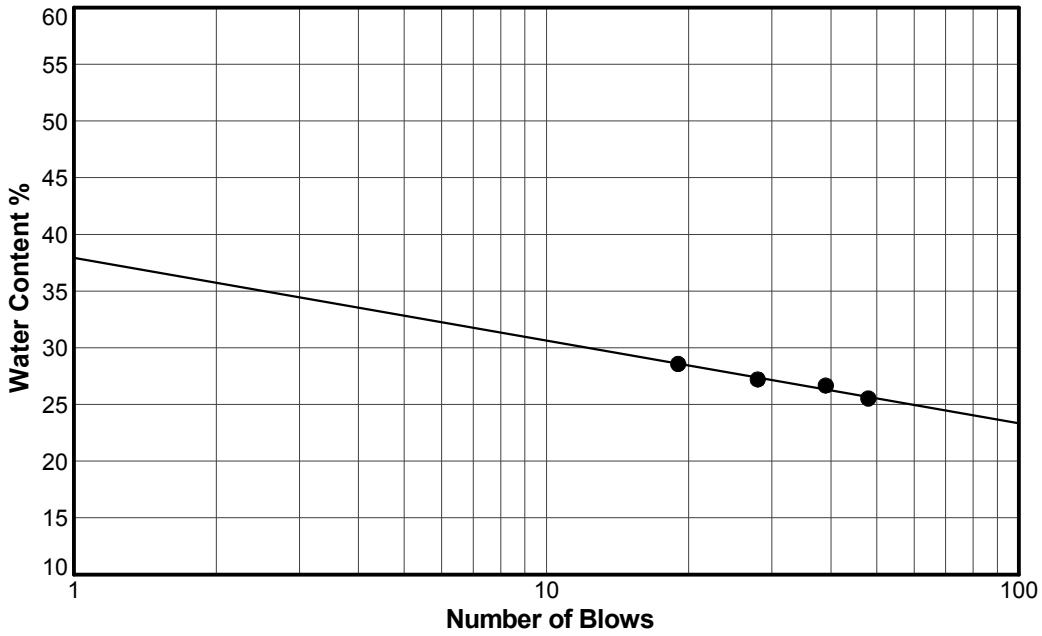
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: M5**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.90 to 2.10	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**87**
Liquid Limit	**28**
Plastic Limit	**23**
Plasticity Index	**5**
Natural Water Content (%)	**27.3**
Liquidity Index	**0.9**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	23/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

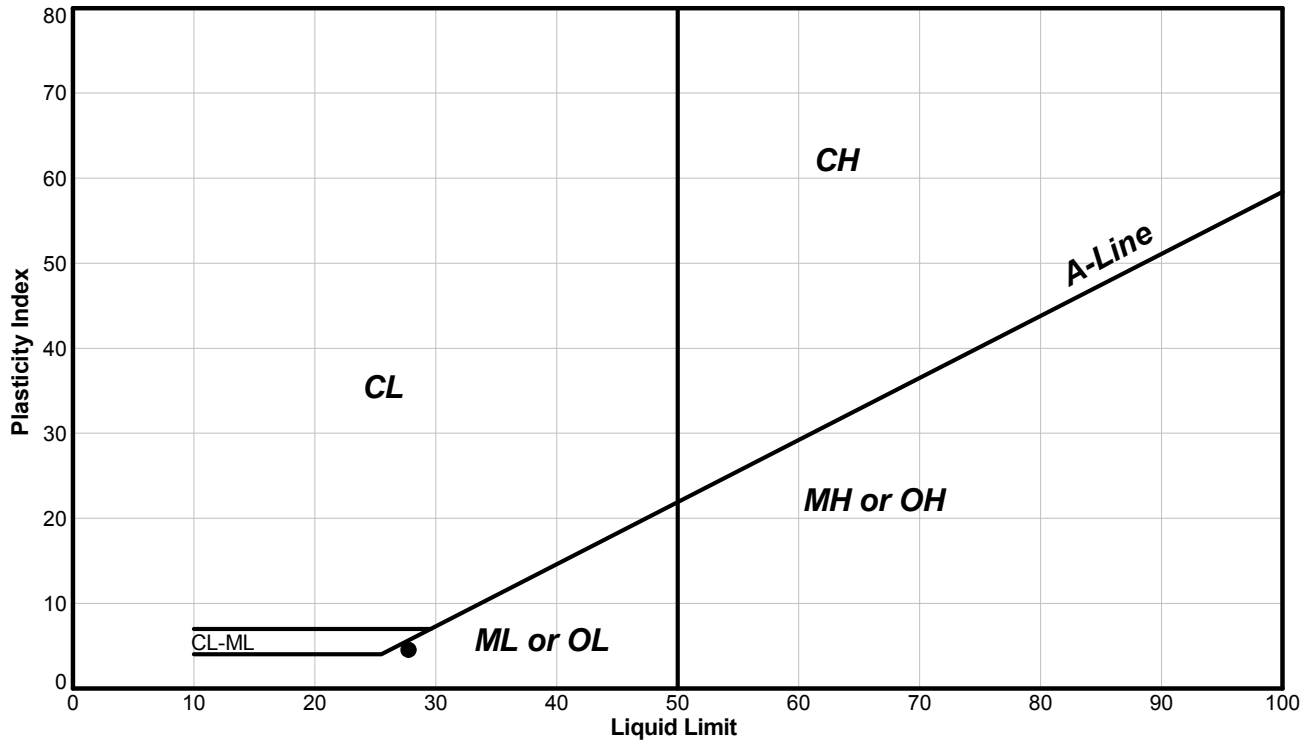
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-82**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: M5**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.90 to 2.10
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-82	M5	1.90	2.10	87	28	23	5	27.3	0.9

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	23/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

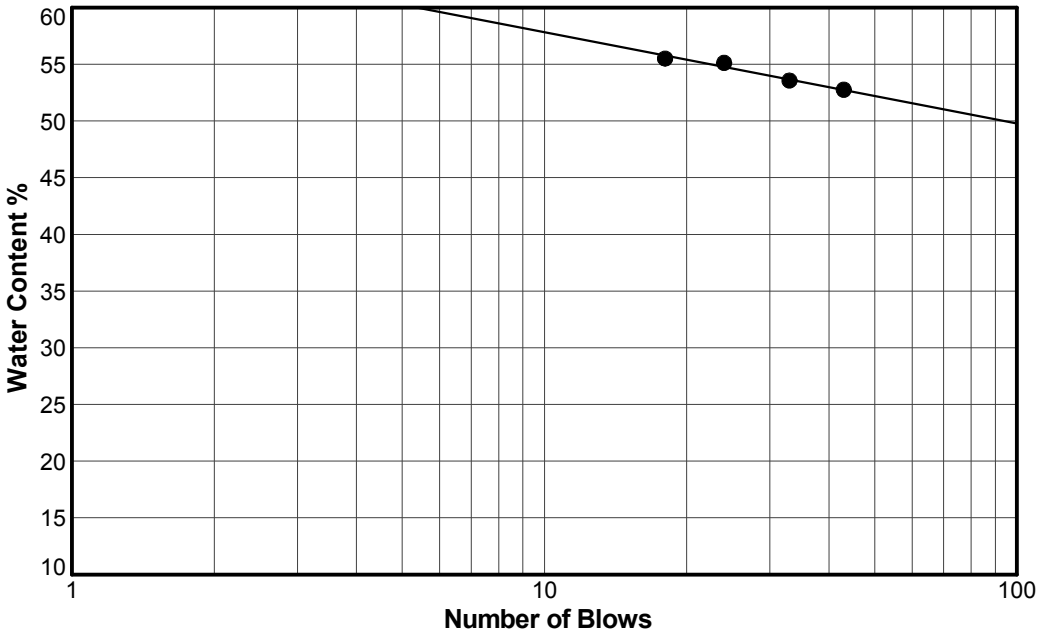
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-83**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: MH - Inorganic silts, micaeous or diatomaceous fine sandy or silty soils, elastic silts.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**45**
Liquid Limit	**55**
Plastic Limit	**44**
Plasticity Index	**11**
Natural Water Content (%)	**20.1**
Liquidity Index	**-2.2**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	08/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

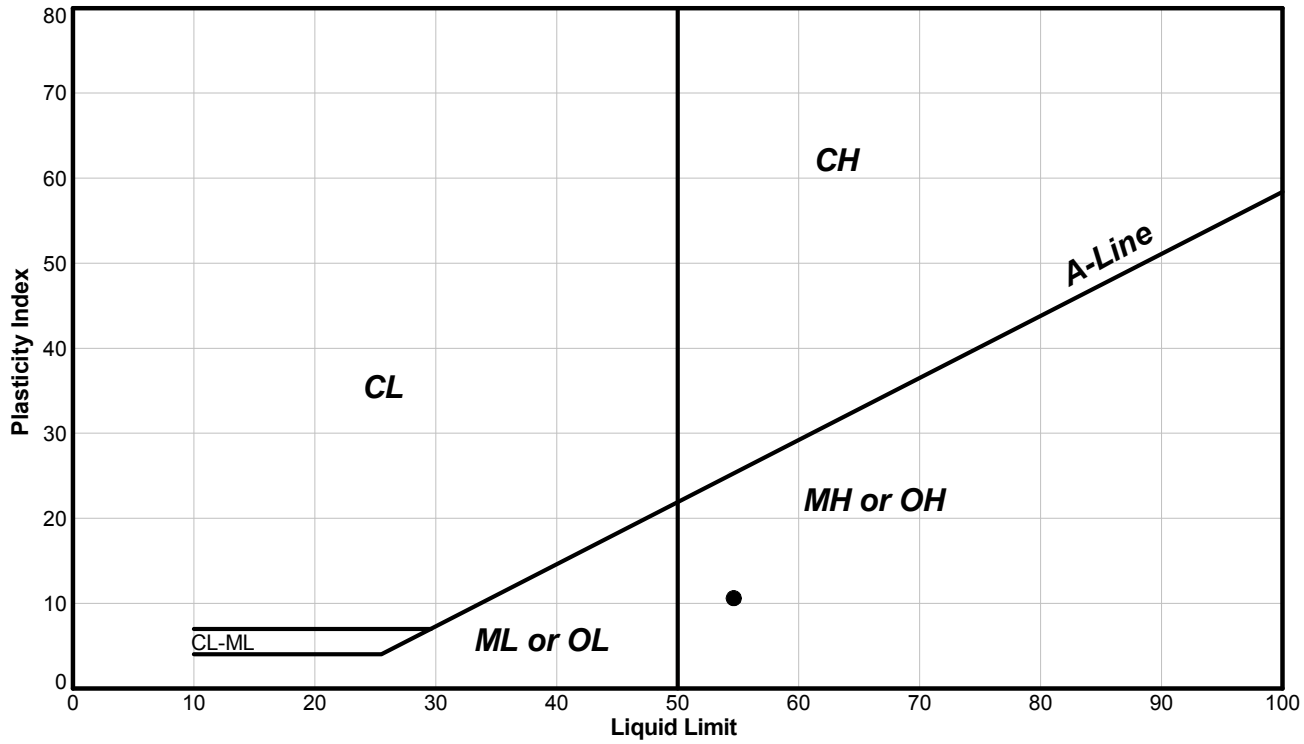
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-83**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: MH - Inorganic silts, micaeous or diatomaceous fine sandy or silty soils, elastic silts.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-83	1	0.60	0.80	45	55	44	11	20.1	-2.2

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	08/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-84**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 2.50 to 2.50	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**95**
Liquid Limit	**29**
Plastic Limit	**26**
Plasticity Index	**3**
Natural Water Content (%)	**28.5**
Liquidity Index	**0.8**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	04/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

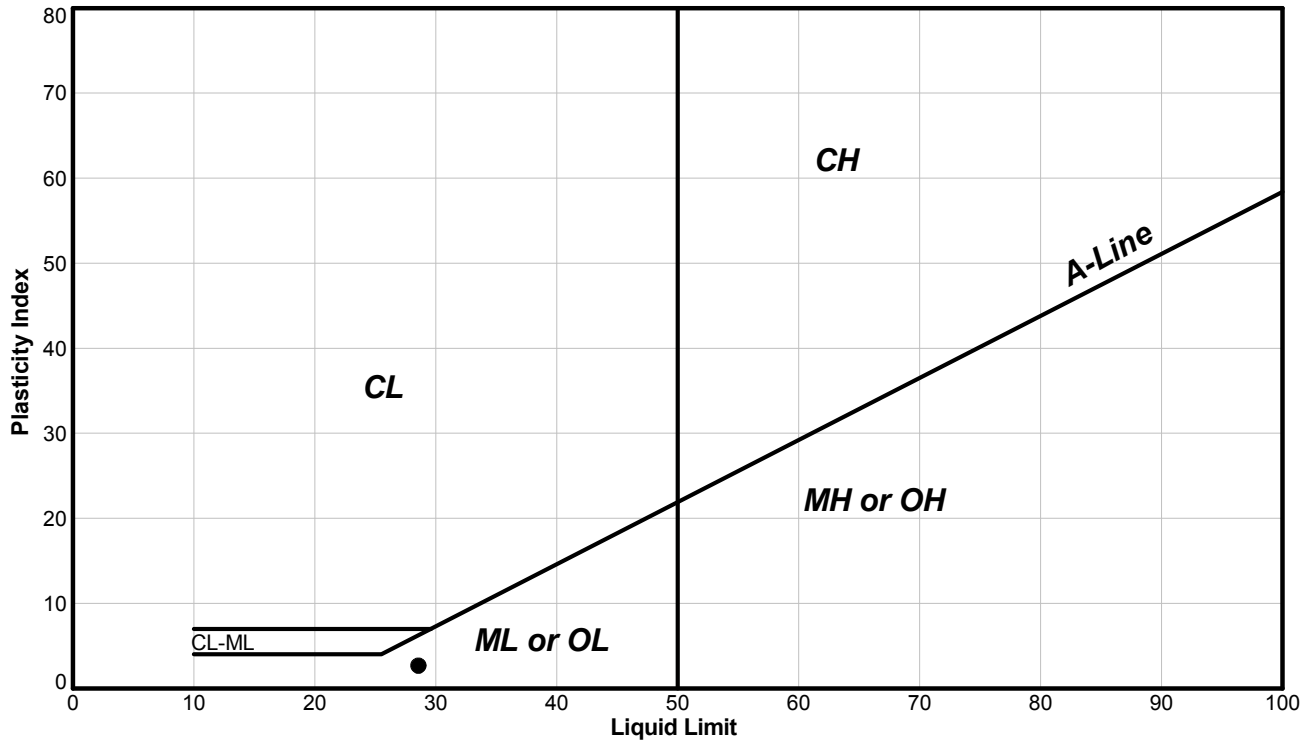
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-84**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 2.50 to 2.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-84	2	2.50	2.50	95	29	26	3	28.5	0.8

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	04/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

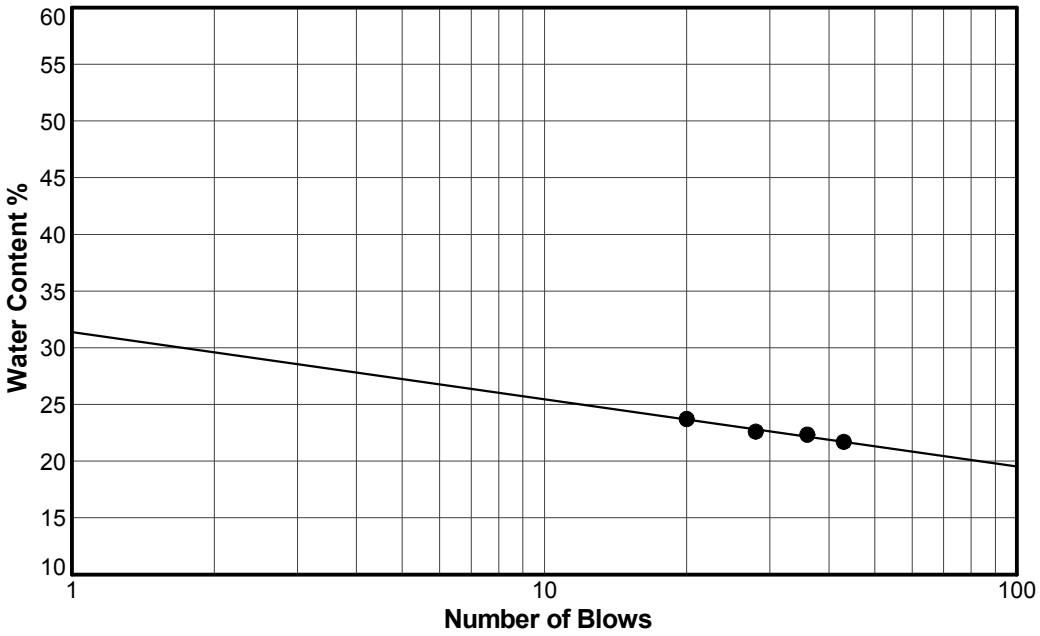
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-85**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**64**
Liquid Limit	**23**
Plastic Limit	**22**
Plasticity Index	**1**
Natural Water Content (%)	**16.6**
Liquidity Index	**-5.4**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	28/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

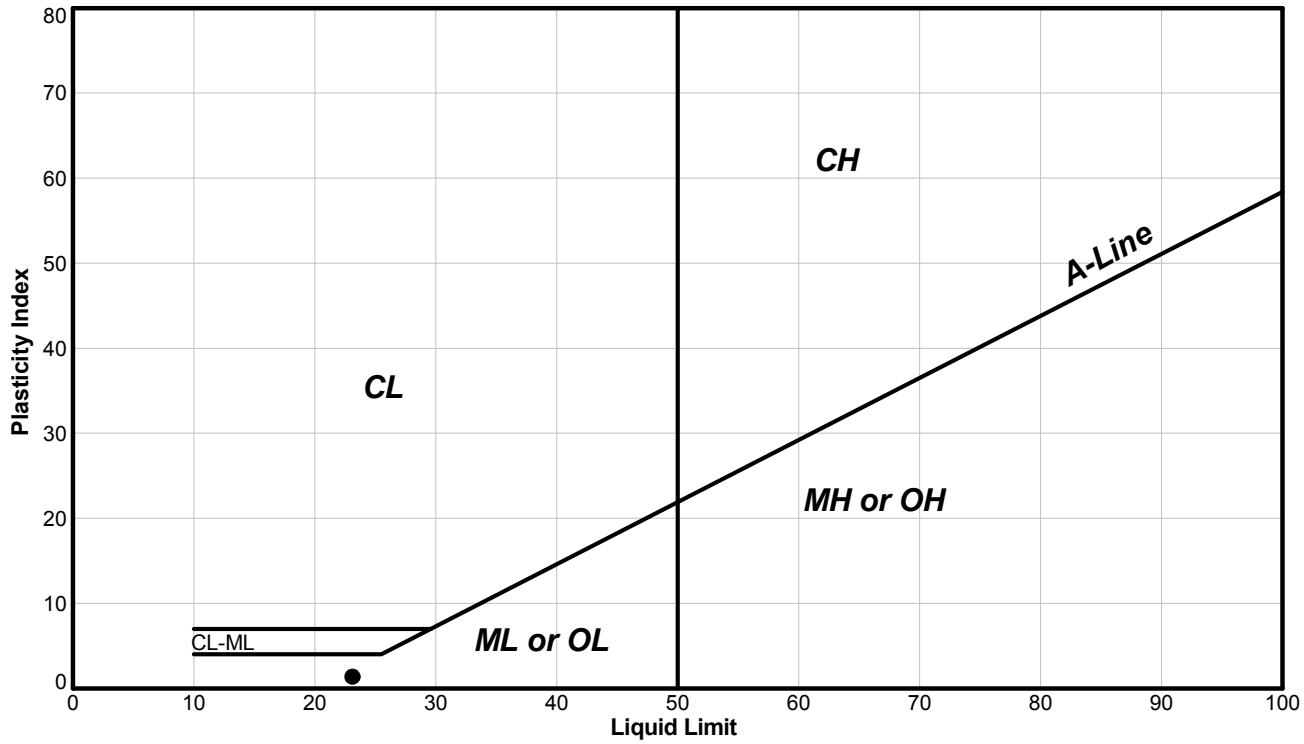
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-85**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-85	1	0.60	0.80	64	23	22	1	16.6	-5.4

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	28/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-88**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.50 to 1.80	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**44**
Liquid Limit	**26**
Plastic Limit	**19**
Plasticity Index	**7**
Natural Water Content (%)	**12.7**
Liquidity Index	**-0.9**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	05/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

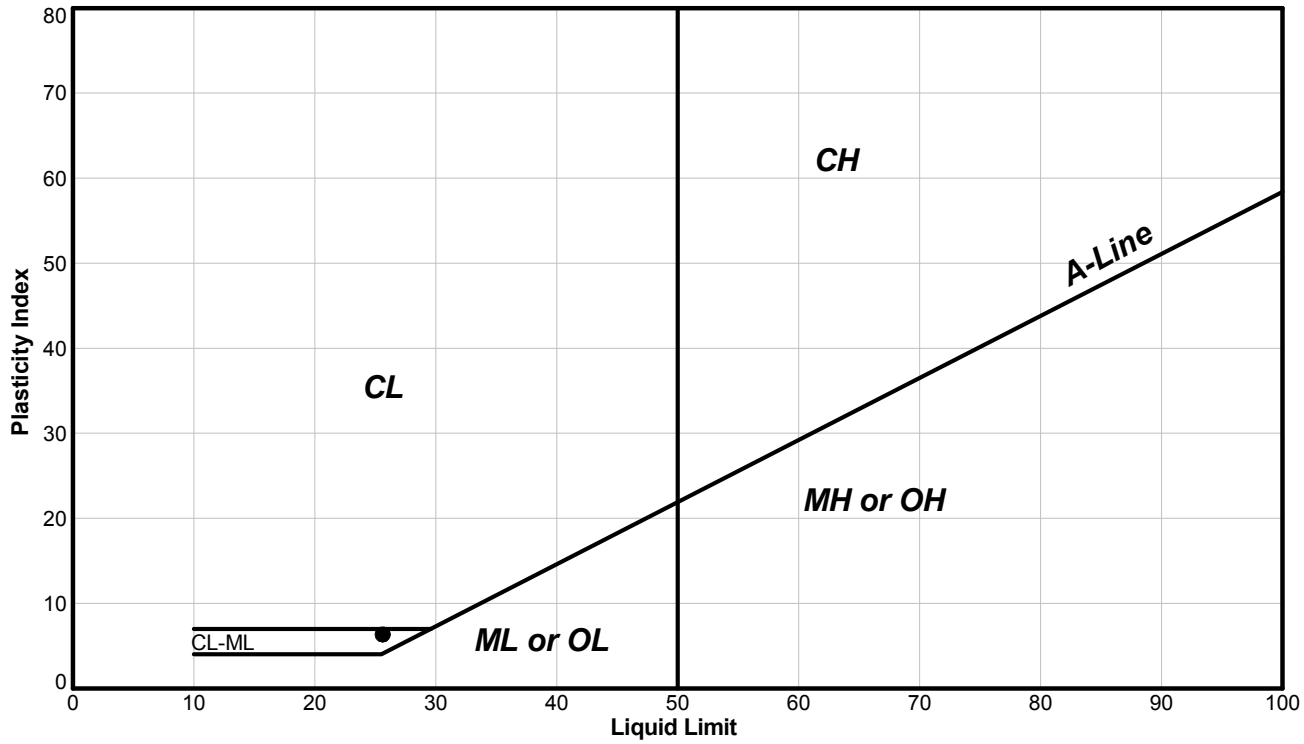
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-88**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.50 to 1.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-88	1	1.50	1.80	44	26	19	7	12.7	-0.9

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	05/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

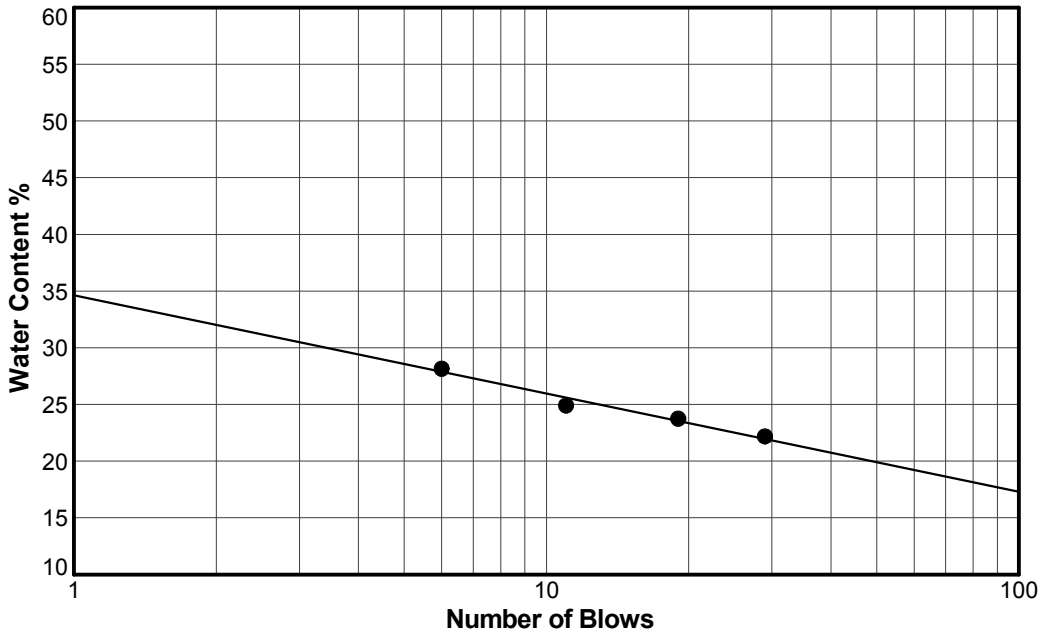
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-89**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.50	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**55**
Liquid Limit	**23**
Plastic Limit	**21**
Plasticity Index	**2**
Natural Water Content (%)	**14.3**
Liquidity Index	**-3.3**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	26/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

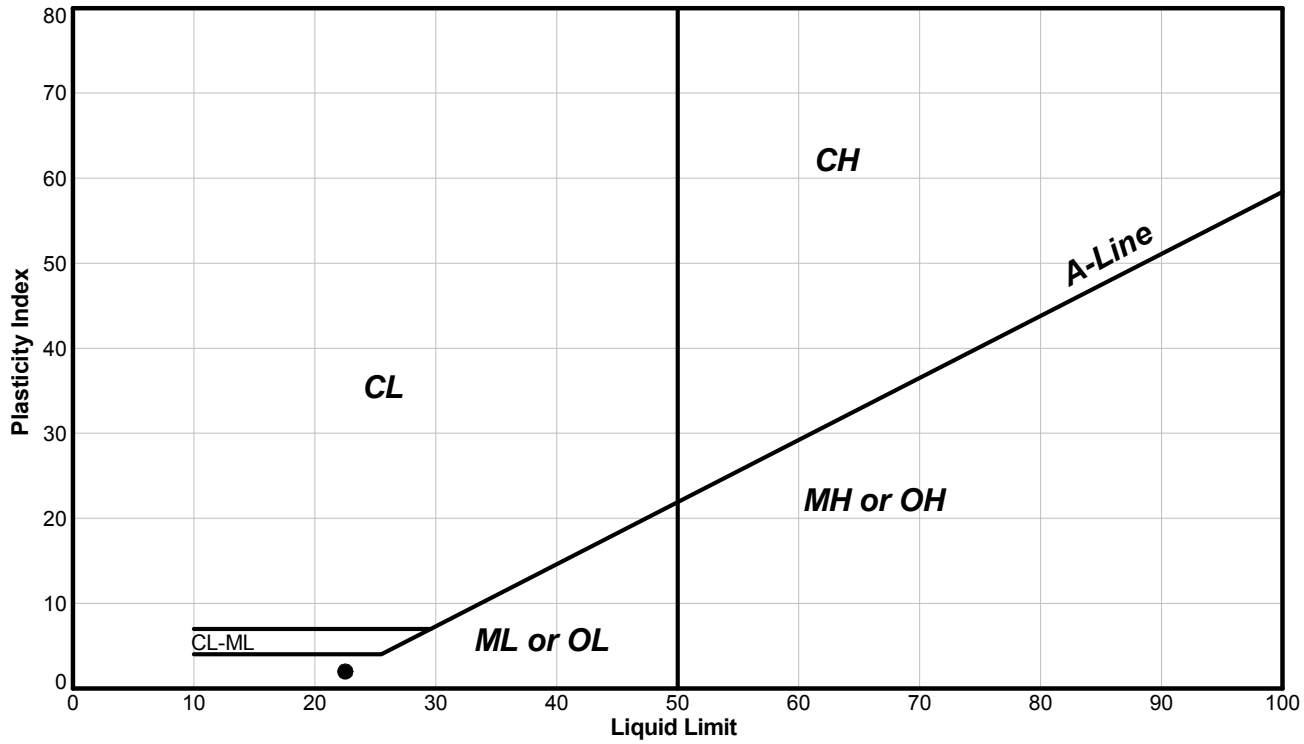
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-89**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-89	2	1.30	1.50	55	23	21	2	14.3	-3.3

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	26/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-90**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 3.50 to 3.60	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**99**
Liquid Limit	**24**
Plastic Limit	**22**
Plasticity Index	**2**
Natural Water Content (%)	**23.3**
Liquidity Index	**0.7**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	08/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

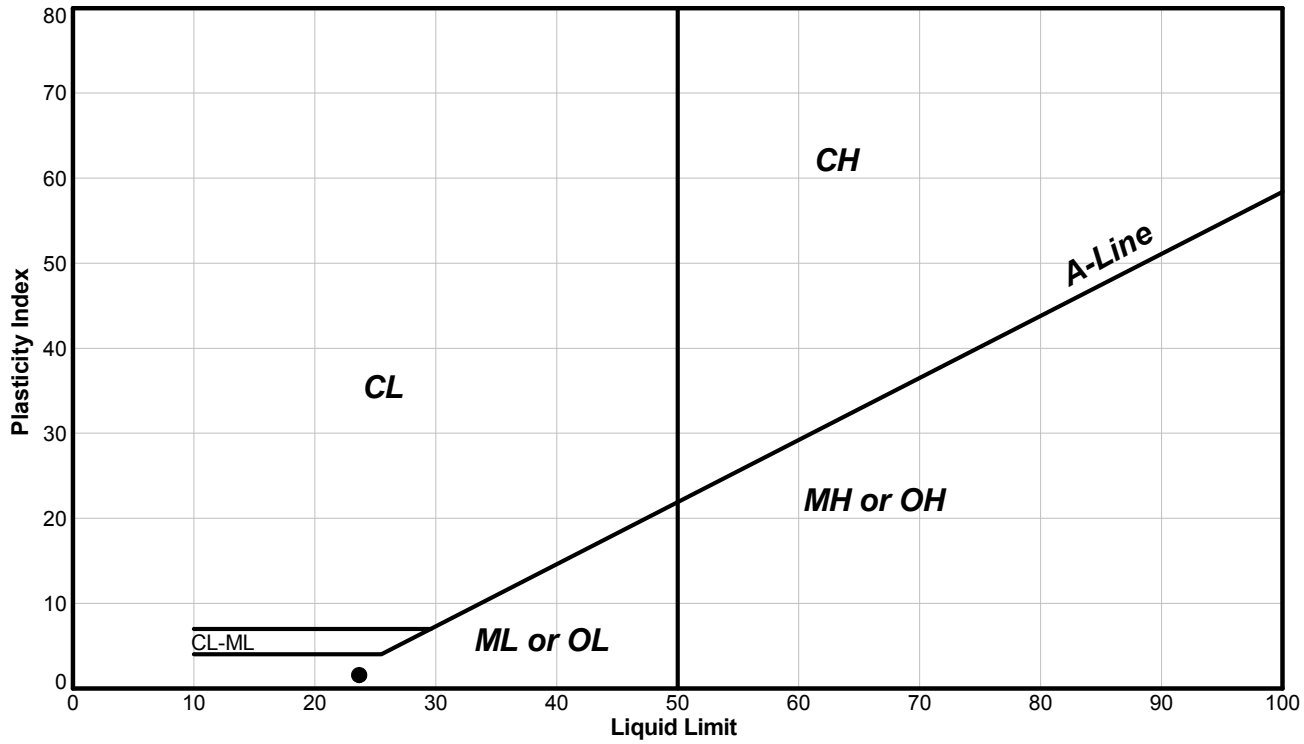
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-90**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 3.50 to 3.60
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-90	2	3.50	3.60	99	24	22	2	23.3	0.7

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	08/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

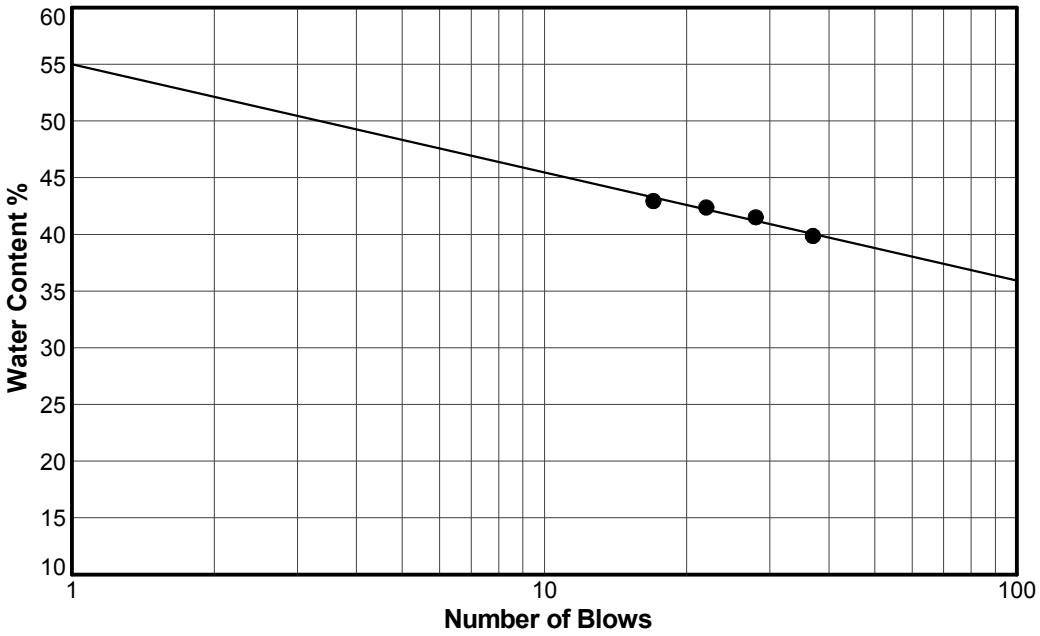
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-91**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 1.00	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**79**
Liquid Limit	**42**
Plastic Limit	**35**
Plasticity Index	**7**
Natural Water Content (%)	**49.5**
Liquidity Index	**2.1**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

		LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

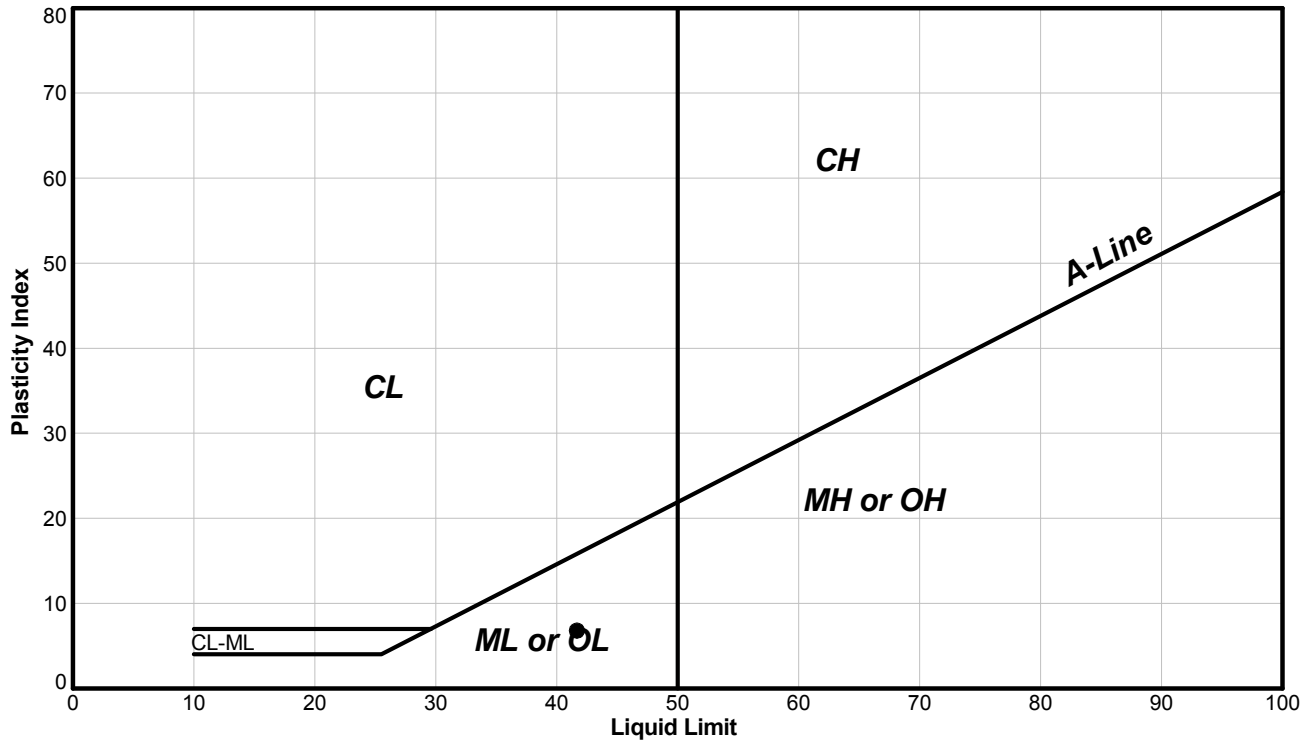
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-91**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.80 to 1.00
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-91	1	0.80	1.00	79	42	35	7	49.5	2.1

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

		LP	**15/10/2011**
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

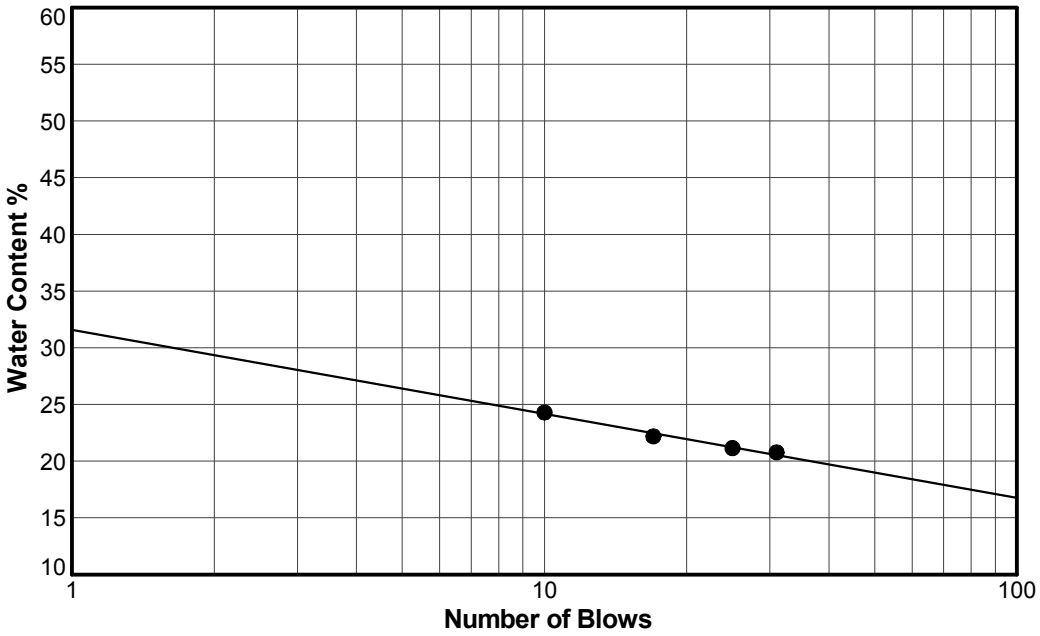
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-91**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.60 to 1.80	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**23**
Liquid Limit	**NP**
Plastic Limit	**NP**
Plasticity Index	**NP**
Natural Water Content (%)	**6.1**
Liquidity Index	**NP**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	28/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form:_LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

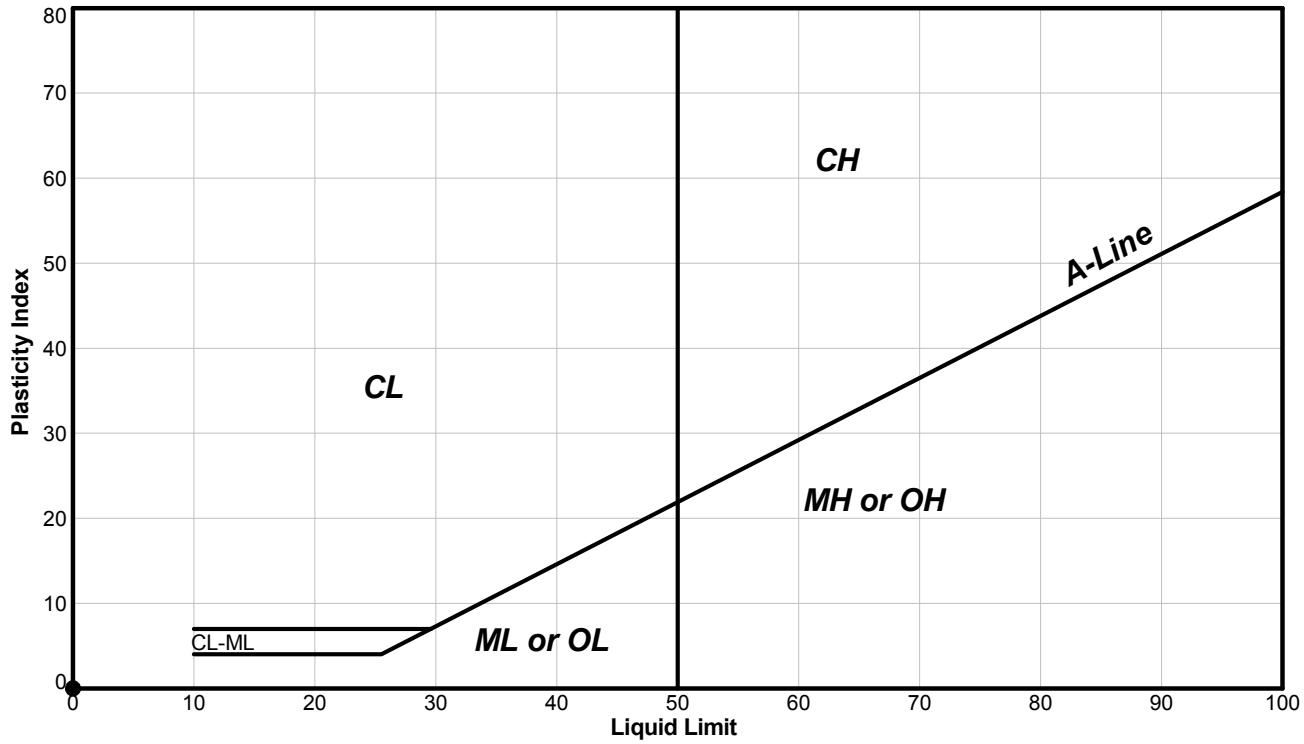
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-91**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.60 to 1.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-91	2	1.60	1.80	23	NP	NP	NP	6.1	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	28/09/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-92**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**97**
Liquid Limit	**45**
Plastic Limit	**42**
Plasticity Index	**3**
Natural Water Content (%)	**63.6**
Liquidity Index	**7.2**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	05/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

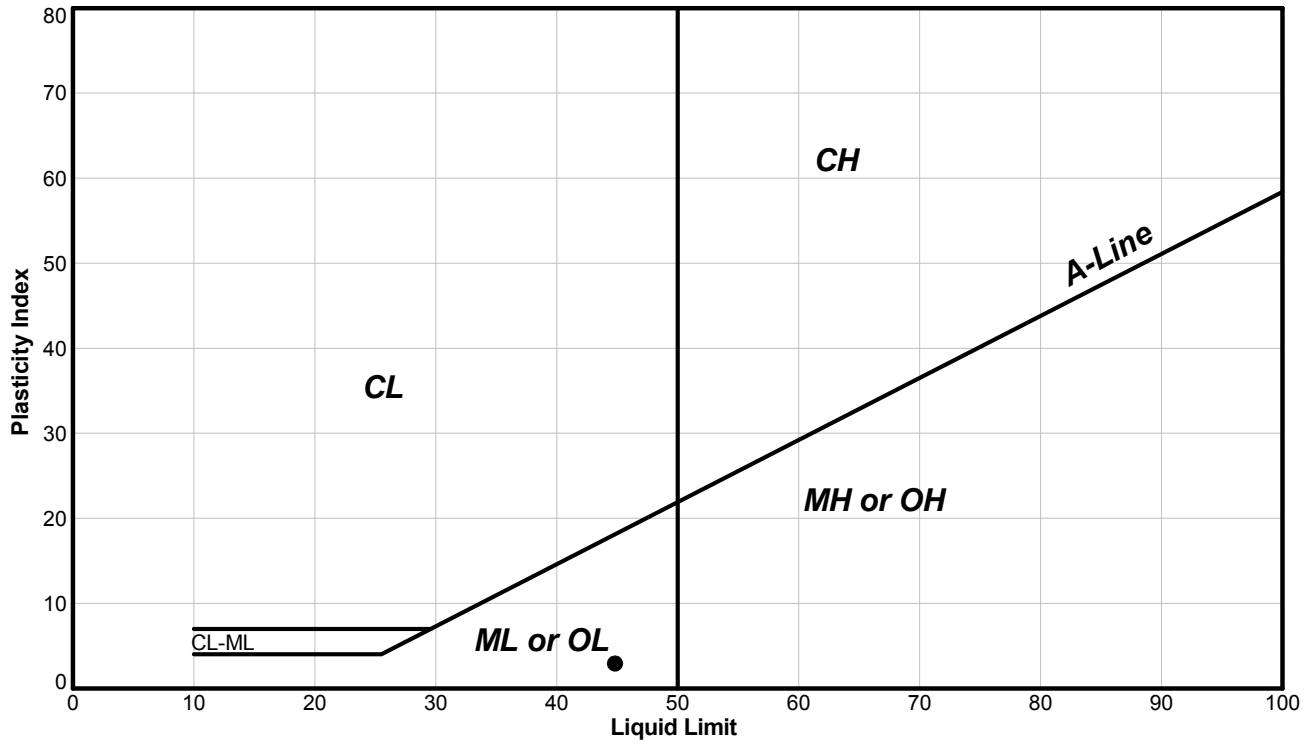
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-92**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 0.60 to 0.80
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-92	1	0.60	0.80	97	45	42	3	63.6	7.2

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	05/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-94**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.20 to 1.30	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**52**
Liquid Limit	**27**
Plastic Limit	**24**
Plasticity Index	**3**
Natural Water Content (%)	**16.4**
Liquidity Index	**-2.5**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	04/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

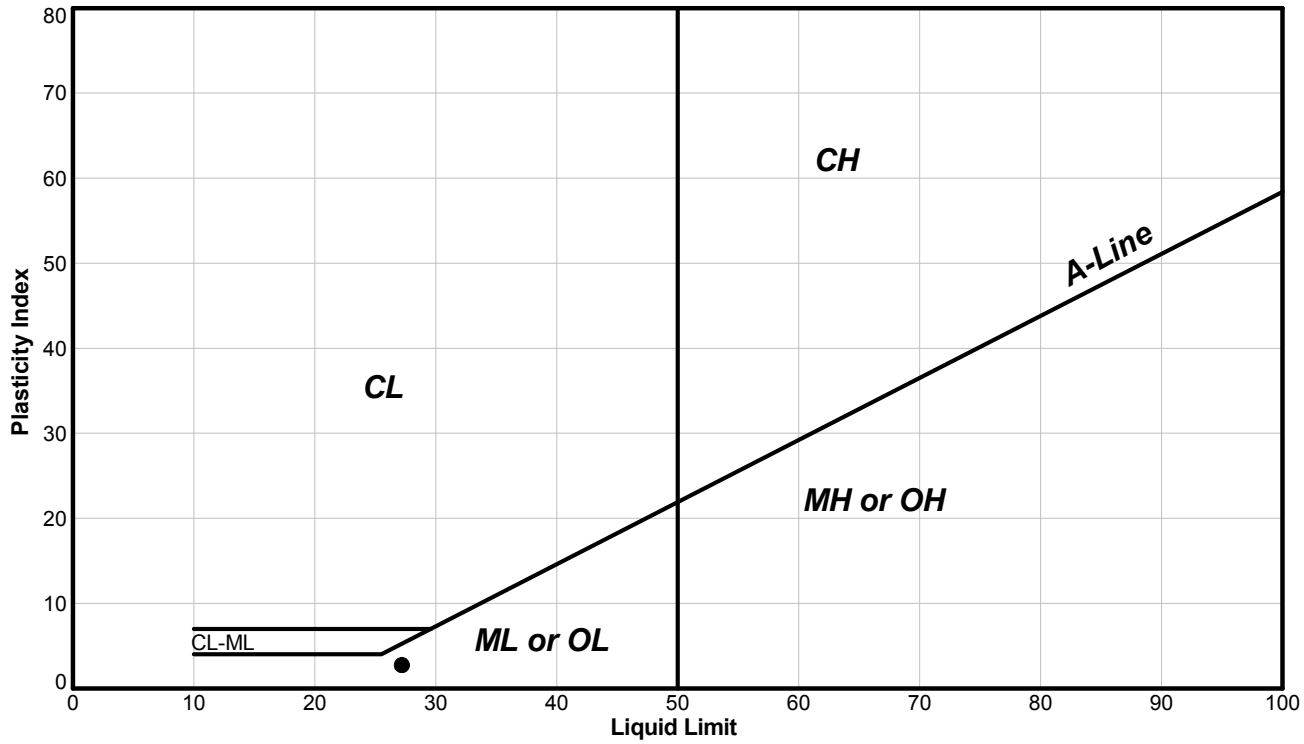
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-94**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 1**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.20 to 1.30
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-94	1	1.20	1.30	52	27	24	3	16.4	-2.5

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	04/10/2011	LP	15/10/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/10/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

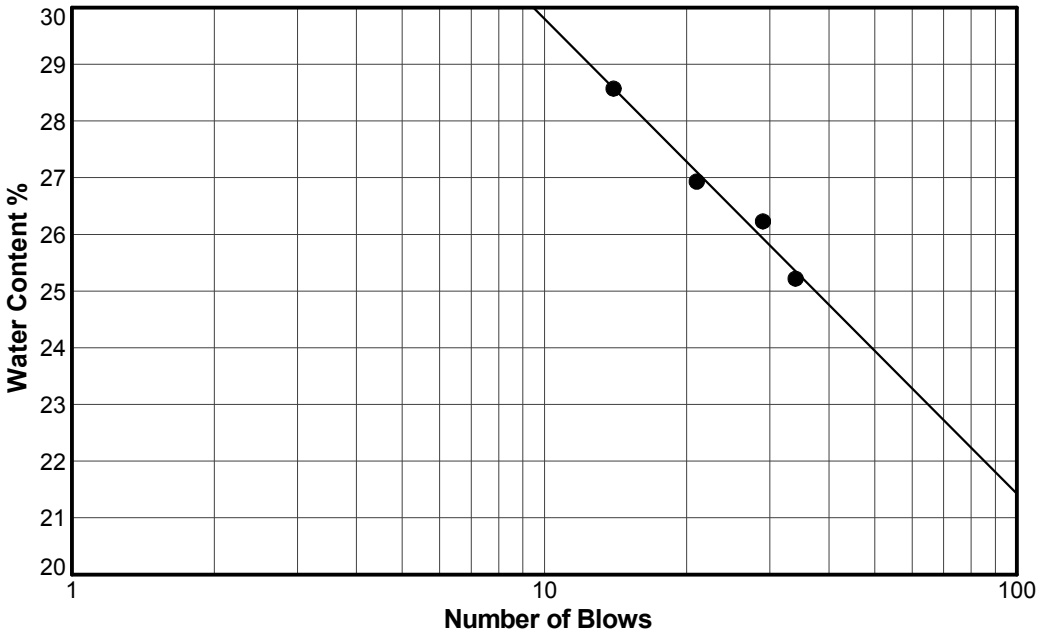
Client:	BGC (Proj 0792-006-04)	**ID: TP-BGC11-96**	
Project:	Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**	
Location:	Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.50	
Project No.:	11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141	

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

SUMMARY	
Percent Passing #40 Sieve (%)	**72**
Liquid Limit	**26**
Plastic Limit	**22**
Plasticity Index	**4**
Natural Water Content (%)	**19.8**
Liquidity Index	**-0.6**



Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	03/11/2011	LP	03/11/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: _LAB_ATTERBERG LIMITS (REPORT) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

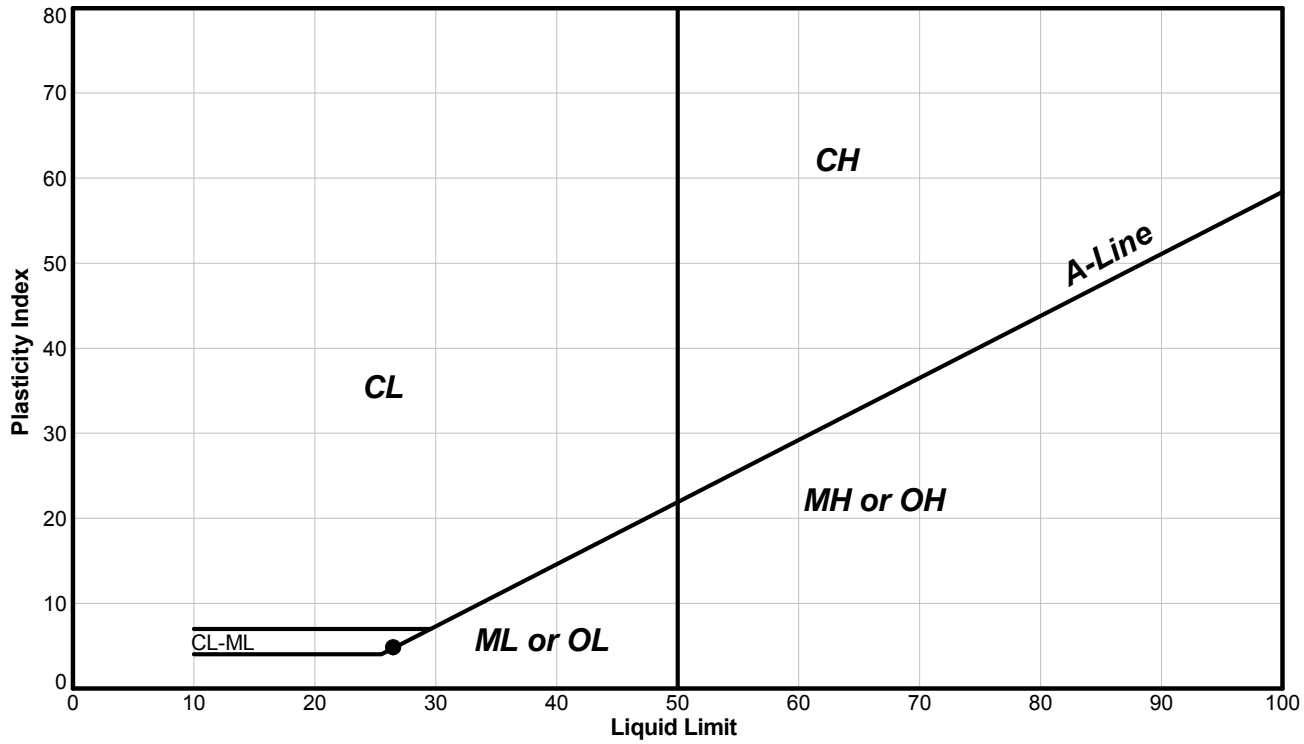
Client: BGC (Proj 0792-006-04)	**ID: TP-BGC11-96**
Project: Eagle Gold Mine Site Infra FS SI	**Sample No.: 2**
Location: Dublin Gulch, Yukon	**Depth Interval (m):** 1.30 to 1.50
Project No.: 11-1415-0029 **Phase:** 7000	**Lab Schedule No.:** 141

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	TP-BGC11-96	2	1.30	1.50	72	26	22	4	19.8	-0.6

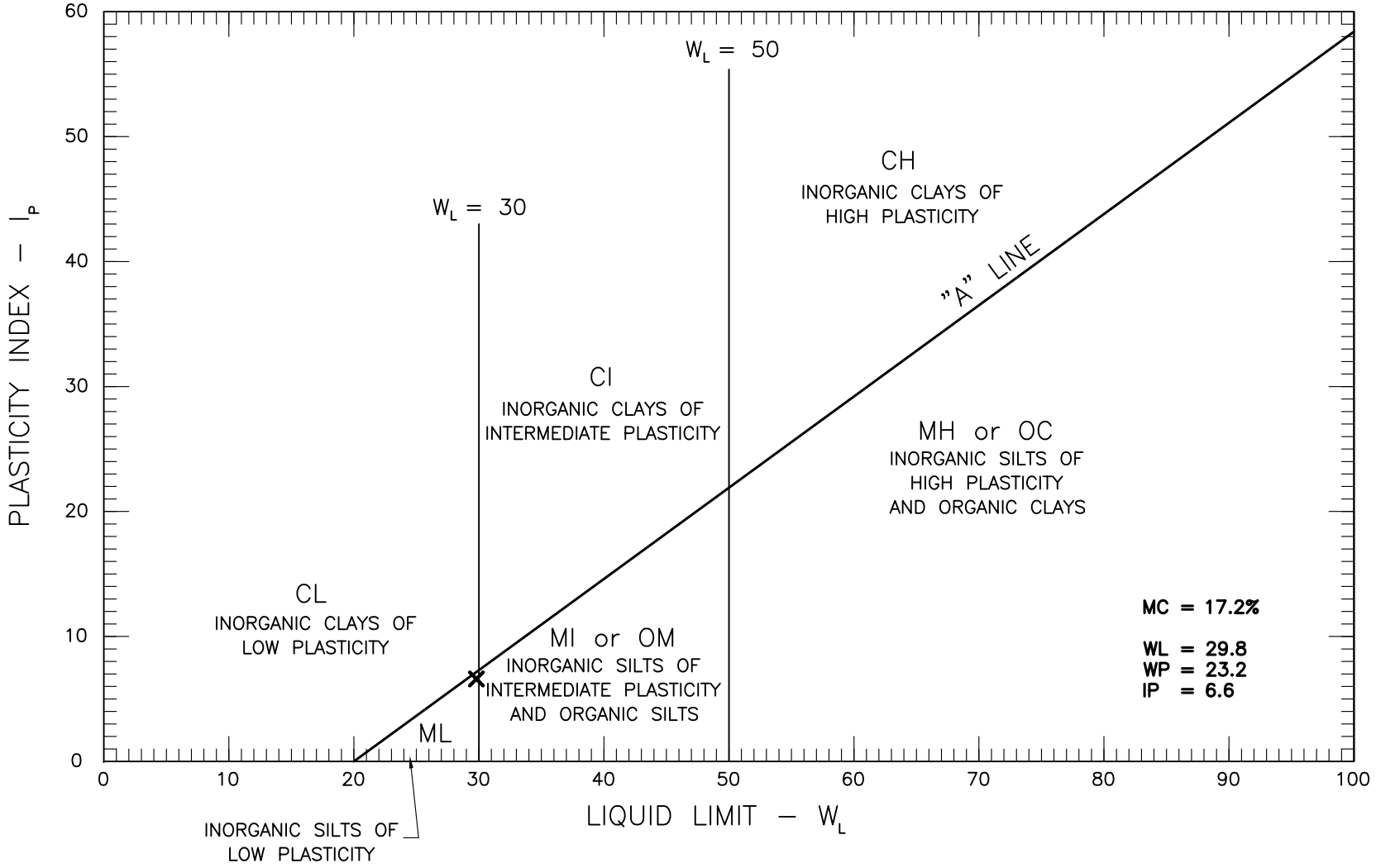
Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	03/11/2011	LP	03/11/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0029\PHASE 7000\11-1415-0029 EAGLE GOLD.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 04/11/11

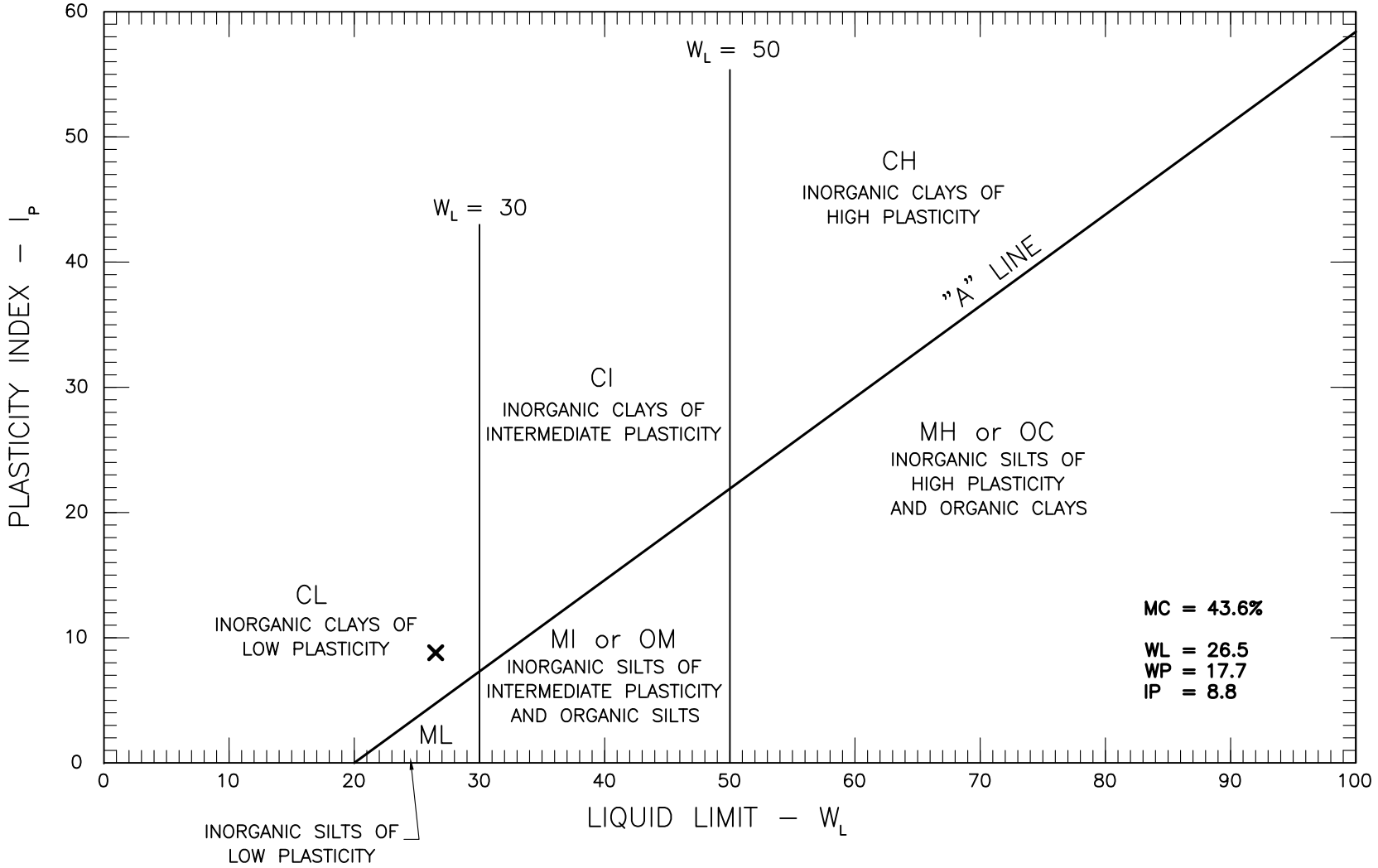


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-42-S2

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH42-S2

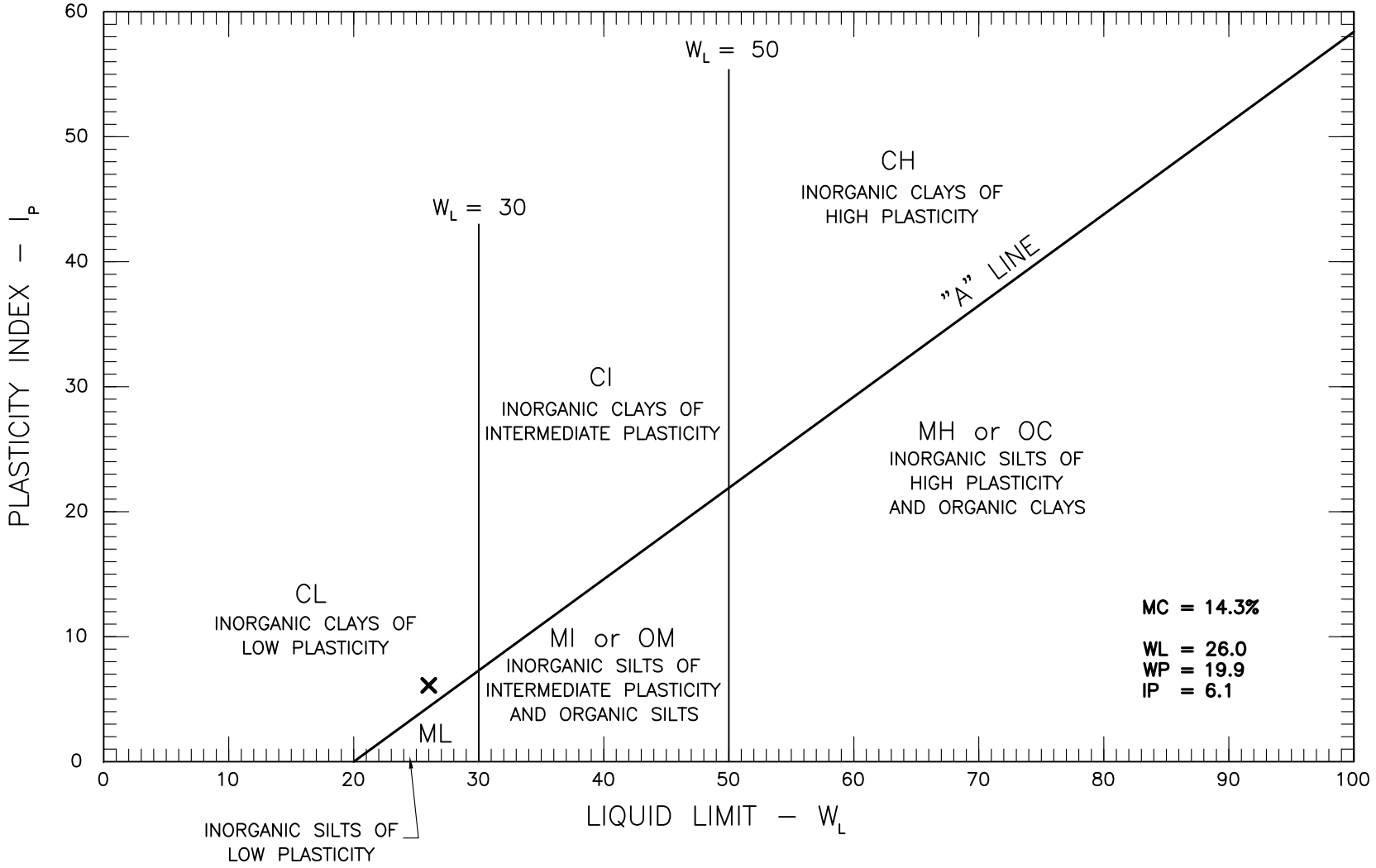


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-44-S5

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH42-S5

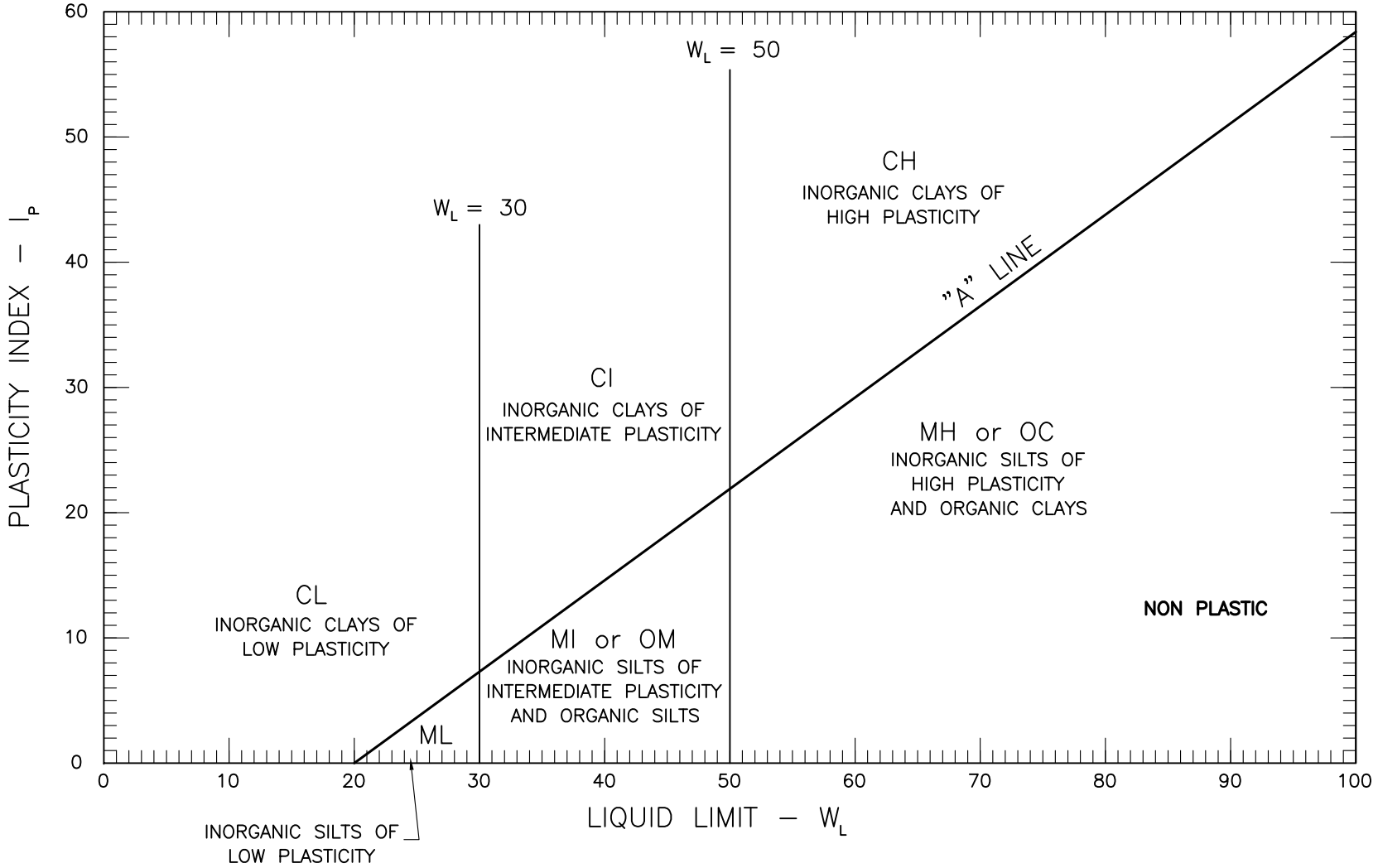


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-44-S1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH44-S1

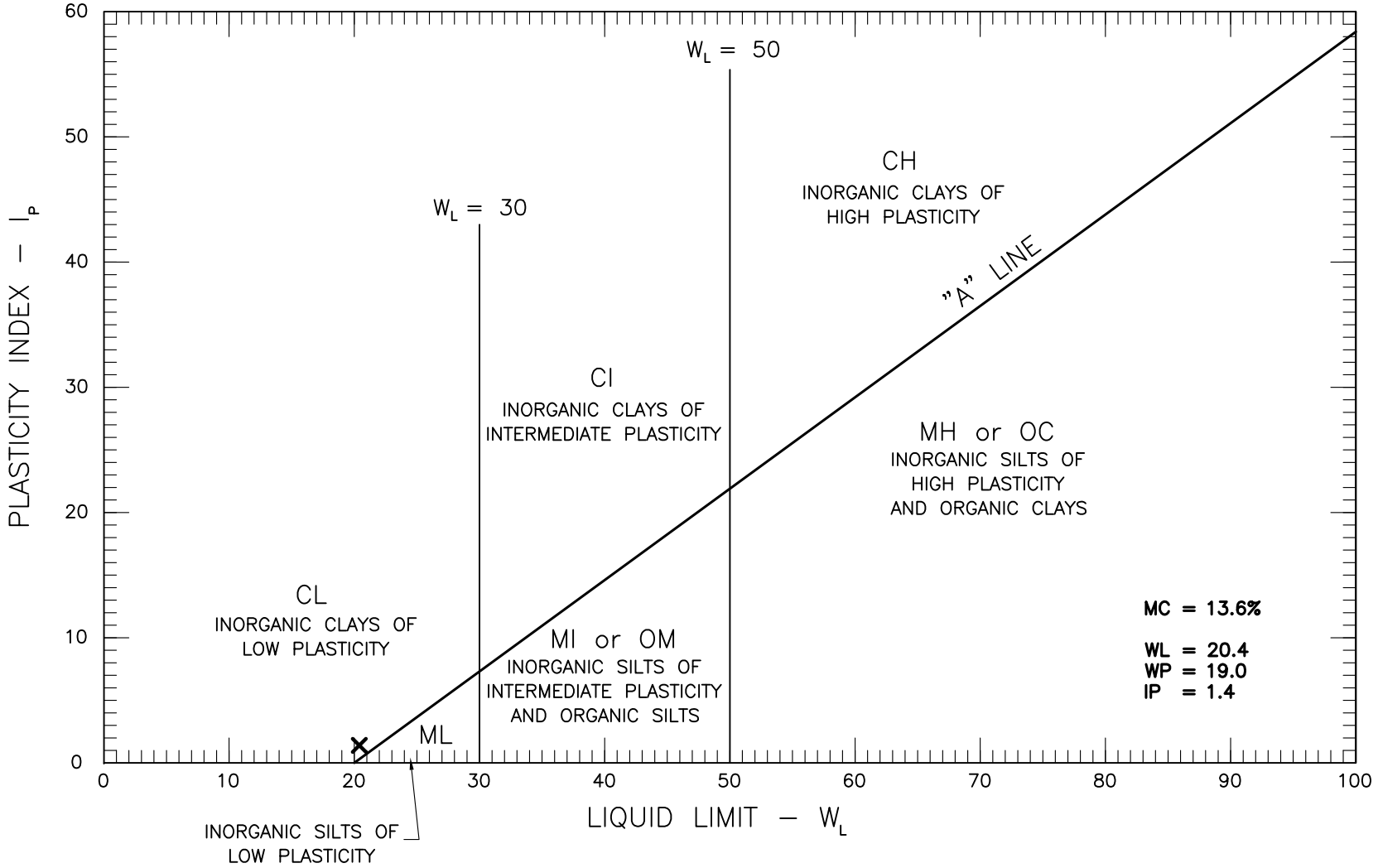


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-44-S3

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH44-S3

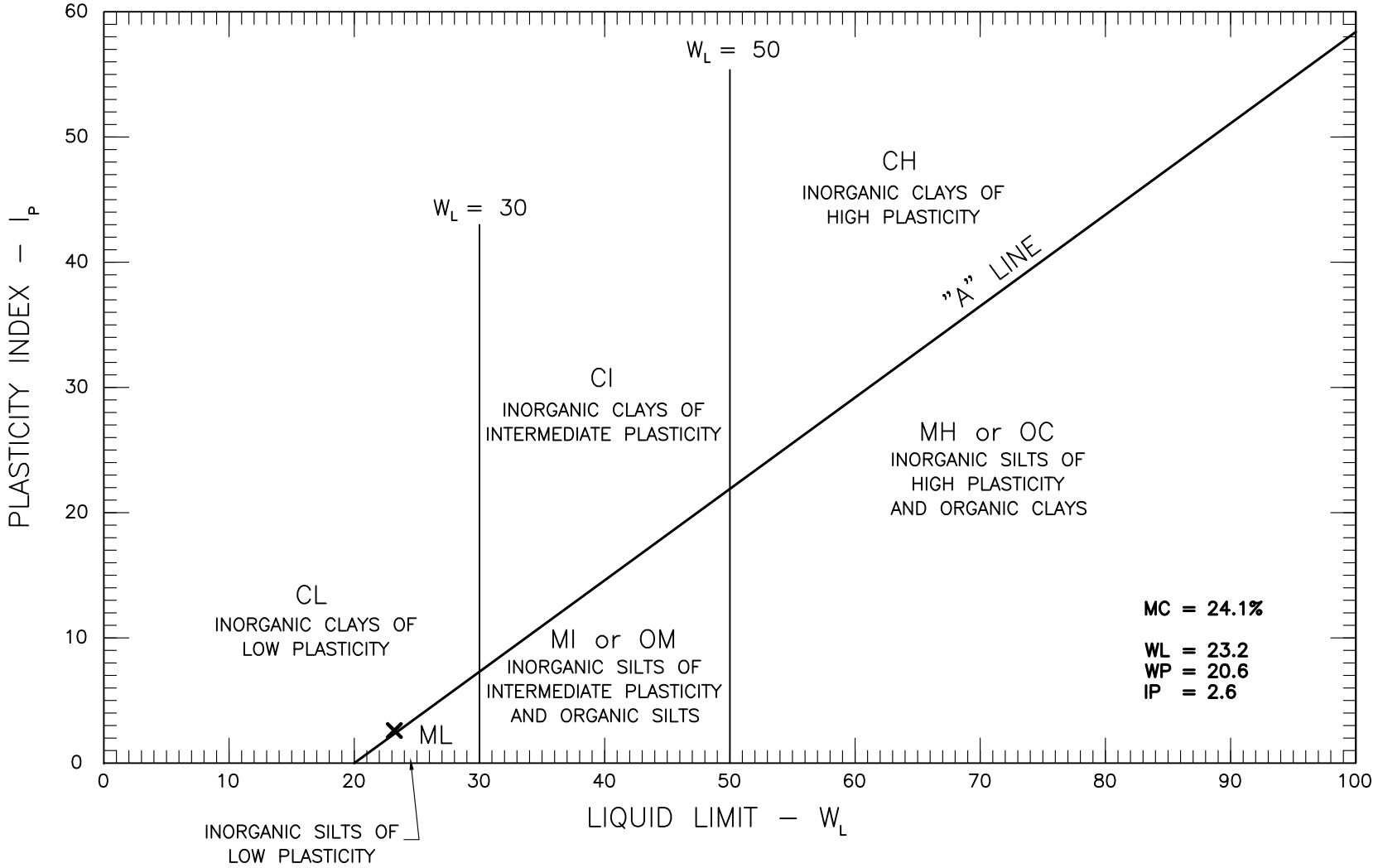


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-44-S5

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH44-S5

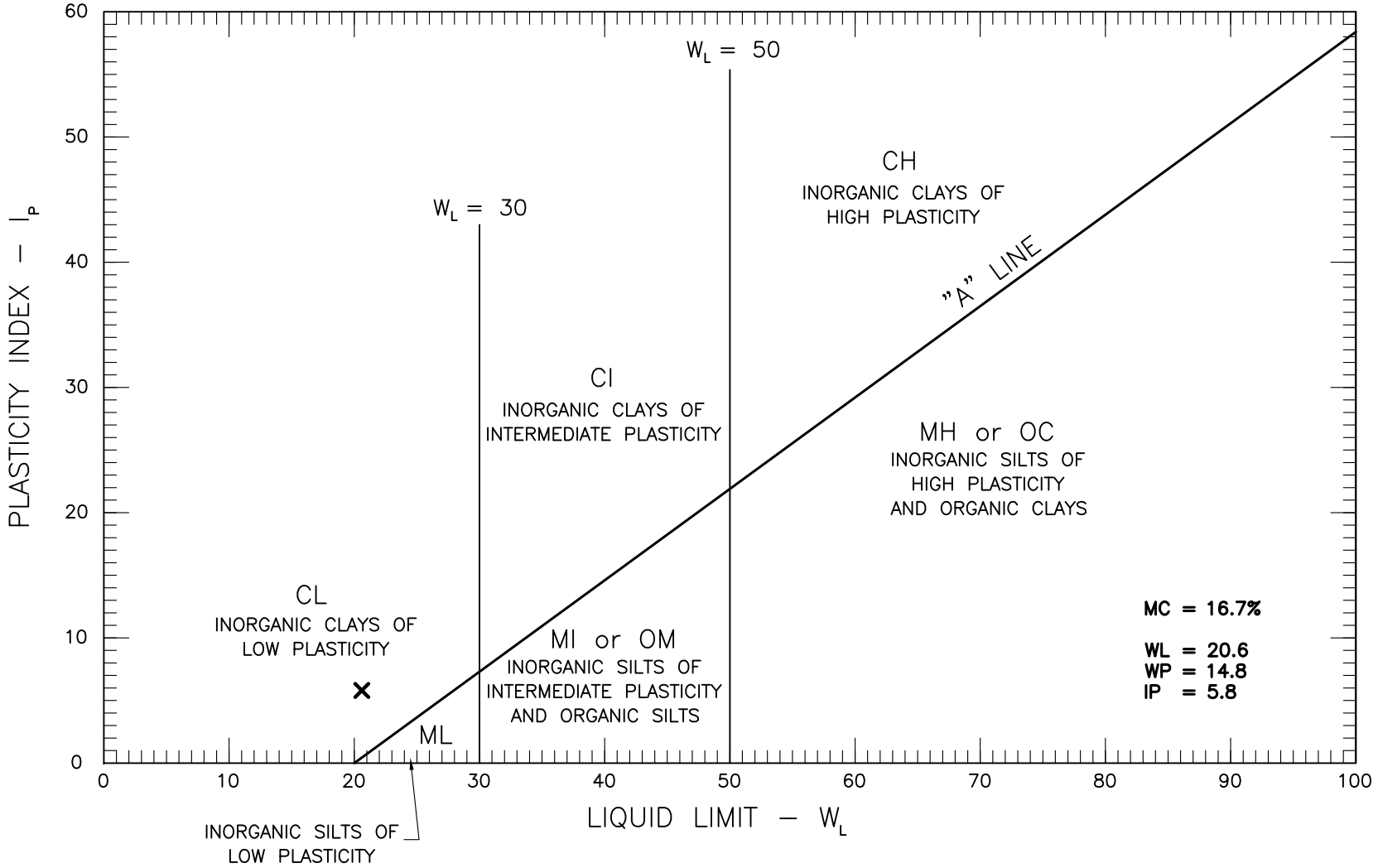


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-44-S7

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH44-S7

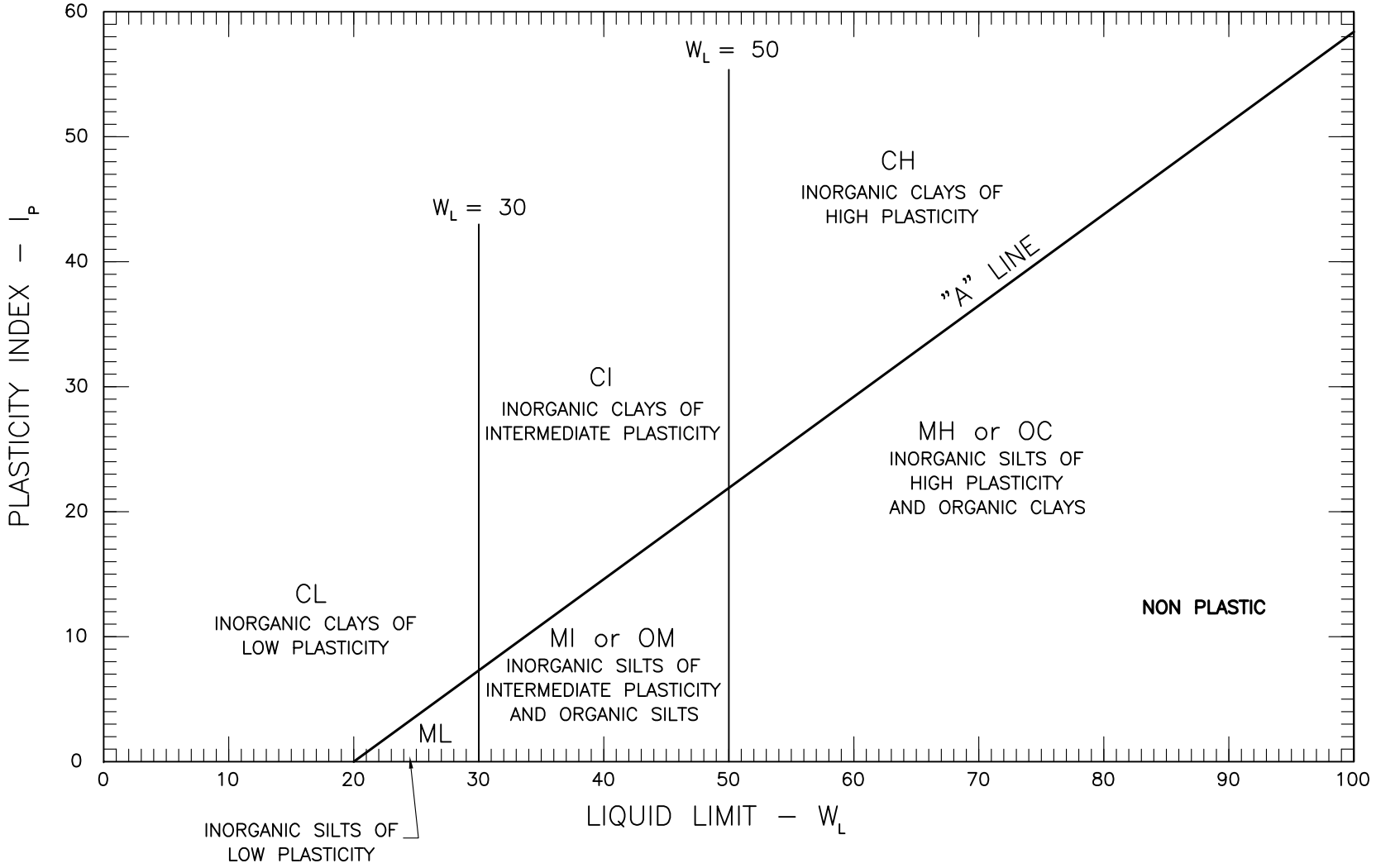


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-44-S11

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH44-S11

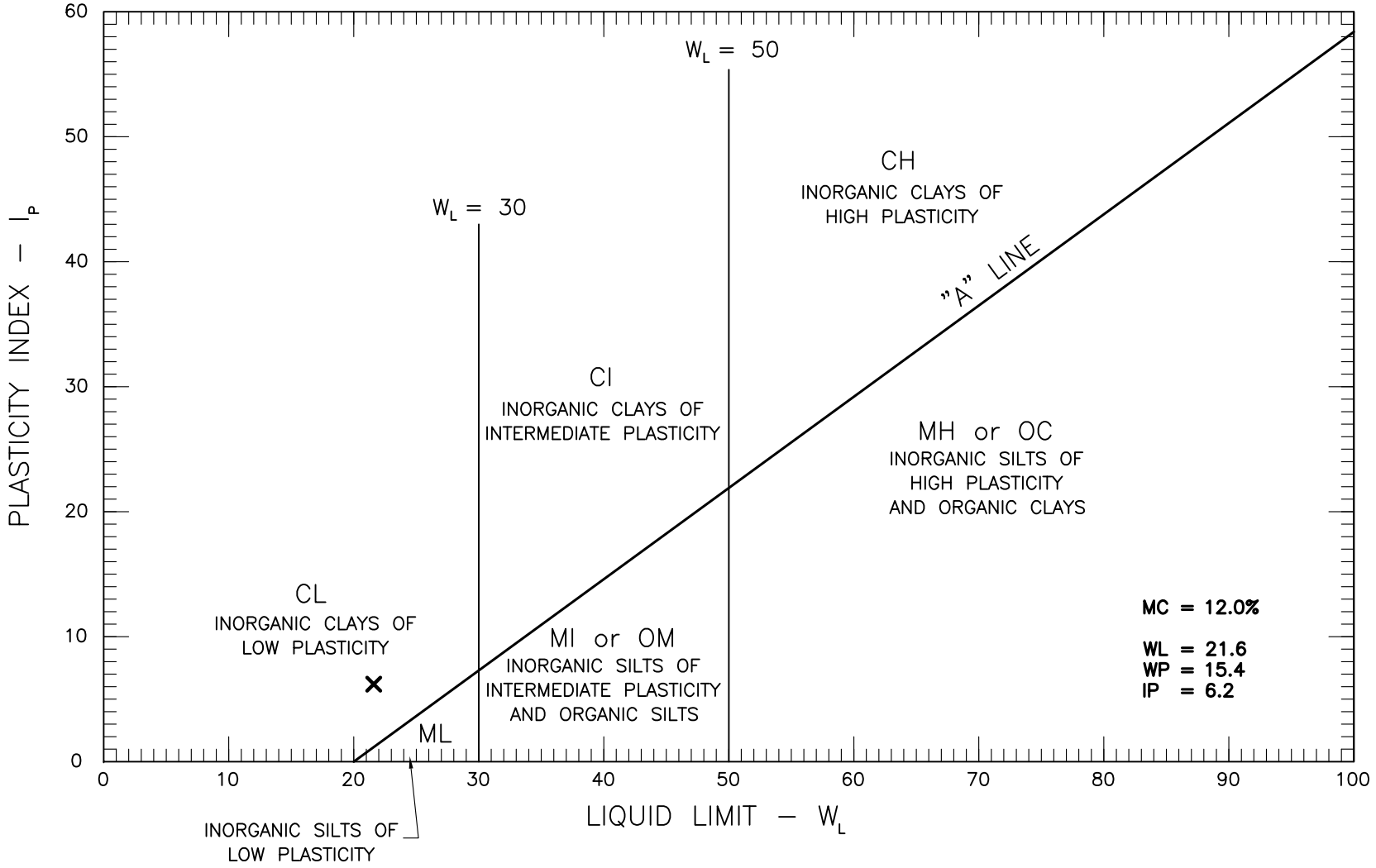


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-44-SPT2

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH44-SPT2

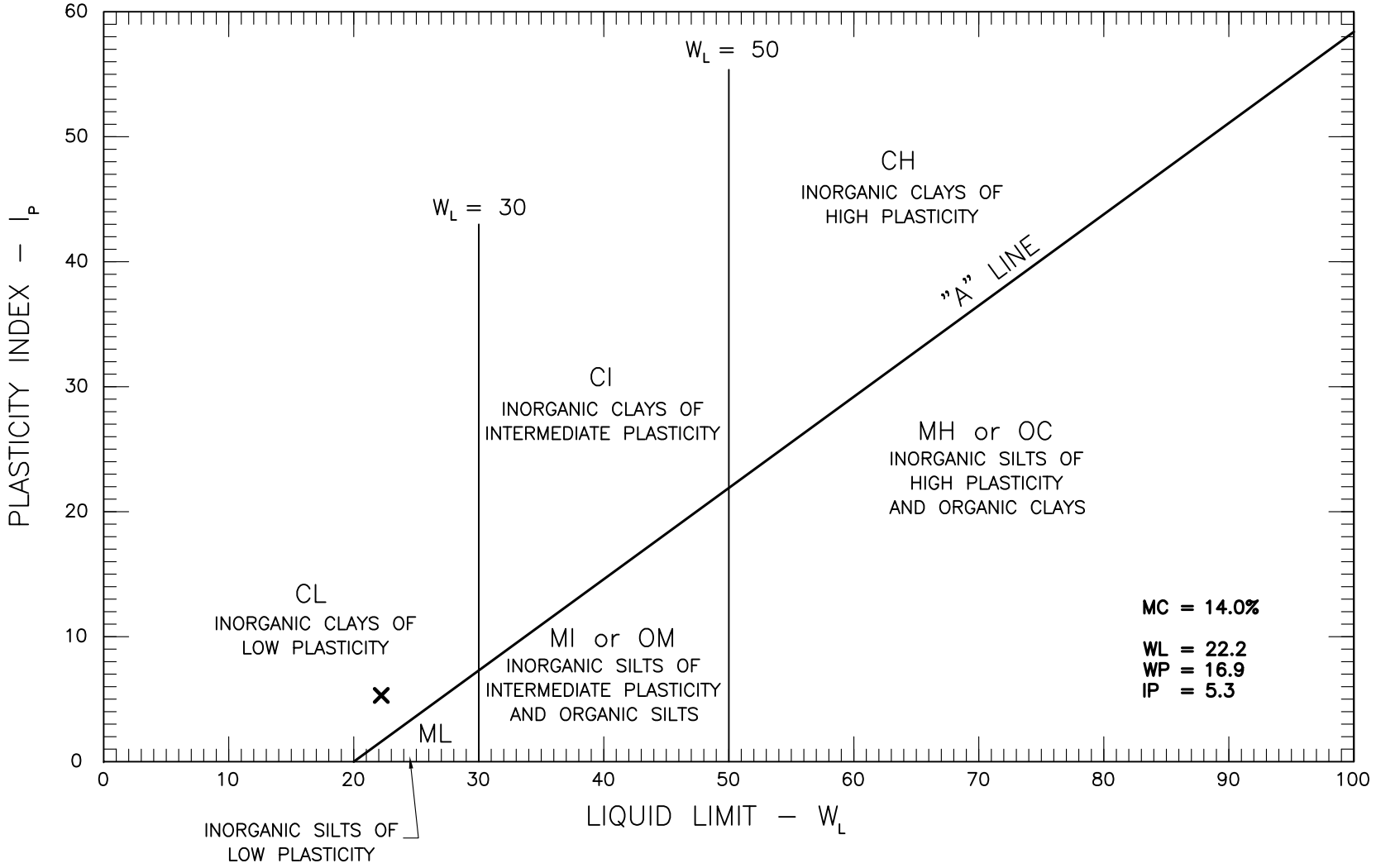


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-44-SPT10

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH44-SPT10

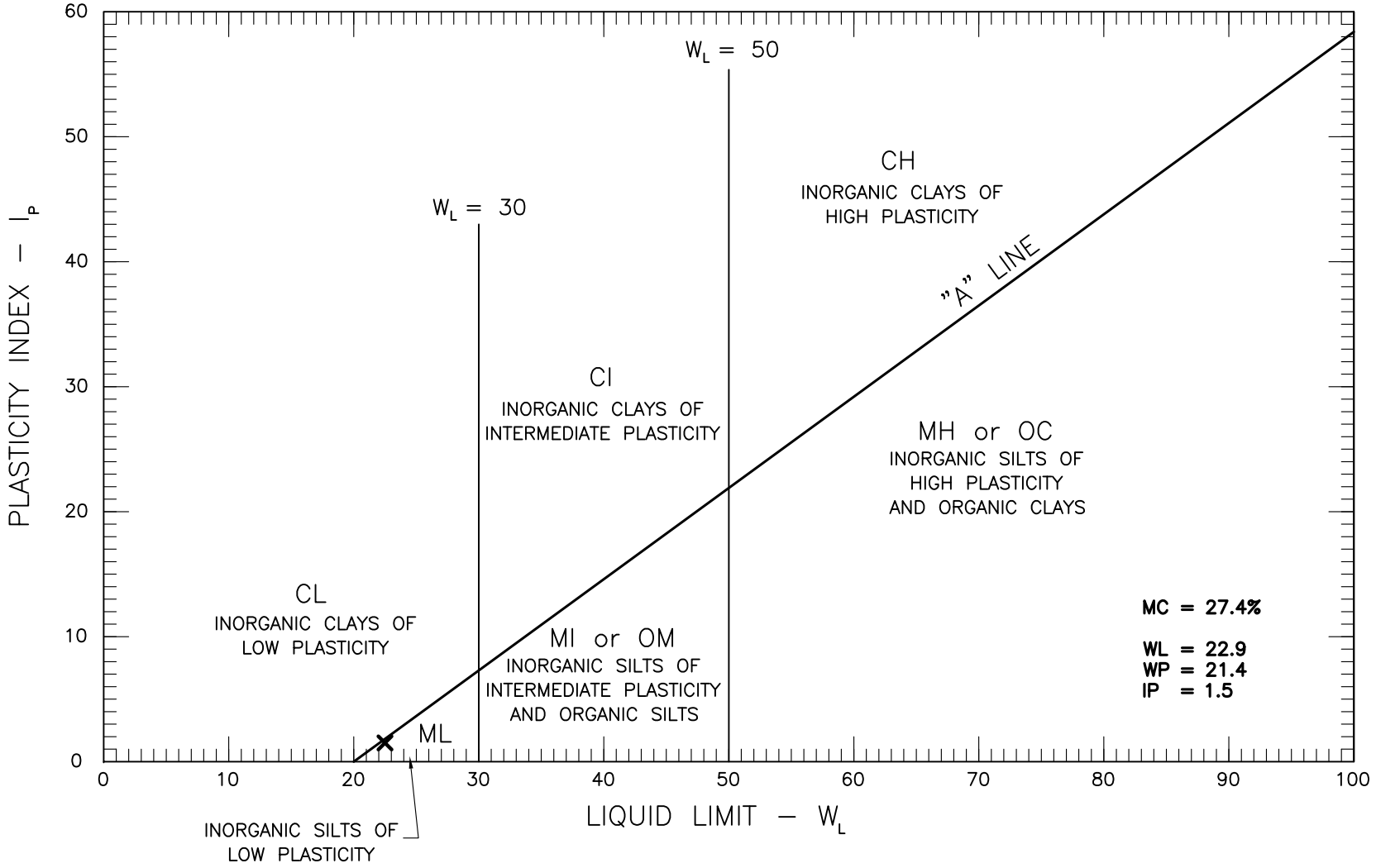


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-44-SPT11

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH44-SPT11

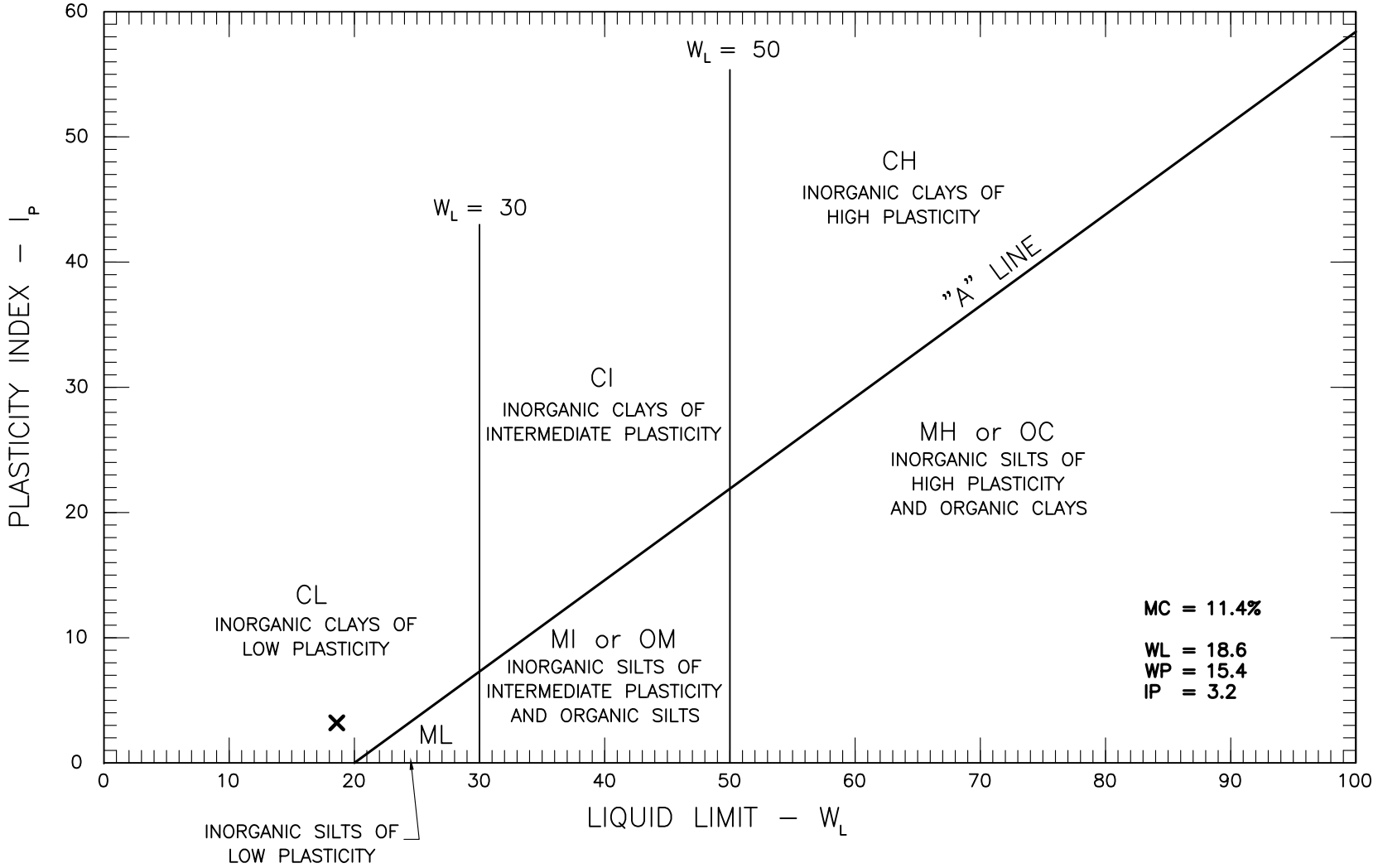


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-47-G3

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH47-G3

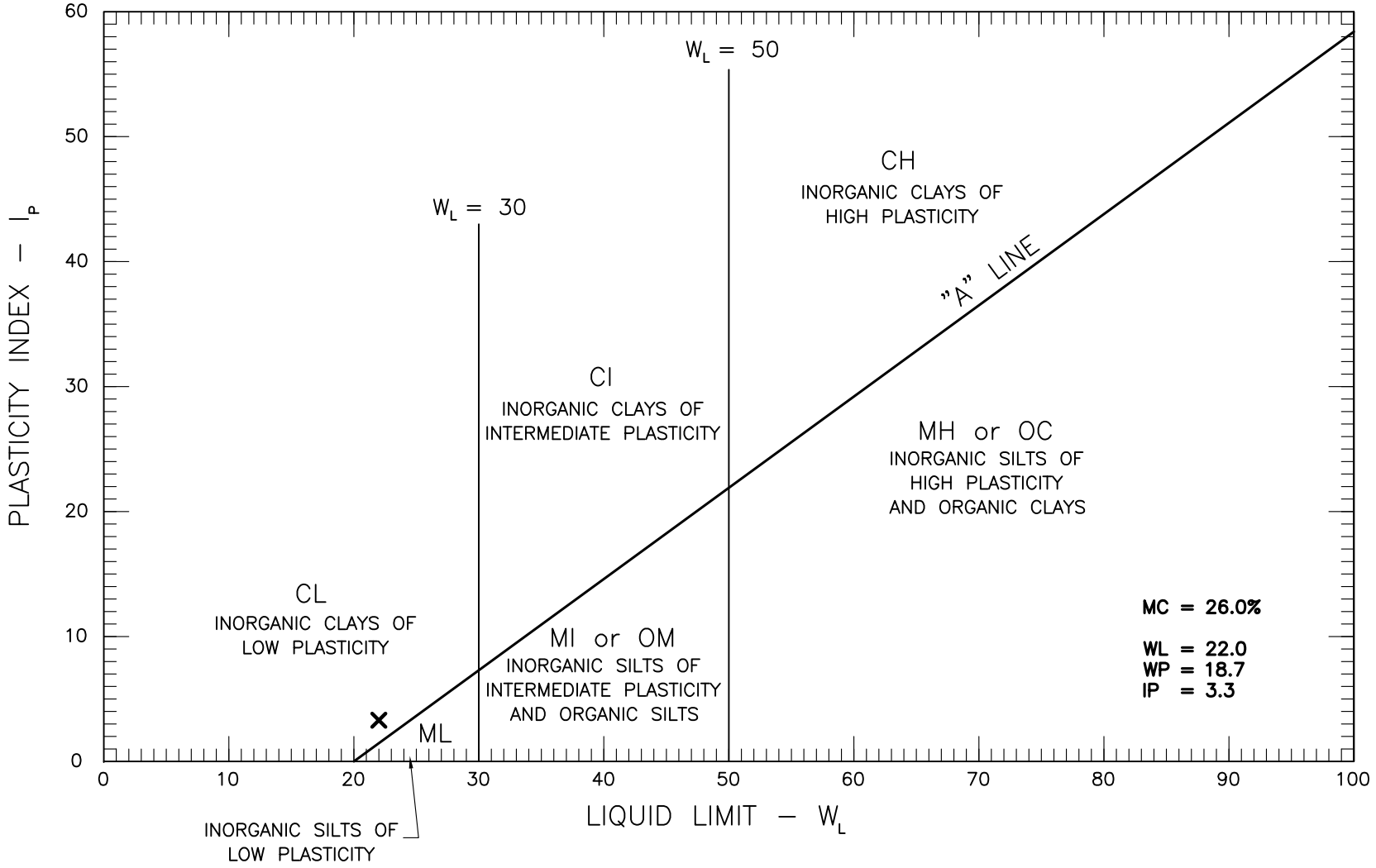


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-47-G10

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH47-G10

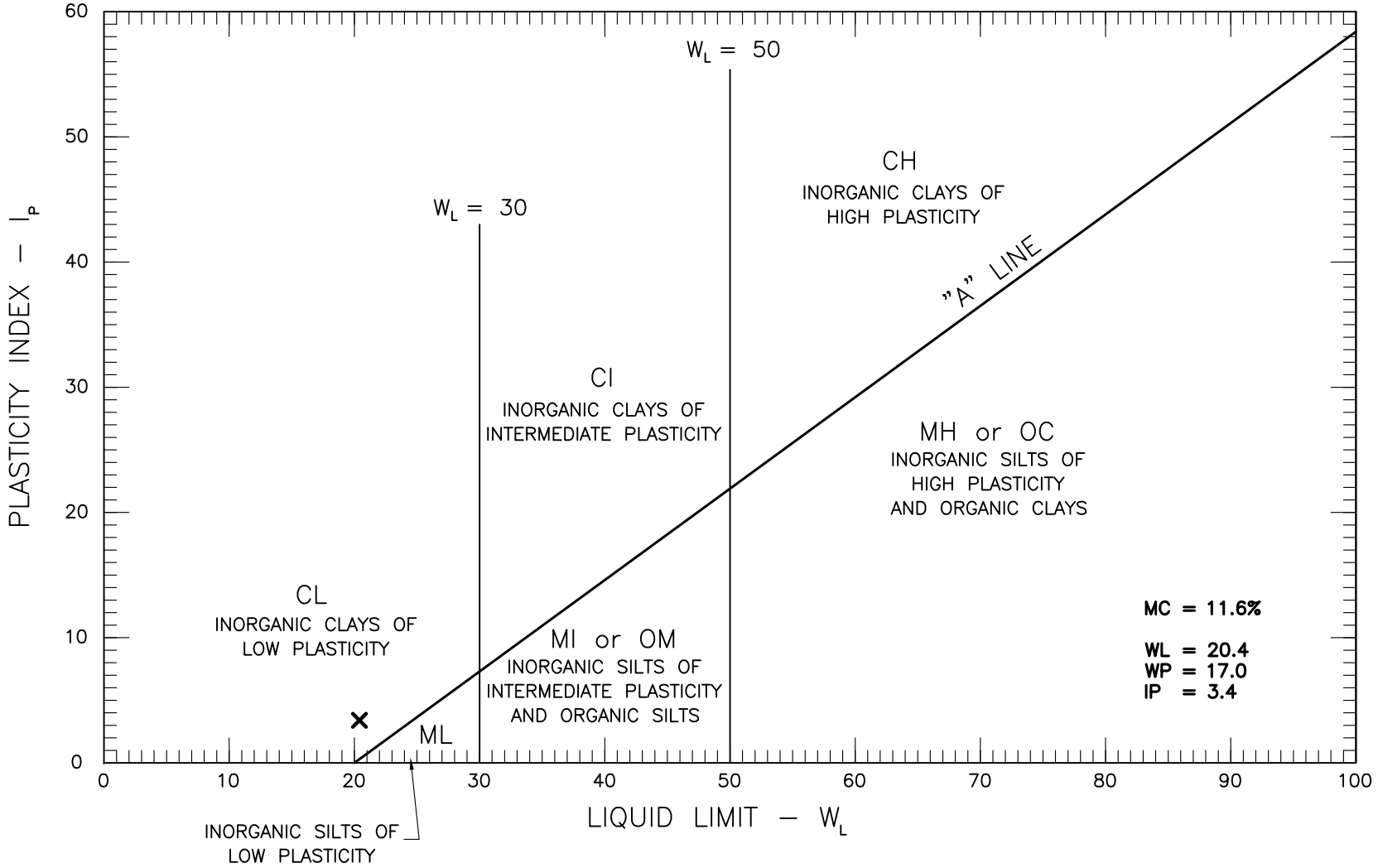


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-47-SPT1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH47-SPT1

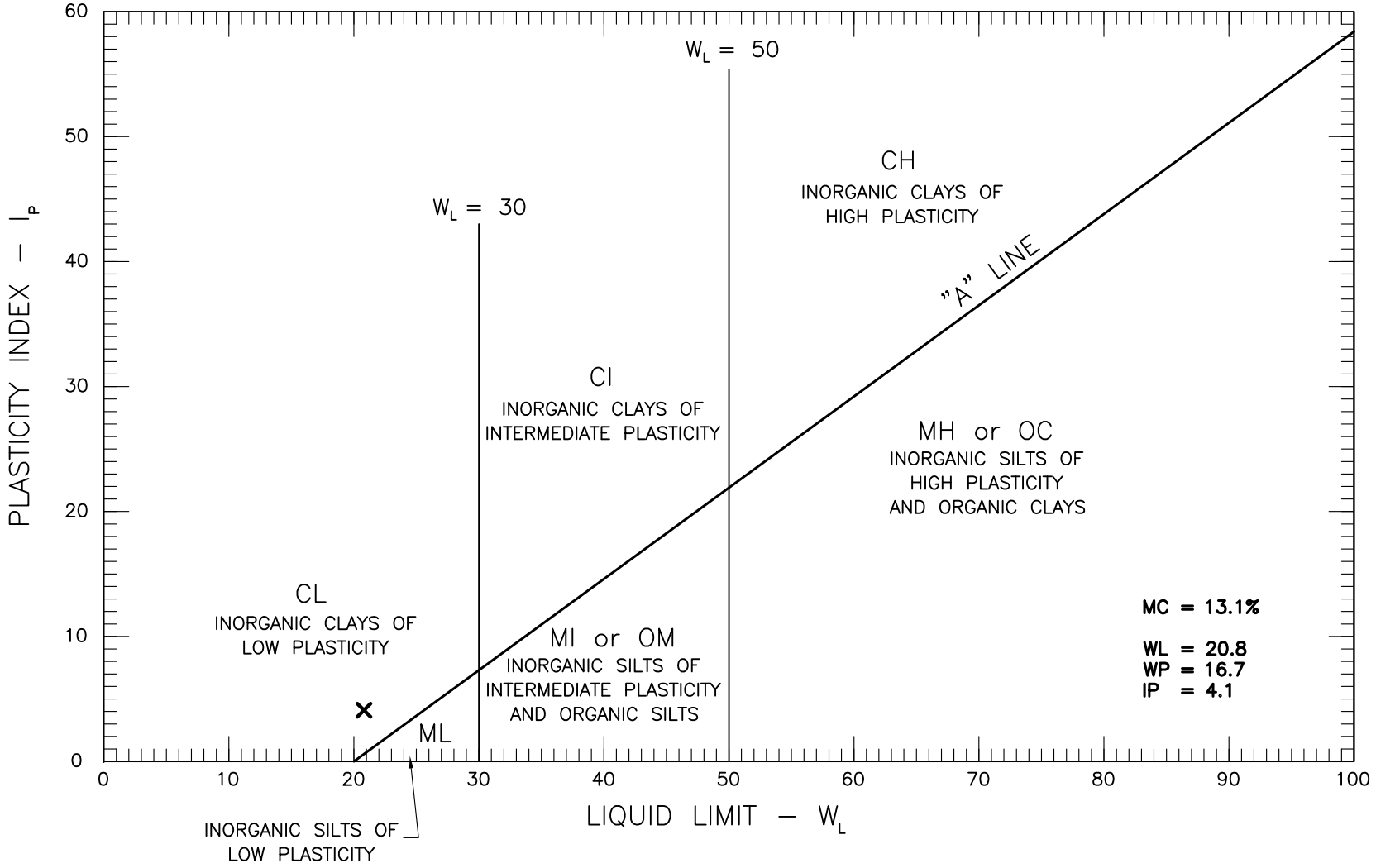


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-49-G4

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH49-G4

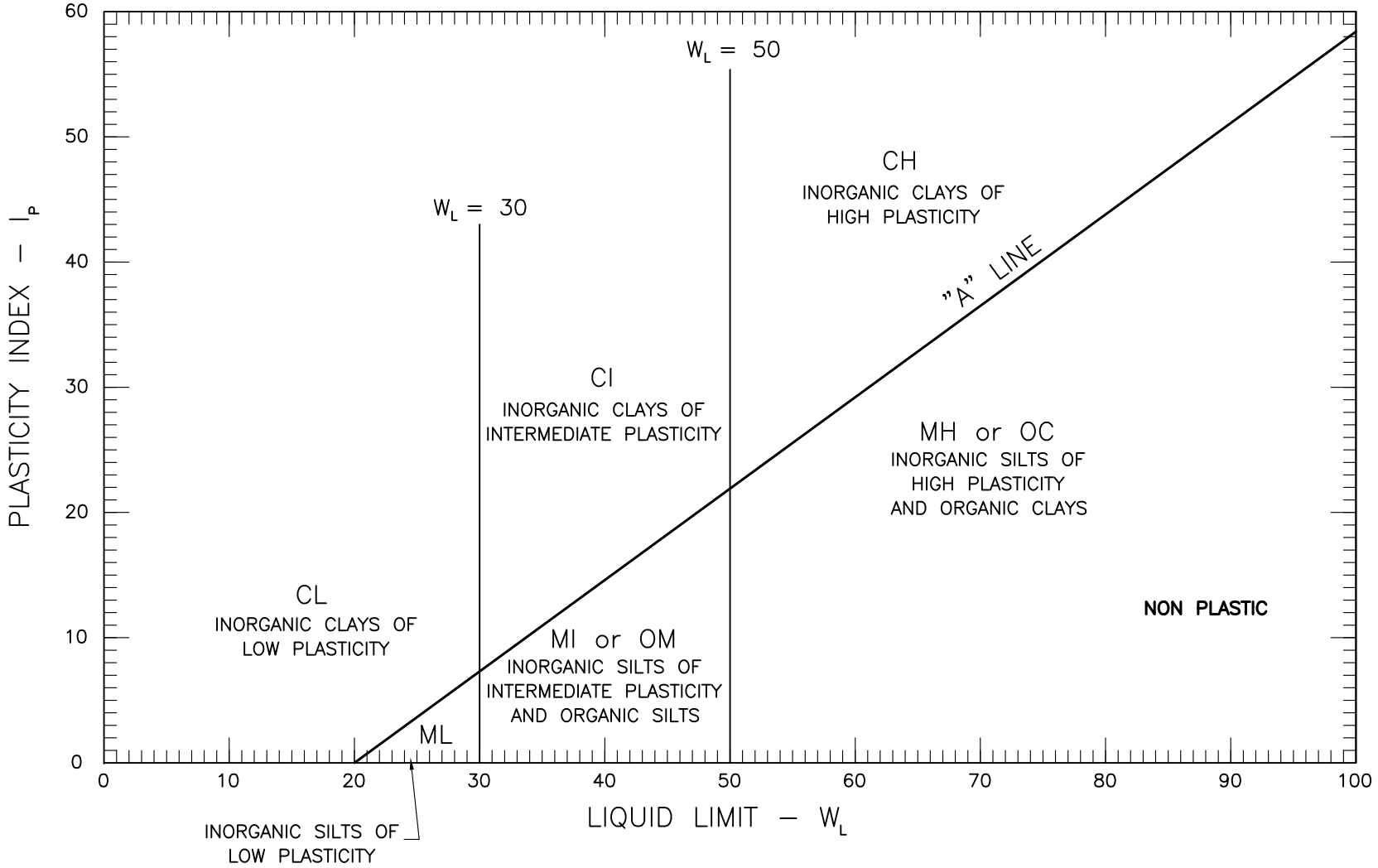


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-49-G6

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH49-G6

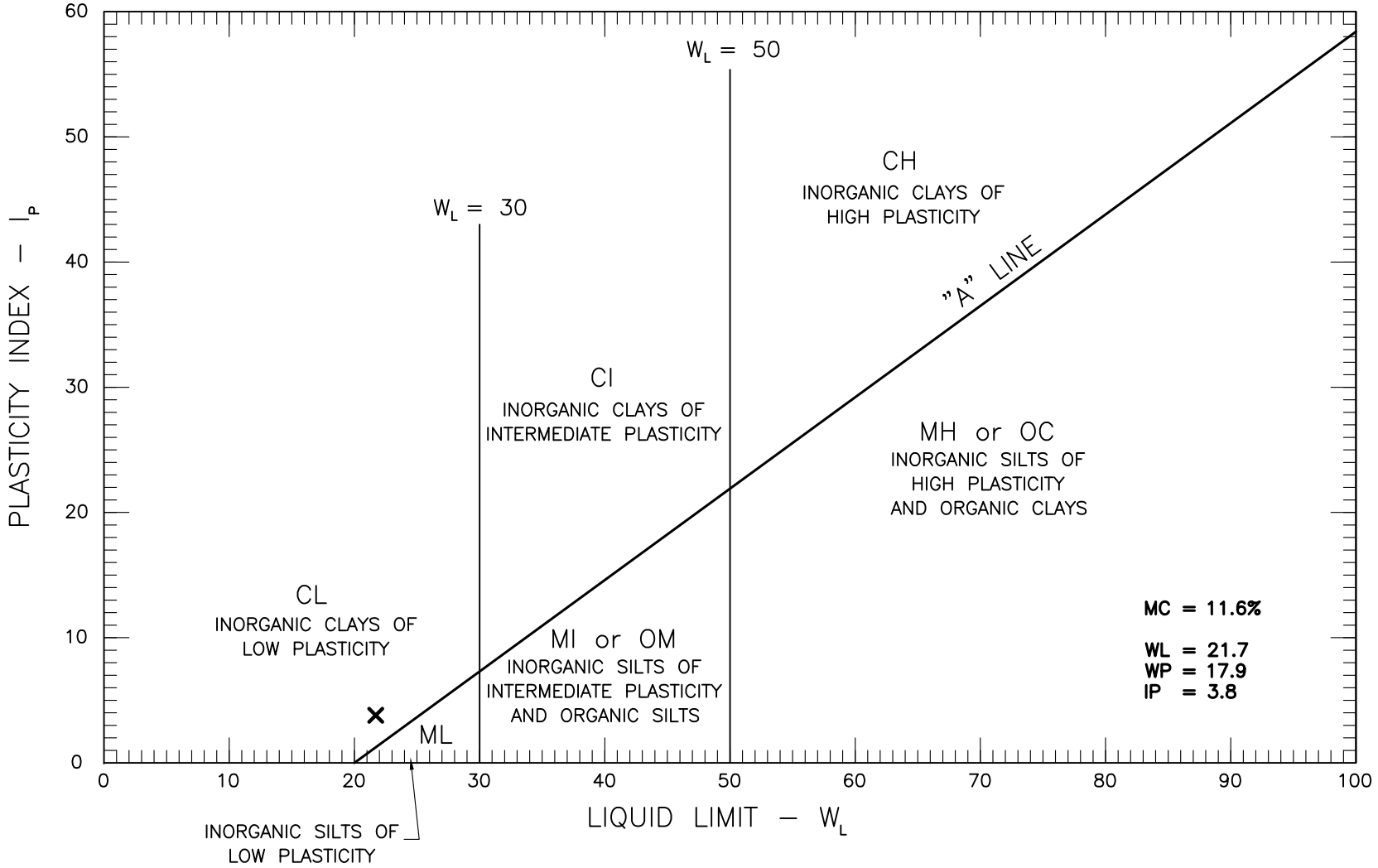


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-49-G8

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH49-G8

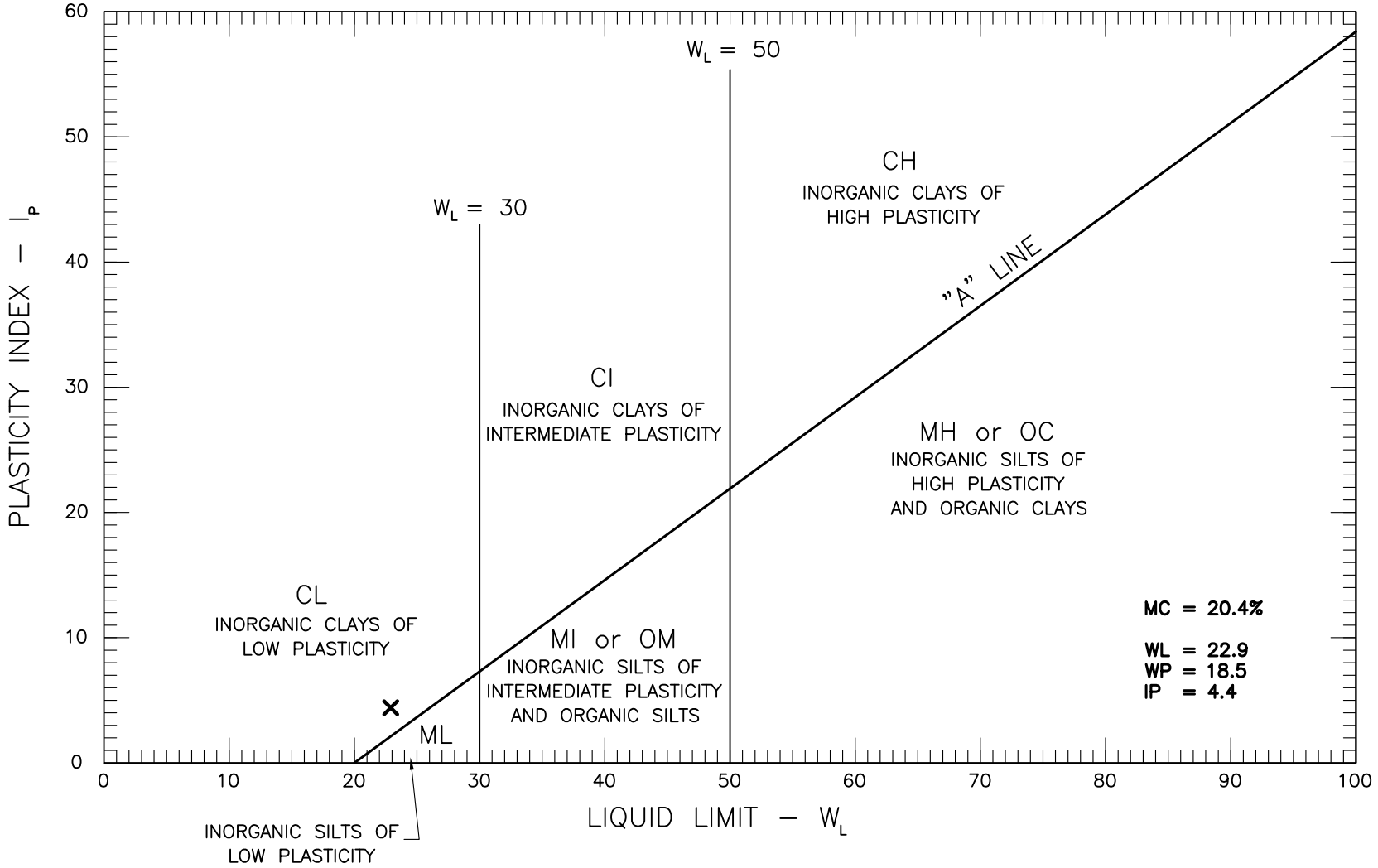


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-49-G10

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH49-G10

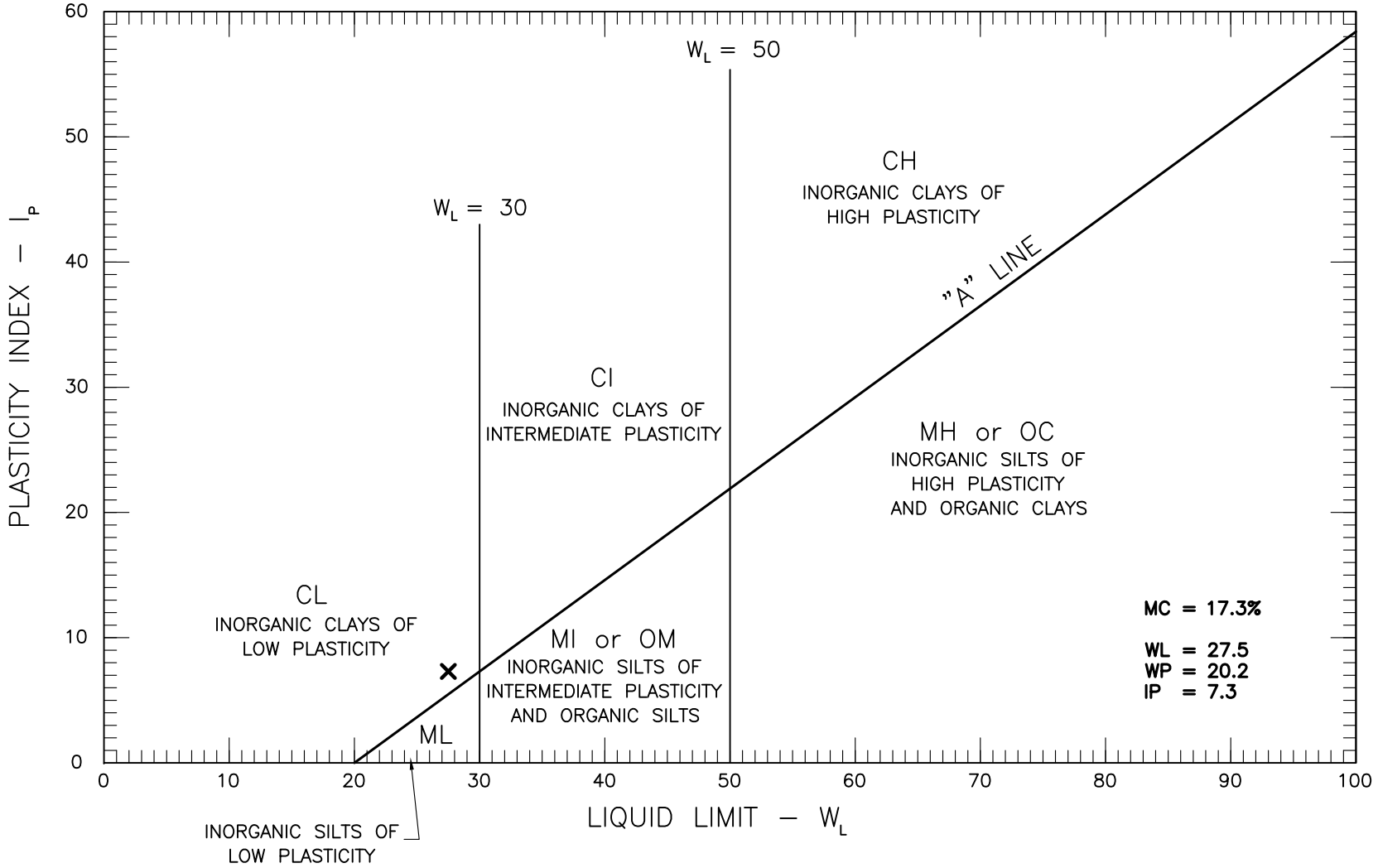


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-49-SPT2

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH49-SPT2

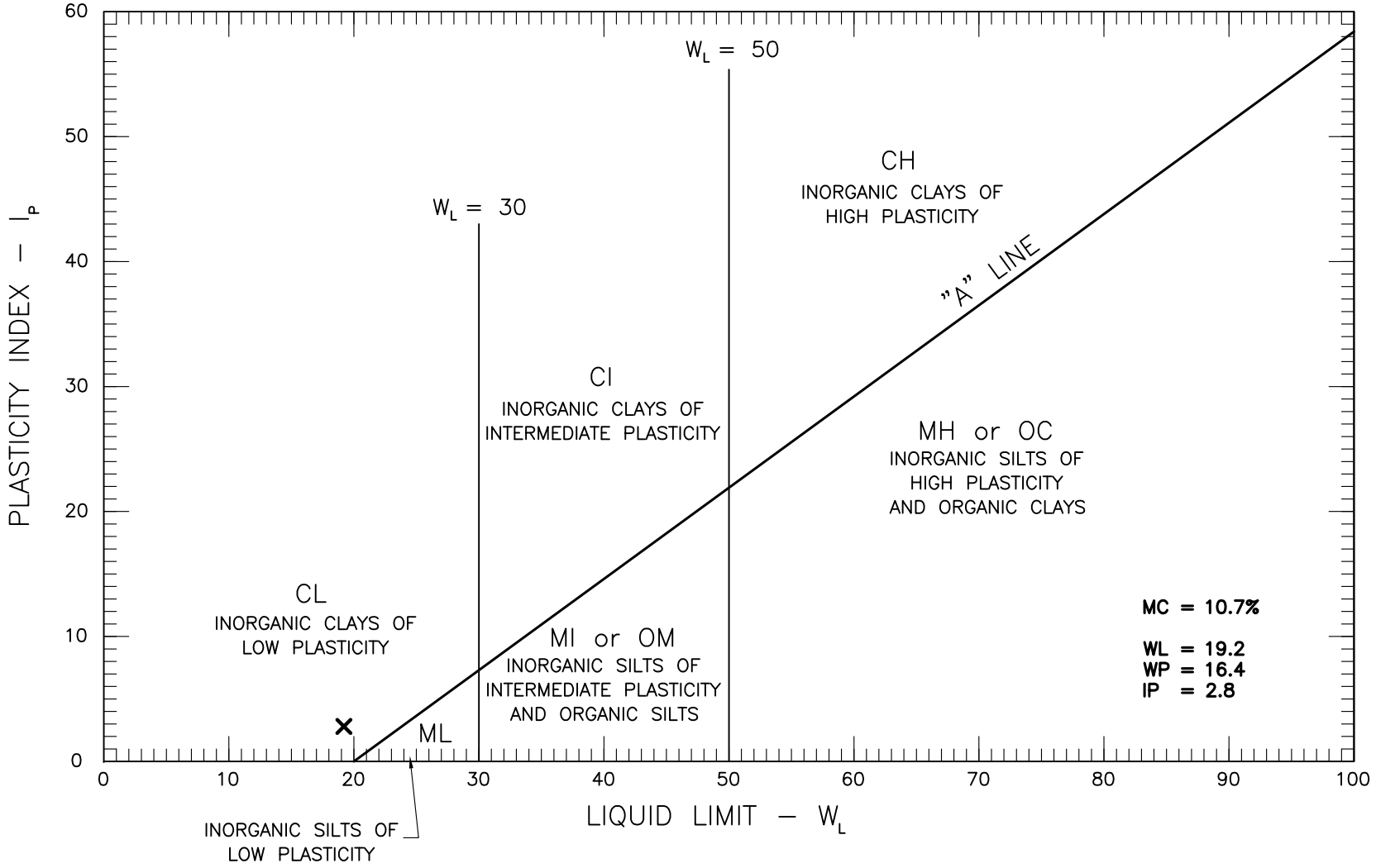


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-51-G6

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH51-G6

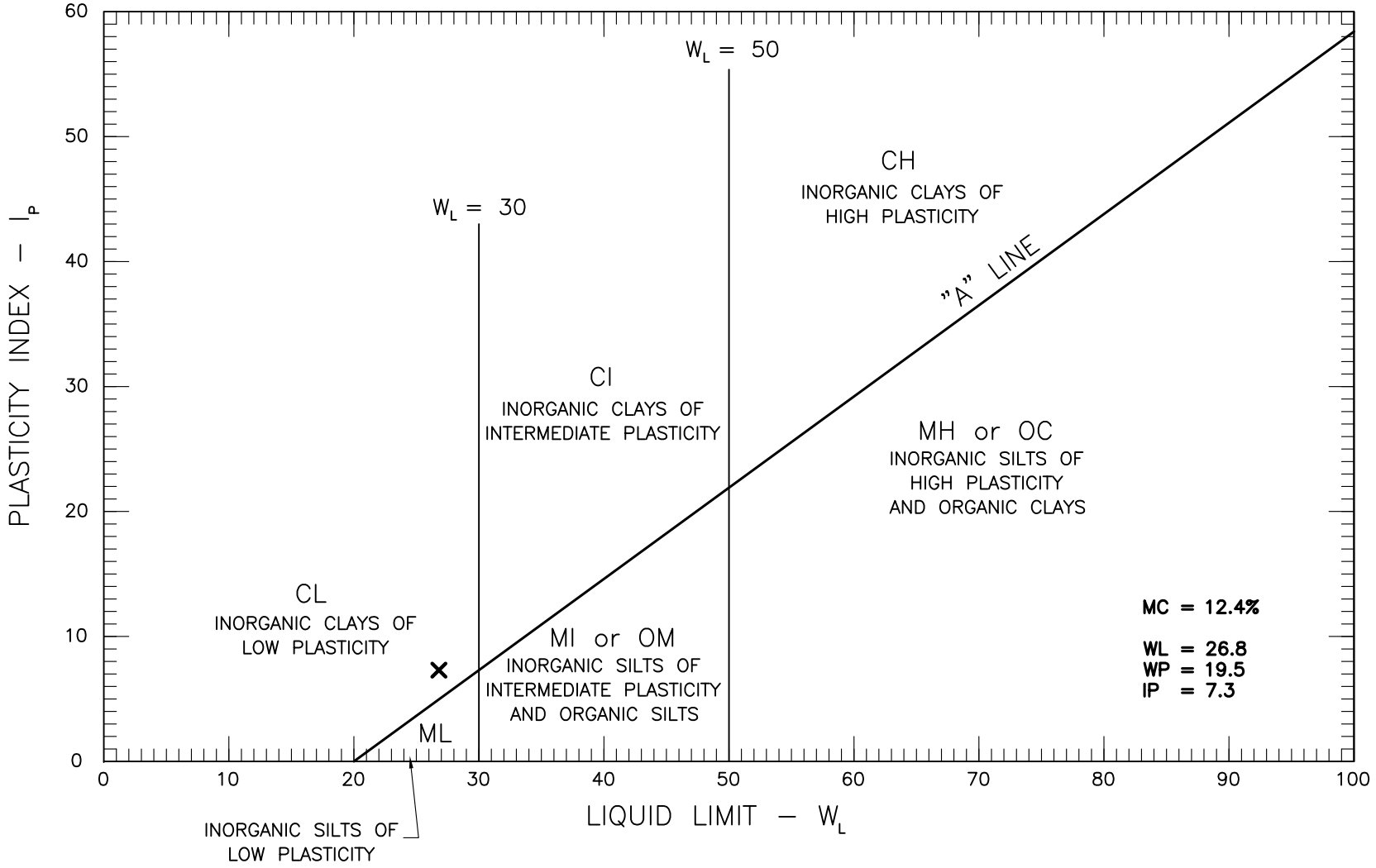


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-51-G10

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH51-G10

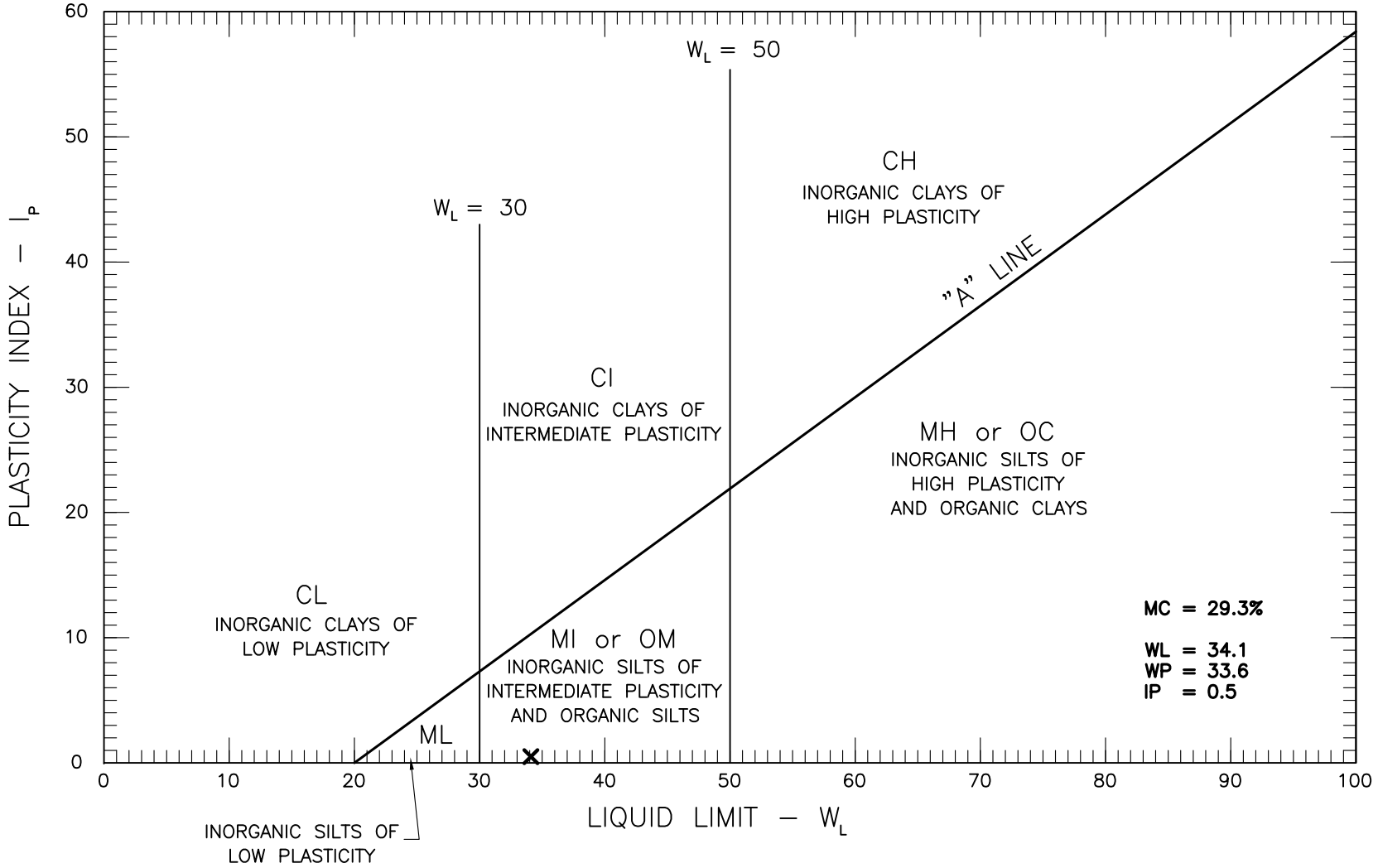


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-51-SPT1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH51-SPT1

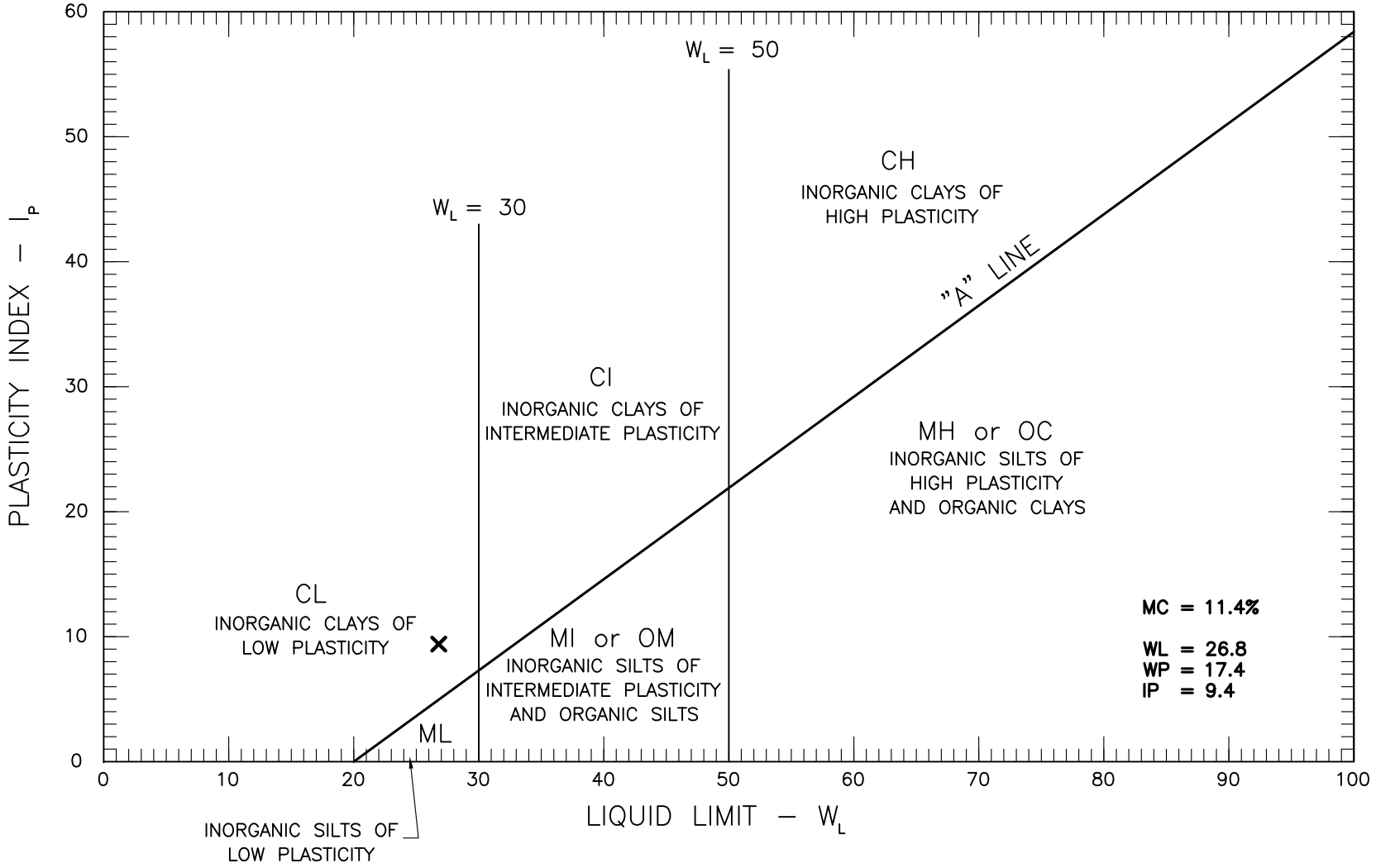


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-51-SPT3

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH51-SPT3

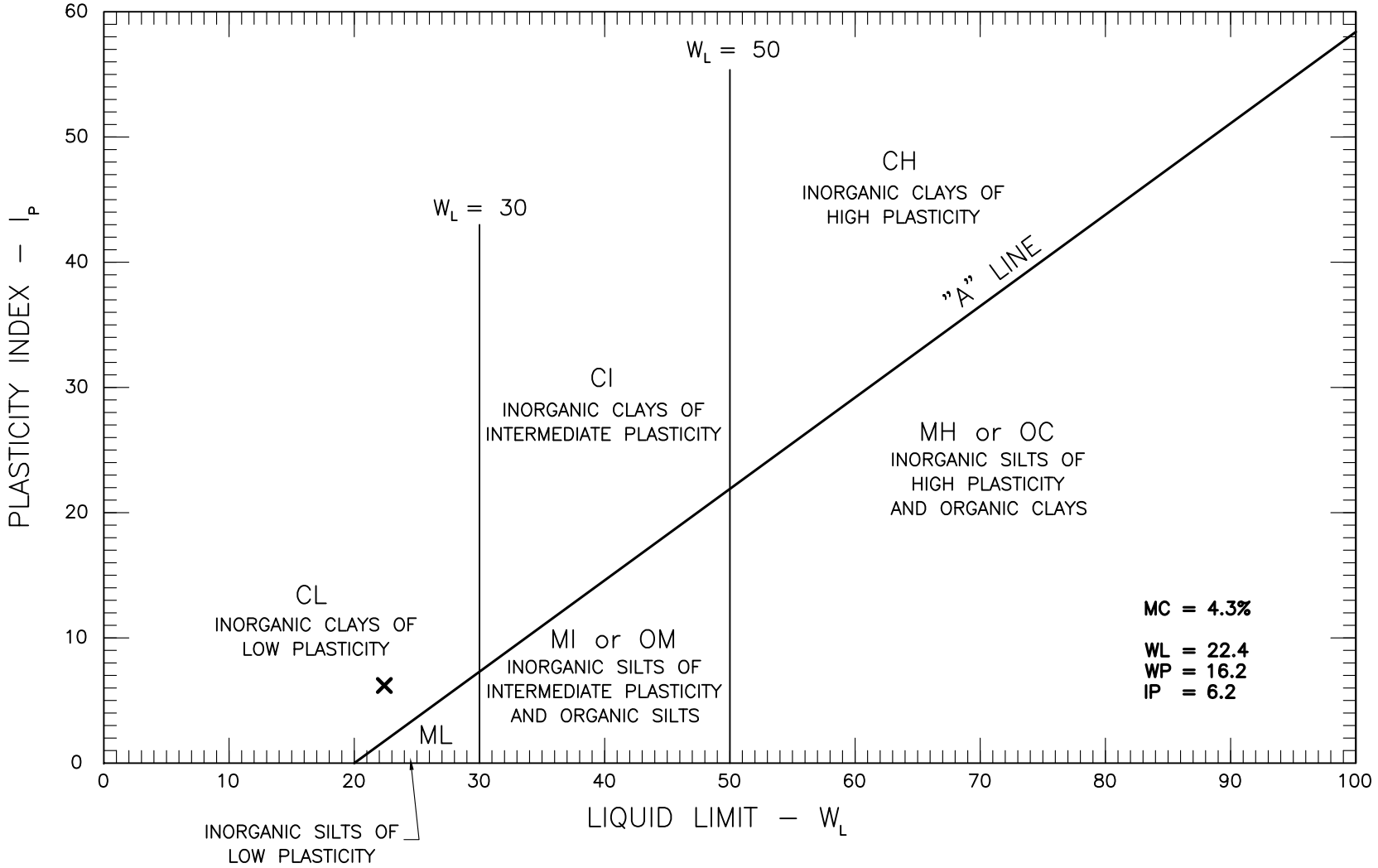


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-53-G2

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH53-G2

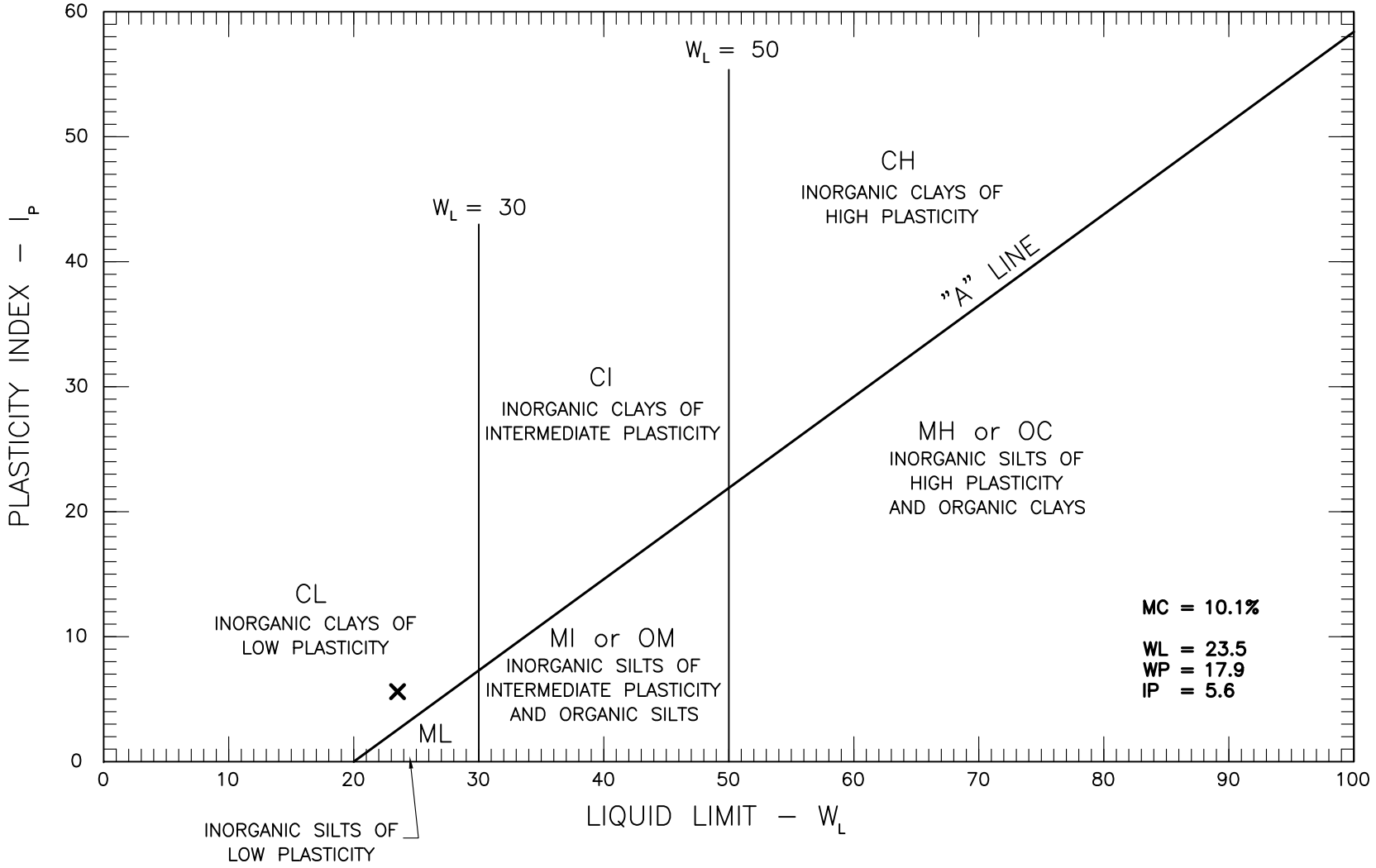


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-53-G4

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH53-G4

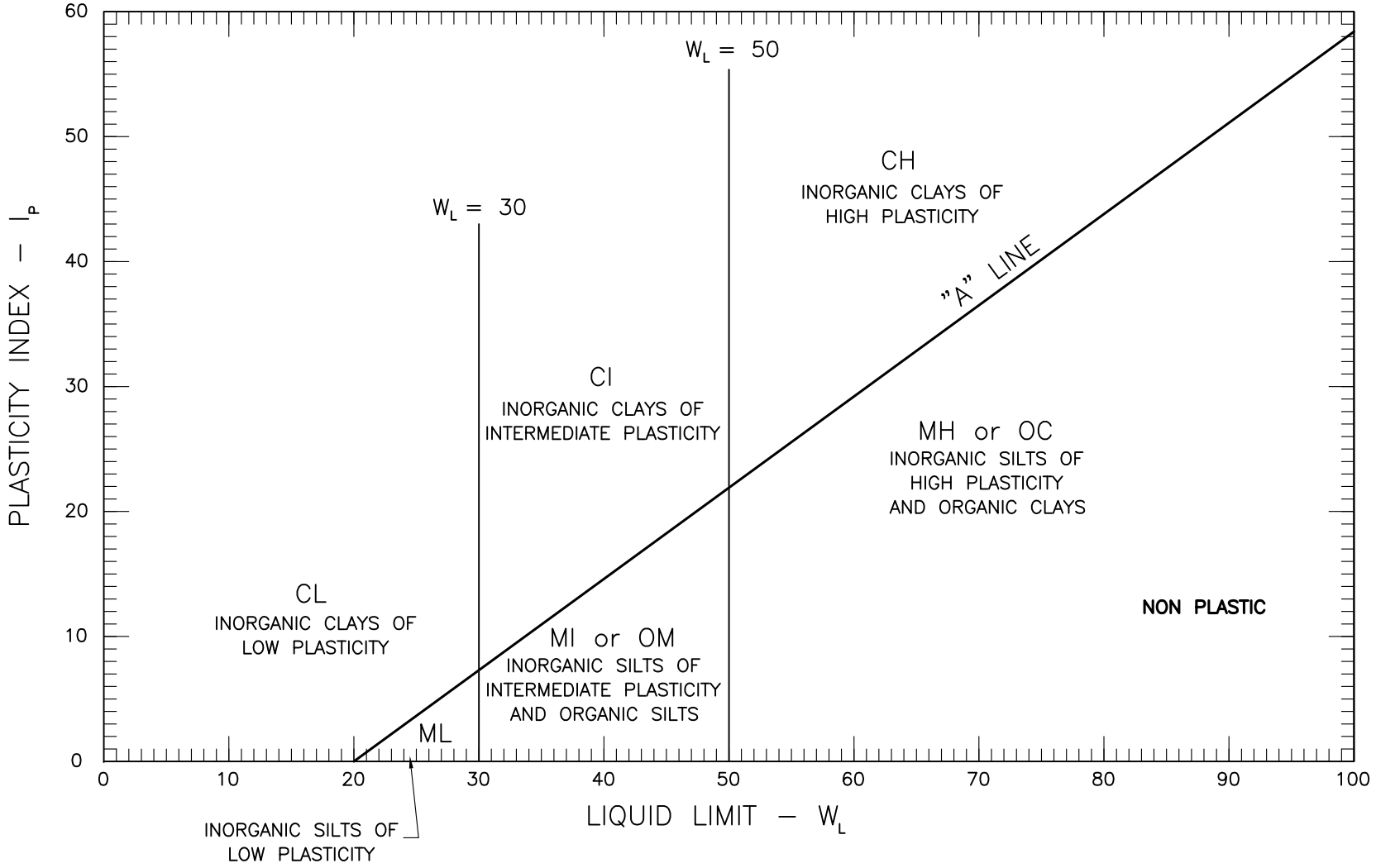


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-53-SPT2

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH53-SPT2

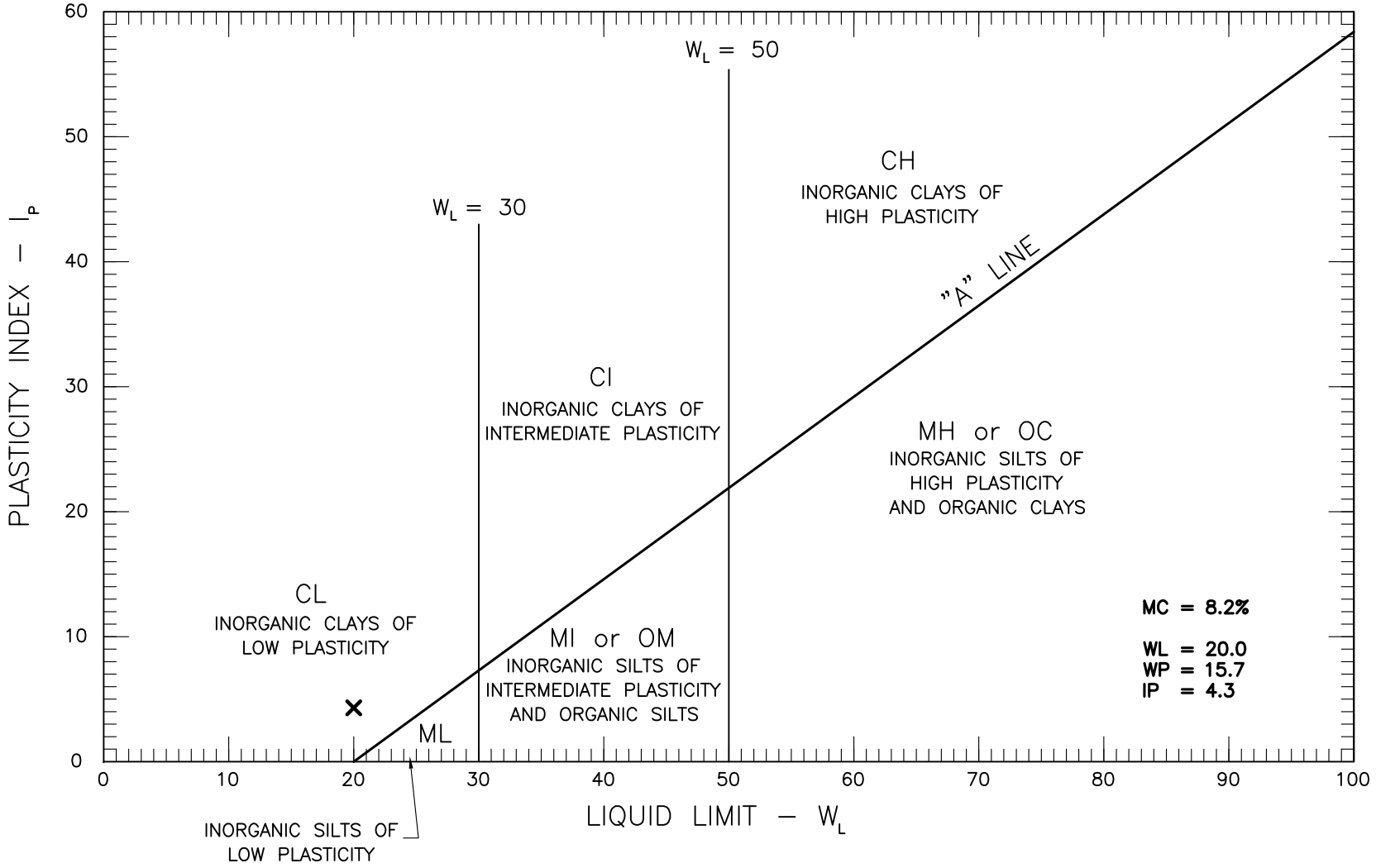


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-53-SPT4

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH53-SPT4

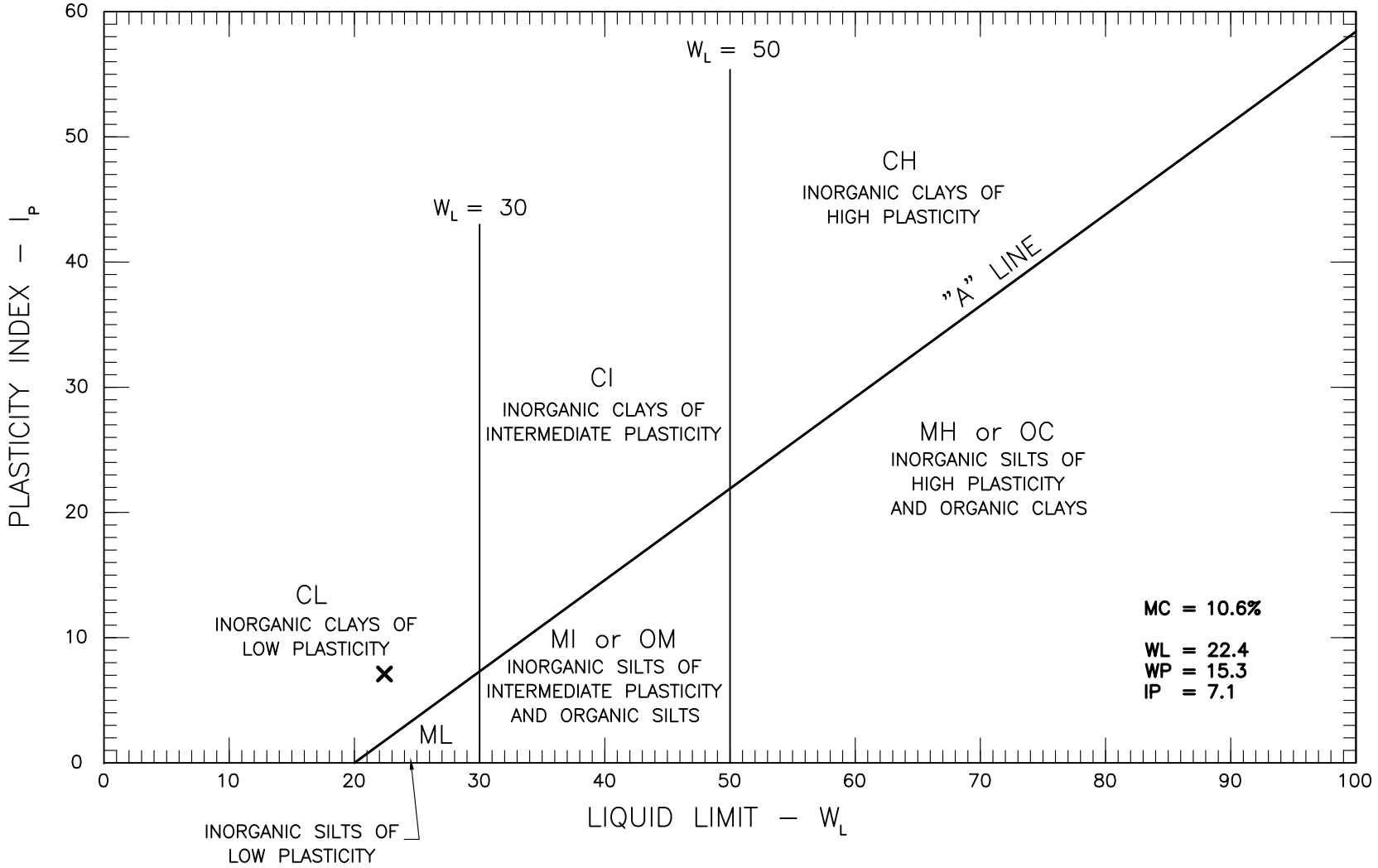


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-54-G1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH54-G1

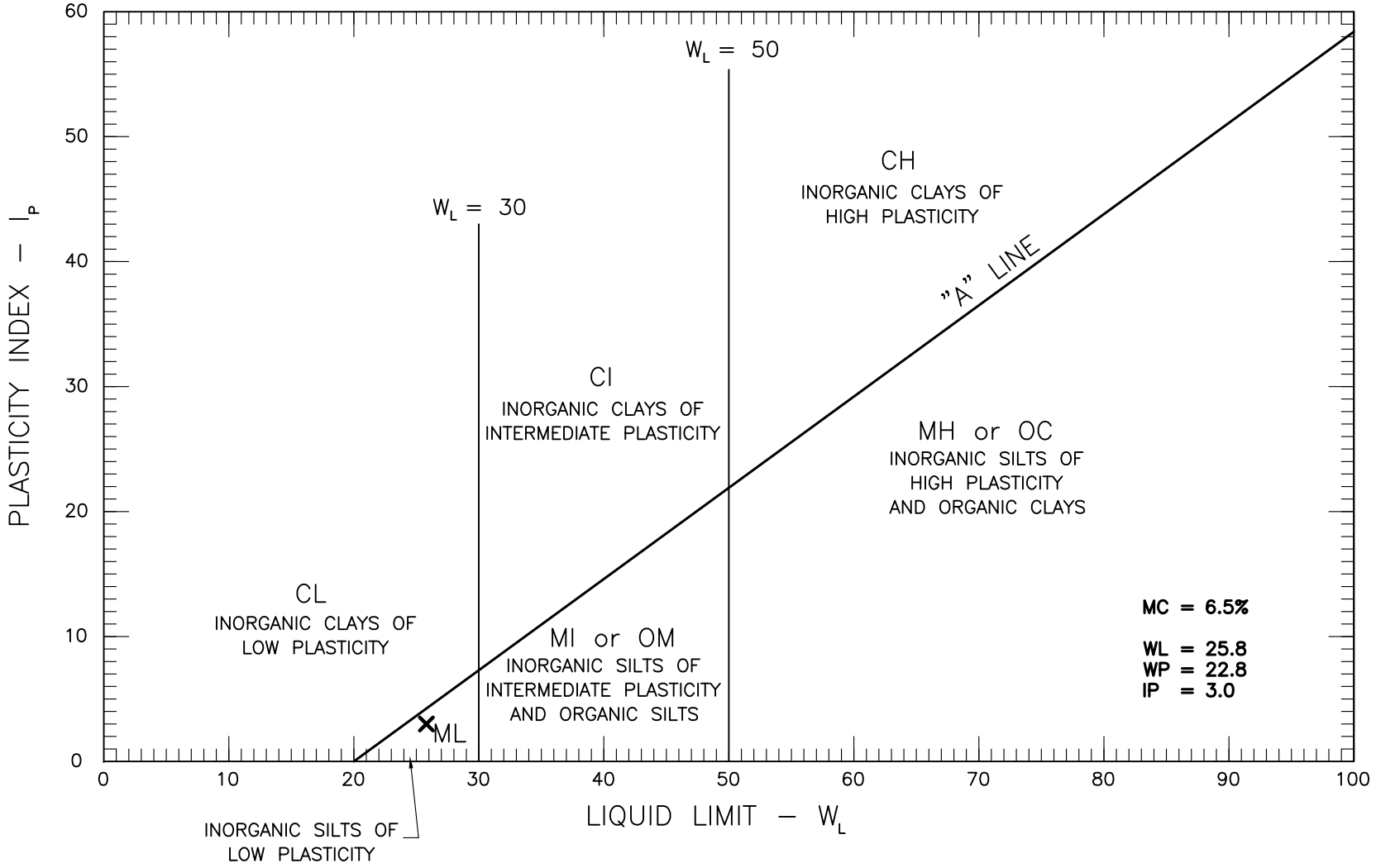


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-55-G4

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH55-G4

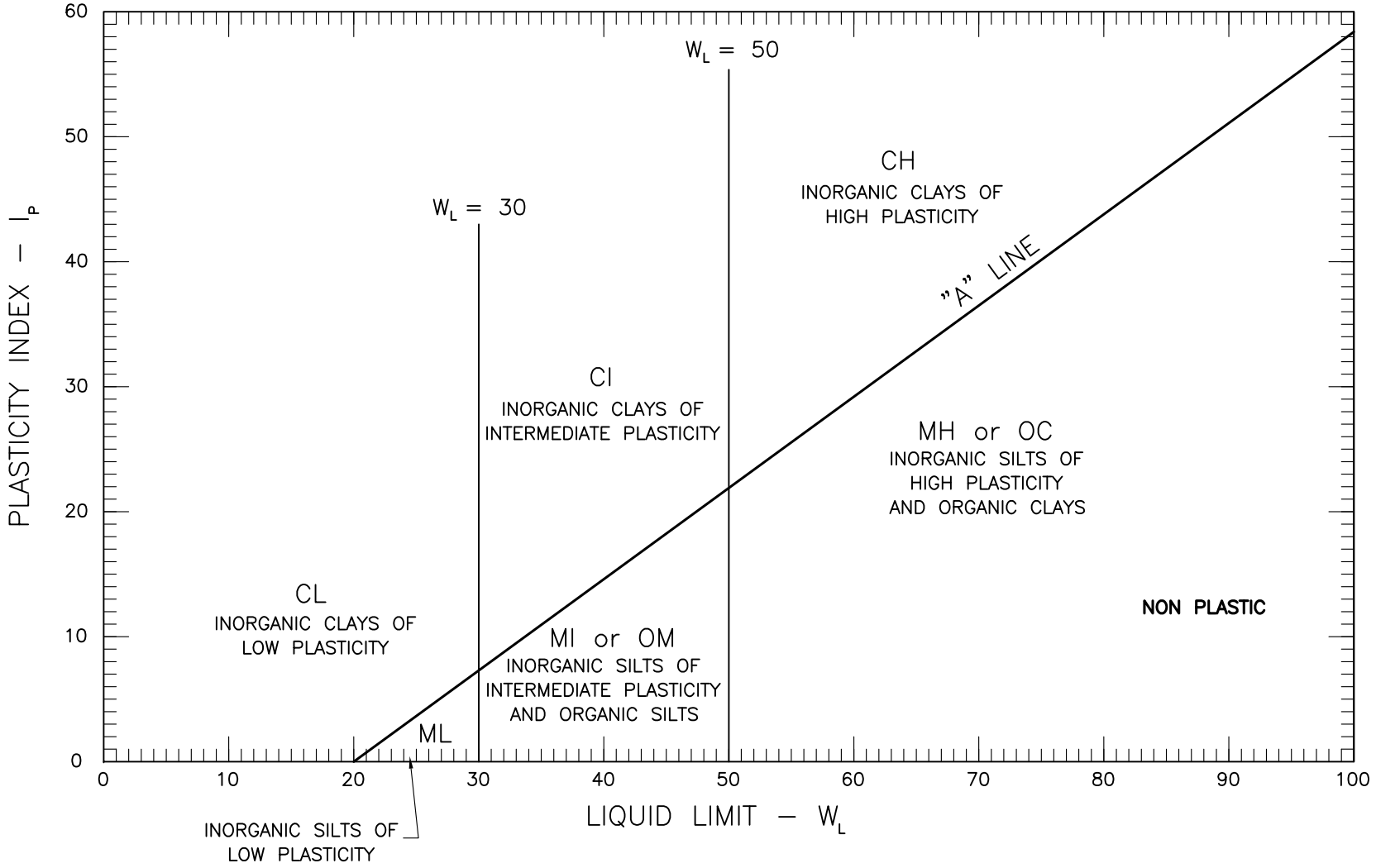


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-55-SPT6

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH55-SPT6

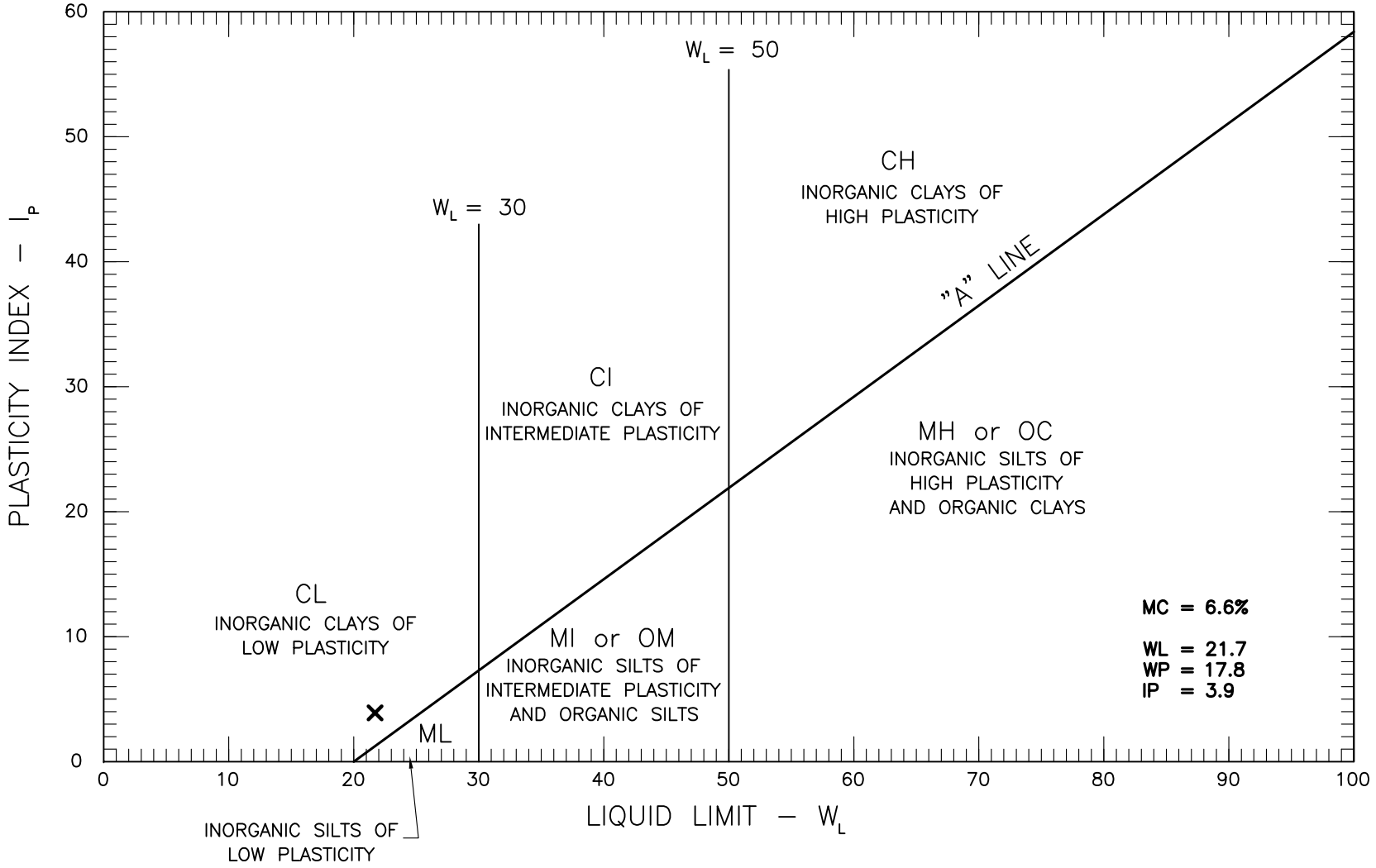


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-56-SPT3

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH56-SPT3

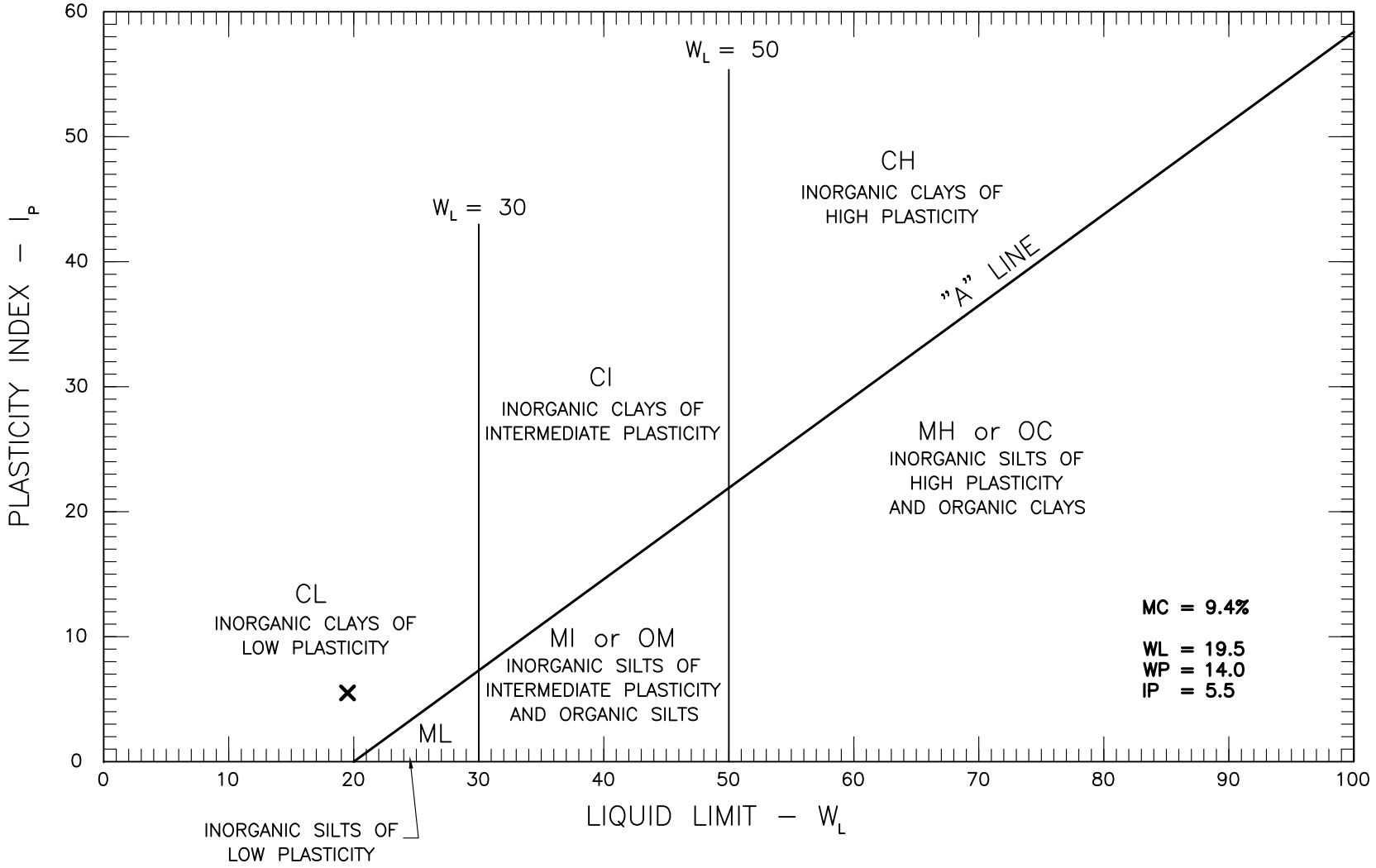


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-56-SPT4

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH56-SPT4

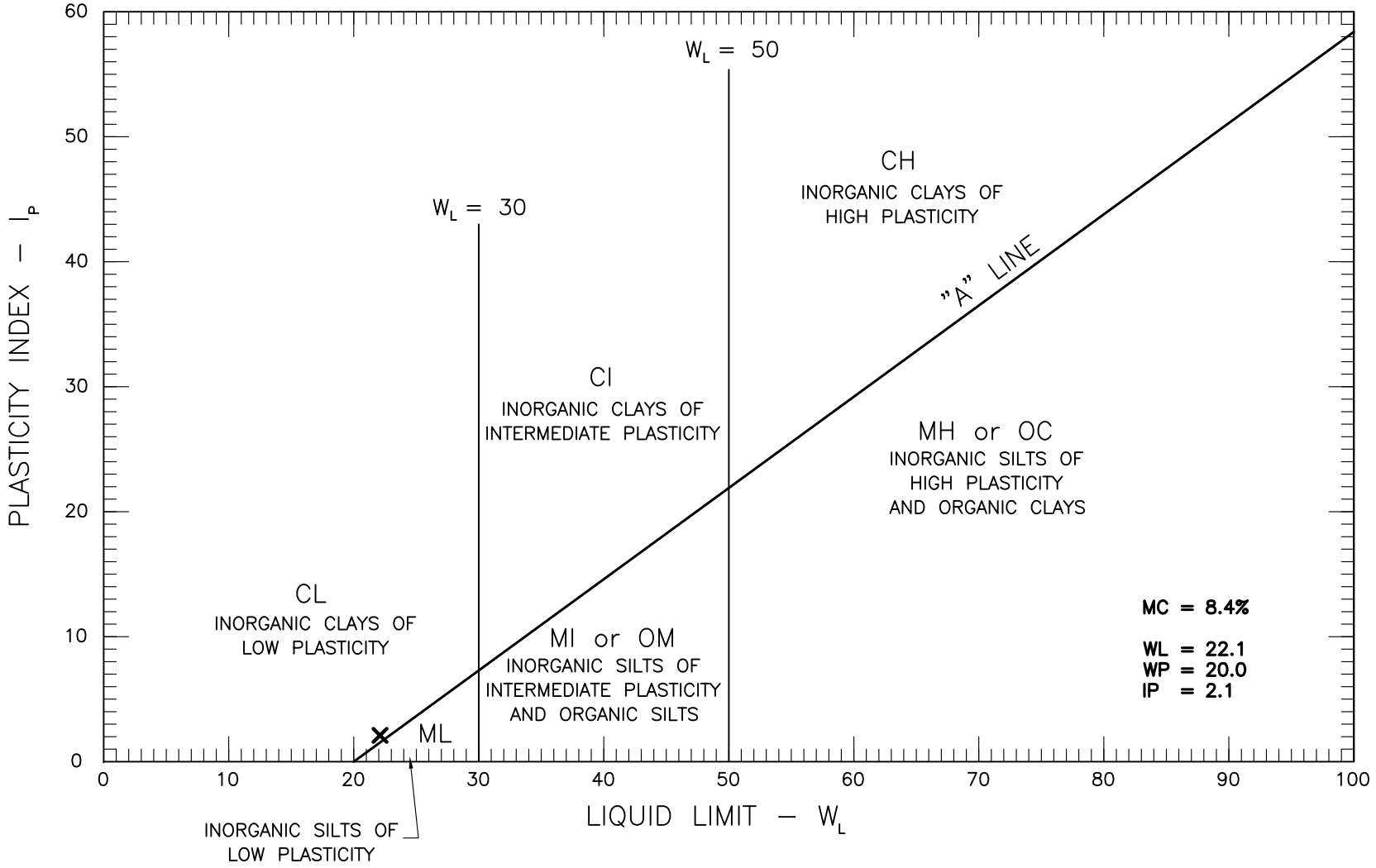


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-57-SPT2

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH57-SPT2

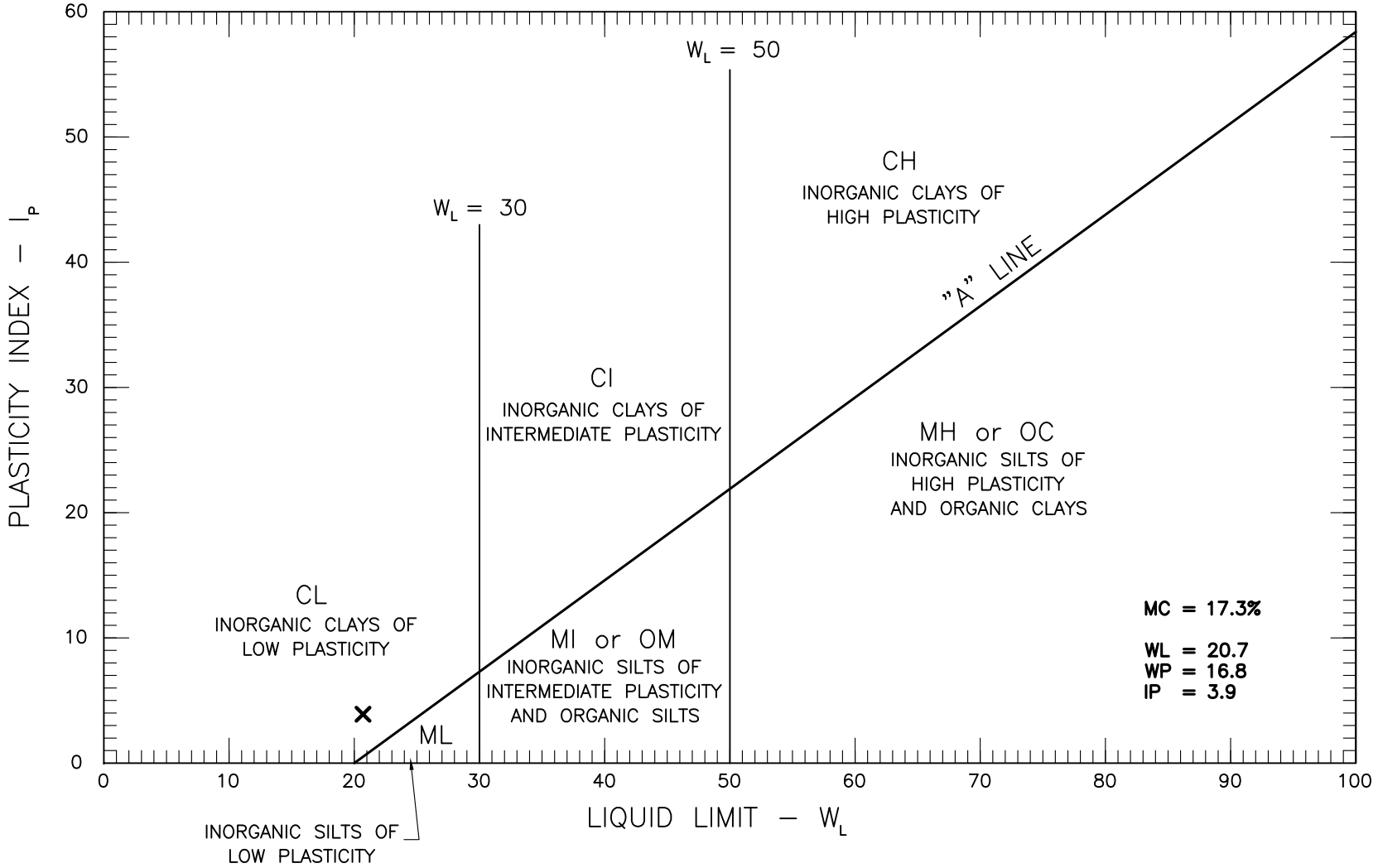


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-57-SPT4

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH57-SPT4

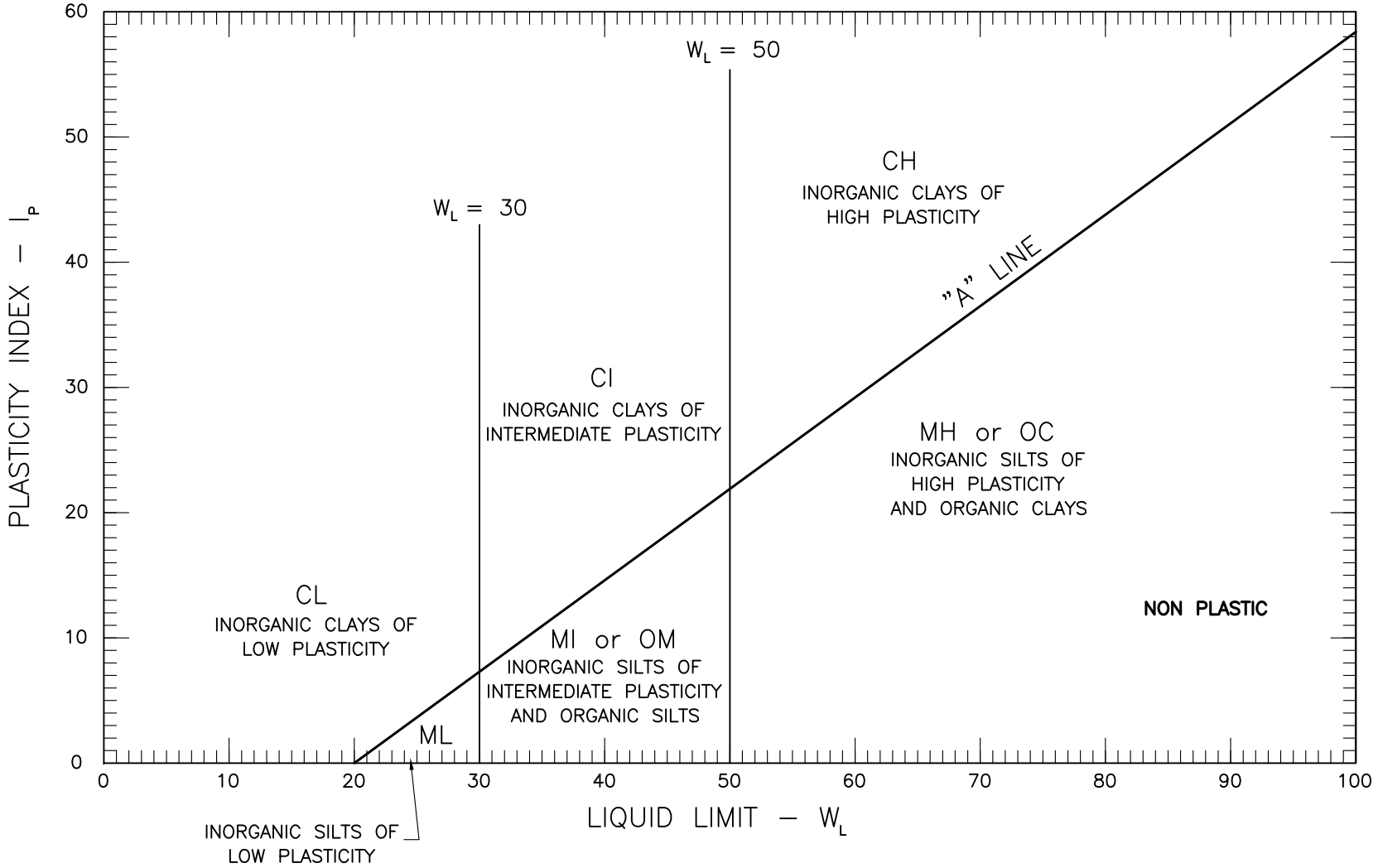


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-58-G2

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH58-G2

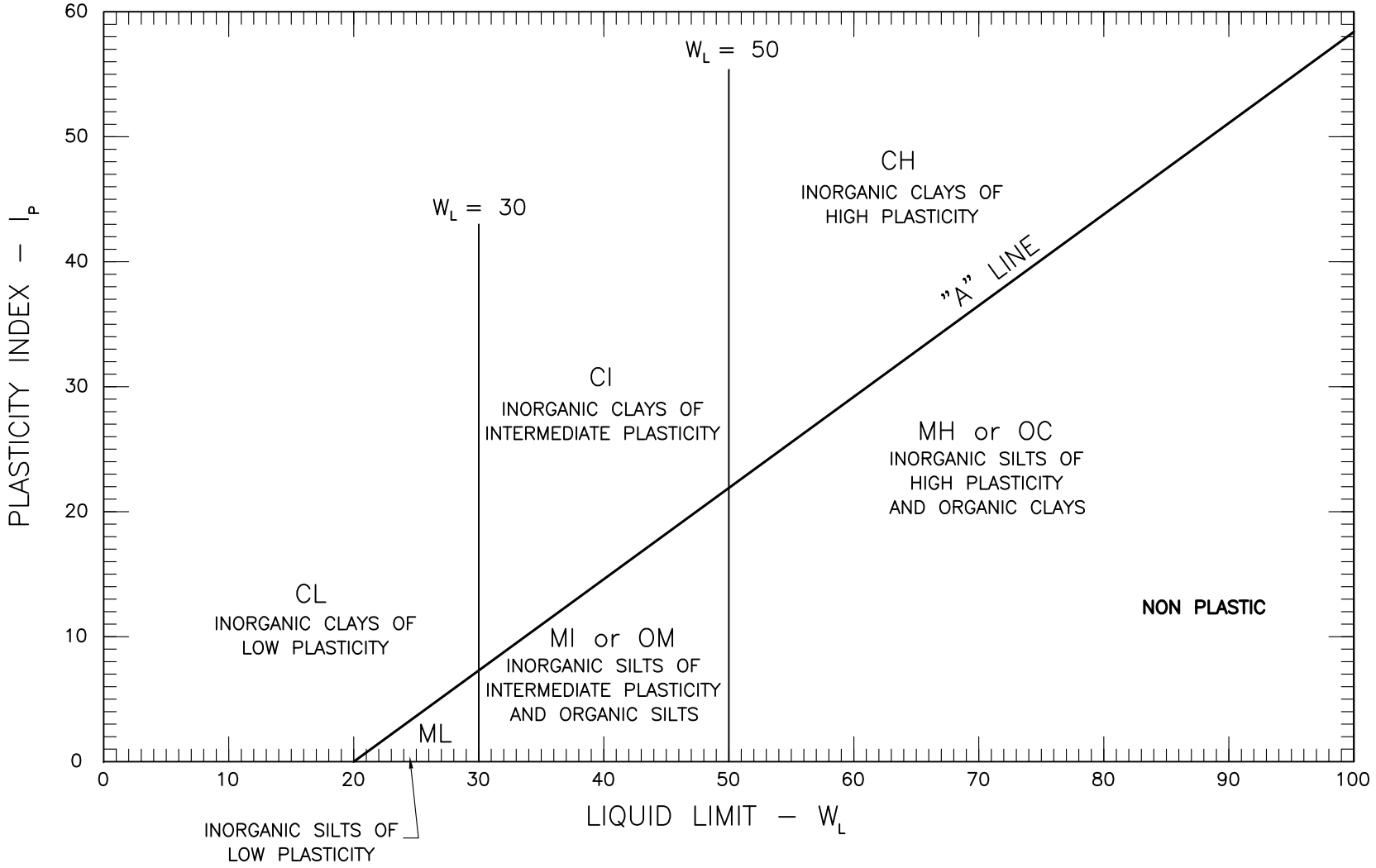


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-58-G4

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH58-G4

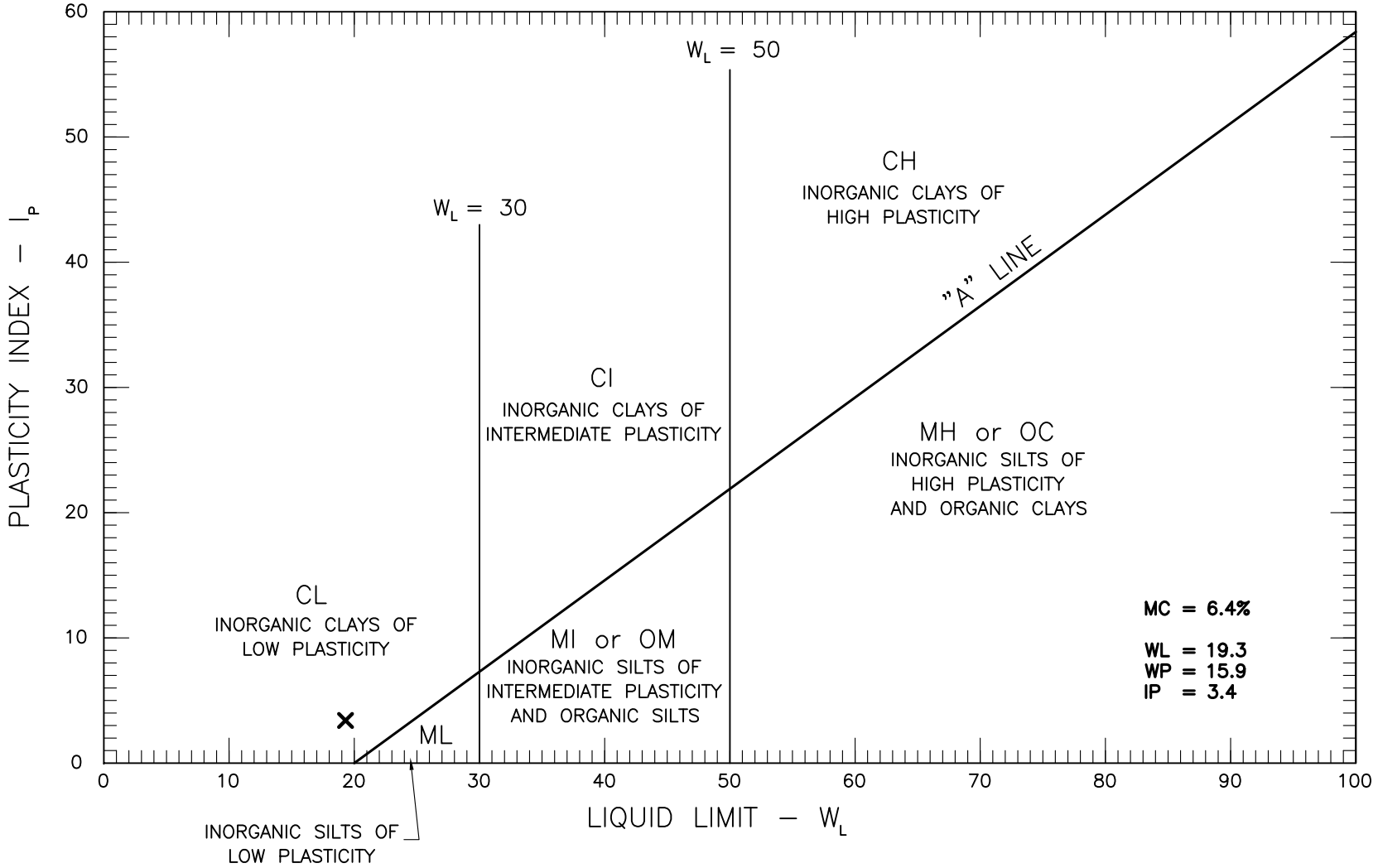


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250–564–4304 Fax 250–564–9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH–BGC11–58–G6

PROJECT NO.
K–3300

PLATE NO.
3300–AL–BH58–G6

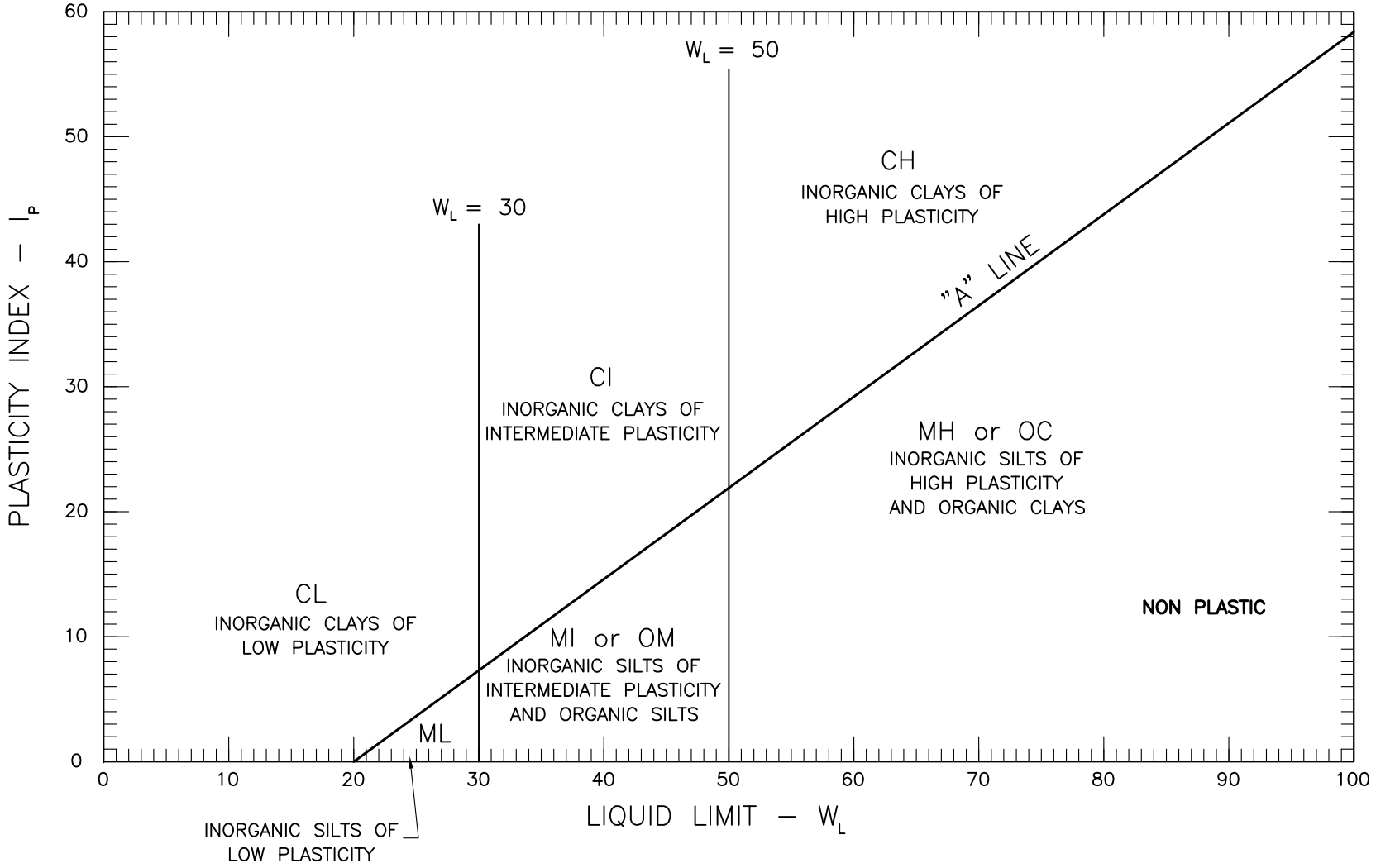


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-58-G8

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH58-G8

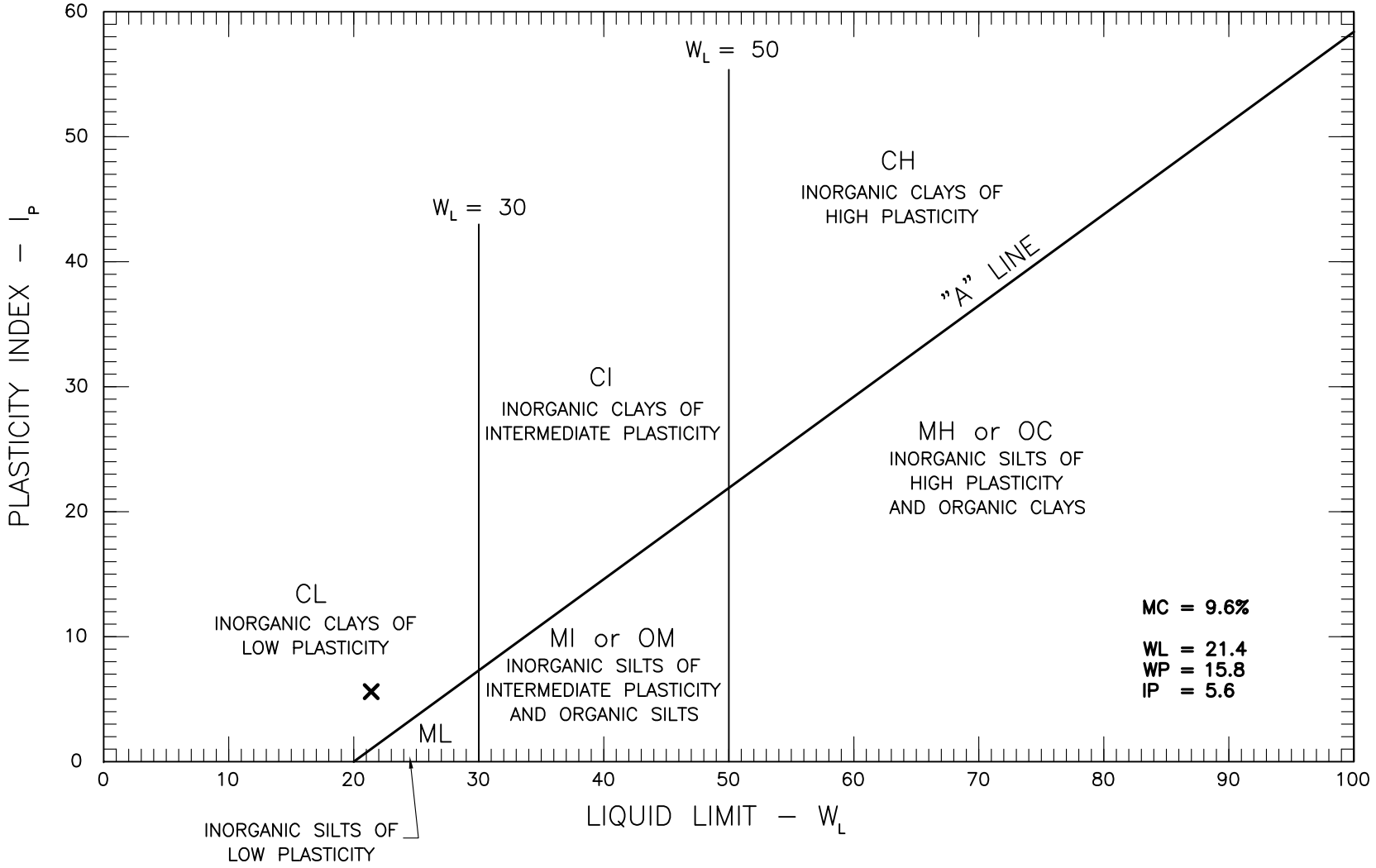


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-58-G10

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH58-G10

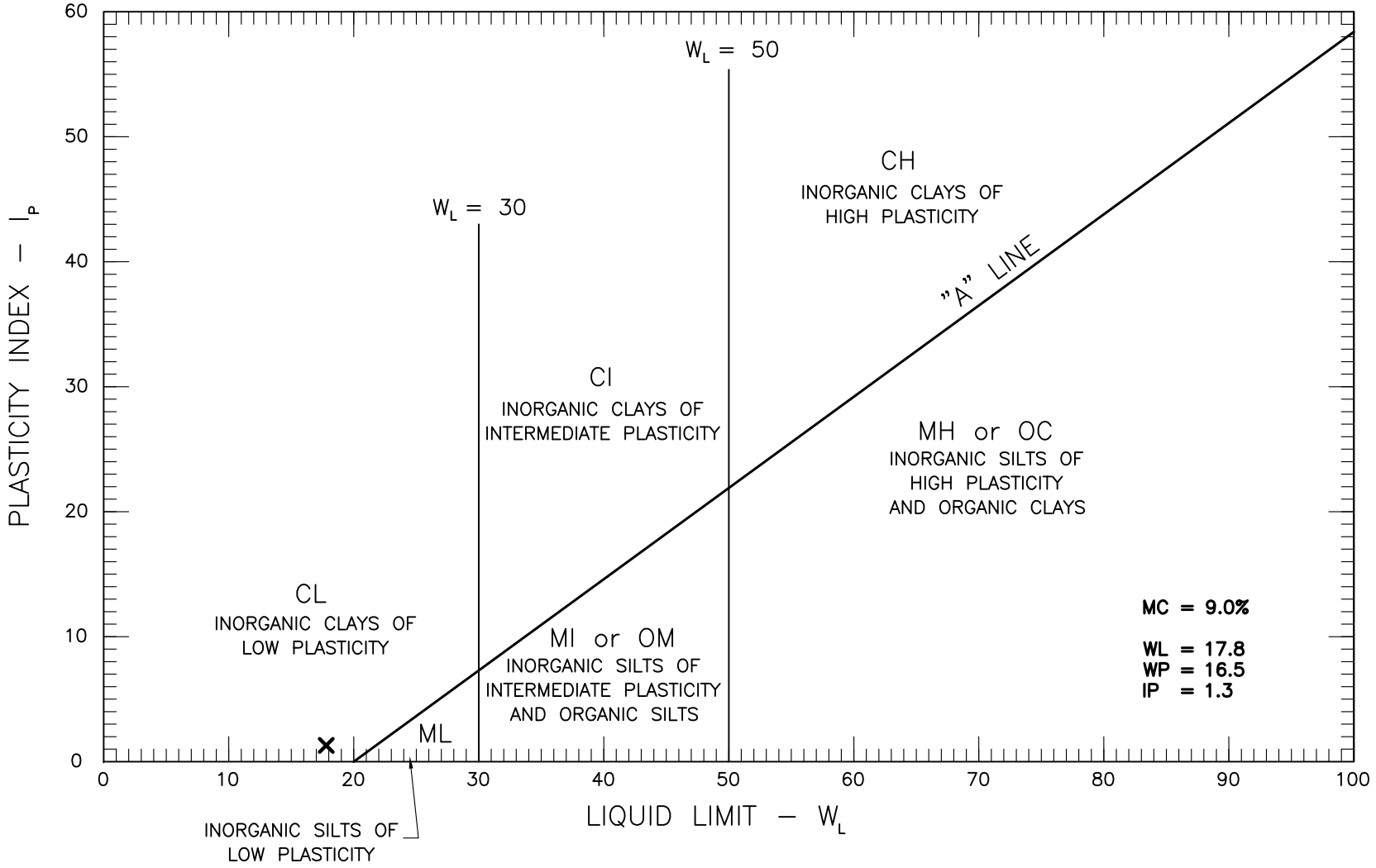


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-60-G3

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH60-G3

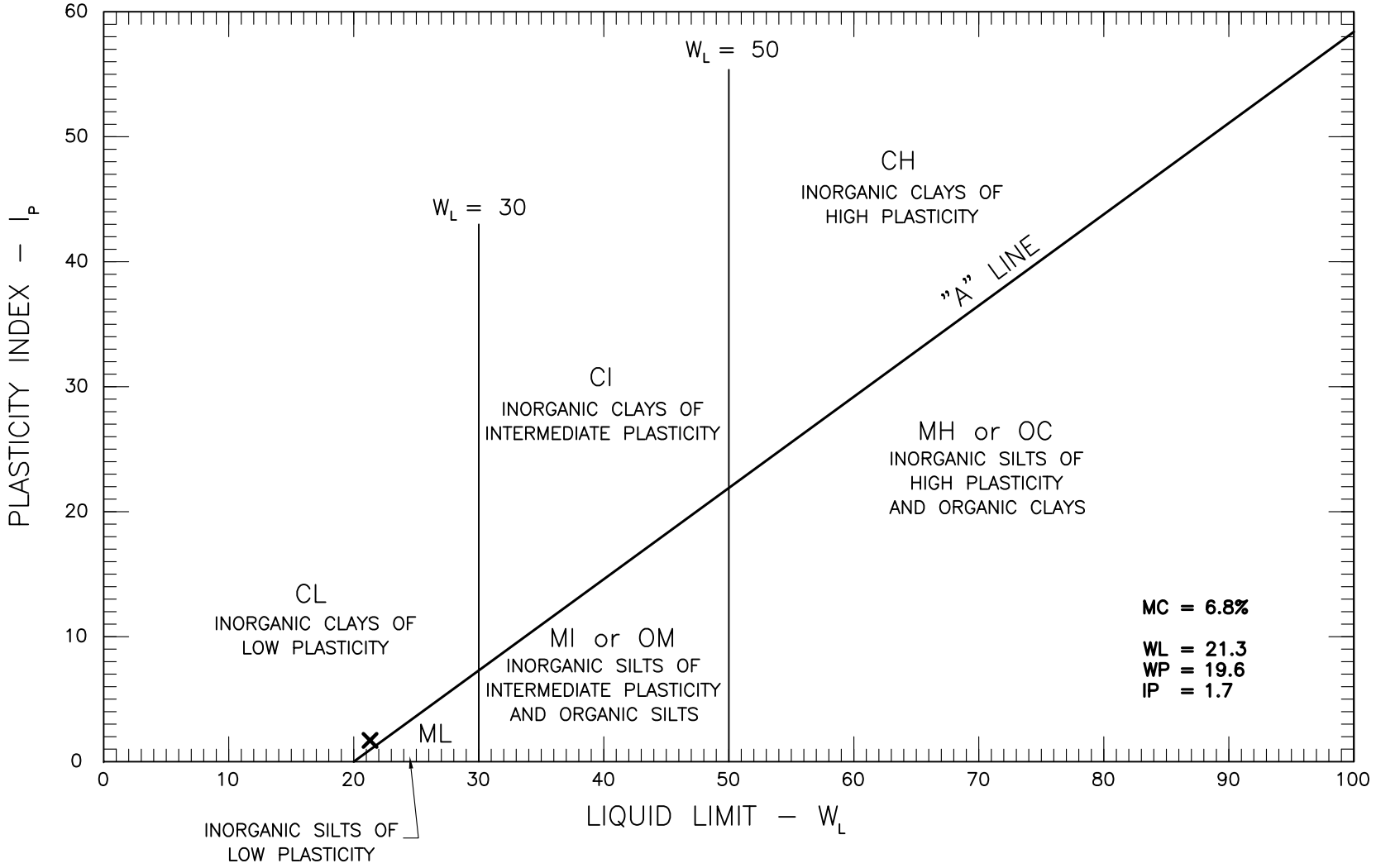


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-60-G5

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH60-G5

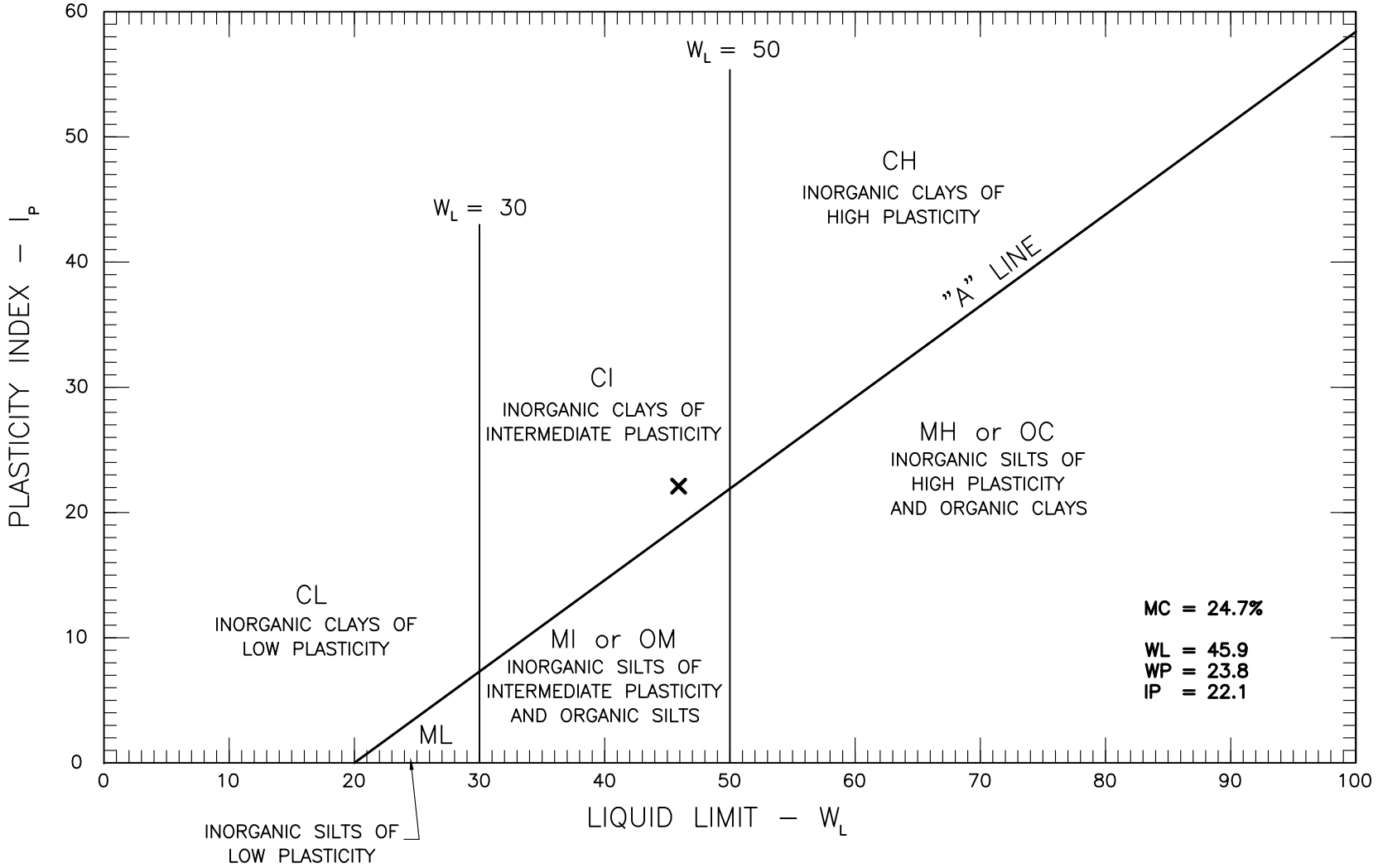


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-60-G7

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH60-G7

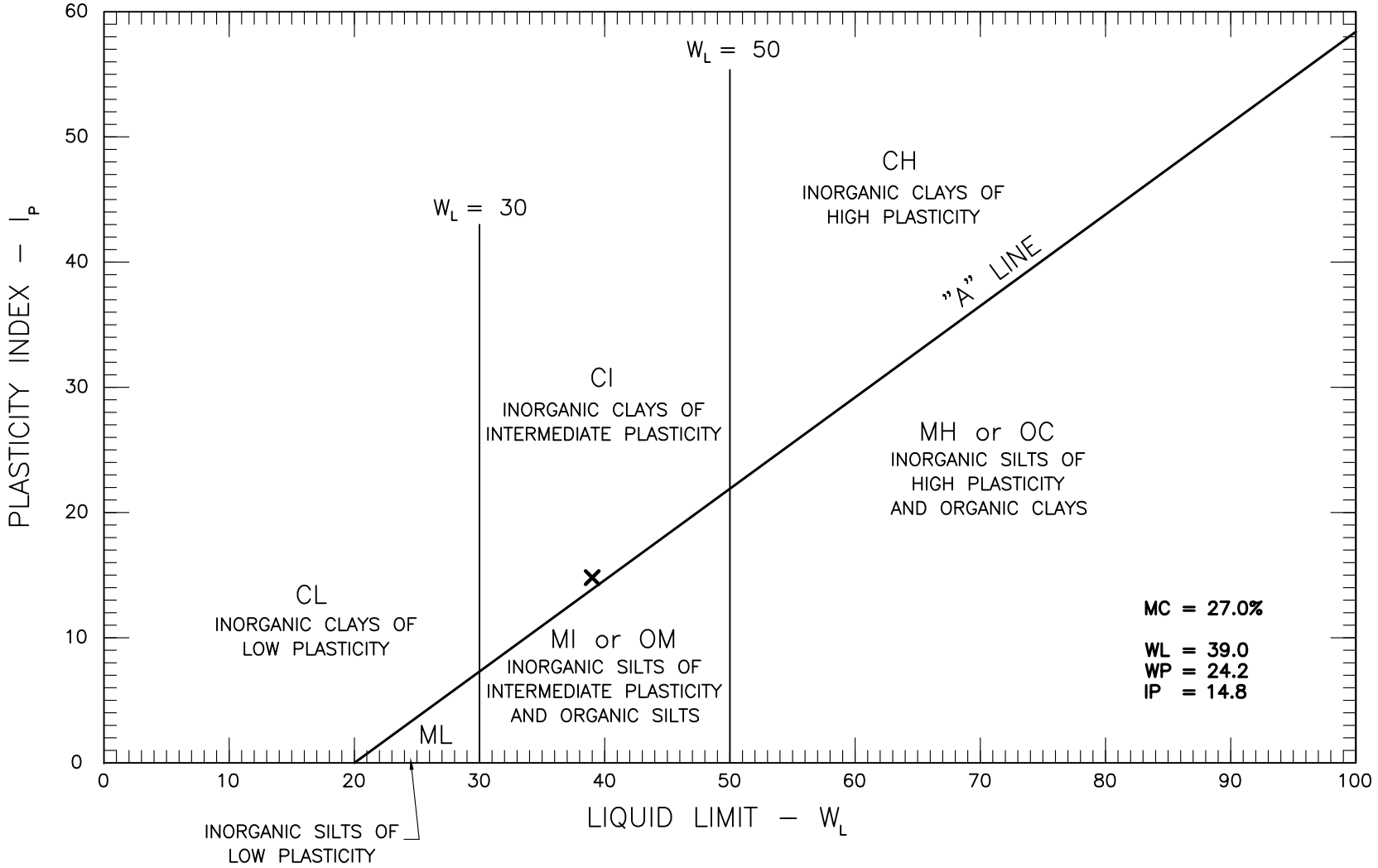


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-63-G2

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH63-G2

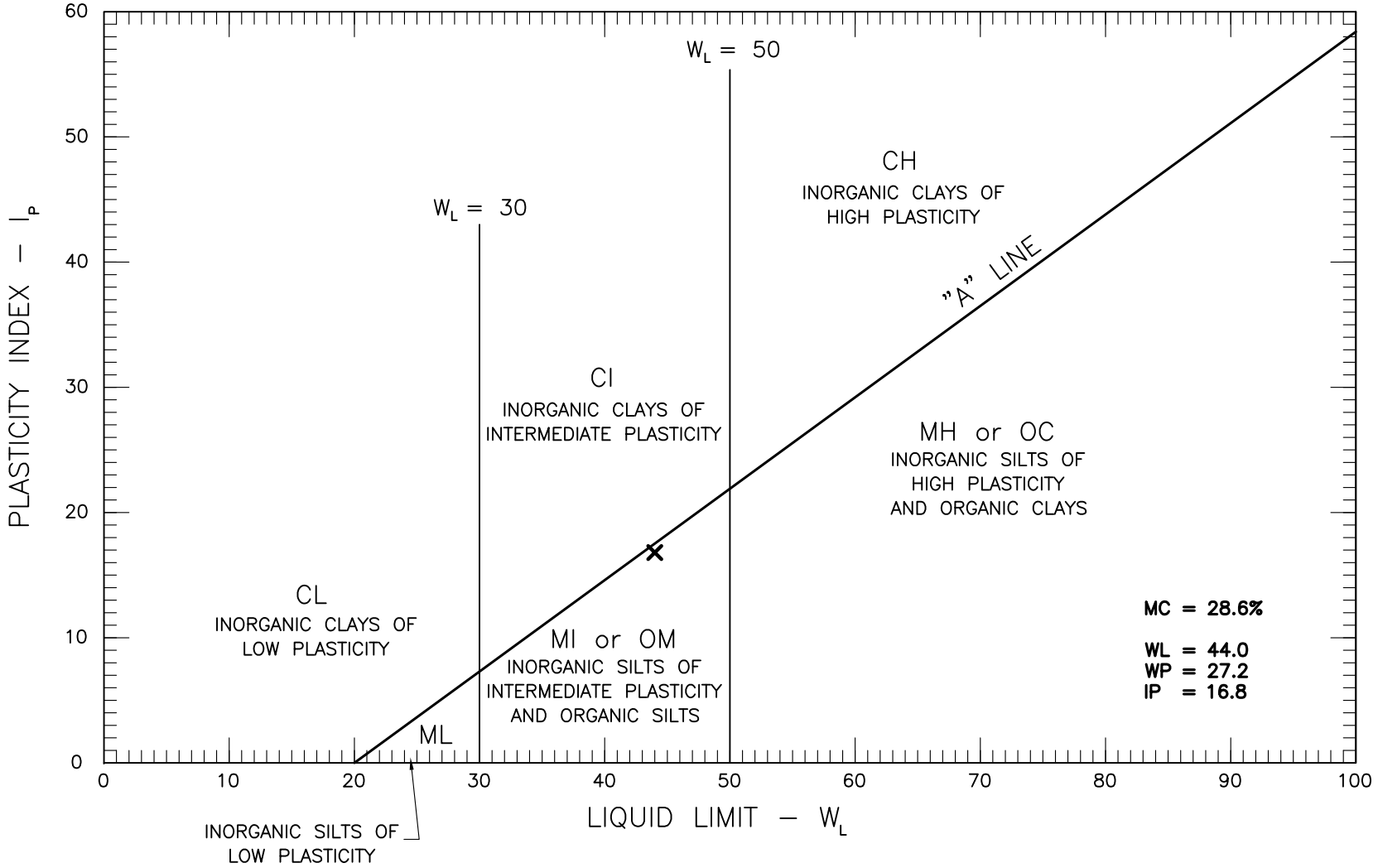


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-63-G5

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH63-G5

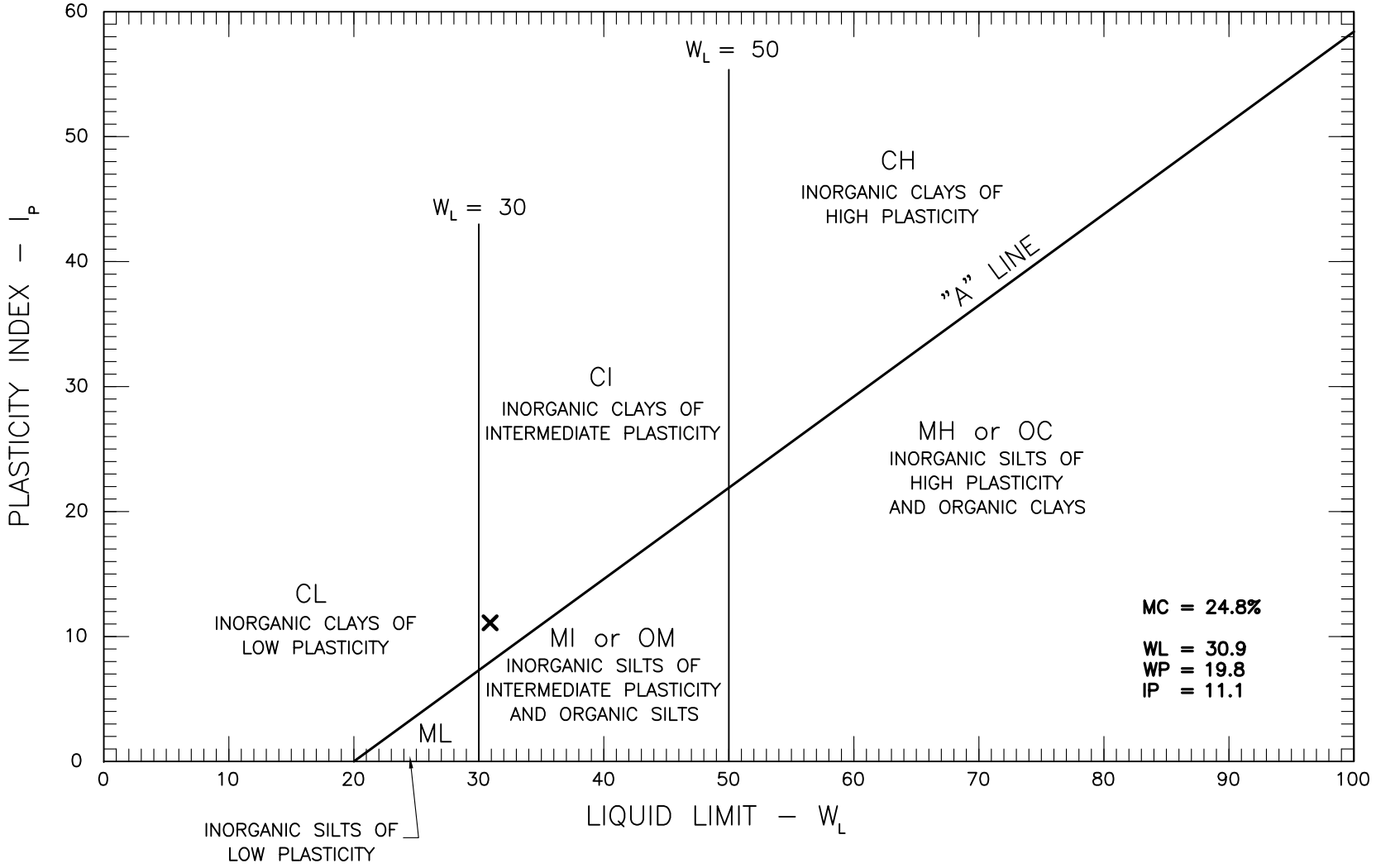


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-63-G9

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH63-G9

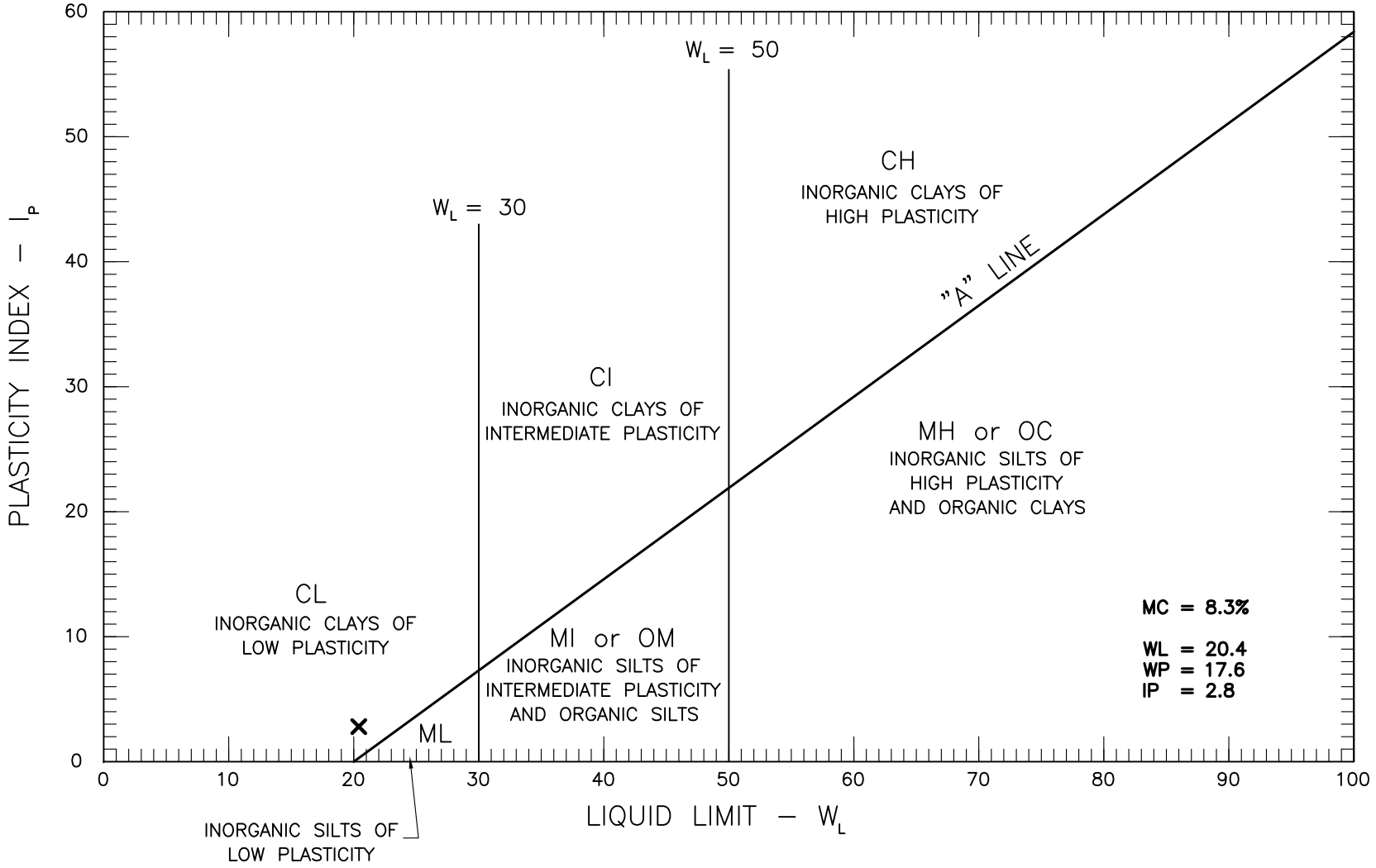


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-63-G12

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH63-G12

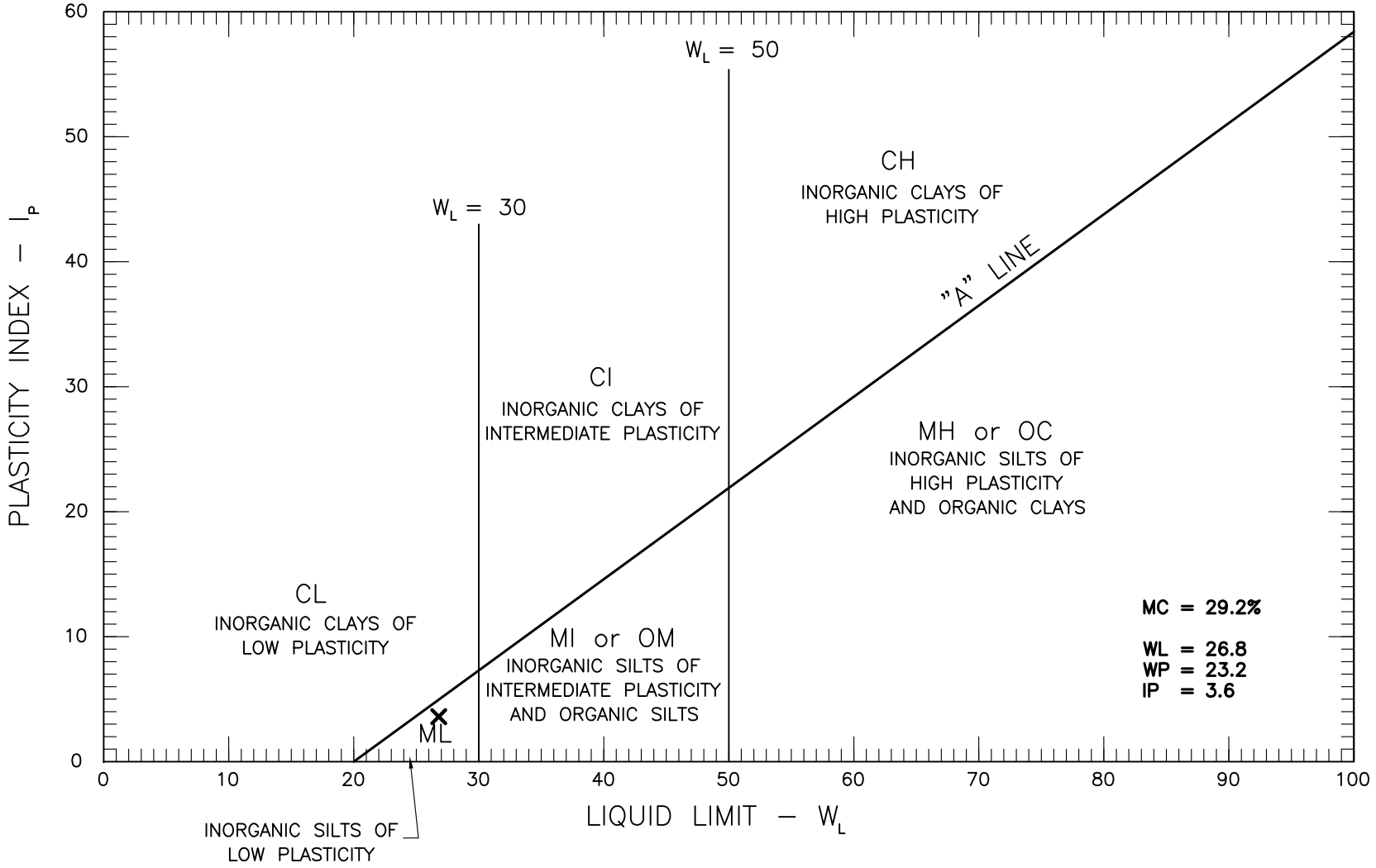


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF BH-BGC11-116-G2

PROJECT NO.
K-3300

PLATE NO.
3300-AL-BH116-G2

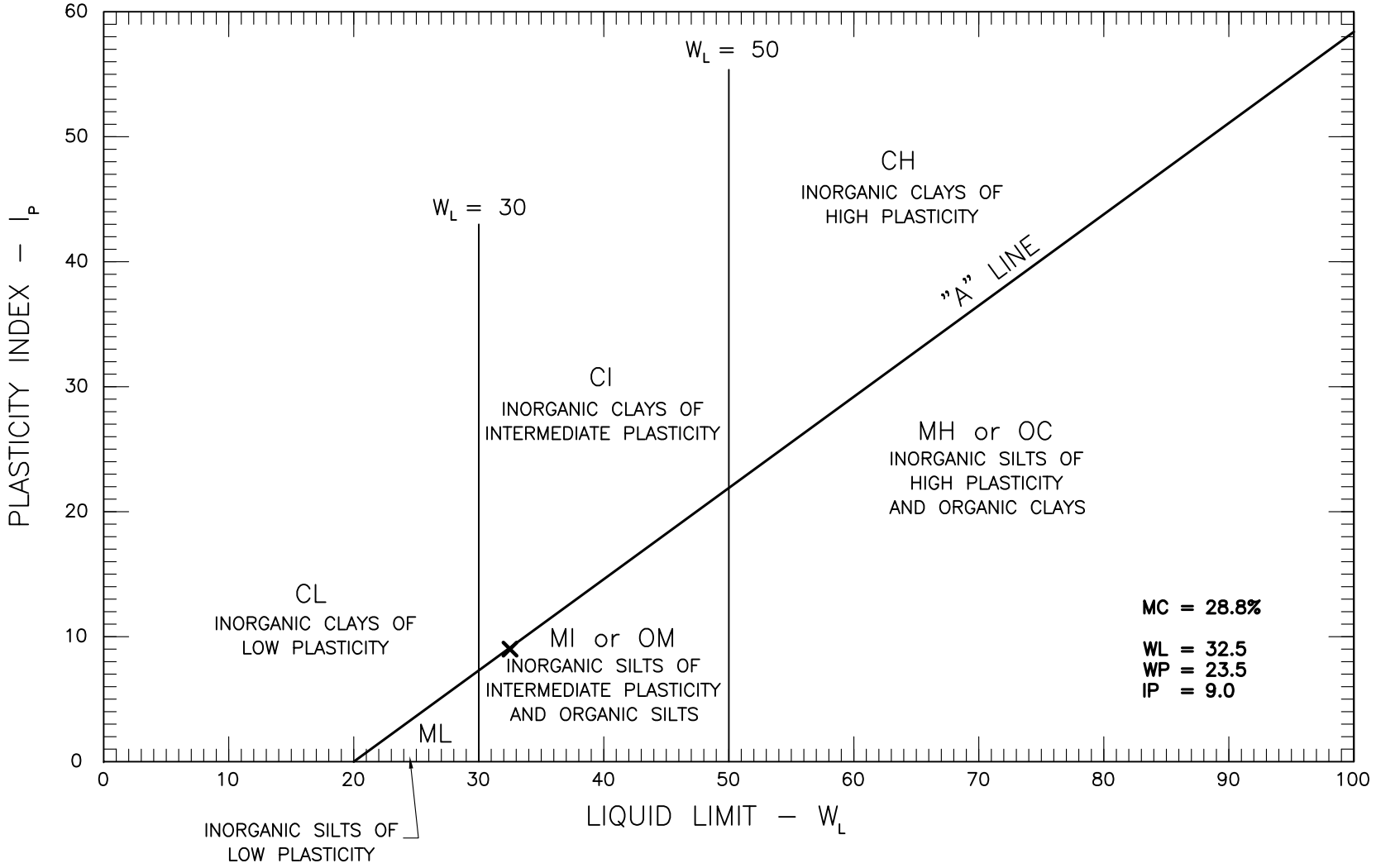


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF TP-BGC11-119-G1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-TP119-G1

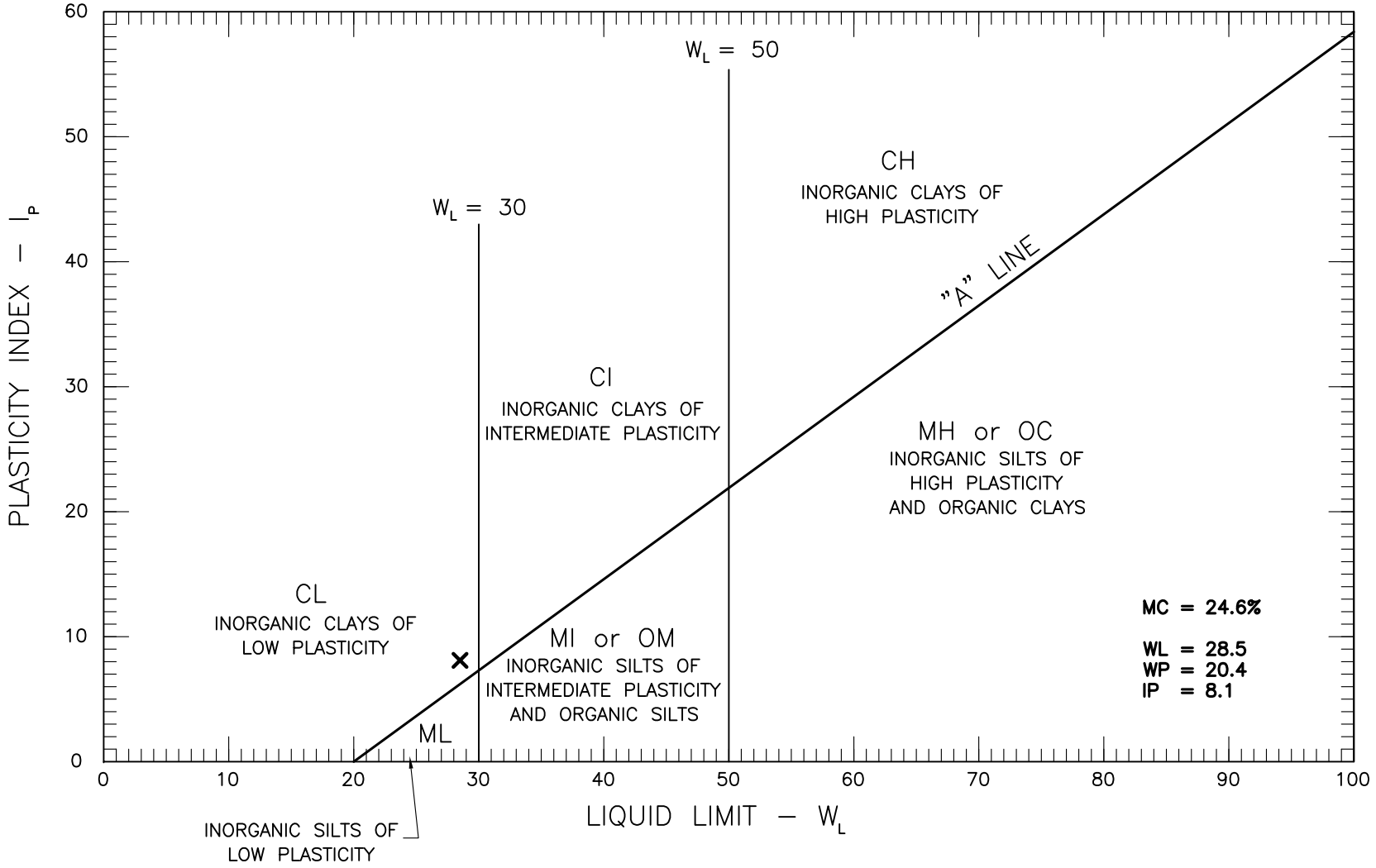


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF TP-BGC11-120-G1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-TP120-G1

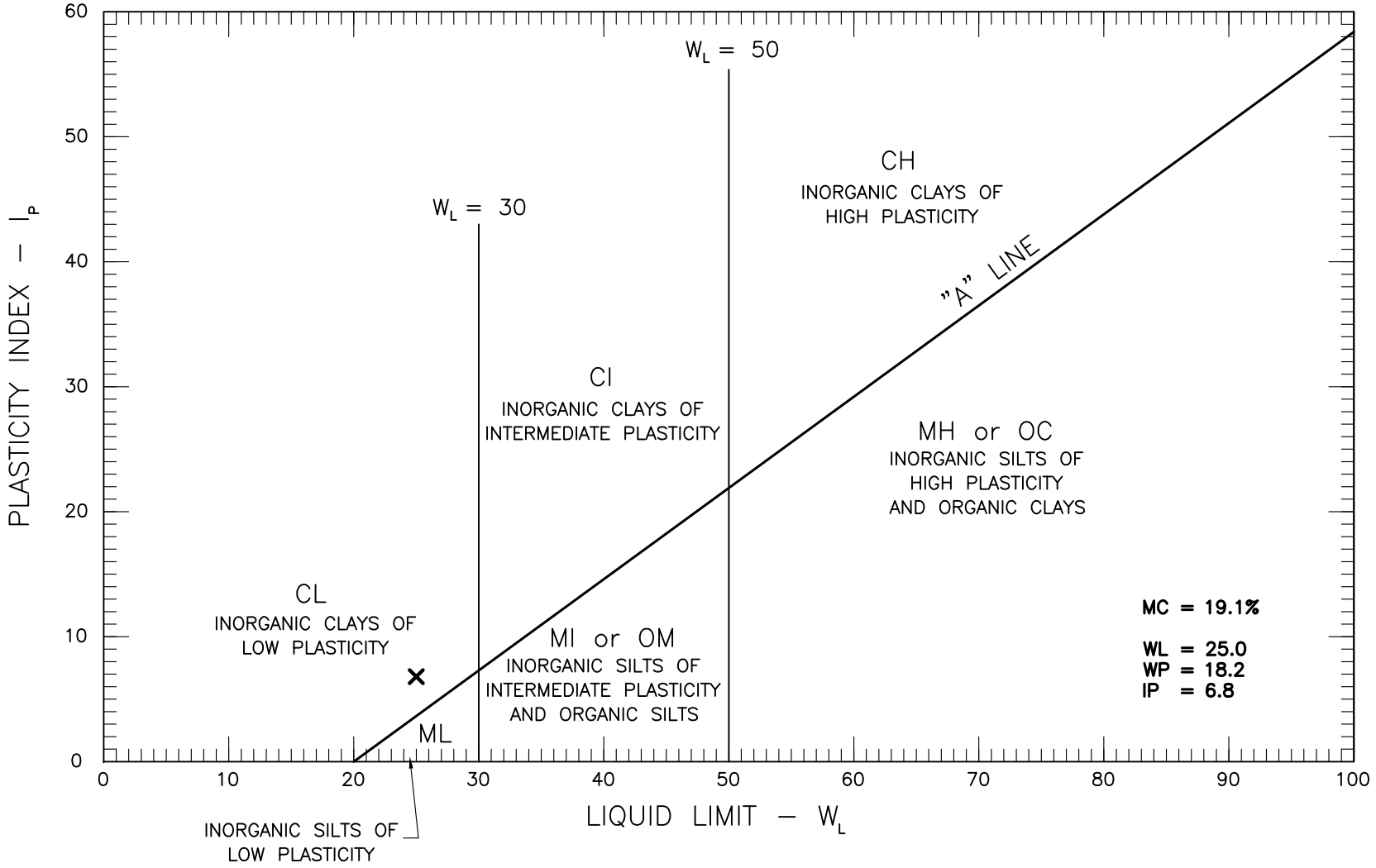


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF TP-BGC11-121, 2.9-3.1 m DEPTH

PROJECT NO.
K-3300

PLATE NO.
3300-AL-TP121

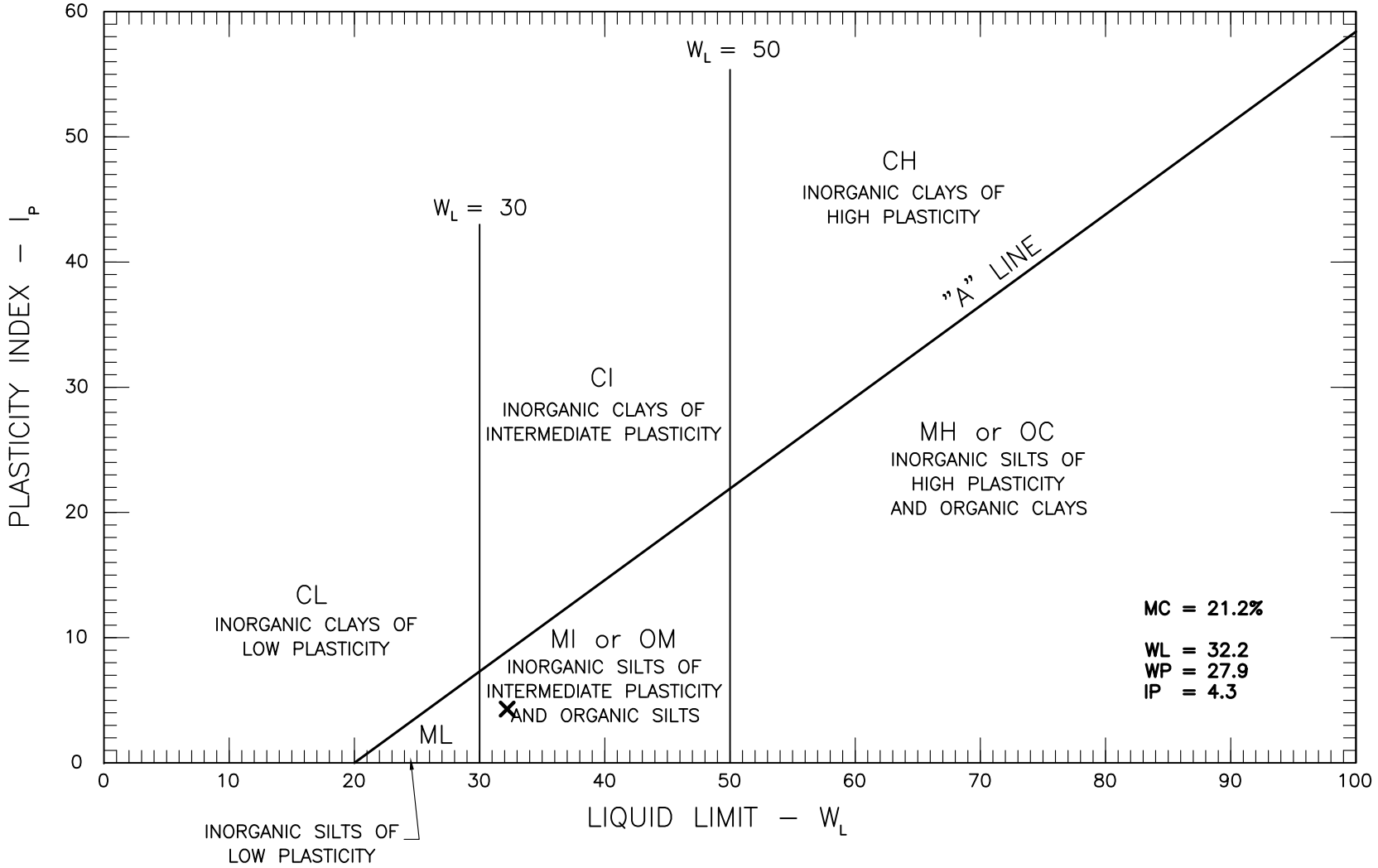


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF TP-BGC11-122, 5.4-5.8 m DEPTH

PROJECT NO.
K-3300

PLATE NO.
3300-AL-TP122

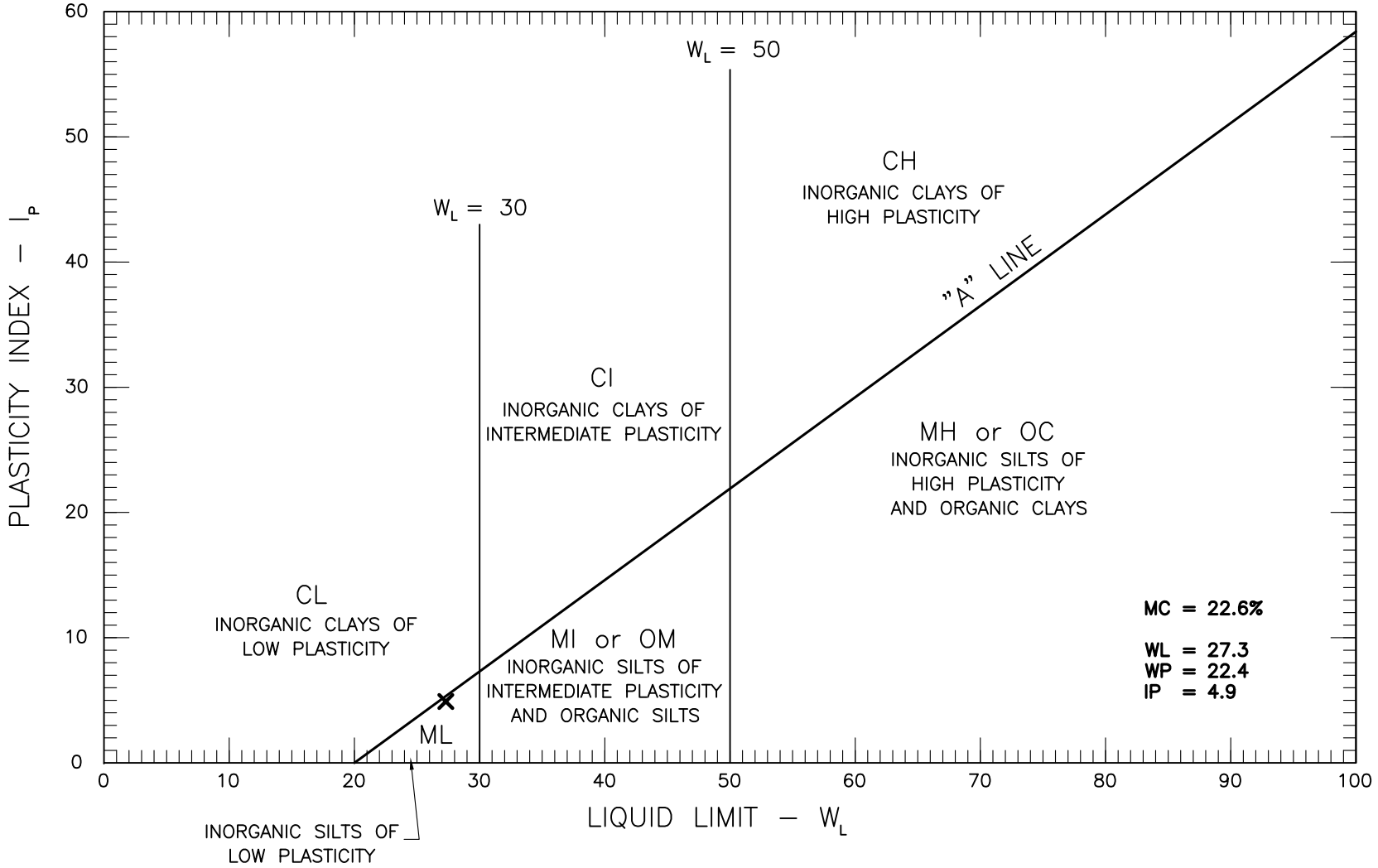


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF TP-BGC11-124-G1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-TP124-G1

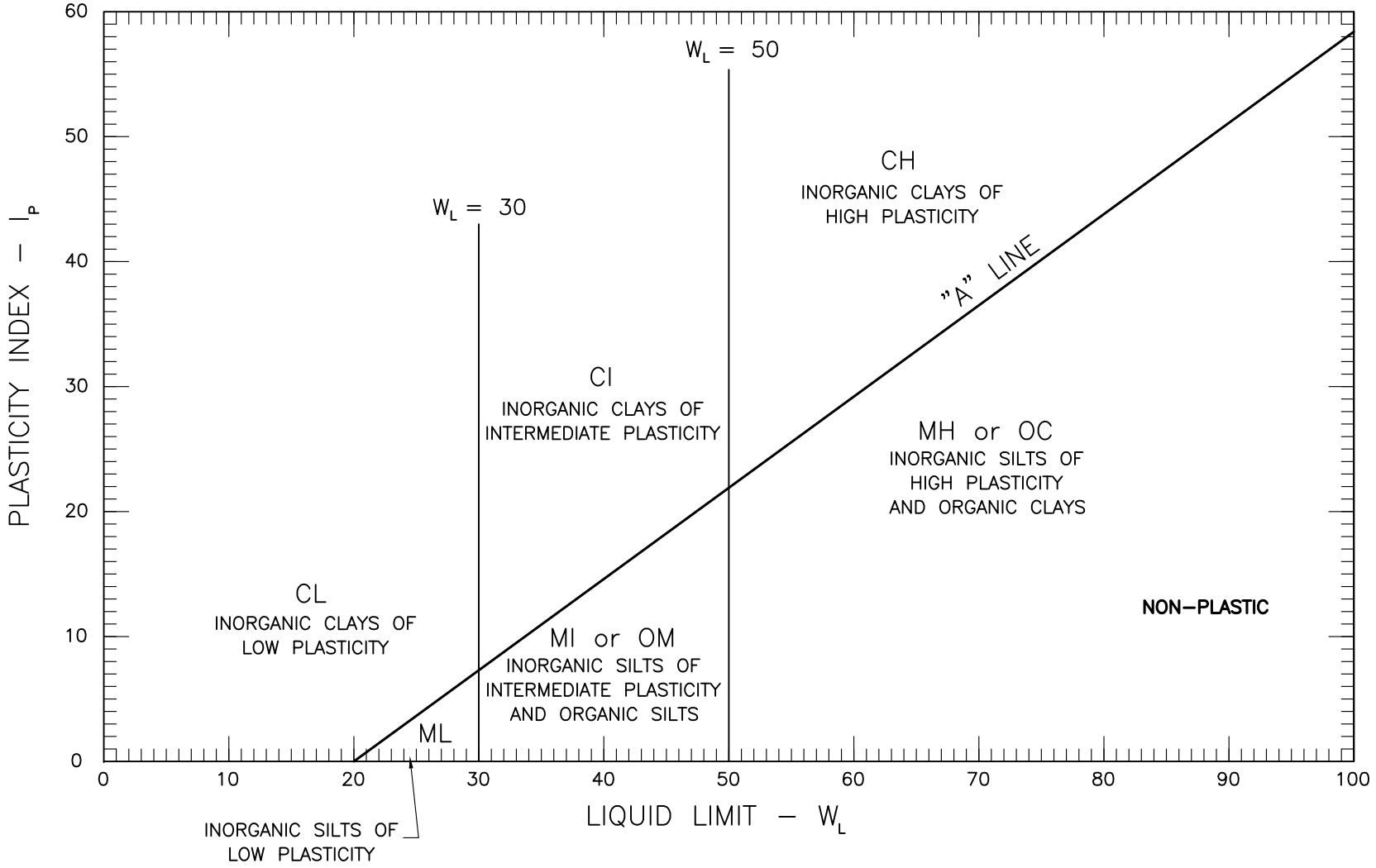


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF TP-BGC11-129-G1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-TP129-G1

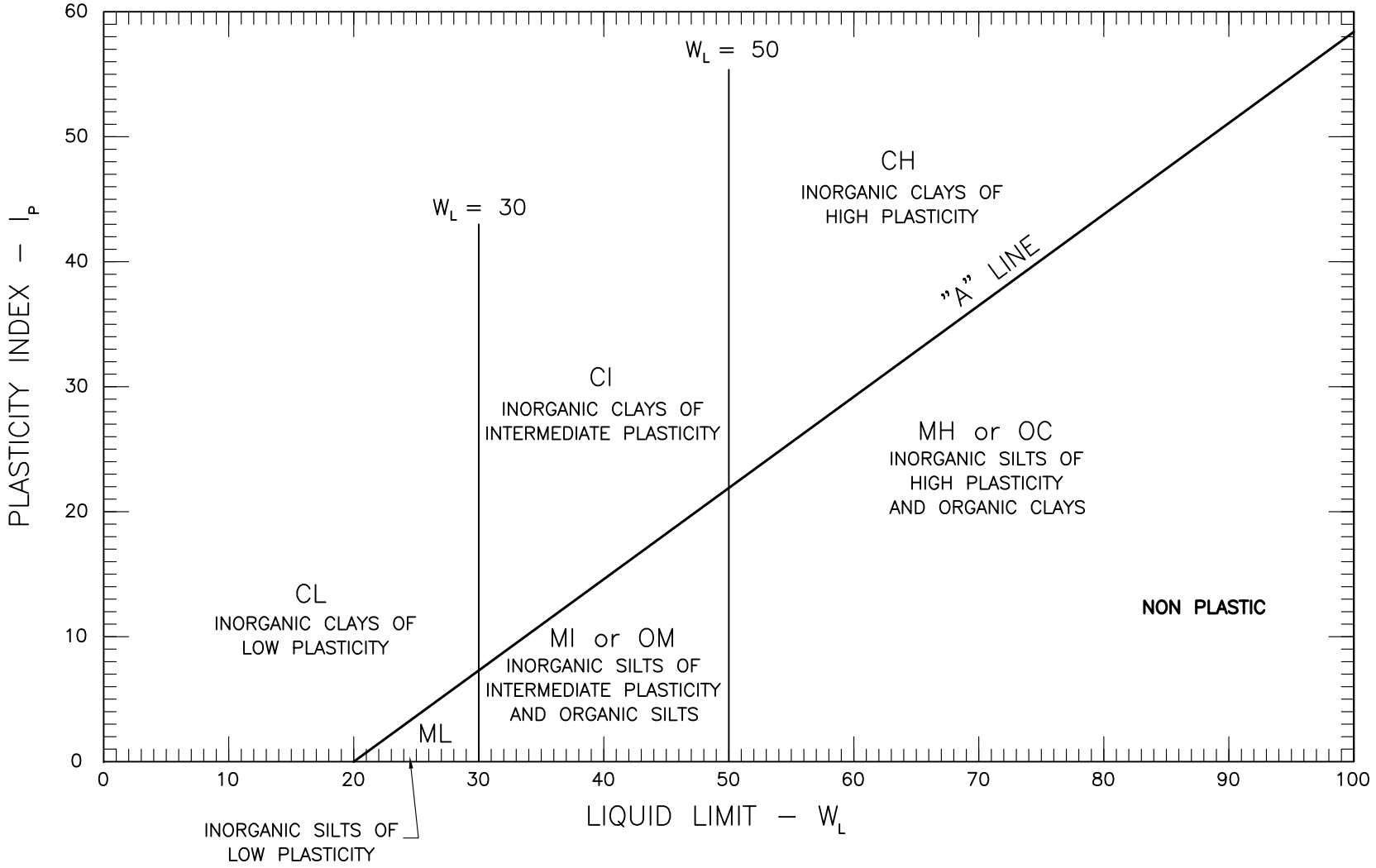


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250–564–4304 Fax 250–564–9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF TP–BGC11–130, 5.8–6.0 m DEPTH

PROJECT NO.
K–3300

PLATE NO.
3300–AL–TP130

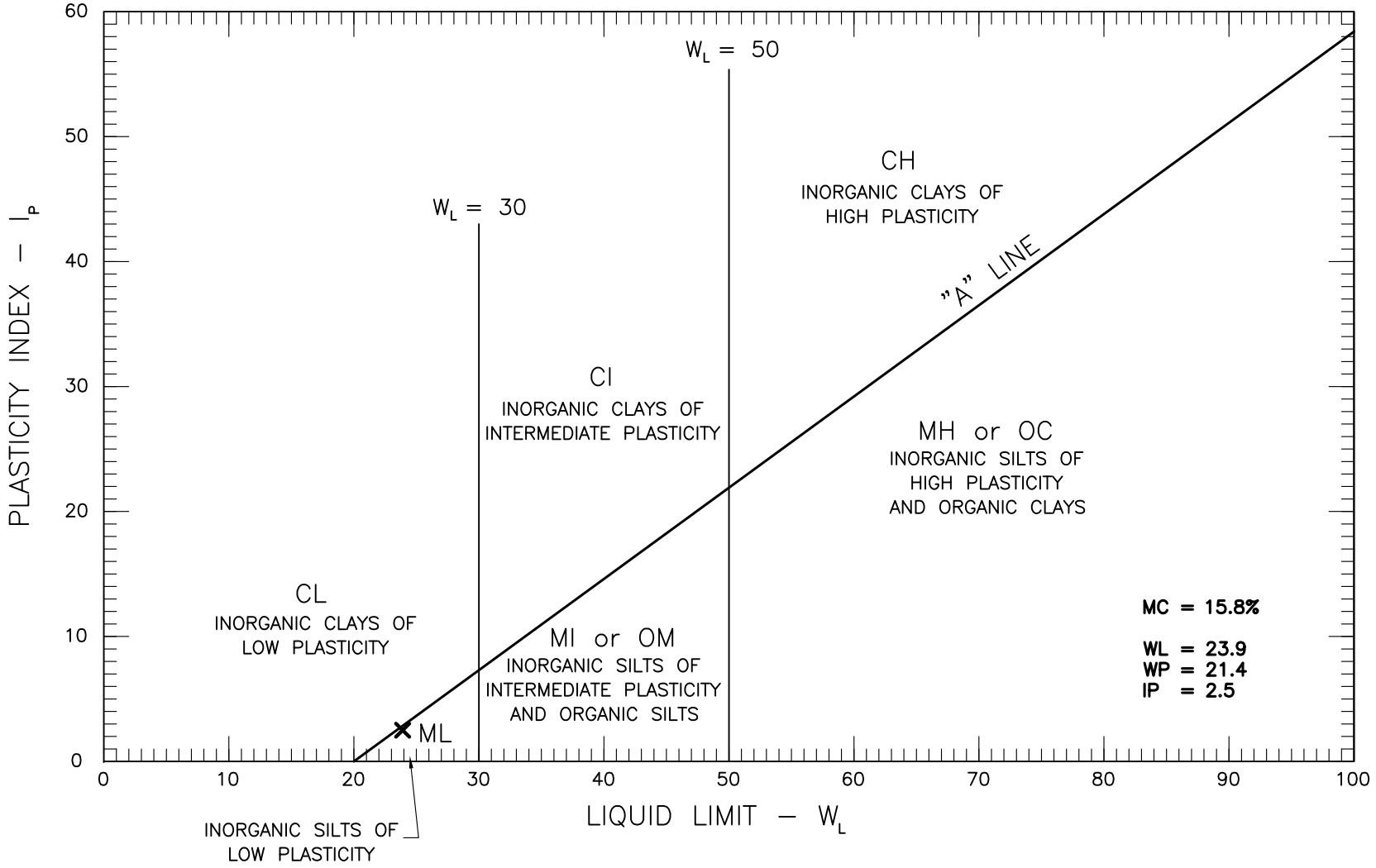


GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF TP-BGC11-131-G1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-TP131-G1



GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, B.C. V2N 1B2
Tel. 250-564-4304 Fax 250-564-9323

BGC ENGINEERING INC.
EAGLE GOLD SOILS AND AGGREGATE TESTING
DUBLIN GULCH, YUKON
ATTERBERG LIMITS OF TP-BGC11-140-G1

PROJECT NO.
K-3300

PLATE NO.
3300-AL-TP140-G1

Specific Gravity and Absorption of Rock For Erosion Control

ASTM D6473-99(2005)

Project #:	11-1415-0029/7000
Short Title:	Eagle Gold Mine Site Infra FS SI
Client	BGC (Proj 0792-006-04)
Location	Dublin Gulch,Yukon
Lab ID	141

Borehole	BH-BGC-29	BH-BGC-34				
Sample Number	1	1				
Depth (m)	27.46-27.77	26.60-36.96				
Bulk G_S (Oven Dry)	2.71	2.56				
Bulk G_S (SSD)	2.73	2.64				
Apparent G_S	2.77	2.78				
% Absorption	0.79	3.14				

Borehole						
Sample Number						
Depth (m)						
Bulk G_S (Oven Dry)						
Bulk G_S (SSD)						
Apparent G_S						
% Absorption						

Borehole						
Sample Number						
Depth (m)						
Bulk G_S (Oven Dry)						
Bulk G_S (SSD)						
Apparent G_S						
% Absorption						

Borehole						
Sample Number						
Depth (m)						
Bulk G_S (Oven Dry)						
Bulk G_S (SSD)						
Apparent G_S						
% Absorption						

G. Patton	September 19, 2011	LPerrey	October 27,2011
TESTED BY	DATE TESTED	CHECKED BY	DATE CHECKED

Golder Associates Ltd.
500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
Tel: +1 (604) 296 4200 Fax: +1 (604) 298 5253 www.golder.com

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

Specific Gravity and Absorption of Rock For Erosion Control

ASTM D6473-99(2005)

Project #:	11-1415-0029/7000
Short Title:	Eagle Gold
Client	BGC Engineering Inc.
Location	Yukon
Lab ID	141

Borehole	BH-BGC11-40A	BH-BGC11-40B	BH-BGC11-43	BH-BGC11-45	BH-BGC11-46	BH-BGC11-62
Sample Number	2	UCS 1	1	UCS	UCS	UCS
Depth (m)	30.98-31.30	21.81-22.06	4.24-4.48	17.80-18.04	13.11-13.65	28.59-28.84
Bulk G_S (Oven Dry)	2.67	2.74	2.71	2.76	2.69	2.59
Bulk G_S (SSD)	2.68	2.75	2.71	2.78	2.70	2.63
Apparent G_S	2.70	2.78	2.73	2.81	2.72	2.69
% Absorption	0.36	0.54	0.30	0.61	0.48	1.33

Borehole	BH-BGC11-69					
Sample Number	UCS 1					
Depth (m)	12.26-12.54					
Bulk G_S (Oven Dry)	2.52					
Bulk G_S (SSD)	2.59					
Apparent G_S	2.70					
% Absorption	2.64					

Borehole						
Sample Number						
Depth (m)						
Bulk G_S (Oven Dry)						
Bulk G_S (SSD)						
Apparent G_S						
% Absorption						

Borehole						
Sample Number						
Depth (m)						
Bulk G_S (Oven Dry)						
Bulk G_S (SSD)						
Apparent G_S						
% Absorption						

G. Patton	September 19, 2011	LP	October 7,2011
TESTED BY	DATE TESTED	CHECKED BY	DATE CHECKED

Golder Associates Ltd.
500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
Tel: +1 (604) 296 4200 Fax: +1 (604) 298 5253 www.golder.com

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-06 Method B

Project No.:	11-1415-0029/7000	**Borehole**	**TP-BGC11-50**
Client:	BGC (Proj 0792-006-04)	**Sample No.:**	SA1
Project:	Eagle Gold Mine Site Infra FS SI	**Depth (m):**	N/A
Location:	Dublin Gulch,Yukon	**Lab Sch No:**	141

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		15.54		
Test Number		1		2
Flask Number		6		7
Air Removal Method		Vacuum		Vacuum
Mass of Flask (g)		173.40		171.33
Mass of Flask + Dry Soil (g)	M_P	271.20		262.18
Mass of Dry Soil (g)		97.64		90.59
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	734.09		727.40
Test Temperature (g)	T_t	20.50		20.50
Mass of Flask + Water (g)	$M_{\rho w,t}$	671.34		669.18
Mass of Dish + Dry Soil (g)		467.92		443.84
Mass of Dish (g)		370.28		353.25
Mass of Oven Dry Soil (g)	M_S	97.64		90.59
Temperature Coefficient	K	1.00		1.00
Density of Solids (g/cm3)	ρ_s	2.80		2.80
Specific Gravity at Test Temperature	G_t	2.80		2.80
Specific Gravity at 20ºC	$G_{20°C}$	2.80		2.80
AVERAGE SPECIFIC GRAVITY		**2.80**		

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		84.46
Mass of Sample in Water (g)	A	457.51
Mass of Sample @ SSD (g)	B	718.88
Mass of Oven Dryed Sample (g)	C	682.7
Bulk G (Oven Dry)	C/(B-A)	2.61
Bulk G (SSD)	B/(B-A)	2.75
Apparent	C/(C-A)	3.03
Absorbtion (%)	(B-C)/C	5.30

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	$G_{avg\ @20°C}$	2.99

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

SK	September 28, 2011	LP	October 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-06 Method B

Project No.:	11-1415-0029/7000	**Borehole**	**TP-BGC11-58**
Client:	BGC (Proj 0792-006-04)	**Sample No.:**	SA2
Project:	Eagle Gold	**Depth (m):**	1.9-2.0
Location:	Dublin Gulch, Yukon	**Lab Sch No:**	141

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		100		
Test Number		1		2
Flask Number		6		7
Air Removal Method		Vacuum		Vacuum
Mass of Flask (g)		173.41		171.35
Mass of Flask + Dry Soil (g)	M_P	277.90		273.49
Mass of Dry Soil (g)		104.10		101.83
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	738.77		734.87
Test Temperature (g)	T_t	21.70		21.50
Mass of Flask + Water (g)	$M_{\rho w,t}$	671.22		669.08
Mass of Dish + Dry Soil (g)		466.51		472.53
Mass of Dish (g)		362.41		370.70
Mass of Oven Dry Soil (g)	M_S	104.10		101.83
Temperature Coefficient	K	1.00		1.00
Density of Solids (g/cm3)	ρ_s	2.85		2.83
Specific Gravity at Test Temperature	G_t	2.85		2.83
Specific Gravity at 20ºC	$G_{20°C}$	2.85		2.83
AVERAGE SPECIFIC GRAVITY		**2.84**		

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		
Mass of Sample in Water (g)	A	0
Mass of Sample @ SSD (g)	B	0
Mass of Oven Dryed Sample (g)	C	0
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	
Apparent	C/(C-A)	
Absorbtion (%)	(B-C)/C	

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	Gavg @20°C	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

SK	November 1, 2002	LP	NOVEMBER 3,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-06 Method B

Project No.:	11-1415-0029/7000	**Borehole**	**TP-BGC11-67**
Client:	BGC (Proj 0792-006-04)	**Sample No.:**	SA1
Project:	Eagle Gold	**Depth (m):**	0.7-0.9
Location:	Dublin Gulch, Yukon	**Lab Sch No:**	141

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		100		
Test Number		1		2
Flask Number		4		5
Air Removal Method		Vacuum		Vacuum
Mass of Flask (g)		172.75		174.83
Mass of Flask + Dry Soil (g)	M_P	272.17		278.92
Mass of Dry Soil (g)		99.45		104.02
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	733.82		738.64
Test Temperature (g)	T_t	21.60		21.80
Mass of Flask + Water (g)	$M_{\rho w,t}$	671.06		672.89
Mass of Dish + Dry Soil (g)		452.55		461.38
Mass of Dish (g)		353.10		357.36
Mass of Oven Dry Soil (g)	M_S	99.45		104.02
Temperature Coefficient	K	1.00		1.00
Density of Solids (g/cm3)	ρ_s	2.71		2.72
Specific Gravity at Test Temperature	G_t	2.72		2.72
Specific Gravity at 20ºC	$G_{20°C}$	2.72		2.72
AVERAGE SPECIFIC GRAVITY		**2.72**		

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		
Mass of Sample in Water (g)	A	0
Mass of Sample @ SSD (g)	B	0
Mass of Oven Dryed Sample (g)	C	0
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	
Apparent	C/(C-A)	
Absorbtion (%)	(B-C)/C	

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	Gavg @20°C	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

SK	November 1, 2002	LP	NOVEMBER 3,2011
TESTED BY	DATE	CHECKED BY	DATE

GEONORTH ENGINEERING LTD.

3975 18th Avenue
Prince George, B.C., V2N 1B2
Phone 250-564-4304
Fax 250-564-9323
E-mail mail@geonorth.ca

December 7, 2011

K-3300

BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC V6Z 2A9

Attention: Pete Quinn

Dear Sirs:

Re:Eagle Gold BH-BGC11-42 Sample 5 Specific Gravity Test Results

Listed below are results for the specific gravity test that you requested for the above mentioned sample.

Bulk Specific Gravity:	2.533
Bulk Specific Gravity Saturated Surface Dry	2.577
Apparent Specific Gravity	2.649
Absorption	1.718%

If you require any further information, please do not hesitate to call me at our office at (250) 564-4304.

Yours truly,

GeoNorth Engineering Ltd.

Per: Hans Jorgensen
Supervisor, Technical Services

DETERMINATION OF TOTAL OR WATER-SOLUBLE SULPHATE ION CONTENT OF SOIL

CSA A23.2-3B

October 27, 2011
Project Number: 11-1415-0029-7000

BGC Engineering Inc.
500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTENTION: Mr. Peter Quinn, Ph.D, P.Eng.

PROJECT: Eagle Gold Mine Site Infra FS S1, Dublin Gulch, Yukon

Date Tested: October 25, 2011

Sample ID	Date Sampled	Total Sulphate Ion Content %	Water-Soluble Sulphate Ion Content %
TP-BGC11-51 SA2 2.4-2.8 m	29 June 2011	0.13	Not Applicable *
TP-BGC11-60 SA1 0.7-0.9 m	7 July 2011	0.07	Not Applicable *
TP-BGC11-84 SA1 0.4-0.6 m	13 July 2011	0.07	Not Applicable *

Note:
1. * Per Clause 5.1.4, the water-soluble sulphate ion content need not be tested when the total sulphate ion content is less than 0.20%
2. Detection limit for the test is 0.005%

Tested by: S. John, AScT

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the samples provided. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

MOISTURE - DENSITY RELATIONSHIP REPORT

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

ATTN: Peter Quinn

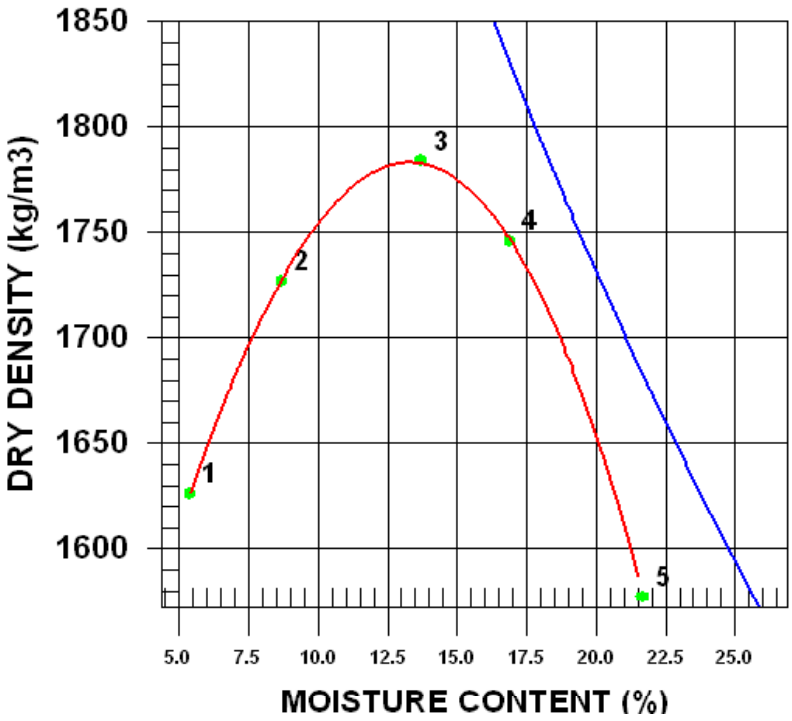
PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

PROCTOR NO. 3 DATE TESTED 2011.Nov.10 DATE RECEIVED 2011.Sep.13 DATE SAMPLED 2011.Aug.18

INSITU MOISTURE N/A %
SAMPLED BY Client
TESTED BY MM
SUPPLIER TP-BGC11-119
SOURCE G1 @ 0.9 - 1.1m
MATERIAL IDENTIFICATION
MAJOR COMPONENT Silt
SIZE 4.75mm
DESCRIPTION
ROCK TYPE

COMPACTION STANDARD Modified Proctor, ASTM D1557
COMPACTION PROCEDURE A: 101.6mm Mold, Passing 4.75mm
RAMMER TYPE Automatic
PREPARATION Moist
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN %
OVERSIZE SPECIFIC GRAVITY
TOTAL NUMBER OF TRIALS 5



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1714	1626	5.4
2	1877	1727	8.7
3	2028	1784	13.7
4	2041	1746	16.9
5	1919	1577	21.7

ZERO AIR VOIDS CURVE FOR ESTIMATED SPECIFIC GRAVITY OF 2.65	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1780	13.5

COMMENTS
Permeability at 95% MPD (Over Optimum Moisture Conditions): 4.2 x 10^-8 cm/s

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

MOISTURE - DENSITY RELATIONSHIP REPORT

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

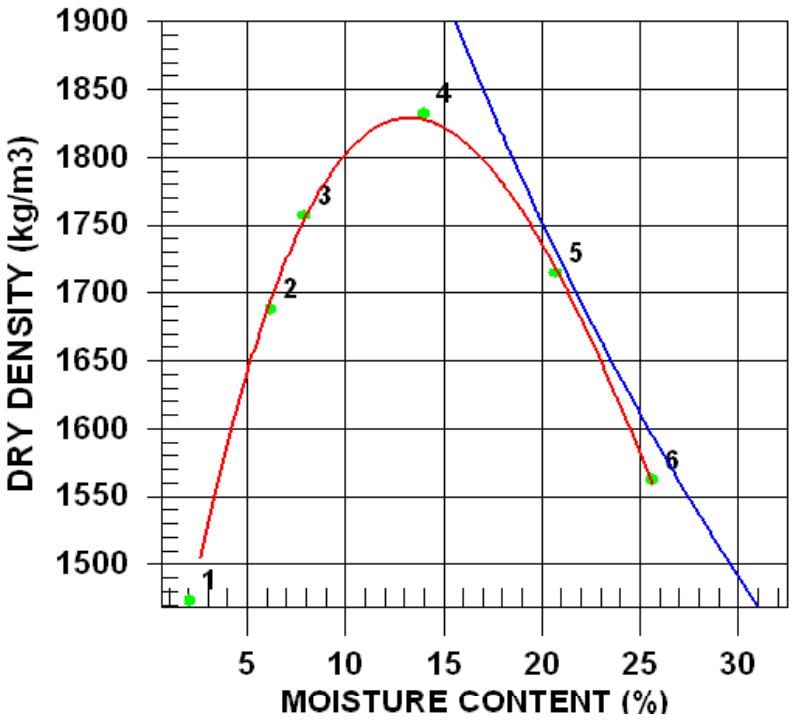
ATTN: Peter Quinn

PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

PROCTOR NO. 4 DATE TESTED 2011.Nov.10 DATE RECEIVED 2011.Sep.13 DATE SAMPLED 2011.Aug.18

INSITU MOISTURE	N/A %	COMPACTION STANDARD	Modified Proctor, ASTM D1557
SAMPLED BY	Client	COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
TESTED BY	MM	RAMMER TYPE	Automatic
SUPPLIER	TP-BGC11-120	PREPARATION	Moist
SOURCE	G1 @ 3.8 - 4.0m	OVERSIZE CORRECTION METHOD	ASTM 4718
MATERIAL IDENTIFICATION		RETAINED 4.75mm SCREEN	2.4 %
MAJOR COMPONENT	Silt	OVERSIZE SPECIFIC GRAVITY	2.65
SIZE	25 mm	TOTAL NUMBER OF TRIALS	6
DESCRIPTION			
ROCK TYPE			



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1504	1473	2.1
2	1793	1688	6.2
3	1896	1757	7.9
4	2089	1832	14.0
5	2070	1715	20.7
6	1962	1562	25.6

ZERO AIR VOIDS CURVE FOR ESTIMATED SPECIFIC GRAVITY OF 2.70	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1830	13.5
OVERSIZE CORRECTED	1840	13.0

COMMENTS
Permeability at 95% MPD (Over Optimum Moisture Conditions): 6.5 x 10^-8 cm/s

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

MOISTURE - DENSITY RELATIONSHIP REPORT

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

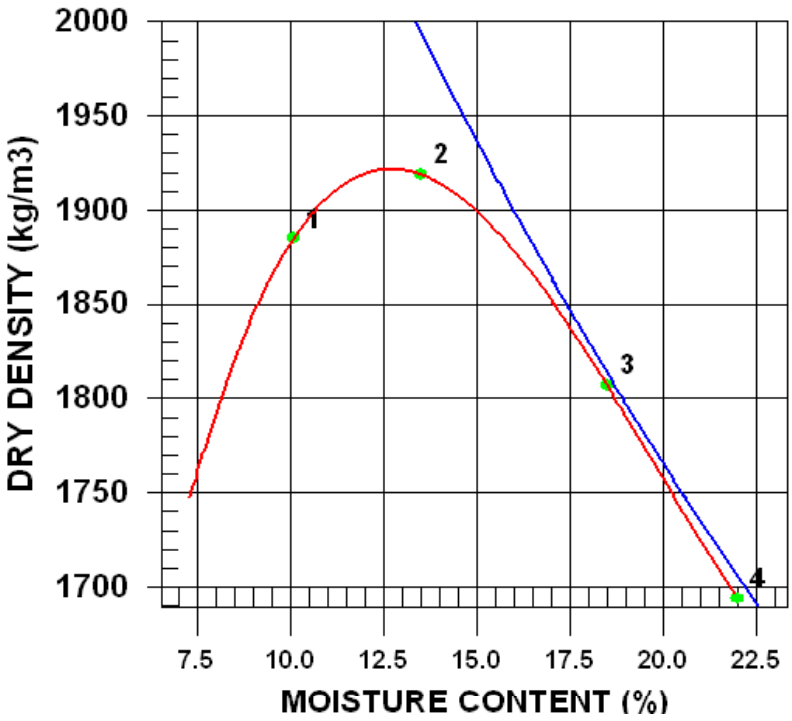
ATTN: Peter Quinn

PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

PROCTOR NO. 1 DATE TESTED 2011.Nov.09 DATE RECEIVED 2011.Sep.13 DATE SAMPLED 2011.Aug.18

INSITU MOISTURE	N/A %	COMPACTION STANDARD	Modified Proctor, ASTM D1557
SAMPLED BY	Client	COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
TESTED BY	RO	RAMMER TYPE	Automatic
SUPPLIER	TP-BGC11-121	PREPARATION	Moist
SOURCE	G1 @ 2.9-3.1m	OVERSIZE CORRECTION METHOD	ASTM 4718
MATERIAL IDENTIFICATION		RETAINED 4.75mm SCREEN	4.3 %
MAJOR COMPONENT	Silt, sandy	OVERSIZE SPECIFIC GRAVITY	2.65
SIZE	37.5mm	TOTAL NUMBER OF TRIALS	4
DESCRIPTION			
ROCK TYPE			



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	2075	1885	10.1
2	2178	1919	13.5
3	2141	1807	18.5
4	2067	1694	22.0

ZERO AIR VOIDS CURVE FOR ESTIMATED SPECIFIC GRAVITY OF 2.73	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1920	12.5
OVERSIZE CORRECTED	1940	12.0

COMMENTS
Permeability at 95% MPD (Over Optimum Moisture Conditions): 4.0 x 10^-8 cm/s

GeoNorth Engineering Ltd.
3975 18th Avenue Prince George, BC V2N 1B2
Phone (250)564-4304; Fax (250)564-9323

MOISTURE - DENSITY RELATIONSHIP REPORT

PROJECT NO. K-3300
CLIENT BGC Engineering Inc.
C.C.

TO
BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC
V6Z 2A9

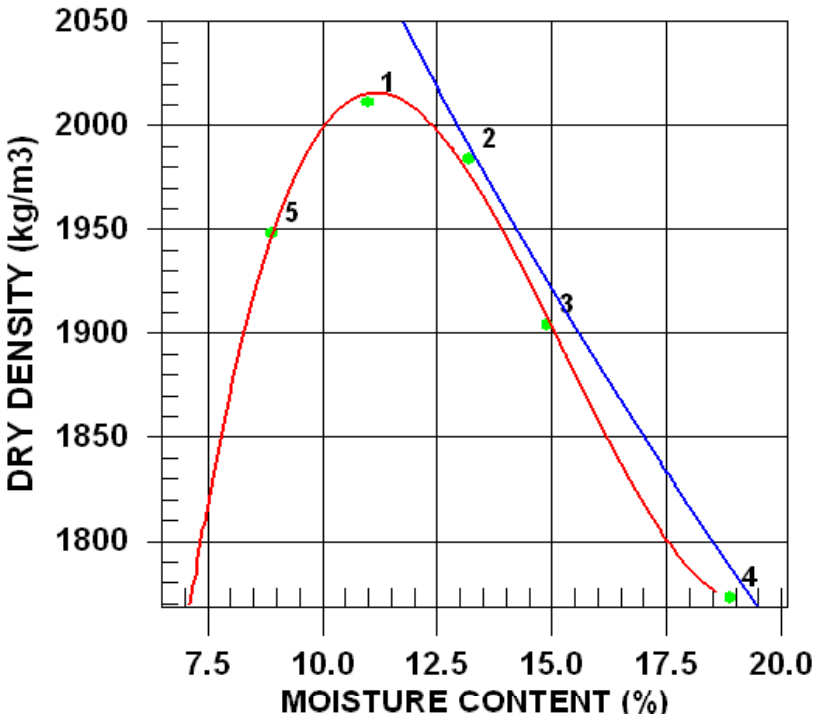
ATTN: Peter Quinn

PROJECT Eagle Gold Soils and Aggregate Testing
Dublin Gulch, Yukon

CONTRACTOR

PROCTOR NO. 2 DATE TESTED 2011.Nov.09 DATE RECEIVED 2011.Sep.13 DATE SAMPLED 2011.Aug.18

INSITU MOISTURE	N/A %	COMPACTION STANDARD	Modified Proctor, ASTM D1557
SAMPLED BY	Client	COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
TESTED BY	RO	RAMMER TYPE	Automatic
SUPPLIER	TP-BGC11-122	PREPARATION	Moist
SOURCE	G1 @ 5.4-5.8m	OVERSIZE CORRECTION METHOD	ASTM 4718
MATERIAL IDENTIFICATION		RETAINED 4.75mm SCREEN	17.8 %
MAJOR COMPONENT	Silt, sandy	OVERSIZE SPECIFIC GRAVITY	2.65
SIZE	75 mm	TOTAL NUMBER OF TRIALS	5
DESCRIPTION			
ROCK TYPE			

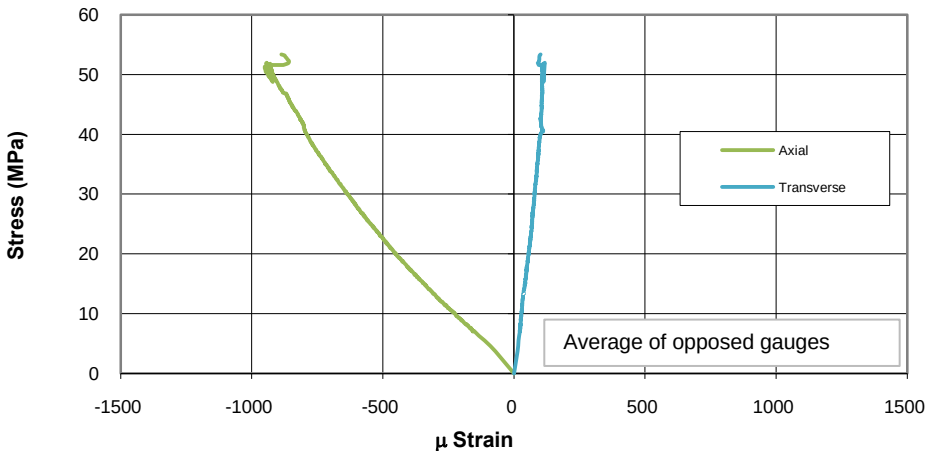


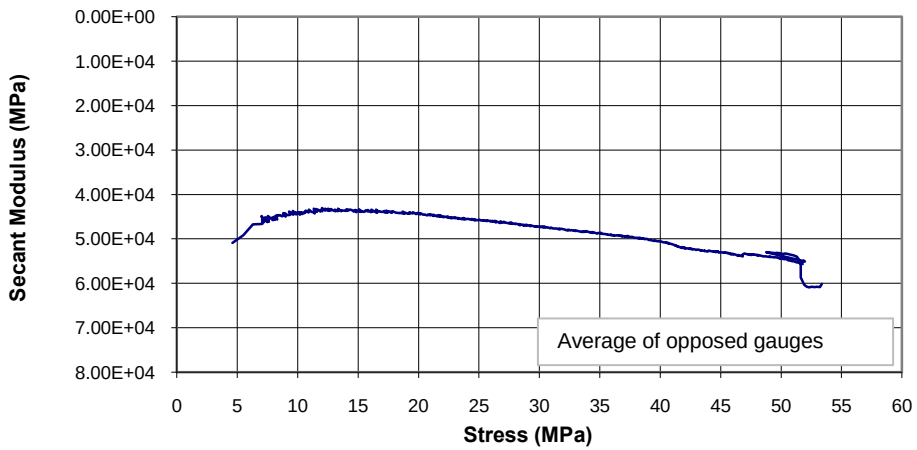
TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	2232	2011	11.0
2	2246	1984	13.2
3	2188	1904	14.9
4	2108	1773	18.9
5	2121	1948	8.9

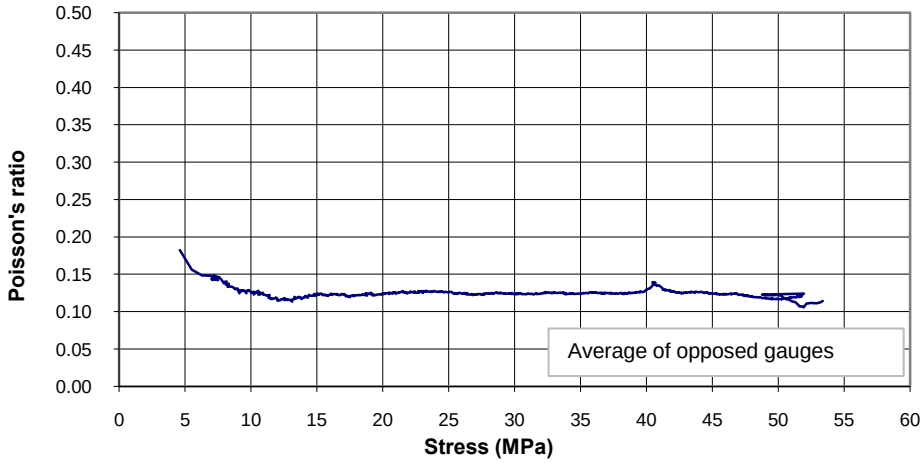
ZERO AIR VOIDS CURVE FOR ESTIMATED SPECIFIC GRAVITY OF 2.70	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	2020	11.0
OVERSIZE CORRECTED	2110	9.0

COMMENTS
Permeability at 95% MPD (Over Optimum Moisture Conditions): 3.15 x 10^-8 cm/s

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test

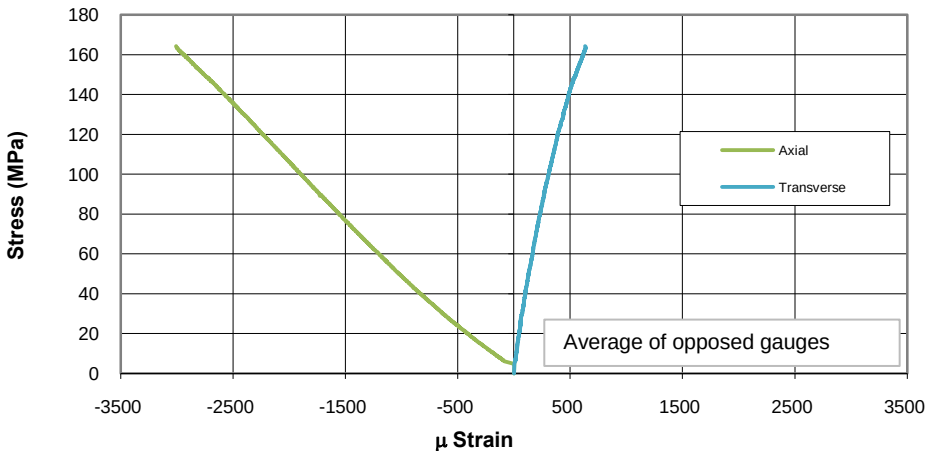


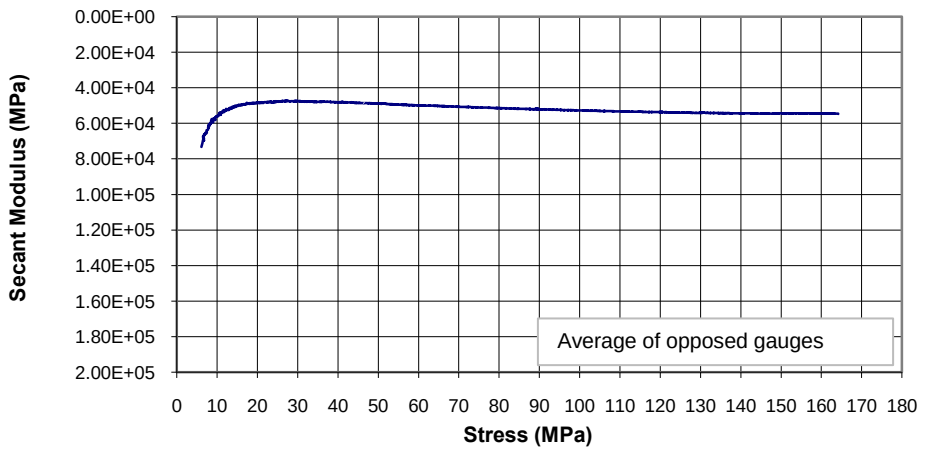
After Test

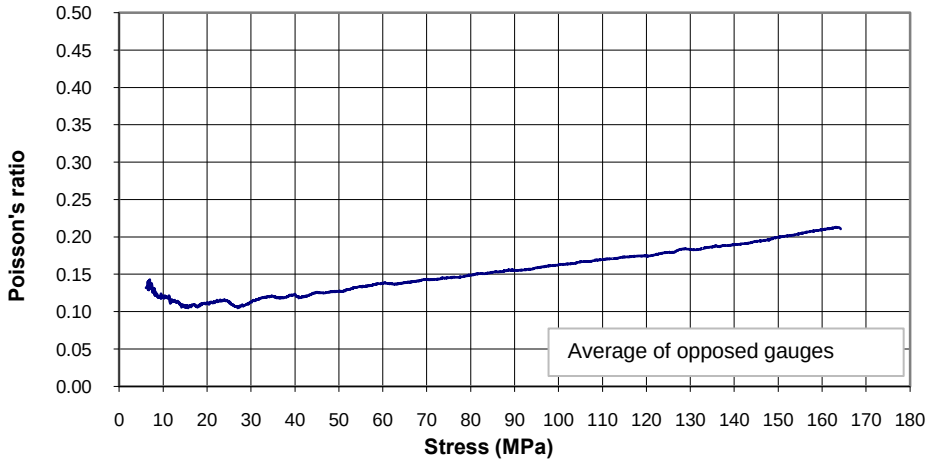
Test Summary			ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	53.4	MPa	Borehole:	BH-BGC11-34	Project No.:	11-1415-0029/7000
Secant Modulus, ε_{50}	46.3	GPa	Sample:	UCS	Project:	Eagle Gold Mine Site Infra FS SI
Poisson's Ratio, ν_{50}	0.12		Depth (m):	36.60-36.96	Location	Dublin Gulch,Yukon
Height:	126.80	mm	Tested By:	G. Patton	Client	BGC (Proj 0792-006-04)
Diameter:	60.83	mm	Reviewed By	LPerrey		
Failure Mode:	Along Discontinuities					

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test



After Test

Test Summary		
Peak Stress σ_{peak}	164.2	MPa
Secant Modulus, ε_{50}	51.6	GPa
Poisson's Ratio, ν_{50}	0.15	
Height:	122.85	mm
Diameter:	60.62	mm
Failure Mode:	Shear 33°	

ASTM D7012-07 Method D
Modulus in Uniaxial Compression

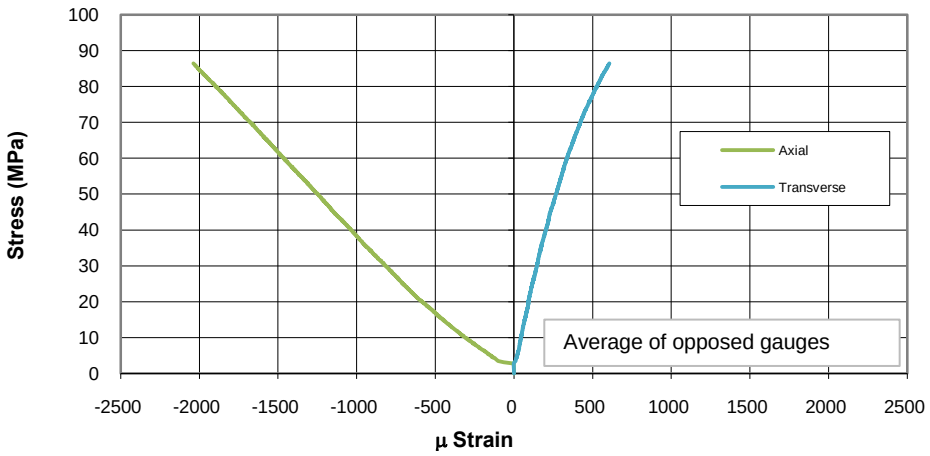
Borehole:	BH-BGC11-40A
Sample:	2
Depth (m):	30.98-31.30
Tested By:	G. Patton
Reviewed By	EK

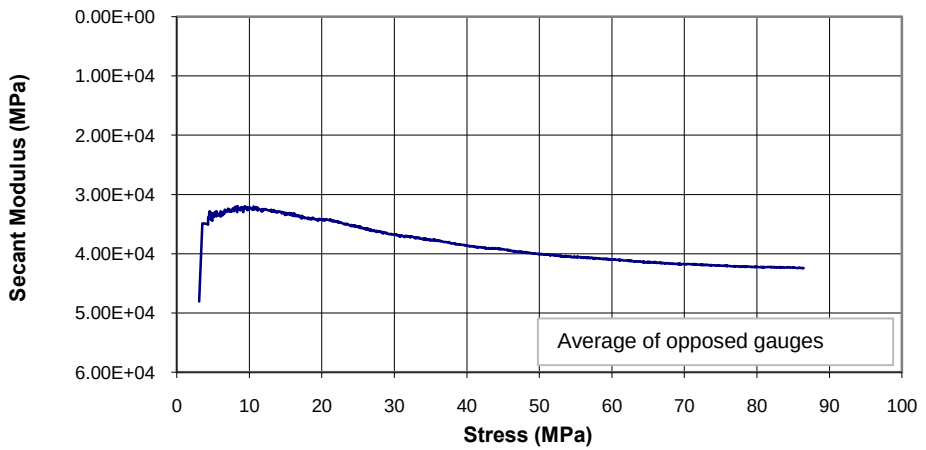
Project Details

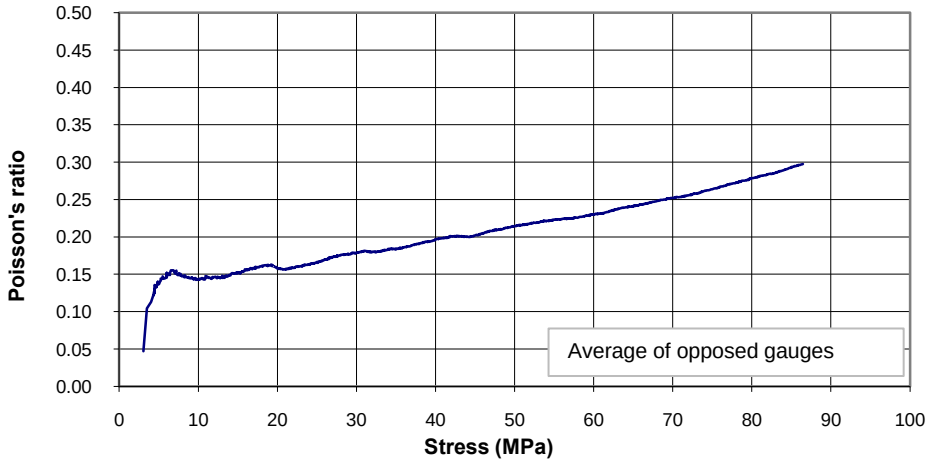
Project No.:	11-1415-0029/7000
Project:	Eagle Gold
Location	Yukon
Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test



After Test

Test Summary		
Peak Stress σ_{peak}	86.5	MPa
Secant Modulus, ε_{50}	3.9	GPa
Poisson's Ratio, ν_{50}	0.20	
Height:	125.77	mm
Diameter:	61.05	mm
Failure Mode:	Shear along foliation 30°	

ASTM D7012-07 Method D
Modulus in Uniaxial Compression

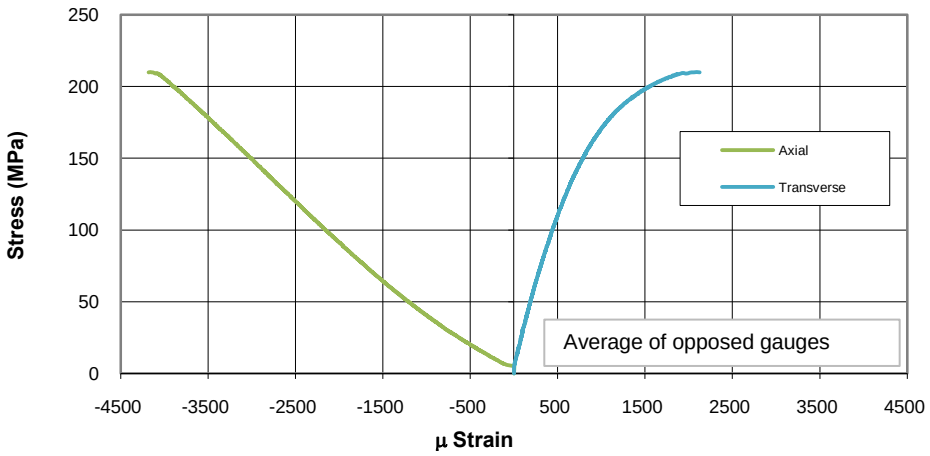
Borehole:	BH-BGC11-40B
Sample:	UCS 1
Depth (m):	21.81-22.06
Tested By:	G. Patton
Reviewed By	EK

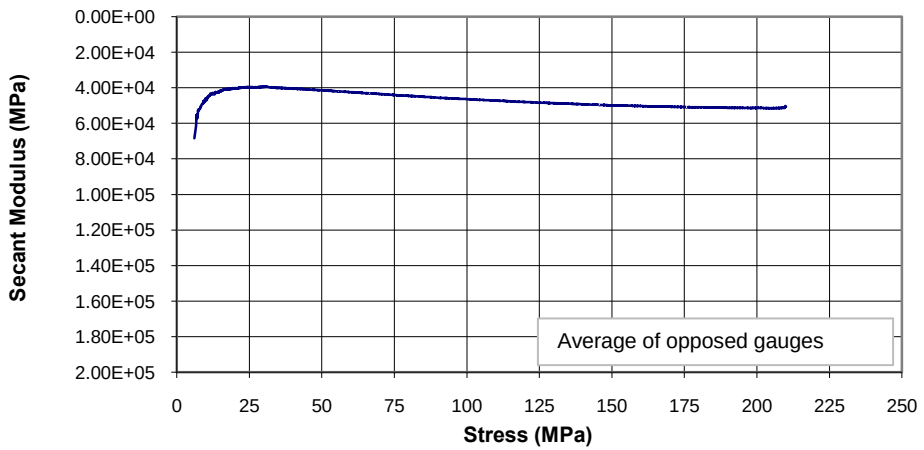
Project Details

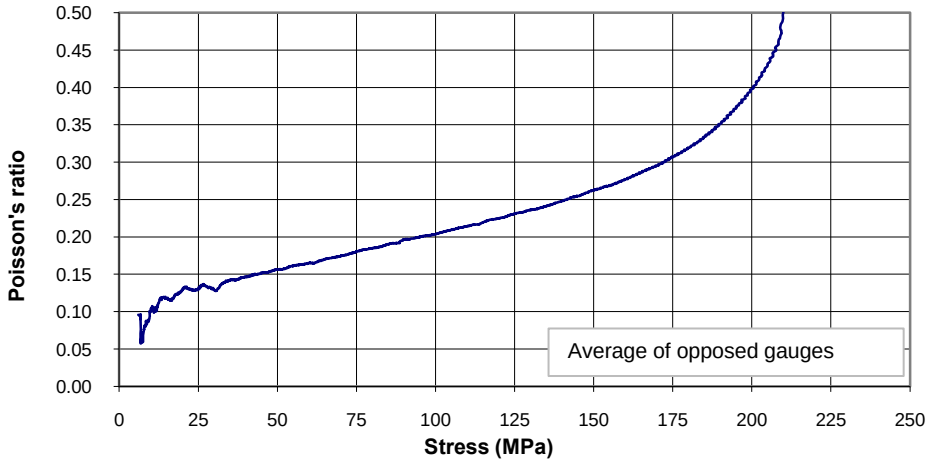
Project No.:	11-1415-0029/7000
Project:	Eagle Gold
Location	Yukon
Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test



After Test

Test Summary		
Peak Stress σ_{peak}	210.1	MPa
Secant Modulus, ε_{50}	46.8	GPa
Poisson's Ratio, ν_{50}	0.21	
Height:	126.25	mm
Diameter:	60.95	mm
Failure Mode:	Shear 27°	

ASTM D7012-07 Method D
Modulus in Uniaxial Compression

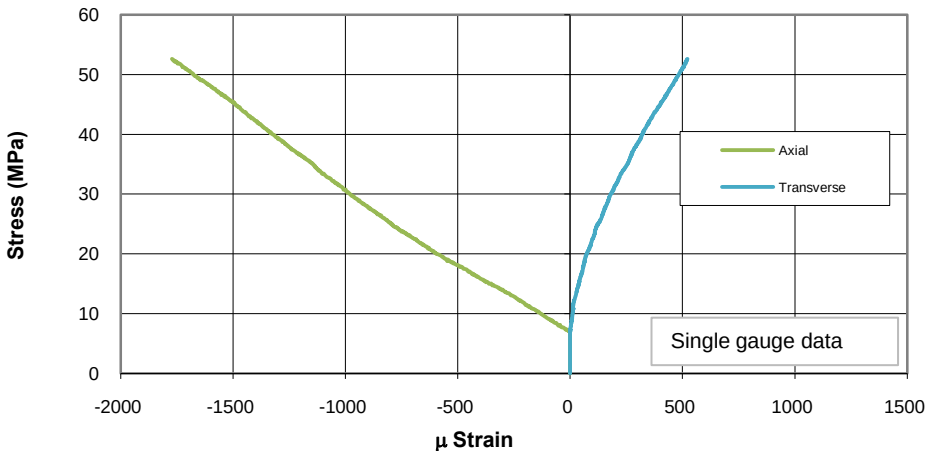
Borehole:	BH-BGC11-43
Sample:	1
Depth (m):	4.24-4.48
Tested By:	G. Patton
Reviewed By	EK

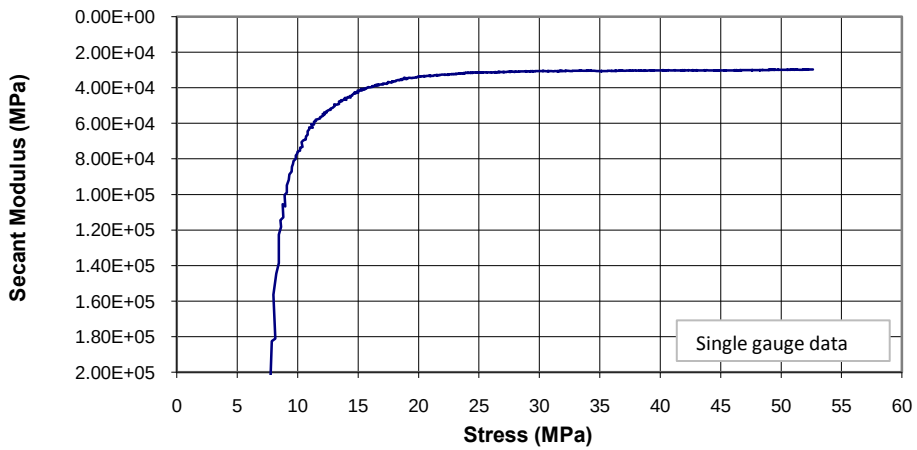
Project Details

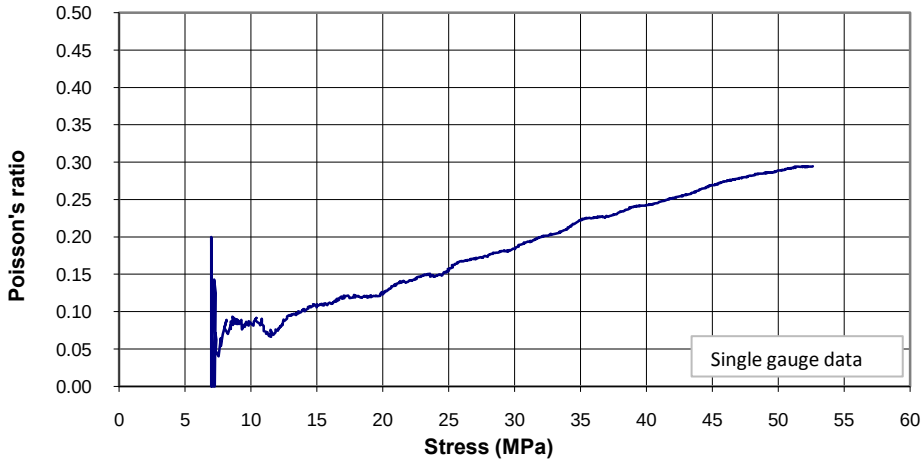
Project No.:	11-1415-0029/7000
Project:	Eagle Gold
Location	Yukon
Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test



After Test

Test Summary		
Peak Stress σ_{peak}	52.6	MPa
Secant Modulus, ε_{50}	31.1	GPa
Poisson's Ratio, ν_{50}	0.17	
Height:	123.14	mm
Diameter:	60.77	mm
Failure Mode:	Shear along foliation 33°	

ASTM D7012-07 Method D
Modulus in Uniaxial Compression

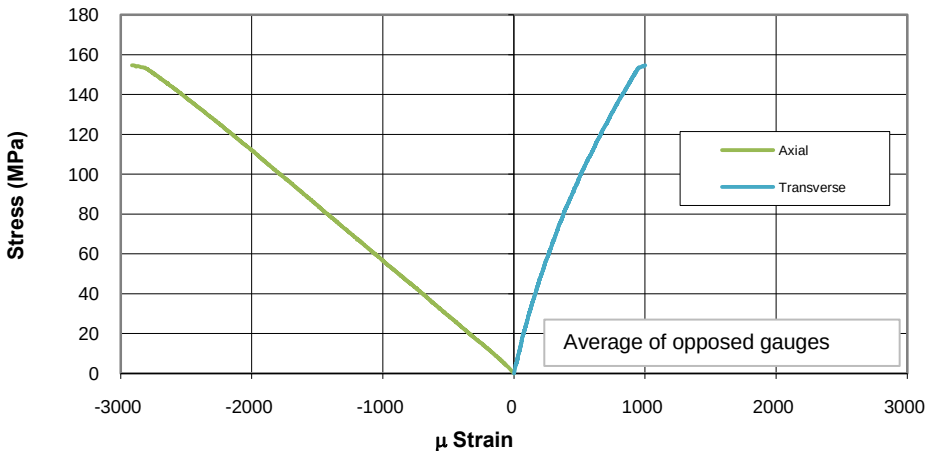
Borehole:	BH-BGC11-45
Sample:	UCS
Depth (m):	17.80-18.04
Tested By:	G. Patton
Reviewed By	EK

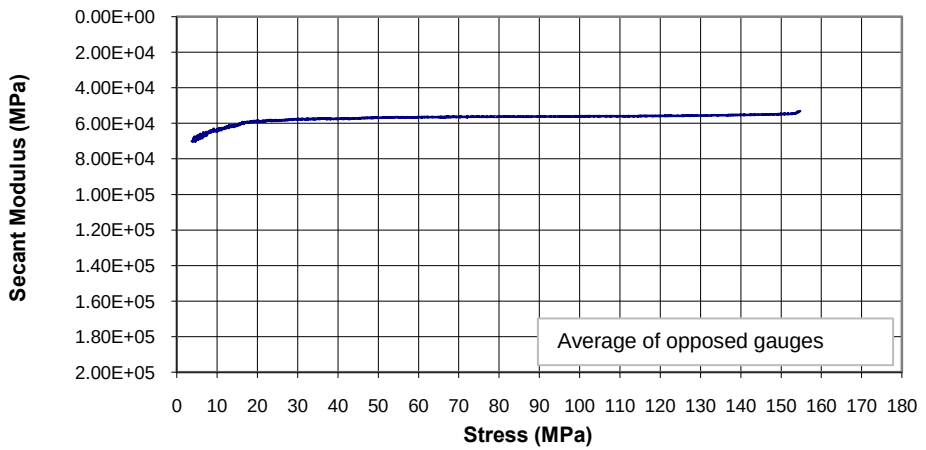
Project Details

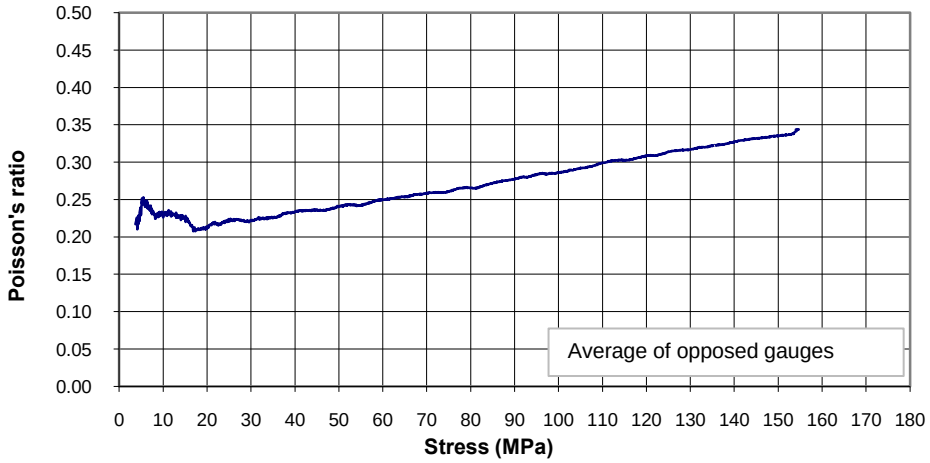
Project No.:	11-1415-0029/7000
Project:	Eagle Gold
Location	Yukon
Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test



After Test

Test Summary		
Peak Stress σ_{peak}	154.7	MPa
Secant Modulus, ε_{50}	56.3	GPa
Poisson's Ratio, ν_{50}	0.27	
Height:	126.37	mm
Diameter:	60.80	mm
Failure Mode:	Multi-Vertical	

ASTM D7012-07 Method D
Modulus in Uniaxial Compression

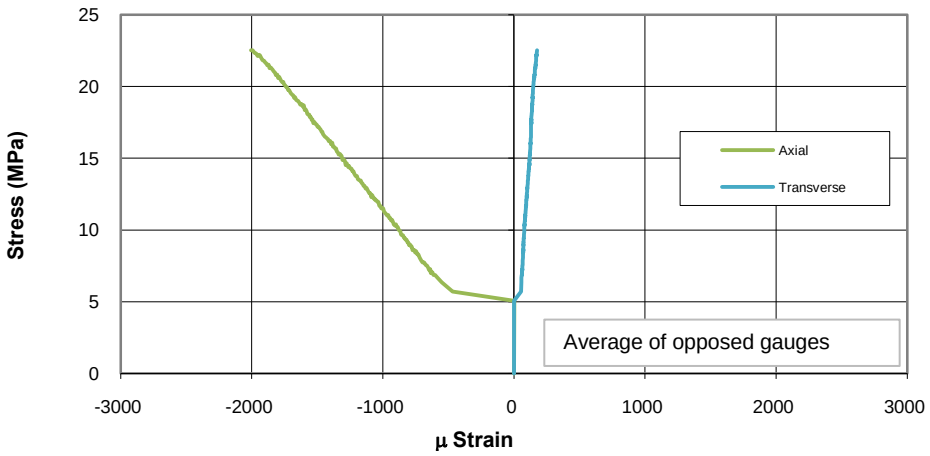
Borehole:	BH-BGC11-46
Sample:	UCS
Depth (m):	13.11-13.65
Tested By:	G. Patton
Reviewed By	EK

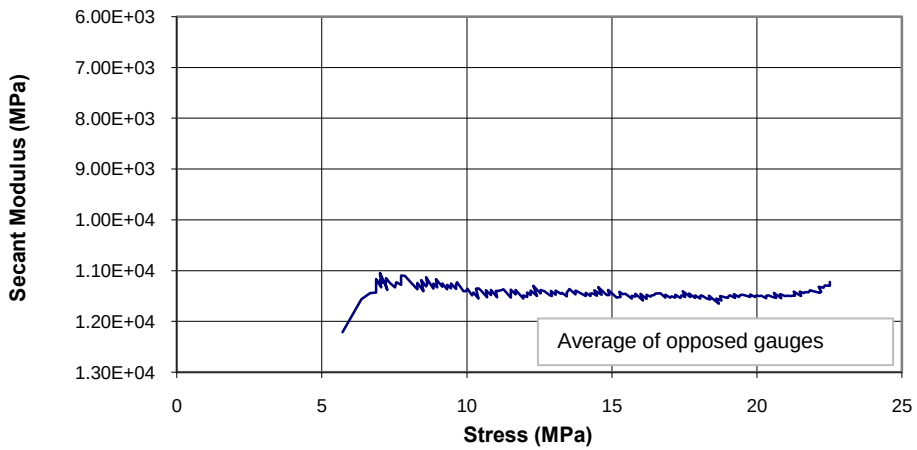
Project Details

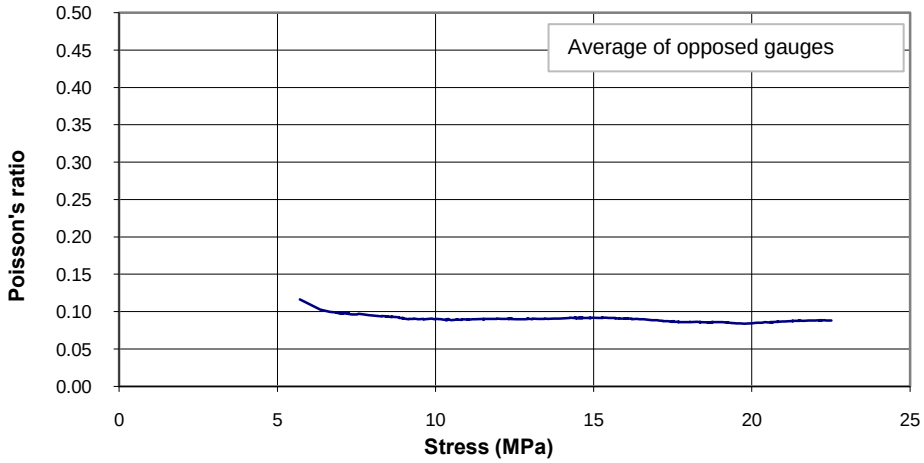
Project No.:	11-1415-0029/7000
Project:	Eagle Gold
Location	Yukon
Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test

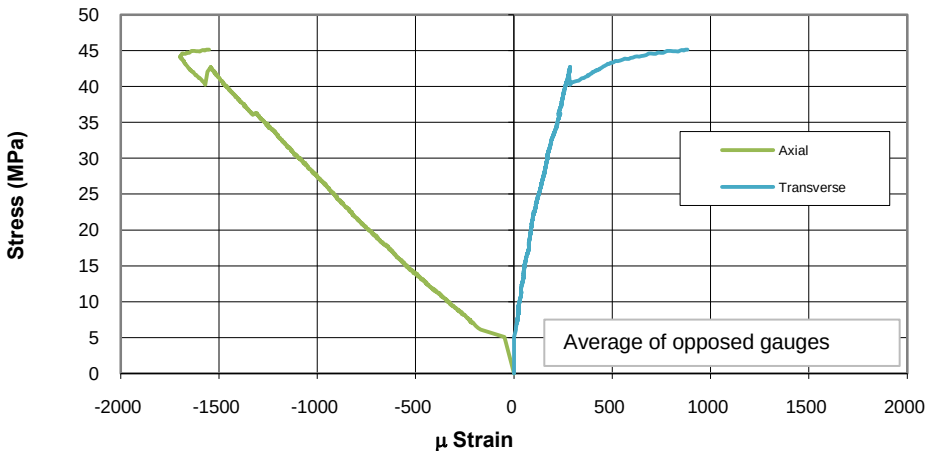


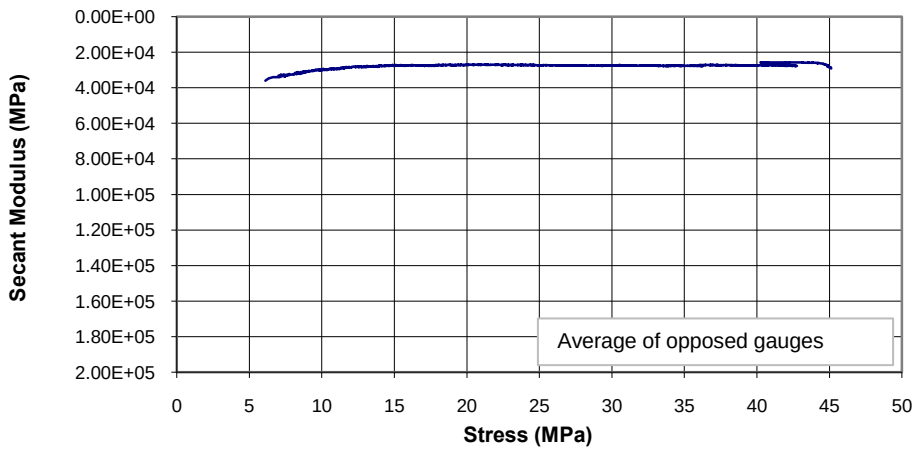
After Test

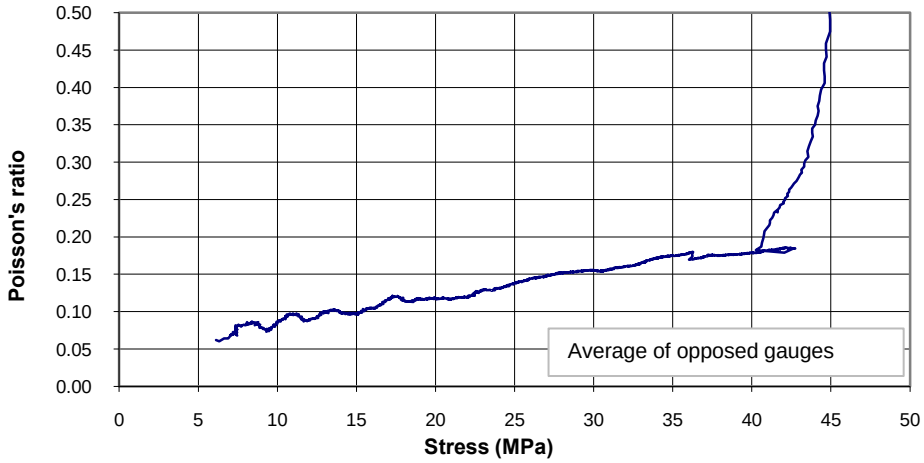
Test Summary			ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	22.5	MPa	Borehole:	BH-BGC11-62	Project No.:	11-1415-0029/7000
Secant Modulus, ε_{50}	11.4	GPa	Sample:	UCS	Project:	Eagle Gold
Poisson's Ratio, ν_{50}	0.09		Depth (m):	28.59-28.84	Location	Yukon
Height:	122.75	mm	Tested By:	G. Patton	Client	BGC Engineering Inc.
Diameter:	60.89	mm	Reviewed By	EK		
Failure Mode:	Shear along folitaion 38°					

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test



After Test

Test Summary			ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	45.1	MPa				
Secant Modulus, ε_{50}	27.1	GPa	Borehole:	BH-BGC11-69	Project No.:	11-1415-0029/7000
Poisson's Ratio, ν_{50}	0.13		Sample:	UCS 1	Project:	Eagle Gold
Height:	123.03	mm	Depth (m):	12.26-12.54	Location	Yukon
Diameter:	60.83	mm	Tested By:	G. Patton	Client	BGC Engineering Inc.
Failure Mode:	Shear 14°		Reviewed By	EK		

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-29**
Project:	Eagle Gold Mine Site Infra FS SI	**Sample Number:**	Sa 1 BTS 1
Location:	Dublin Gulch, Yukon	**Depth (m):**	27.46-27.77
Client:	BGC (Proj 0792-006-04)	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0163**
Tensile Stress (MPa)	**5.6**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.93
Thickness (mm)	30.64
Area (cm^2)	29.16
Volume (cm^3)	89.34
Mass (g)	232.70
Moisture Content (%)	1.05
Wet Density (Kg/m^3)	2604.69
Dry Density (Kg/m^3)	2577.62

Failure Mode

Type: Along Discontinuities

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

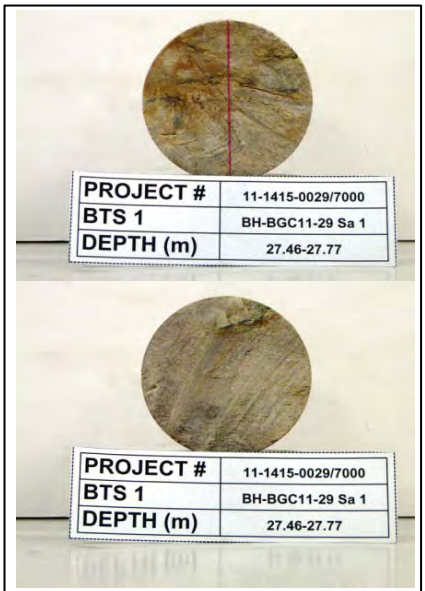
Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	October 24, 2011	LPerrey	October 27,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-29**
Project:	Eagle Gold Mine Site Infra FS SI	**Sample Number:**	Sa 1 BTS 2
Location:	Dublin Gulch, Yukon	**Depth (m):**	27.46-27.77
Client:	BGC (Proj 0792-006-04)	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0087**
Tensile Stress (MPa)	**3.2**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.87
Thickness (mm)	28.35
Area (cm^2)	29.10
Volume (cm^3)	82.50
Mass (g)	215.90
Moisture Content (%)	1.05
Wet Density (Kg/m^3)	2617.00
Dry Density (Kg/m^3)	2589.80

Failure Mode

Type: Along Discontinuities

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

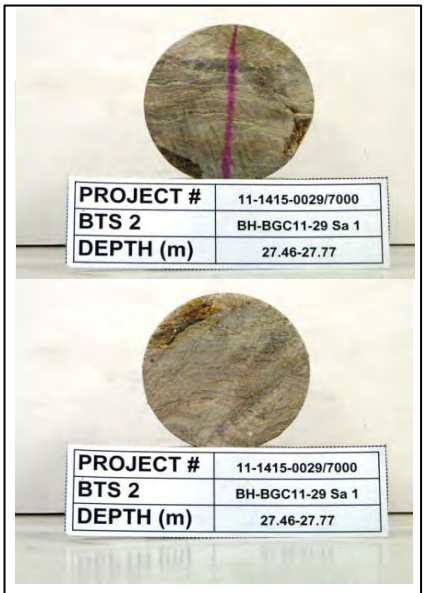
Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

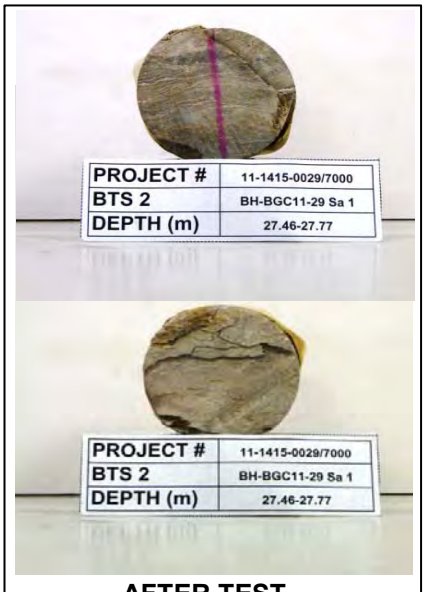
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	October 24, 2011	LPerrey	October 27,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-34**
Project:	Eagle Gold Mine Site Infra FS SI	**Sample Number:**	UCS BTS 1
Location:	Dublin Gulch, Yukon	**Depth (m):**	36.60-36.96
Client:	BGC (Proj 0792-006-04)	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0246**
Tensile Stress (MPa)	**9.2**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.81
Thickness (mm)	27.92
Area (cm^2)	29.04
Volume (cm^3)	81.09
Mass (g)	212.20
Moisture Content (%)	0.32
Wet Density (Kg/m^3)	2616.92
Dry Density (Kg/m^3)	2608.57

Failure Mode

Type: Shear

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	October 24, 2011	LPerrey	October 27,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-34**
Project:	Eagle Gold Mine Site Infra FS SI	**Sample Number:**	UCS BTS 2
Location:	Dublin Gulch, Yukon	**Depth (m):**	36.60-36.96
Client:	BGC (Proj 0792-006-04)	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0379**
Tensile Stress (MPa)	**11.8**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.76
Thickness (mm)	33.54
Area (cm^2)	29.00
Volume (cm^3)	97.25
Mass (g)	261.30
Moisture Content (%)	0.32
Wet Density (Kg/m^3)	2686.90
Dry Density (Kg/m^3)	2678.33

Failure Mode

Type: Shear

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	October 24, 2011	LPerrey	October 27,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-40A**
Project:	Eagle Gold	**Sample Number:**	Sa 1 BTS 1
Location:	Yukon	**Depth (m):**	30.98-31.30
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0389**
Tensile Stress (MPa)	**13.0**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.66
Thickness (mm)	31.32
Area (cm^2)	28.90
Volume (cm^3)	90.51
Mass (g)	239.70
Moisture Content (%)	0.10
Wet Density (Kg/m^3)	2648.20
Dry Density (Kg/m^3)	2645.56

Failure Mode

Type: Along Discontinuity

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

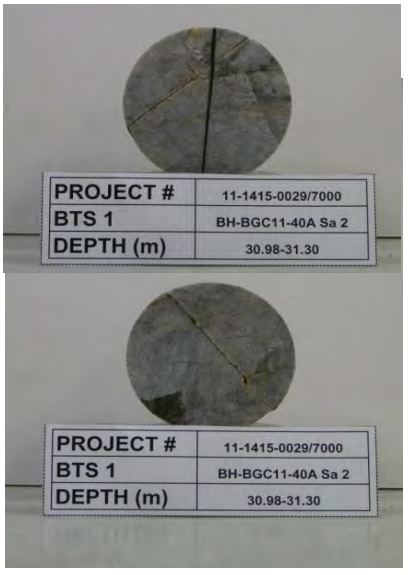
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-40A**
Project:	Eagle Gold	**Sample Number:**	Sa 1 BTS 2
Location:	Yukon	**Depth (m):**	30.98-31.30
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0333**
Tensile Stress (MPa)	**12.2**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.64
Thickness (mm)	28.58
Area (cm^2)	28.88
Volume (cm^3)	82.54
Mass (g)	219.90
Moisture Content (%)	0.10
Wet Density (Kg/m^3)	2664.13
Dry Density (Kg/m^3)	2661.46

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

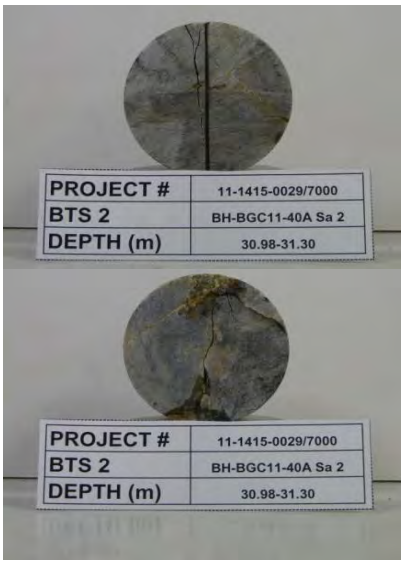
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-40B**
Project:	Eagle Gold	**Sample Number:**	UCS 1 BTS 1
Location:	Yukon	**Depth (m):**	21.81-22.06
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0334**
Tensile Stress (MPa)	**11.3**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	61.02
Thickness (mm)	30.92
Area (cm^2)	29.24
Volume (cm^3)	90.42
Mass (g)	253.10
Moisture Content (%)	0.10
Wet Density (Kg/m^3)	2799.10
Dry Density (Kg/m^3)	2796.30

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-40B**
Project:	Eagle Gold	**Sample Number:**	UCS 1 BTS 2
Location:	Yukon	**Depth (m):**	21.81-22.06
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0374**
Tensile Stress (MPa)	**13.0**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	61.05
Thickness (mm)	29.88
Area (cm^2)	29.27
Volume (cm^3)	87.47
Mass (g)	237.50
Moisture Content (%)	0.10
Wet Density (Kg/m^3)	2715.32
Dry Density (Kg/m^3)	2712.61

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-43**
Project:	Eagle Gold	**Sample Number:**	Sa 1 BTS 1
Location:	Yukon	**Depth (m):**	4.24-4.48
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0444**
Tensile Stress (MPa)	**15.6**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.91
Thickness (mm)	29.66
Area (cm^2)	29.14
Volume (cm^3)	86.42
Mass (g)	233.50
Moisture Content (%)	0.10
Wet Density (Kg/m^3)	2701.77
Dry Density (Kg/m^3)	2699.07

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

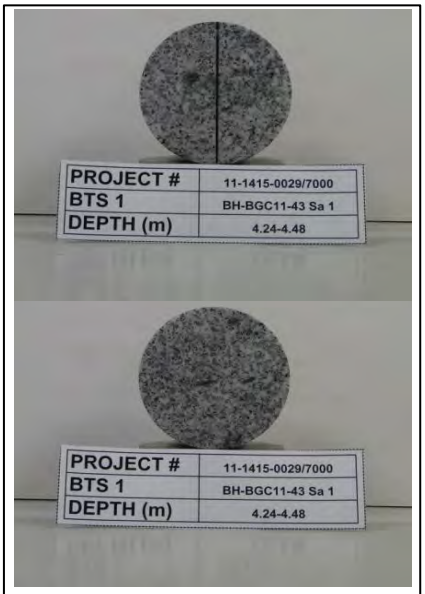
Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-43**
Project:	Eagle Gold	**Sample Number:**	Sa 1 BTS 2
Location:	Yukon	**Depth (m):**	4.24-4.48
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0421**
Tensile Stress (MPa)	**14.0**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.95
Thickness (mm)	31.28
Area (cm^2)	29.18
Volume (cm^3)	91.26
Mass (g)	244.80
Moisture Content (%)	0.10
Wet Density (Kg/m^3)	2682.30
Dry Density (Kg/m^3)	2679.62

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

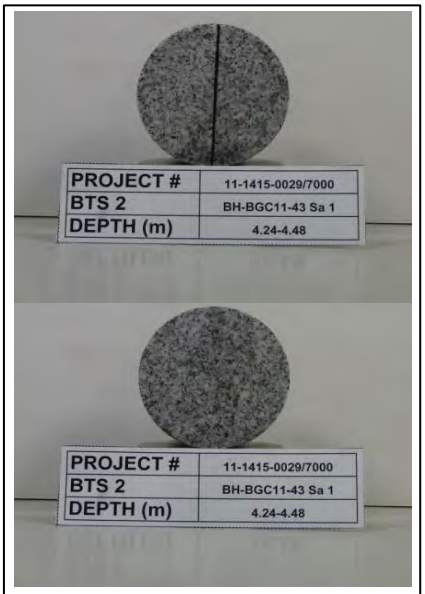
Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

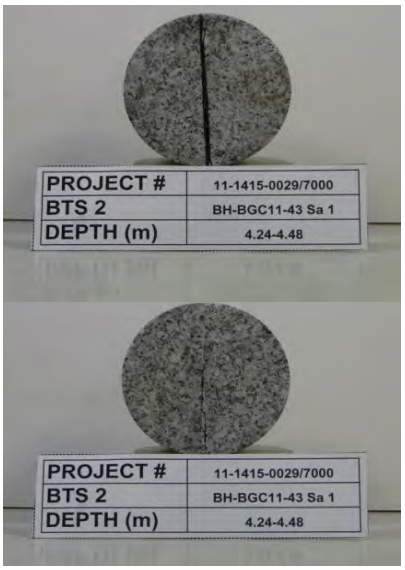
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

TESTED BY	DATE	CHECKED BY	DATE
G. Patton	September 20, 2011	EK	OCTOBER 7,2011

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-45**
Project:	Eagle Gold	**Sample Number:**	UCS BTS 1
Location:	Yukon	**Depth (m):**	17.80-18.04
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0381**
Tensile Stress (MPa)	**13.6**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.77
Thickness (mm)	29.24
Area (cm^2)	29.00
Volume (cm^3)	84.81
Mass (g)	232.80
Moisture Content (%)	0.20
Wet Density (Kg/m^3)	2744.97
Dry Density (Kg/m^3)	2739.49

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

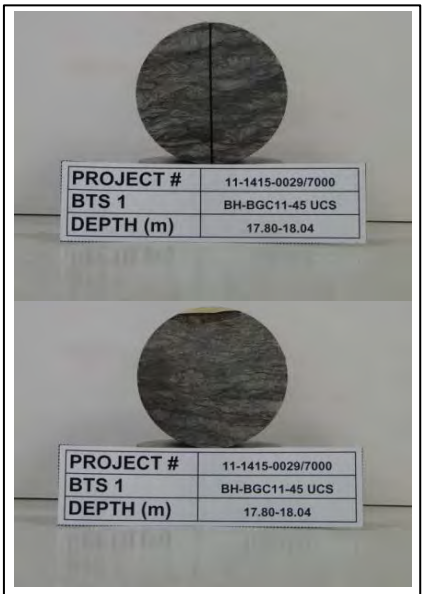
Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

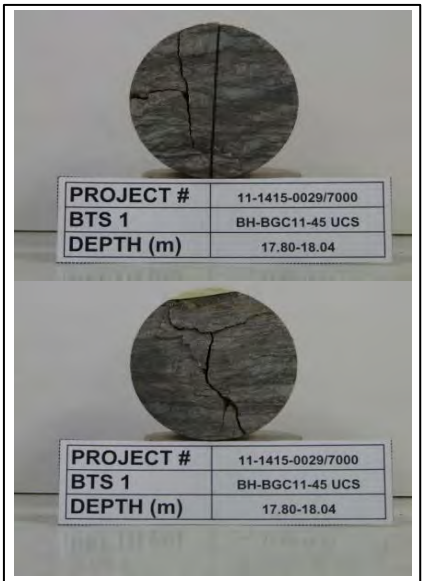
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

TESTED BY	DATE	CHECKED BY	DATE
G. Patton	September 20, 2011	EK	OCTOBER 7,2011

Golder Associates

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-45**
Project:	Eagle Gold	**Sample Number:**	UCS BTS 2
Location:	Yukon	**Depth (m):**	17.80-18.04
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0375**
Tensile Stress (MPa)	**11.6**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.79
Thickness (mm)	33.81
Area (cm^2)	29.02
Volume (cm^3)	98.13
Mass (g)	271.20
Moisture Content (%)	0.20
Wet Density (Kg/m^3)	2763.70
Dry Density (Kg/m^3)	2758.18

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

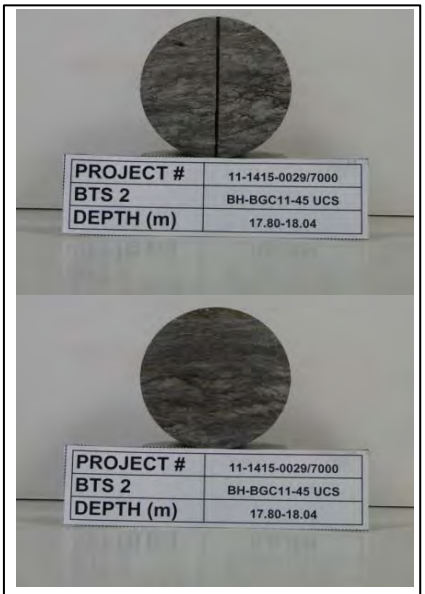
Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

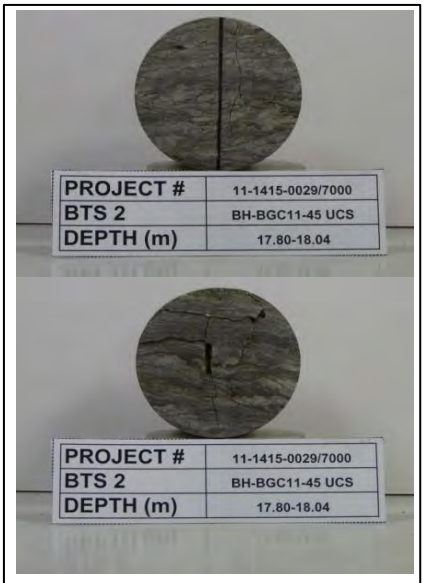
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-46**
Project:	Eagle Gold	**Sample Number:**	UCS BTS 1
Location:	Yukon	**Depth (m):**	13.11-13.65
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0402**
Tensile Stress (MPa)	**15.0**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.81
Thickness (mm)	28.04
Area (cm^2)	29.04
Volume (cm^3)	81.44
Mass (g)	217.60
Moisture Content (%)	0.10
Wet Density (Kg/m^3)	2672.03
Dry Density (Kg/m^3)	2669.36

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A



BEFORE TEST



AFTER TEST

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-46**
Project:	Eagle Gold	**Sample Number:**	UCS BTS 2
Location:	Yukon	**Depth (m):**	13.11-13.65
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0431**
Tensile Stress (MPa)	**15.3**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.80
Thickness (mm)	29.42
Area (cm^2)	29.03
Volume (cm^3)	85.42
Mass (g)	229.30
Moisture Content (%)	0.10
Wet Density (Kg/m^3)	2684.51
Dry Density (Kg/m^3)	2681.82

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

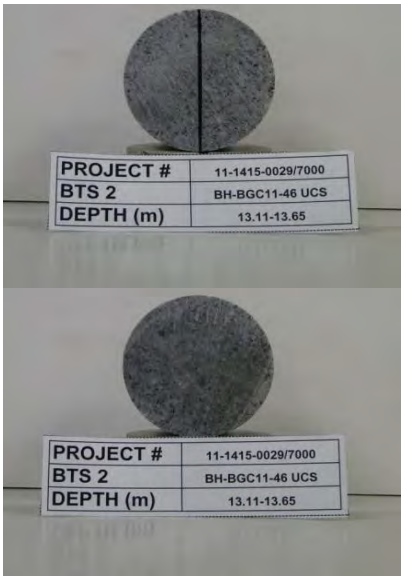
Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

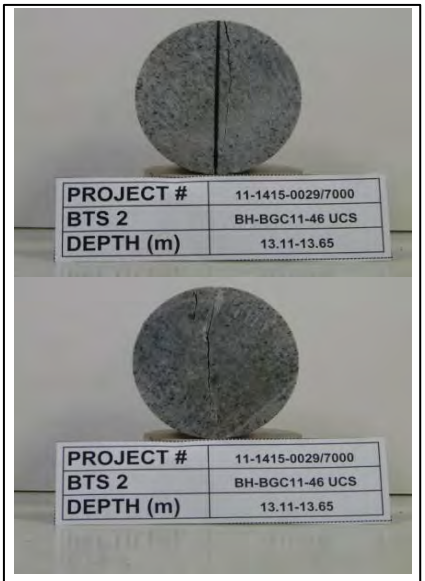
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-62**
Project:	Eagle Gold	**Sample Number:**	UCS BTS 1
Location:	Yukon	**Depth (m):**	28.59-28.84
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0167**
Tensile Stress (MPa)	**5.4**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.97
Thickness (mm)	32.31
Area (cm^2)	29.20
Volume (cm^3)	94.33
Mass (g)	242.30
Moisture Content (%)	0.50
Wet Density (Kg/m^3)	2568.59
Dry Density (Kg/m^3)	2555.81

Failure Mode

Type: Along Discontinuities

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

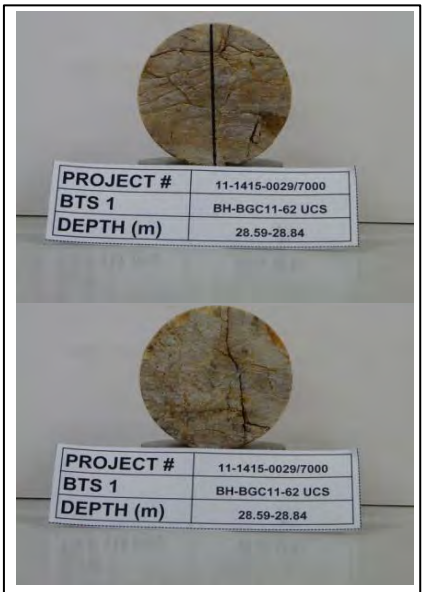
Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

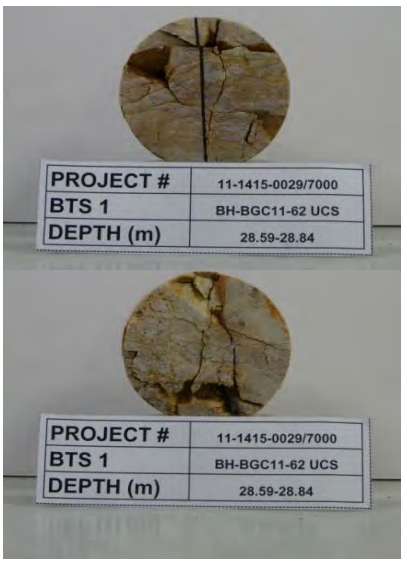
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

TESTED BY	DATE	CHECKED BY	DATE
G. Patton	September 20, 2011	EK	OCTOBER 7,2011

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-69**
Project:	Eagle Gold	**Sample Number:**	UCS 1 BTS 1
Location:	Yukon	**Depth (m):**	12.26-12.54
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0082**
Tensile Stress (MPa)	**2.8**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.77
Thickness (mm)	31.03
Area (cm^2)	29.00
Volume (cm^3)	90.00
Mass (g)	229.50
Moisture Content (%)	0.40
Wet Density (Kg/m^3)	2549.96
Dry Density (Kg/m^3)	2539.80

Failure Mode

Type: Along Discontinuities

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

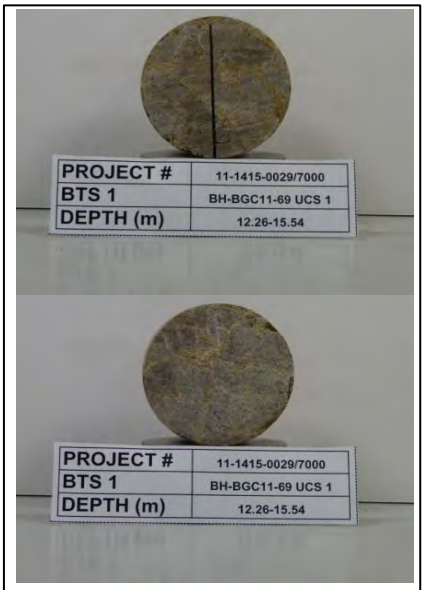
Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

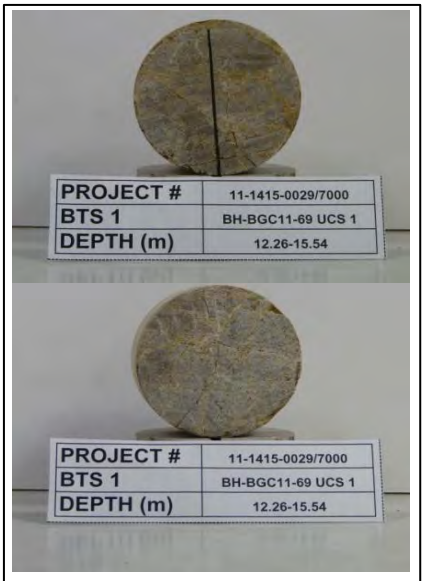
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	11-1415-0029/7000	**Borehole:**	**BH-BGC11-69**
Project:	Eagle Gold	**Sample Number:**	UCS 1 BTS 2
Location:	Yukon	**Depth (m):**	12.26-12.54
Client:	BGC Engineering Inc.	**Lab ID No:**	141

Testing Results

Max Load (MN)	**0.0180**
Tensile Stress (MPa)	**6.3**
Rate of Loading (kN/s)	0.5

Sample Measurements

Diameter (mm)	60.87
Thickness (mm)	29.92
Area (cm^2)	29.10
Volume (cm^3)	87.07
Mass (g)	220.90
Moisture Content (%)	0.40
Wet Density (Kg/m^3)	2537.10
Dry Density (Kg/m^3)	2526.99

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	ELE
Transducer ID	N/A
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	September 20, 2011	EK	OCTOBER 7,2011
TESTED BY	DATE	CHECKED BY	DATE

METRO TESTING GROUP
Materials Testing & Engineering Services
CCIL & CSA Certified Company
Innovative Quality Solutions

METROTESTING LABORATORIES LTD.
6991 Curragh Avenue, Burnaby, B.C. V5J 4V6
Tel.: (604) 436-9111 Fax.: (604) 436-9050

TO: GEONORTH ENGINEERING LTD.
3975 18TH AVENUE
PRINCE GEORGE, BC
V2N 1B2

ATTN: Mr. Barry Tessmer

TEST METHOD FOR THE RESISTANCE OF UNCONFINED COARSE AGGREGATE TO FREEZING AND THAWING

(CSA A23.2-24A)

Project No:	15585
Project:	Aggregate Suitability Test for Concrete
Scope:	Aggregate Testing
Source:	Placer Trailings
Type of sample:	40mm Crushed Stone
Sample by:	Client
Date Sampled:	n/a
Date Received:	9-Nov-2011
Test No:	1
Tested by:	Mimi
Date Tested:	November 15 - 23, 2011
Report Date	24-Nov-2011

COARSE AGGREGATE

SIEVE SIZES	SUGGESTED WEIGHTS OF TEST SAMPLES	MASS OF TEST FRACTIONS BEFORE TEST	MASS OF TEST FRACTIONS AFTER TEST	FREEZE THAW LOSS	PERCENT LOSS	GRADING OF COARSE PORTION	D LOSS	WEIGHTED LOSS OF CONTROL AGGREGATE
	(grams)	(grams)	(grams)	(grams)	(%)	(%)	(%)	(%)
80mm to 28mm	4500.0	4750.5	4730.3	20.2	0.4	13.8	**0.06**	0.3
28mm to 20mm	2500.0	2509.5	2496.3	13.2	0.5	4.3	**0.02**	0.8
20mm to14mm	1250.0	1263.5	1250.3	13.2	1.0	3.5	**0.04**	4.2
14mm to 10mm	1000.0	1055.0	1034.8	20.2	1.9	10	**0.19**	3.7
10mm to 5mm	500.0	567.4	550.9	16.5	2.9	30.8	**0.90**	5.5
(-) 5mm						37.6		
						100	**1.2%**	**14.5**

Comment:
Weighted sample loss of 1.2% meets the CSA requirement of 6% max. for concrete exposed to freezing and thawing.
Weighted loss of control aggregates is 14.5% which is within the specified limits of 8.5% - 15.3% (Drain Quarry)

Per:

Mimi Baraquio, AScT
Laboratory Technologist

Reviewed by:

Prakash Joshi, AScT, Eng.L.
Senior Materials Engineering Technologist

Association of Professional Engineers and Geoscientists of the Province of British Columbia
P. V. JOSHI
ENGINEERING LICENSEE
Limited Licence 31356

Reporting of these test results constitutes a testing service only.
Engineering interpretation or evaluation of test results is provided only on written request.

METRO TESTING LABORATORIES LTD.
6991 Curragh Avenue, Burnaby B.C., V5J 4V6
Tel: (604) 436-9111 Fax: (604) 436-9050

SIEVE ANALYSIS REPORT
SI Standard SERIES

PROJECT NO. 15585
CLIENT GEONORTH ENGINEERING LTD.
C.C.

TO
GEONORTH ENGINEERING LTD.
3975 18TH AVENUE
PRINCE GEORGE, BRITISH COLUMBI
V2N 1B2

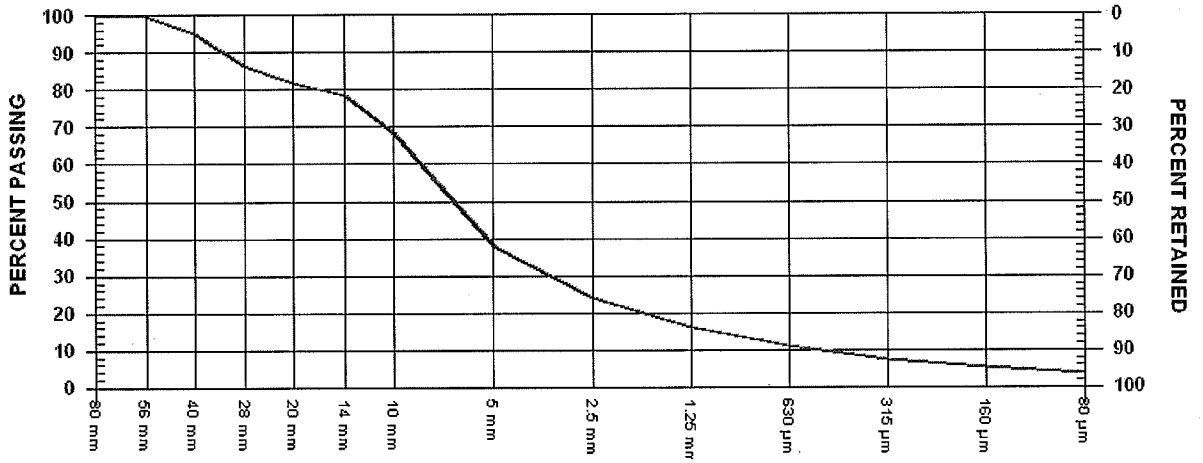
ATTN: BARRY TESSMER

PROJECT SUITABILITY OF AGGREGATE FOR CONCRTE
CONCRETE
CONTRACTOR GEONORTH ENGINEERING LTD.

SIEVE TEST NO. 1 DATE RECEIVED 2011.Nov.09 DATE TESTED 2011.Nov.09 DATE SAMPLED 2011.Nov.08

SUPPLIER
SOURCE PLACER TAILING
SPECIFICATION
MATERIAL TYPE CRUSHED STONE

SAMPLED BY CLIENT
TESTED BY AP
TEST METHOD WASHED



GRAVEL SIZES	PERCENT PASSING	GRADATION LIMITS
80 mm	100.0	
56 mm	99.5	
40 mm	95.0	
28 mm	86.2	
20 mm	81.9	
14 mm	78.4	
10 mm	68.4	

SAND SIZES AND FINES	PERCENT PASSING	GRADATION LIMITS
5 mm	37.6	
2.5 mm	24.1	
1.25 mm	16.1	
630 µm	11.1	
315 µm	7.6	
160 µm	5.3	
80 µm	3.6	

COMMENTS

Association of Professional Engineers and Geoscientists of the Province of British Columbia
P. V. JOSHI
ENGINEERING LICENSEE
Limited Licence

 2011.Nov.14 METRO TESTING LABORATORIES LTD. PER. _____

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of test results is provided only on written request.

METRO TESTING GROUP
Materials Testing & Engineering Services
CCIL & CSA Certified Company
Innovative Quality Solutions

TO: GEONORTH ENGINEERING LTD.
3975 18TH AVENUE
PRINCE GEORGE, BC
V2N 1B2

ATTN: Mr. Barry Tessmer

PROJECT: Suitability of Aggregate for Concrete
SCOPE: Aggregate Testing

LOG No.: 112
PROJECT No: 15585
TESTED BY: Andrey

Resistance to Degradation of Small Size Coarse Aggregate by Abrasion & Impact in the Los Angeles Machine

CSA A23.2-16A

SAMPLE DATA		TEST DATA		
Sample I.D.	N/A	**Number of Revolutions:**	500	
Sample Sourse:	Placer Tailing	**Number of Spheres:**	8	
Sample Type:	40mm Crushed Stone	**Mass of Spheres:**	3334.0	grams
Date Sampled:	N/A	**Mass of Sample Tested:**	5001.8	grams
Date Received:	09-Nov-11	**Grading Catergory:**	C	
Date Tested:	14-Nov-11	**Date Reported**	14-Nov-11	

TESTED SAMPLE DATA					CSA A23.2-16A, SPECIFIED TEST REQUIREMENTS				
					CSA A23.2-16A, Table 1: Numbers of Sphere and Mass				
Sieve Sizes		**Tested Sample**	**After 500 Revolutions**		A	B	C	D	E
					12 Balls	11 Balls	**8 Balls**	6 Balls	
					5000+/- 25 g	4584+/- 25 g	**3330+/- 20 g**	2500+/- 15 g	
Passing	**Retained**	**(Grams)**	**+1.8mm (Grams)**	**-1.8mm (Grams)**	CSA A23.2-16A, Table 2: Suggested Gradings of Test Samples				
					(Grams)	(Grams)	(Grams)	(Grams)	(Grams)
40.0 mm	- 28.0 mm				1250+/-25				
28.0 mm	- 20.0 mm				1250+/-25				
20.0 mm	- 14.0 mm				1250+/-10	2500+/-10			
14.0 mm	- 10.0 mm	**2501.8**			1250+/-10	2500+/-10	**2500+/-10**		
10.0 mm	- 5.0 mm	**2500.0**					**2500+/-10**	5000+/-10	
5.0 mm	- 2.5 mm								5000+/-10
	Totals	**5001.8**	**3506.8**	**1495.0**	5000+/-10	5000+/-10	**5000+/-10**	5000+/-10	5000+/-10

Loss at 500 Revolutions	**29.9%**
Comments:	
* For concrete exposed to freezing and thawing or for other exposure conditions.	

APPLICABLE REQUIREMENTS			
Standard	**Section**	**Reference**	**Max Limit**
CSA A23.1		Table 12	50

Per:

Tatyana Tsvetkova, AScT
Laboratory Supervisor

Reviewed by:

Cengiz Guldemet, P.Eng
Materials Engineer

Reporting of these test results constitutes a testing service only.
Engineering interpretation or evaluation of test results is provided only on written request

METRO TESTING GROUP
Materials Testing & Engineering Services
CCIL & CSA Certified Company
Innovative Quality Solutions

METROTESTING LABORATORIES LTD.
6991 Curragh Avenue, Burnaby, B.C. V5J 4V6
Tel.: (604) 436-9111 Fax.: (604) 436-9050

TO: GEONORTH ENGINEERING LTD.
3975 18TH AVENUE
PRINCE GEORGE, BC
V2N 1B2

ATTN: Mr. Barry Tessmer

TEST METHOD FOR THE RESISTANCE OF UNCONFINED COARSE AGGREGATE TO FREEZING AND THAWING

(CSA A23.2-24A)

Project No:	15585
Project:	Aggregate Suitability Test for Concrete
Scope:	Aggregate Testing
Source:	Pit Outcrop
Type of sample:	40mm Crushed Stone
Sample by:	Client
Date Sampled:	n/a
Date Received:	9-Nov-2011
Test No:	1
Tested by:	Mimi
Date Tested:	November 15 - 23, 2011
Report Date	24-Nov-2011

COARSE AGGREGATE

SIEVE SIZES	SUGGESTED WEIGHTS OF TEST SAMPLES	MASS OF TEST FRACTIONS BEFORE TEST	MASS OF TEST FRACTIONS AFTER TEST	FREEZE THAW LOSS	PERCENT LOSS	GRADING OF COARSE PORTION	D LOSS	WEIGHTED LOSS OF CONTROL AGGREGATE
	(grams)	(grams)	(grams)	(grams)	(%)	(%)	(%)	(%)
80mm to 28mm	4500.0	4690.3	4670.3	20.0	0.4	16.5	**0.07**	0.3
28mm to 20mm	2500.0	2520.5	2510.3	10.2	0.4	5.1	**0.02**	0.8
20mm to14mm	1250.0	1283.6	1260.4	23.2	1.8	4.7	**0.08**	4.2
14mm to 10mm	1000.0	1067.0	1047.5	19.5	1.8	14.2	**0.26**	3.7
10mm to 5mm	500.0	579.9	570.9	9.0	1.6	28.5	**0.44**	5.5
(-) 5mm						31		
						100	**0.9%**	**14.5**

Comment:
Weighted sample loss of 0.9% meets the CSA requirement of 6% max. for concrete exposed to freezing and thawing.
Weighted loss of control aggregates is 14.5% which is within the specified limits of 8.5% - 15.3% (Drain Quarry)

Per:
Mimi Baraquio, AScT
Laboratory Technologist

Reviewed by:
Prakash Joshi, AScT, Eng.L
Senior Materials Engineering Technologist

Association of Professional Engineers and Geoscientists of the Province of British Columbia
P. V. JOSHI
ENGINEERING LICENSEE
Limited Licence 181356

Reporting of these test results constitutes a testing service only.
Engineering interpretation or evaluation of test results is provided only on written request.

METRO TESTING LABORATORIES
6991 Curragh Avenue, Burnaby B.C., V5J 4V6
Tel: (604) 436-9111 Fax: (604) 436-9050

SIEVE ANALYSIS REPORT
CSA SIEVES SERIES

PROJECT NO. 15585
CLIENT GEONORTH ENGINEERING LTD.
C.C.

TO
GEONORTH ENGINEERING LTD.
3975 18TH AVENUE
PRINCE GEORGE, BRITISH COLUMBI
V2N 1B2

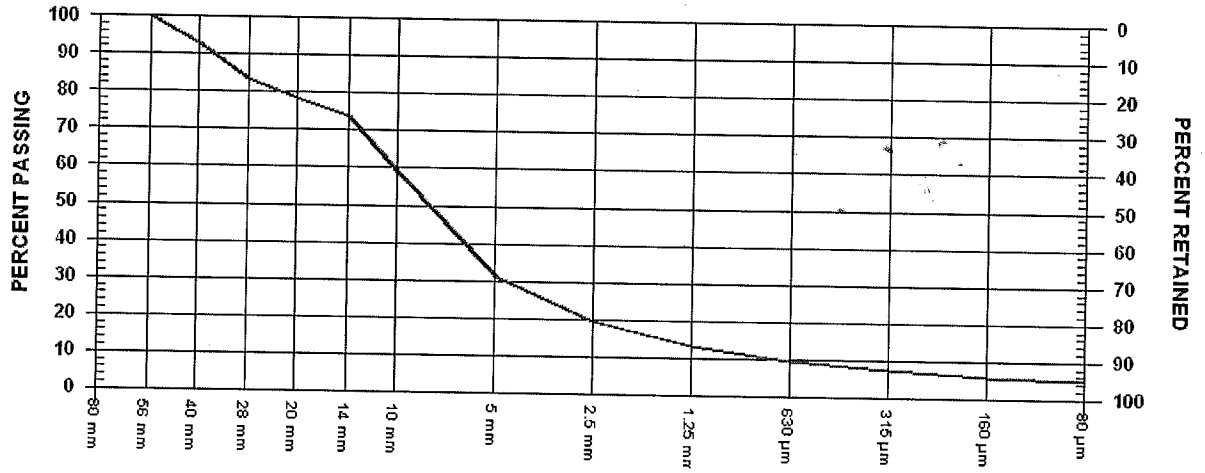
ATTN: BARRY TESSMER

PROJECT SUITABILITY OF AGGREGATE FOR CONCRTE
CONCRETE
CONTRACTOR GEONORTH ENGINEERING LTD.

SIEVE TEST NO. 2 DATE RECEIVED 2011.Nov.09 DATE TESTED 2011.Nov.14 DATE SAMPLED 2011.Nov.08

SUPPLIER
SOURCE PIT OUTCROP
SPECIFICATION
MATERIAL TYPE CRUSHED STONE

SAMPLED BY CLIENT
TESTED BY AP
TEST METHOD WASHED



GRAVEL SIZES	PERCENT PASSING	GRADATION LIMITS
80 mm		
56 mm	100.0	
40 mm	93.0	
28 mm	83.5	
20 mm	78.4	
14 mm	73.7	
10 mm	59.5	

SAND SIZES AND FINES	PERCENT PASSING	GRADATION LIMITS
5 mm	31.0	
2.5 mm	19.7	
1.25 mm	13.3	
630 µm	9.6	
315 µm	7.3	
160 µm	5.9	
80 µm	4.8	

COMMENTS

Association of Professional Engineers and Geoscientists of the Province of British Columbia
P. V. JOSHI
ENGINEERING
Limited Licence
131356

 2011.Nov.14 METRO TESTING LABORATORIES PER. _____

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of test results is provided only on written request.

METRO TESTING GROUP
Materials Testing & Engineering Services
CCIL & CSA Certified Company
Innovative Quality Solutions

TO: GEONORTH ENGINEERING LTD.
3975 18TH AVENUE
PRINCE GEORGE, BC
V2N 1B2

ATTN: Mr. Barry Tessmer

PROJECT: Suitability of Aggregate for Concrete
SCOPE: Aggregate Testing

LOG No.: 112
PROJECT No: 15585
TESTED BY: Andrey

Resistance to Degradation of Small Size Coarse Aggregate by Abrasion & Impact in the Los Angeles Machine

CSA A23.2-16A

SAMPLE DATA	
Sample I.D.	N/A
Sample Sourse:	Pit Outcrop
Sample Type:	40mm Crushed Stone
Date Sampled:	N/A
Date Received:	09-Nov-11
Date Tested:	14-Nov-11

TEST DATA		
Number of Revolutions:	500	
Number of Spheres:	8	
Mass of Spheres:	3333.6	grams
Mass of Sample Tested:	5001.0	grams
Grading Catergory:	C	
Date Reported	14-Nov-11	

TESTED SAMPLE DATA				CSA A23.2-16A, SPECIFIED TEST REQUIREMENTS				
				CSA A23.2-16A, Table 1: Numbers of Sphere and Mass				
Sieve Sizes		**Tested Sample**	**After 500 Revolutions**	A	B	C	D	E
				12 Balls	11 Balls	**8 Balls**	6 Balls	
				5000+/- 25 g	4584+/- 25 g	**3330+/- 20 g**	2500+/- 15 g	
Passing	**Retained**	**(Grams)**	**+1.8mm (Grams)** / **-1.8mm (Grams)**	CSA A23.2-16A, Table 2: Suggested Gradings of Test Samples				
				(Grams)	**(Grams)**	**(Grams)**	**(Grams)**	**(Grams)**
40.0 mm	- 28.0 mm			1250+/-25				
28.0 mm	- 20.0 mm			1250+/-25				
20.0 mm	- 14.0 mm			1250+/-10	2500+/-10			
14.0 mm	- 10.0 mm	**2500.0**		1250+/-10	2500+/-10	**2500+/-10**		
10.0 mm	- 5.0 mm	**2501.0**				**2500+/-10**	5000+/-10	
5.0 mm	- 2.5 mm							5000+/-10
	Totals	**5001.0**	**4316.4** / **684.6**	5000+/-10	5000+/-10	**5000+/-10**	5000+/-10	5000+/-10

Loss at 500 Revolutions	**13.7%**
Comments:	
* For concrete exposed to freezing and thawing or for other exposure conditions.	

APPLICABLE REQUIREMENTS			
Standard	**Section**	**Reference**	**Max Limit**
CSA A23.1		Table 12	50

Per:

Tatyana Tsvetkova, AScT
Laboratory Supervisor

Reviewed by:

Cengiz Guldemet, P.Eng
Materials Engineer

Reporting of these test results constitutes a testing service only.
Engineering interpretation or evaluation of test results is provided only on written request

VALLEY
TESTING SERVICES LTD

Consulting Engineering

Inspection & Testing

Materials Technology

Geoscience Environmental

#18 – 3275 McCallum Rd,
Abbotsford, BC
V2S 7W8

TF (1888) 855-9733
Tel. (604) 855-6568
Fax (604) 855-7378
www.valleytesting.ca

Branch Offices:

- Burnaby
  604-436-9111
- Surrey
  (604) 543-8871
- Whistler
  (604) 938-2821
- Kelowna
  (250) 860-9955
- Sechelt
  (604) 740-0920
- Squamish
  1-604-898-1420
- Salmon Arm
  (250) 803 0248
- Williams Lake
  (250) 296-4118
- Fort St. John
  (250) 261-6615
- Dawson Creek
  (250) 261-6615

VALLEY TESTING SERVICES LTD 20 YEARS 1990-2010

INNOVATION QUALITY SOLUTIONS

GeoNorth Engineering Ltd.

Preliminary Source Acceptance Testing

Project: Aggregate Quality Assessment
Examination of Coarse Aggregate
50mm to 9.5mm Fraction
Samples From "Placer Tailings" and "Pit Outcrop"

Petrographic Examination in accordance with:
CSA A23.2-04 15A Petrographic Examination Of Aggregates

Submitted To:

Metro Testing Laboratories Ltd.
Burnaby, BC

Submitted By:

Valley Testing Services Ltd.
Abbotsford, BC

December 2, 2011

MTL 15585

December 2, 2011

Metro Testing Laboratories Ltd.
6992 Curragh Avenue
Burnaby, British Columbia

Attention: Mr. Prakash Joshi

RE: Petrographic Examination Of Coarse Aggregate
Examination of Coarse Aggregate
Samples From "Placer Tailings" and "Pit Outcrop"

Dear Sir:

As requested Valley Testing Services Ltd. (Valley Testing) has examined two samples of material as supplied by GeoNorth Engineering Ltd from the above-mentioned locations. The material supplied is summarized in the table below. The purpose of the examination is to determine the suitability of the material for concrete applications.

Table 1.

Sample ID	Material Type	Source	Petrographic Grade	Intended Use
Placer Tailings	crushed rock	tailings pile	117	concrete
Pit outcrop	crushed rock	outcrop	121	concrete

The petrographic examination carried out is based on CSA A23.2-04 15A *Petrographic Examination of Aggregates,* and the MOT SS Section 202, Appendix 2 test method. The worksheet "MTO LS609" in the appendix A is derived from the Ontario test method LS609 for coarse aggregates. The examination assigns a "Petrographic Number" (PN) to the material, which correlates to classifications such as Good, Fair, Poor or Deleterious.

Summary

Placer Tailings: The examination was performed on a screened crushed rock aggregate. The material has been assigned a grade of "Good" with a PN of 117. Medium-hard to hard granodiorite and siliceous sheared rocks dominated the sample with minor amounts of medium hard mafic phyllite, and quartz vein. Particles ranged in size from 55mm to dust; estimated fracture count was 100%. Particles were angular and generally cubic. Slight to moderate weathering was observed, with some intense weathering noted in some sheared rock particles. The porosity of the sample is considered low to medium.

This coarse aggregate material is deemed physically and mechanically suitable for use in ready mix concrete and asphalt.

Pit Outcrop: The examination was performed on a screened crushed rock aggregate. The material has been assigned a grade of "Good" with a PN of 121. Medium-hard to hard sheared rocks dominated the sample with a moderate amount of medium hard diorite. Particles ranged in size from 50mm to dust; estimated fracture count was 100%. Particles were angular and generally cubic. Slight to moderate weathering was observed (mostly surface weathering), with some intense weathering noted in some sheared rock particles. The porosity of the sample is considered low to medium.

This coarse aggregate material is deemed physically and mechanically suitable for use in some construction materials including concrete and asphalt.

Method

As stated previously the basis for the examination was the CSA A23.2-04 15A test method and the MOT test method described in Appendix 2 of Section 202 of their Standard Specifications. The aggregate samples were prepared according to the procedures as outlined in the MOT test method[1]. The resulting coarse fraction material, comprised of aggregate between the 19mm and 9.5mm screens, was washed and analysed. Due to the mass of this fraction the larger particles were re-introduced to produce a large enough sample. Fracture count was estimated, and then the material was examined for its physical and mechanical properties.

Using a hand lens (16X) and microscope, as well as a magnet, steel nail and knife, and dilute HCl, the material was classified by rock type and physical condition. Classifications for the aggregate was noted on the analysis sheets in Appendix A.

Discussion of Coarse Aggregates

Placer Tailings: The material used for this examination was a 55mm-9.5mm coarse fraction of a crushed rock aggregate from the "Placer Tailings" source. The coarse fraction material used was comprised of 19mm to 9.5mm material as per the MOT test method as outlined in Appendix 2 of Section 202 (with larger material re-introduced as mentioned above).

The sample material was generally found to be medium hard to hard, moderately tough with minor to moderate surface weathering. The porosity of the rock types were generally low to moderate, with minor amounts of highly porous sheared material. The majority of the sample was composed of granodiorite and sheared rocks with minor amounts of mafic phyllite, and quartz vein. Much of the sheared rock has rusty limonite surfaces does not appear to have excessive deleterious effects on the aggregate. No significant amounts of flat or elongated particles were observed.

The rock types identified were (in order of magnitude):

Granodiorite: no organics or coatings were noted, shape was angular and generally cubic, medium grain size, crystalline grain arrangement, low porosity, mineralogy dominated by

1 MOT SS Section 202 Appendix 2, page 202 (11 of 12)

feldspar, quartz and biotite, structure of the particles was massive with uneven fracturing, particles were fresh with some surface weathered particles, Mohs hardness ranged from 5.0 - 5.5, color was specked black & white or gray overall.

Sheared Rock: no organics or coatings were noted, shape was very angular and generally cubic (minor flat particles), fine to medium grain size, cryptocrystalline grain arrangement, low to moderate porosity, mineralogy dominated by feldspar, quartz and muscovite, particle structure showed moderate to strong foliation, minor jointing with uneven fracturing, mainly surface weathered with minor deeply weathered particles, Mohs hardness ranged from 5.0 - >5.5, color was pale gray to yellowish gray with brown rusty limonite surfaces.

Mafic Phyllite: no organics or coatings were noted, shape was angular and generally cubic (minor elongated particles), fine to coarse grain size, crystalline and cryptocrystalline grain arrangement, low to moderate porosity, mineralogy dominated by hornblende, calcite, feldspar, and biotite, particle structure showed weak to moderate foliation with uneven fracturing, mainly fresh and surface weathered particles, Mohs hardness ranged from 5.0 - 5.5, color was dark gray to black.

Quartz Vein: no organics or coatings were noted, shape was angular and generally cubic (minor flat particles), fine grain size, cryptocrystalline grain arrangement, low porosity, mineralogy dominated by quartz with some limonite, particle structure massive with concoidal fracturing, mainly fresh particles, Mohs hardness was >5.5, color was white with minor rusty limonite.

Pit Outcrop: The material used for this examination was a 50mm-9.5mm coarse fraction of a crushed rock aggregate from the "Pit Outcrop" source. The coarse fraction material used was comprised of 19mm to 9.5mm material as per the MOT test method as outlined in Appendix 2 of Section 202 (with larger material re-introduced as mentioned above).

The sample material was generally found to be medium hard to hard, moderately tough with minor to moderate weathering. The porosity of the rock types were generally low to moderate, with minor amounts of highly porous sheared material. The majority of the sample was composed of sheared rock with moderate amounts of diorite. Much of the sheared rock has rusty limonite surfaces does not appear to have excessive deleterious effects on the aggregate. No significant amounts of flat or elongated particles were observed.

The rock types identified were (in order of magnitude):

Sheared Rock: no organics or coatings were noted, shape was very angular and generally cubic (minor flat particles), fine to medium grain size, cryptocrystalline grain arrangement, low to moderate porosity, mineralogy dominated by feldspar, hornblende, biotite (minor quartz), particle structure showed moderate to strong foliation, minor jointing with uneven fracturing, mainly surface weathered particles, Mohs hardness ranged from 5.0 - >5.5, color was rusty brown to dark gray.

Diorite: no organics or coatings were noted, shape was very angular to angular and generally cubic (minor flat and elongated particles), fine to medium grain size, crystalline grain

arrangement, low porosity, mineralogy dominated by feldspar, quartz and biotite, structure of the particles was massive with uneven fracturing, particles were fresh with some surface weathered particles, Mohs hardness ranged from 5.0 - 5.5, color was specked black & white or gray overall.

Alkali Aggregate Reactivity

Alkali Silica Reactivity

The petrographic examination revealed that the aggregate material contained rock types with mineralogy that may have a potential for alkali silica reactivity (ASR). These include particular types of quartz mineralogy found in the sheared rocks. Historical usage of similar material as well as ASR evaluations of similar material should be taken into account when assessing the potential for expansive reactivity in Portland cement.

This is a reaction between the hydroxide ions associated with the dissolved salts of sodium and potassium and the silica molecules of certain imperfectly crystallized siliceous rocks and minerals, such as opal, chert, and cristobalite, or highly siliceous volcanic glasses or highly strained or granulated siliceous rocks, such as the metaquartzites, other stressed silicates, and exceptionally fine-grained siliceous rocks (such as siltstone and argillite). The reaction produces a silica gel that will expand in the presence of moisture. The expanding gel causes cracks in the aggregate and paste. The cracks allow more moisture to enter and expansive gel to fill the cracks and cause more expansion.

The aggregate material, once processed for use, should be evaluated for ASR in accordance with CSA A23.2-27A prior to being used in ready mix concrete. If the aggregate will be used as concrete aggregate before any ASR testing can be done (e.g. CSA A23.2-25A) then the ready mix supplier should reference A23.2-27A, Tables 1 to 6 for "Measures to Avoid Deleterious Expansion in Concrete" using supplementary cementing materials such as fly ash and silica fume.

Conclusions

Placer Tailings: PN= 117 *Pit Outcrop:* PN= 121

This aggregate material is physically and mechanically suitable for asphalt and concrete applications. In particular, aggregates with petrographic numbers at or below 125 are considered suitable for all classes of ready mix concrete. Aggregates with petrographic numbers below 140 are suitable for most classes of concrete with the exception of Class C1, C2, and F1 (these are concrete mixes that have entrained air and may be exposed to freeze/thaw) (CSA A23.2 – 15A).

As noted earlier in this report, the potential exists for alkali aggregate reactivity. If the aggregate material has not been evaluated for AAR, this is a recommended action.

As many of the aggregate particles have an oxidized rusty surface, there is the chance that this oxidation could find its way to the surface and cause rusty streaks to form on the surface of the concrete.

I trust this report meets your needs. Please do not hesitate to call if you require any further services or information.

Yours truly,

John Burton, P.Geo
Senior Geoscientist



References

CSA A23.2-04 15A Petrographic Examination Of Aggregates
MTO LS 609 Test Method
Best, Igneous and Metamorphic Petrology, 1982
MOT Standard Specifications for Highway Construction 2009

Appendix A

Aggregate Worksheets

Coarse Aggregate Petrographic Analysis- MTO LS609

Client Name: GeoNorth Engineering

Source: Placer Tailings **Project Name:** Aggregate Qualification

Date: 02-Dec-11 **Fraction:** 30-9.5mm **Sample ID** crush rock **Analyst:** J. Burton

Type	Type No.	Mass (g)	%
Carbonate [hard; silty, hard]	01		
Carbonate [surface weathered; silty, surface weathered; medium hard: silty medium hard]	20		
Carbonate [sandy, hard or medium hard]	02		
Carbonate [slightly cherty; <5% chert]	21		
Chert [hard or medium hard]	23		
Conglomerate-Sandstone-Arkose [hard]	03		
Conglomerate-Sandstone-Arkose [medium hard]	22		
Greywacke-Argillite [hard or medium hard]	06		
Gneiss-Amphibolite-Schist [hard]	04	694.9	46.4
Quartzite [hard]	05		
Granite-Diorite-Gabbro [hard]	08	639.6	42.7
Volcanic [hard or medium hard]	07		
Minerals [hard/medium]	09		
Quartz vein	10	36.6	2.4
Total Good Aggregate		**1371.1**	**91.5**
Carbonate [soft; silty soft; slightly shaley]	35		
Carbonate [soft, pitted]	41		
Carbonate [deeply weathered; silty, deeply weathered]	42		
Carbonate [sandy, soft]	40		
Marble [brittle]	24		
Chert-Cherty Carbonate [<20% leached chert]	26		
Conglomerate-Sandstone-Arkose [brittle]	30		
Greywacke [brittle]	29		
Quartzite [slightly weathered]	52		
Gneiss-Amphibolite-Schist [brittle]	25	100.5	6.7
Minerals [soft]	34		
Granite-Diorite-Gabbro [brittle]	27	26.7	1.8
Volcanic [soft]	28		
Total Fair Aggregate		**127.2**	**8.5**
Carbonate [shaley; clayey; silty, clayey]	43		
Carbonate [ochreous: sandy ochreous]	44		
Marble [friable]	49		
Chert-Cherty Carbonate [>20% leached chert]	45		
Conglomerate-Sandstone-Arkose [friable]	46		
Siltstone	56		
Cementation [partial]	53		
Cementation [total]	54		
Gneiss-Amphibolite [friable]	50		
Schist [soft]	55		
Granite-Diorite-Gabbro [friable]	51		
Volcanic [very soft, porous]	48		
Total Poor Aggregate		**0**	**0.0**
Ochre	60		
Carbonate/Shale	61		
Clay	62		
Volcanic-Gneiss Schist [decomposed]	63		
Total Deleterious Aggregate		**0**	**0.0**

% GOOD	91.5	x 1 =	91.5
% FAIR	8.5	x 3 =	25.5
% POOR	0.0	x 6 =	0.0
% DELETERIOUS	0.0	x 10 =	0.0

Estimated % Crushed: 100%

Estimated % Flat and Elongated: <3%

Asphalt and Ready-Mix Concrete PN: 117

Coarse Aggregate Petrographic Analysis- MTO LS609

Client Name: GeoNorth Engineering

Source: Pit Outcrop **Project Name:** Aggregate Qualification

Date: 02-Dec-11 **Fraction:** 30-9.5mm **Sample ID** crush rock **Analyst:** J. Burton

Type	Type No.	Mass (g)	%
Carbonate [hard; silty, hard]	01		
Carbonate [surface weathered; silty, surface weathered; medium hard: silty medium hard]	20		
Carbonate [sandy, hard or medium hard]	02		
Carbonate [slightly cherty; <5% chert]	21		
Chert [hard or medium hard]	23		
Conglomerate-Sandstone-Arkose [hard]	03		
Conglomerate-Sandstone-Arkose [medium hard]	22		
Greywacke-Argillite [hard or medium hard]	06		
Gneiss-Amphibolite-Schist [hard]	04	974.2	64.5
Quartzite [hard]	05		
Granite-Diorite-Gabbro [hard]	08	397.3	26.3
Volcanic [hard or medium hard]	07		
Minerals [hard/medium]	09		
Quartz vein	10		
Total Good Aggregate		**1371.5**	**90.8**
Carbonate [soft; silty soft; slightly shaley]	35		
Carbonate [soft, pitted]	41		
Carbonate [deeply weathered; silty, deeply weathered]	42		
Carbonate [sandy, soft]	40		
Marble [brittle]	24		
Chert-Cherty Carbonate [<20% leached chert]	26		
Conglomerate-Sandstone-Arkose [brittle]	30		
Greywacke [brittle]	29		
Quartzite [slightly weathered]	52		
Gneiss-Amphibolite-Schist [brittle]	25	96.3	6.4
Minerals [soft]	34		
Granite-Diorite-Gabbro [brittle]	27	29.9	2.0
Volcanic [soft]	28		
Total Fair Aggregate		**126.2**	**8.4**
Carbonate [shaley; clayey; silty, clayey]	43		
Carbonate [ochreous: sandy ochreous]	44		
Marble [friable]	49		
Chert-Cherty Carbonate [>20% leached chert]	45		
Conglomerate-Sandstone-Arkose [friable]	46		
Siltstone	56		
Cementation [partial]	53		
Cementation [total]	54		
Gneiss-Amphibolite [friable]	50		
Schist [soft]	55	12.3	0.8
Granite-Diorite-Gabbro [friable]	51		
Volcanic [very soft, porous]	48		
Total Poor Aggregate		**12.3**	**0.8**
Ochre	60		
Carbonate/Shale	61		
Clay	62		
Volcanic-Gneiss Schist [decomposed]	63		
Total Deleterious Aggregate		**0**	**0.0**

% GOOD	90.8	x 1 =	90.8	Estimated % Crushed:	100%
% FAIR	8.4	x 3 =	25.1	Estimated % Flat and Elongated:	<5%
% POOR	0.8	x 6 =	4.9		
% DELETERIOUS	0.0	x 10 =	0.0		

Asphalt and Ready-Mix Concrete PN: 121

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

T: +1 (780) 438-5522
F: +1 (780) 438-0396
E: Edmonton@exova.com
W: www.exova.com

Exova

Analytical Report

Bill To: GeoNorth Engineering Inc.
Report To: GeoNorth Engineering Inc.
3975 18 Avenue
Prince George, BC, Canada
V2N 1B2
Attn: Hans Jorgensen
Sampled By:
Company:

Project:
ID: K-3300
Name:
Location:
LSD:
P.O.:
Acct code:

Lot ID: **837489**
Control Number:
Date Received: Nov 9, 2011
Date Reported: Nov 17, 2011
Report Number: 1528815

		Reference Number	837489-1	837489-2		
		Sample Date				
		Sample Time				
		Sample Location				
		Sample Description	Placer Tailings	Pit Outcrop		
		Matrix	Soil	Soil		
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Available Nutrients						
Sulfate-S	Available	mg/kg	4	8		1

Approved by:

Darlene Lintott, MSc
Consulting Scientist

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

T: +1 (780) 438-5522
F: +1 (780) 438-0396
E: Edmonton@exova.com
W: www.exova.com

Methodology and Notes

Bill To:	GeoNorth Engineering Inc.	Project:	
Report To:	GeoNorth Engineering Inc.	ID:	K-3300
	3975 18 Avenue	Name:	
	Prince George, BC, Canada	Location:	
	V2N 1B2	LSD:	
Attn:	Hans Jorgensen	P.O.:	
Sampled By:		Acct code:	
Company:			

Lot ID:	**837489**
Control Number:	
Date Received:	Nov 9, 2011
Date Reported:	Nov 17, 2011
Report Number:	1528815

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Sulfate in General Soil	McKeague	* Sulfate Extractable by 0.1M CaCl2, 4.47	10-Nov-11	Exova Edmonton

** Reference Method Modified*

References

McKeague — Manual on Soil Sampling and Methods of Analysis

Comments:

Please direct any inquiries regarding this report to our Client Services group.
Results relate only to samples as submitted.
The test report shall not be reproduced except in full, without the written approval of the laboratory.

Terms and Conditions: www.exova.ca/terms&conditions

GEONORTH ENGINEERING LTD.

3975 18th Avenue
Prince George, B.C., V2N 1B2
Phone 250-564-4304
Fax 250-564-9323
E-mail mail@geonorth.ca

November 15, 2011

K-3300

BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC V6Z 2A9

Attention: Pete Quinn

Dear Sirs:

Re: Eagle Gold Concrete Aggregate Test Results, Pit Outcrop

Listed below are the tests that you requested on your proposed concrete aggregate to determine their conformation to CSA A23.2 specification:

		Results
CSA A23.2-3A	Clay lumps in Aggregate (5mm-10mm)	0.0%
CSA A23.2-4A	Low Density Granular Materials	0.0%
CSA A23.2-12A	Relative Density SSD (Fine Agg)	2.657
	Absorption	0.999
CSA A23.2-13A	Flat & Elongated 4:1 Ratio	35.0%
CSA A23.2-23A	Micro-Deval (Fine Agg)	13.3% Loss
CSA A23.2-29A	Micro-Deval (Coarse Agg)	12.9% Loss

If you require any further information, please do not hesitate to call me at our office at (250) 564-4304.

Yours truly,

GeoNorth Engineering Ltd.

Per: Hans Jorgensen
Manager, Technical Services

GEONORTH ENGINEERING LTD.

3975 18th Avenue
Prince George, B.C., V2N 1B2
Phone 250-564-4304
Fax 250-564-9323
E-mail mail@geonorth.ca

November 15, 2011

K-3300

BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC V6Z 2A9

Attention: Pete Quinn

Dear Sirs:

Re:Eagle Gold Concrete Aggregate Test Results, Placer Tailings

Listed below are the tests that you requested on your proposed concrete aggregate to determine their conformation to CSA A23.2 specification:

		Results
CSA A23.2-3A	Clay lumps in Aggregate (5mm-10mm)	0.0%
CSA A23.2-4A	Low Density Granular Materials	0.0%
CSA A23.2-12A	Relative Density SSD (Fine Agg)	2.704
	Absorption	1.399%
CSA A23.2-13A	Flat & Elongated 4:1 Ratio	19.0%
CSA A23.2-23A	Micro-Deval (Fine Agg)	11.6% Loss
CSA A23.2-29A	Micro-Deval (Coarse Agg)	26.9% Loss

If you require any further information, please do not hesitate to call me at our office at (250) 564-4304.

Yours truly,

GeoNorth Engineering Ltd.

Per: Hans Jorgensen
Manager, Technical Services

GeoNorth Engineering Ltd.

3975 18 th Avenue
Prince George, B.C., V2N 1B2

Soundness of Aggregate
Sulphate Test Report

Project No.:	K-3300
Date:	11/15/2011
P.O.:	
cc:	

Project: Eagle Gold Aggregate Testing		
Source: Pit Outcrop	Type of Sample: Crushed Rock	Sampled By: Client
Date Sampled: 8/23/2011	Date Received: 9/13/2011	Date Tested: 11/6/2011

Solution: $MgSO_4$ Number of Cycles: 5

Coarse Aggregate				Fine Aggregate			
Sieve Size		Original Grading Percent	Weighed Average Percent Loss	Sieve Size		Original Grading Percent	Weighed Average Percent Loss
Passing	Retained			Passing	Retained		
80 mm	56 mm						
56 mm	40 mm	12.43	0.00	5 mm	2.5 mm	37.3	0.22
40 mm	28 mm	9.22	0.00	2.5 mm	1.25 mm	19.7	0.63
28 mm	20 mm	7.54	0.01	1.25 mm	630 μm	11.3	0.46
20 mm	14 mm	6.15	0.54	630 μm	315 μm	7.4	0.18
14 mm	10 mm	22.35	0.28	315 μm	160 μm	4.6	1.66
10 mm	5 mm	42.32	0.13	160 μm		19.7	
Totals		100.0	0.97	Totals		100.0	3.16

Size Fraction	No. Particles	Qualitative Examination of Plus 20 mm Material.
80 mm - 56 mm	Original	
	Final	
56 mm - 40 mm	Original	
	Final	
40 mm - 28 mm	Original	
	Final	
28 mm - 20 mm	Original	
	Final	

Tested in accordance with CSA A23.2 - 9A

Noelco

COMMENTS:

Certified:

Reporting of test results constitutes a testing service only. Engineering evaluation of the test results is provided only on request.

GeoNorth Engineering Ltd.

3975 18 th Avenue
Prince George, B.C., V2N 1B2

Soundness of Aggregate
Sulphate Test Report

Project No.:	K-3300
Date:	11/15/2011
P.O.:	
cc:	

Project: Eagle Gold Aggregate Testing		
Source: Placer Tailings	Type of Sample: Crushed Rock	Sampled By: Client
Date Sampled: 8/23/2011	Date Received: 9/13/2011	Date Tested: 11/6/2011

Solution: $MgSO_4$ Number of Cycles: 5

Coarse Aggregate				Fine Aggregate			
Sieve Size		Original Grading Percent	Weighed Average Percent Loss	Sieve Size		Original Grading Percent	Weighed Average Percent Loss
Passing	Retained			Passing	Retained		
80 mm	56 mm						
56 mm	40 mm	9.53	0.00	5 mm	2.5 mm	34.2	0.50
40 mm	28 mm	10.28	0.00	2.5 mm	1.25 mm	22.4	0.76
28 mm	20 mm	5.23	0.03	1.25 mm	630 μm	14.6	1.03
20 mm	14 mm	5.42	0.02	630 μm	315 μm	9.2	0.94
14 mm	10 mm	15.14	0.10	315 μm	160 μm	6.0	0.64
10 mm	5 mm	54.4	0.12	160 μm		13.5	
Totals		100.0	0.27	Totals		100.0	3.86

Size Fraction	No. Particles	Qualitative Examination of Plus 20 mm Material.
80 mm - 56 mm	Original	
	Final	
56 mm - 40 mm	Original	
	Final	
40 mm - 28 mm	Original	
	Final	
28 mm - 20 mm	Original	
	Final	

Tested in accordance with CSA A23.2 - 9A

Noelco

COMMENTS:

Certified:

Reporting of test results constitutes a testing service only. Engineering evaluation of the test results is provided only on request.

METRO TESTING LABORATORIES LTD.
6991 Curragh Avenue, Burnaby, BC V5J 4V6
Tel: (604) 436-9111 Fax: (604) 436-9050

Detection of Alkali-silica Reactive Aggregate by Accelerated Expansion of Mortar Bars

(CSA A23.2 - 25A)

GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, BC V2N 1B2

Date: 16 December 2011

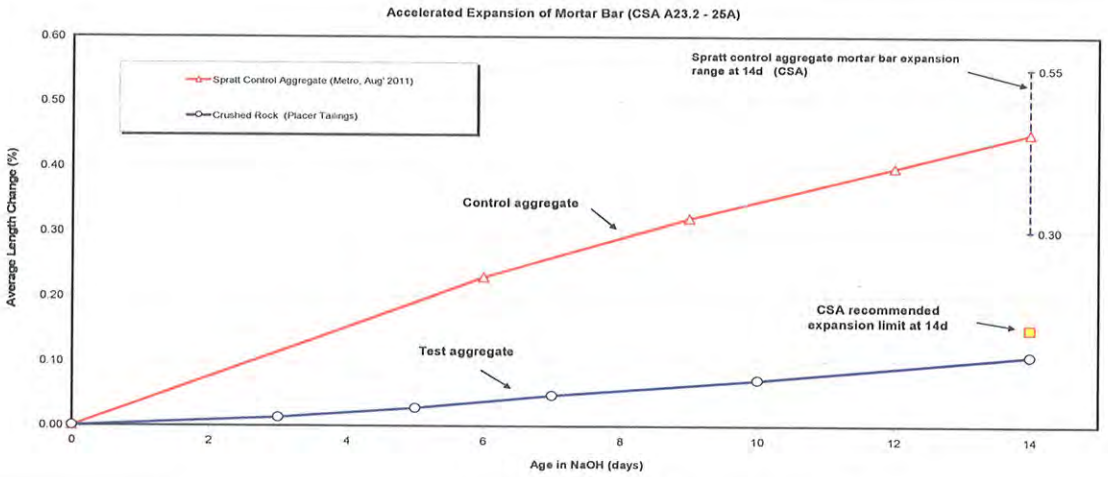
Our File: 15585 Set 2

Attn: Hans Jorgensen

PROJECT: **Suitability of Aggregate for Concrete**

Sample	**Crushed Rock (Source: Placer Tailings)**

Date sample received: 9 Nov. 2011
Date specimens cast: 30 Nov. 2011
Sampled by: Client
Water/Cement Ratio: 0.50
Portland Cement: Essroc type GU, alkali content of 0.94% Na_2O_{eq}.
Test method: CSA A23.2-25A, Test Method for Detection of Alkali-silica Reactive Aggregate by Accelerated Expansion of Mortar Bars



Mortar bar specimens	Expansion, % (age in NaOH solution, days)				
	3	5	7	10	14
1	0.014	0.029	0.050	0.073	0.111
2	0.015	0.029	0.050	0.074	0.112
3	0.011	0.028	0.047	0.072	0.109
4	0.012	0.025	0.043	0.066	0.102
Average	0.013	0.028	0.047	0.071	0.108
CSA recommended limit for deleterious expansion					**0.15**
Spratt control aggregate test results (Metro, Aug' 11)					0.45
Observation: White spots on mortar bars were observed at 7 days test age. Hairline cracks were observed at 14 days test age.					

Comments: Sample meets CSA maximum limit of 0.15% expansion at 14 days. According to CSA A23.2 – 27A, Table 2, the degree of alkali-silica reactivity of the aggregate may be classified as "**Non-reactive**".

Metro Testing Laboratories Ltd.

Des Guo, M.Eng., P.Eng.
Materials Engineer

Reviewed by:

Prakash V. Joshi, ASCT, Eng.
Senior Materials Engineering Technologist

Association of Professional Engineers and Geoscientists of the Province of British Columbia
P. V. JOSHI
ENGINEERING TECHNOLOGIST
Limited Licence
131356

Reporting of these test results constitutes a testing service only.
Engineering interpretation or evaluation of test results is provided only on written request.

METRO TESTING LABORATORIES LTD.
6991 Curragh Avenue, Burnaby, BC V5J 4V6
Tel: (604) 436-9111 Fax: (604) 436-9050

Detection of Alkali-silica Reactive Aggregate by Accelerated Expansion of Mortar Bars

(CSA A23.2 - 25A)

GeoNorth Engineering Ltd.
3975 18th Avenue
Prince George, BC V2N 1B2

Date: 16 December 2011

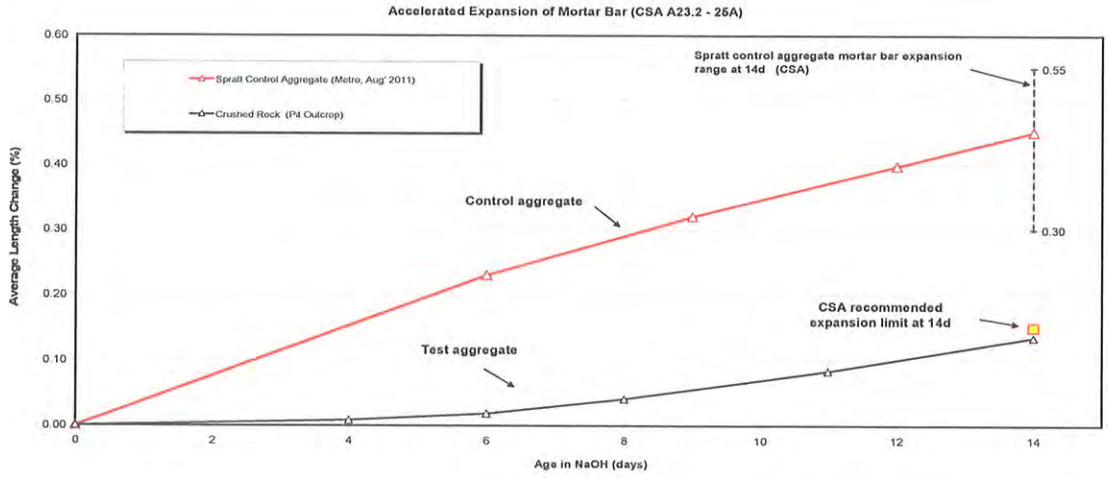
Our File: 15585 Set 1

Attn: Hans Jorgensen

PROJECT: **Suitability of Aggregate for Concrete**

Sample	**Crushed Rock (Source: Pit Outcrop)**

Date sample received: 9 Nov. 2011 **Sampled by:** Client
Date specimens cast: 29 Nov. 2011 **Water/Cement Ratio**: 0.50
Portland cement: Essroc type GU, alkali content of 0.94% Na_2O_{eq}.
Test method: CSA A23.2-25A, Test Method for Detection of Alkali-silica Reactive Aggregate by Accelerated Expansion of Mortar Bars



Mortar bar specimens	Expansion, % (age in NaOH solution, days)				
	4	6	8	11	14
1	0.008	0.017	0.040	0.081	0.136
2	0.008	0.016	0.040	0.080	0.139
3	0.009	0.017	0.039	0.083	0.131
4	0.008	0.022	0.042	0.088	0.133
Average	0.009	0.018	0.040	0.083	0.135
CSA recommended limit for deleterious expansion					**0.15**
Spratt control aggregate test results (Metro, Aug' 11)					0.45
Observation: White spots on mortar bars were observed at 8 days test age.					

Comments: Sample meets CSA maximum limit of 0.15% expansion at 14 days. According to CSA A23.2 – 27A, Table 2, the degree of alkali-silica reactivity of the aggregate may be classified as "**Non-reactive**".

Metro Testing Laboratories Ltd.

Des Guo, M.Eng., P.Eng.
Materials Engineer

Reviewed by:

Prakash V. Joshi, AScT, Eng.L
Senior Materials Engineering Technologist

Association of Professional Engineers and Geoscientists of the Province of British Columbia
P. V. JOSHI
ENGINEERING LICENSEE
Limited Licence 131356

Reporting of these test results constitutes a testing service only.
Engineering interpretation or evaluation of test results is provided only on written request.

GEONORTH ENGINEERING LTD.

3975 18th Avenue
Prince George, B.C., V2N 1B2
Phone 250-564-4304
Fax 250-564-9323
E-mail mail@geonorth.ca

January, 10 2012

K-3300

BGC Engineering Inc.
Suite 500 - 1045 Howe Street
Vancouver, BC V6Z 2A9

Attention: Pete Quinn

Dear Sirs:

Re: Eagle Gold Aggregate Test Results, Placer Steiner Outcrop

Listed below are the tests that you requested on your proposed concrete aggregate to determine their conformation to CSA A23.2 specification:

		Results
CSA A23.2-6A	Relative Density SSD (Fine Agg)	2.718
	Absorption	1.122%
CSA A23.2-29A	Micro-Deval (Coarse Agg)	11.0% Loss

If you require any further information, please do not hesitate to call me at our office at (250) 564-4304.

Yours truly,

GeoNorth Engineering Ltd.

Per: Hans Jorgensen
Supervisor, Technical Services

LABORATORY TESTS COMMISSIONED BY TETRA TECH

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

November 4, 2011
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

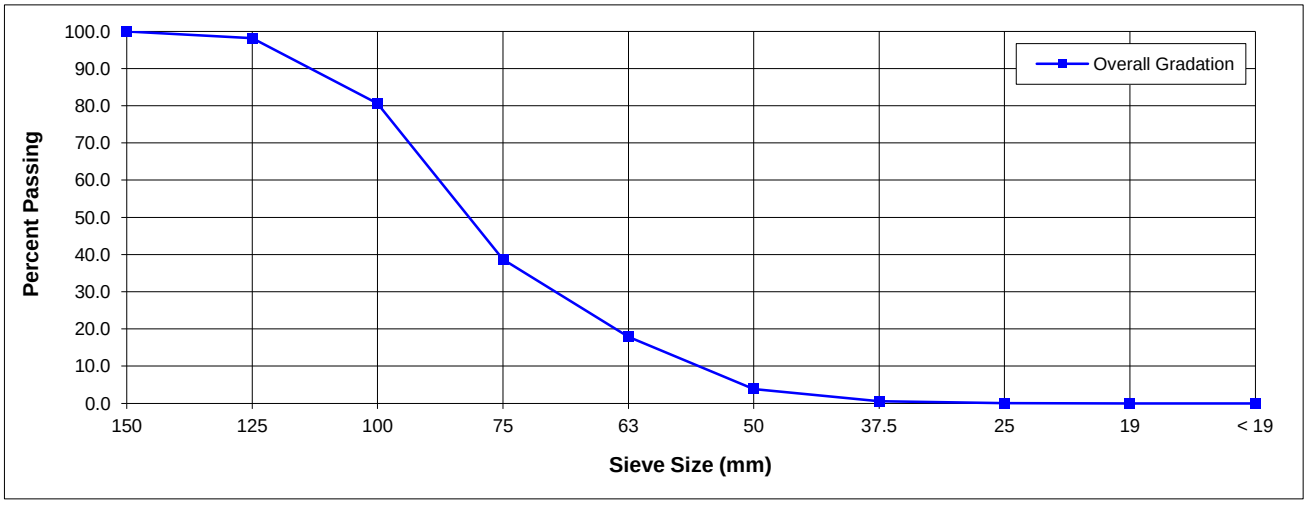
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF , As Received**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: November 3, 2011
DATE TESTED: November 4, 2011

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					**MATERIAL SPECIFICATION :**
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)		
			+ < 19	- < 19	
150	0.0	100.0	0.0		
125	1.8	98.2	1.8		
100	17.6	80.6	17.6		
75	41.9	38.7	41.9		
63	20.8	17.9	20.8		
50	14.0	3.9	14.0		
37.5	3.3	0.6	3.3		
25	0.5	0.0	0.5		
19	0.0	0.0	0.0		
< 19	0.0	0.0	0.0		
Total	100.0		100.0		



Remarks: Entire sample received sieved; total mass: 174928 g

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

November 4, 2011
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

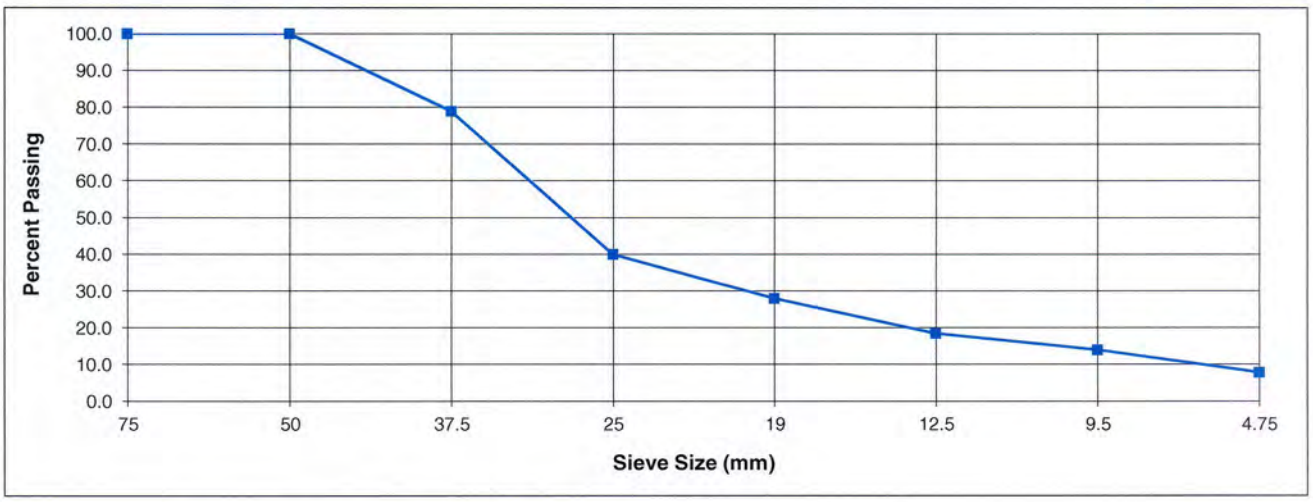
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF, 50mm minus lab crushed**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: November 3, 2011
DATE TESTED: November 7, 2011

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					MATERIAL SPECIFICATION :
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)		
			+ 4.75	- 4.75	
75	0.0	100.0	0.0		
50	0.0	100.0	0.0		
37.5	21.1	78.9	22.9		
25	38.9	40.0	42.2		
19	12.0	28.0	13.0		
12.5	9.6	18.4	10.4		
9.5	4.5	14.0	4.8		
4.75	6.1	7.9	6.7		
PAN	7.9			100.0	
Total	100.0		100.0	100.0	



Remarks: Combined Sample(BGC-GD-1, 2,3,4,5 and BGC-MS-1, 2,3,4,5)
Sample crushed to 50mm minus by lab jaw crusher.

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

MAXIMUM AND MINIMUM INDEX DENSITY USING A VIBRATORY TABLE

ASTM D 4253 & D 4254

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 50 mm minus lab crushed**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: December 21, 2011

Date received: November 3, 2011
Tested by: DC

Trial	Maximum Index Density (Dry method 2A) kg/m^3	Maximum Index Density (Wet method 2B) kg/m^3	Minimum Index Density (Method A) kg/m^3
1	1755	1764	1400
2	--	--	--
AVERAGE	**1755**	**1764**	**1400**

Note: Tests were carried out with the large mould.

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF COARSE AGGREGATE

ASTM C 127

December 12, 2011
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 50mm minus crushed, Coarse Portions**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: November 30, 2011

Date received: November 3, 2011
Tested by: DC

Size Fractions	Relative Density (oven dry basis) g/cm^3	Relative Density (SSD basis) g/cm^3	Relative Density (Apparent) g/cm^3	Absorption (%)
50 x 37.5mm	2.661	2.683	2.722	0.84
37.5 x 25.0mm	2.643	2.665	2.702	0.82
25.0 x 12.5mm	2.634	2.659	2.701	0.94
12.5 x 4.75mm	2.603	2.638	2.697	1.33

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF FINE AGGREGATE

ASTM C 128

December 12, 2011
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 50mm minus crushed, Passing 4.75mm Portion**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: November 30, 2011

Date received: November 3, 2011
Tested by: DC

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.452	2.545	2.704	3.79
2	2.458	2.550	2.707	3.73
AVERAGE	**2.455**	**2.548**	**2.705**	**3.76**

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

January 12, 2012
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

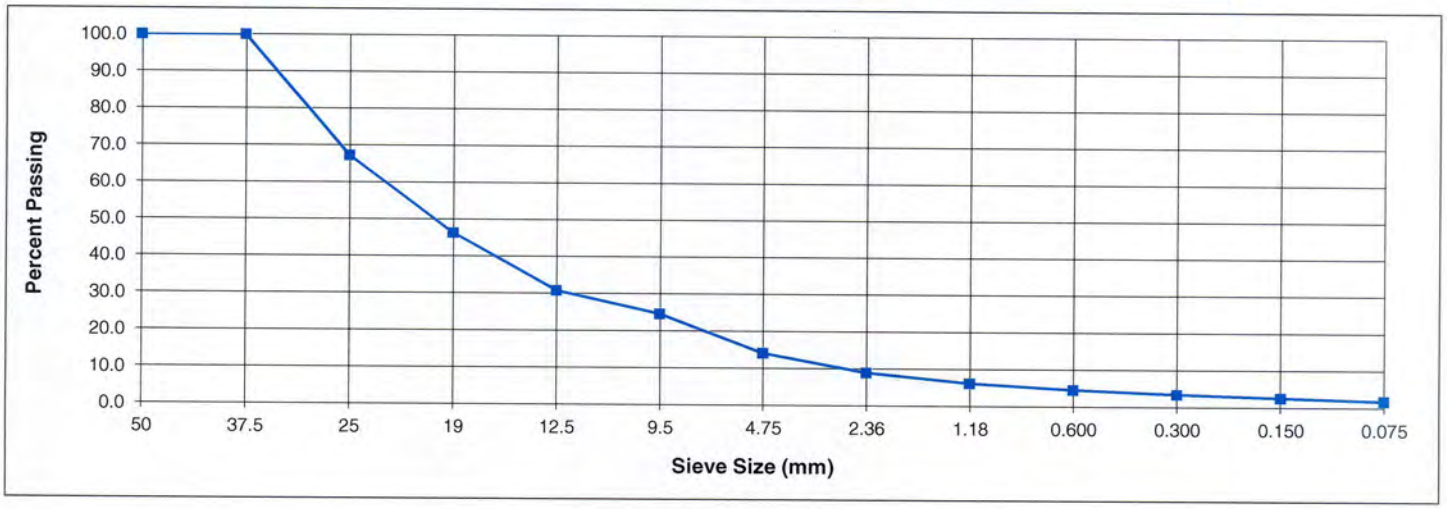
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF, 37.5mm minus lab crushed**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: November 3, 2011
DATE TESTED: December 20, 2011

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
50	0.0	100.0	0.0			
37.5	0.0	100.0	0.0			
25	32.7	67.3	38.1			
19	21.0	46.3	24.4			
12.5	15.5	30.8	18.1			
9.5	6.2	24.6	7.2			
4.75	10.4	14.2	12.2			
2.36	5.2	9.0		36.5		
1.18	2.7	6.3		19.3		
0.600	1.6	4.6		11.4		
0.300	1.2	3.5		8.2		
0.150	0.8	2.7		5.8		
0.075	0.8	1.8		5.9		
PAN	1.8	0		12.9		
Total	100.0		100.0	100.0		



Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

MAXIMUM AND MINIMUM INDEX DENSITY USING A VIBRATORY TABLE

ASTM D 4253 & D 4254

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 37.5 mm minus lab crushed**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 5, 2012

Date received: November 3, 2011
Tested by: DC

Trial	Maximum Index Density (Dry method 2A) kg/m^3	Maximum Index Density (Wet method 2B) kg/m^3	Minimum Index Density (Method A) kg/m^3
1	1854	1908	1553
2	1891	--	1532
AVERAGE	**1872**	**1908**	**1543**

Note: Tests were carried out with the large mould.

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF FINE AGGREGATE

ASTM C 128

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 37.5mm minus lab crushed, passing 4.75mm portion**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: December 21, 2011

Date received: November 3, 2011
Tested by: DC

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.609	2.637	2.683	1.05
2	2.610	2.635	2.678	0.97
AVERAGE	**2.610**	**2.636**	**2.681**	**1.01**

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RESISTANCE TO DEGRADATION OF SMALL-SIZE COARSE AGGREGATE BY ABRASION & IMPACT IN THE LOS ANGELES MACHINE

ASTM C 131

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 37.5mm minus lab crushed**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 9, 2012

Date received: November 3, 2011
Tested by: DC

Grading	**A**
Number of revolutions	500
Loss after 500 revolutions (%)	**28.4**

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

January 12, 2012
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

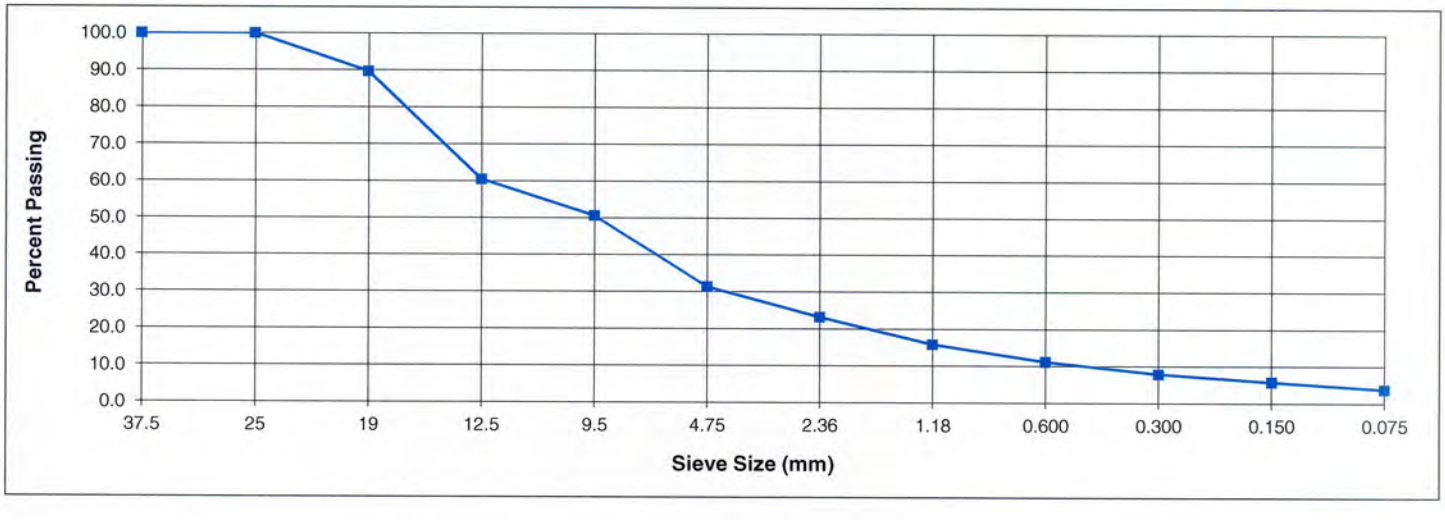
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF, 25mm minus lab crushed**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: November 3, 2011
DATE TESTED: January 9, 2012

SAMPLED BY: BGC
TESTED BY: DC

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
37.5	0.0	100.0	0.0			
25	0.0	100.0	0.0			
19	10.3	89.7	15.1			
12.5	29.2	60.5	42.5			
9.5	9.8	50.7	14.3			
4.75	19.3	31.4	28.1			
2.36	8.2	23.2		26.0		
1.18	7.3	16.0		23.1		
0.600	4.7	11.3		15.0		
0.300	3.3	8.0		10.5		
0.150	2.1	5.8		6.8		
0.075	2.0	3.8		6.4		
PAN	3.8	0		12.2		
Total	100.0		100.0	100.0		



Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

MAXIMUM AND MINIMUM INDEX DENSITY USING A VIBRATORY TABLE

ASTM D 4253 & D 4254

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF, 25 mm minus lab crushed**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 11, 2012

Date received: November 3, 2011
Tested by: DC

Trial	Maximum Index Density (Dry method 2A) kg/m^3	Maximum Index Density (Wet method 2B) kg/m^3	Minimum Index Density (Method A) kg/m^3
1	1991	2108	1620
2	1984	--	1634
AVERAGE	**1988**	**2108**	**1627**

Note: Tests were carried out with the large mould.

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF COARSE AGGREGATE

ASTM C 127

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr. Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 25mm minus crushed, retain on 4.75mm portions**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 10, 2012
Date received: November 3, 2011
Tested by: DC

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.638	2.661	2.699	0.87
2	2.634	2.658	2.700	0.93
AVERAGE	**2.636**	**2.660**	**2.700**	**0.90**

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF FINE AGGREGATE

ASTM C 128

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 25mm minus lab crushed, passing 4.75mm portion**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 10, 2012

Date received: November 3, 2011
Tested by: IC

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.601	2.639	2.704	1.48
2	2.610	2.646	2.708	1.39
AVERAGE	**2.605**	**2.643**	**2.706**	**1.43**

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

Golder Associates Ltd. - Burnaby Laboratory

4280 Still Creek Drive

Burnaby, B.C. Canada V5C 6C8

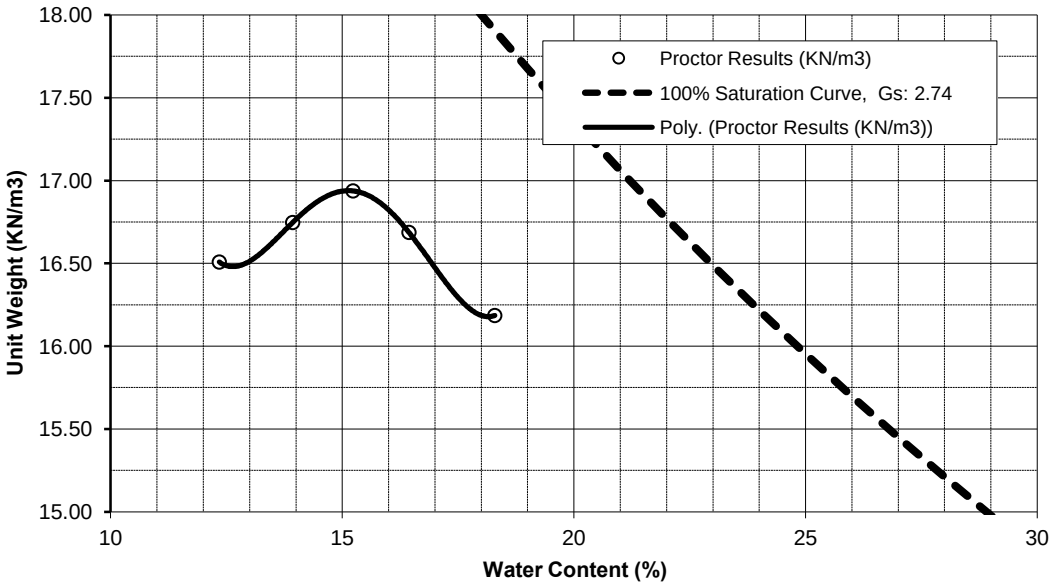
Compaction of Soil Using Standard Effort

Reference ASTM D 698-07

Client:	Tetra Tech	**Sample No.:**	Section 2 Silt
Project:	Aggregate Testing	**Sample Location:**	
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013/1000	**Lab ID No:**	211
Effort Type:	Standard	**Visual Description:**	-
Test Method:	A	**Type of Rammer:**	Mechanical
Preparation Method:	Moist	**Mould Volume (m^3):**	0.000945
Remarks:			

Compaction Results

Trial No.:	1	2	3	4	5
Unit Weight (KN/m^3)	16.51	16.75	16.94	16.19	16.7
Water Content (%):	12.3	13.9	15.2	18.3	16.4



Uncorrected Optimum w (%):	15.2	**Uncorrected Unit Weight (KN/m^3)**	16.93

ASTM D 4718-87 (2007) Correction for oversize particles

Max Percent Oversize (%):	25	**Sieve Size (mm):**	4.75
Oversized Fraction		***Test Fraction***	
Percent Oversized Fraction (%):	0.0	**Percent Test Fraction (%):**	100.0
Gsc (calculated):	2.74	**Gsf (calculated):**	2.74
Water Content of Oversized (%):	16.3	**Water Content of Test (%):**	15.2

Final Results

Corrected Optimum w (%):	15.2	**Corrected Unit Weight (KN/m^3)**	16.93
		Corrected Dry Density (Kg/m3)	1726

SK	December-09-11	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-06 Method B

Project No.:	11-1415-0013/1000	**Borehole**	**Section 2 Silt**
Client:	Tetra Tech	**Sample No.:**	N/A
Project:	Aggregate Testing	**Depth (m):**	N/A
Location:	Eagle Gold, Yukon	**Lab Sch No:**	211

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		100		
Test Number		1		2
Flask Number		5		6
Air Removal Method		Vacuum		Vacuum
Mass of Flask (g)		174.83		173.41
Mass of Flask + Dry Soil (g)	M_P	248.33		251.02
Mass of Dry Soil (g)		73.37		77.76
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	719.75		720.71
Test Temperature (g)	T_t	18.50		18.40
Mass of Flask + Water (g)	$M_{\rho w,t}$	673.08		671.53
Mass of Dish + Dry Soil (g)		252.00		424.26
Mass of Dish (g)		178.63		346.50
Mass of Oven Dry Soil (g)	M_S	73.37		77.76
Temperature Coefficient	K	1.00		1.00
Density of Solids (g/cm3)	ρ_s	2.75		2.72
Specific Gravity at Test Temperature	G_t	2.75		2.72
Specific Gravity at 20ºC	$G_{20°C}$	2.75		2.73
AVERAGE SPECIFIC GRAVITY		**2.74**		

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		0
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	
Apparent	C/(C-A)	
Absorbtion (%)	(B-C)/C	

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	$G_{avg\ @20°C}$	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

SK/RS	December 5, 2011	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

December 16, 2011
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

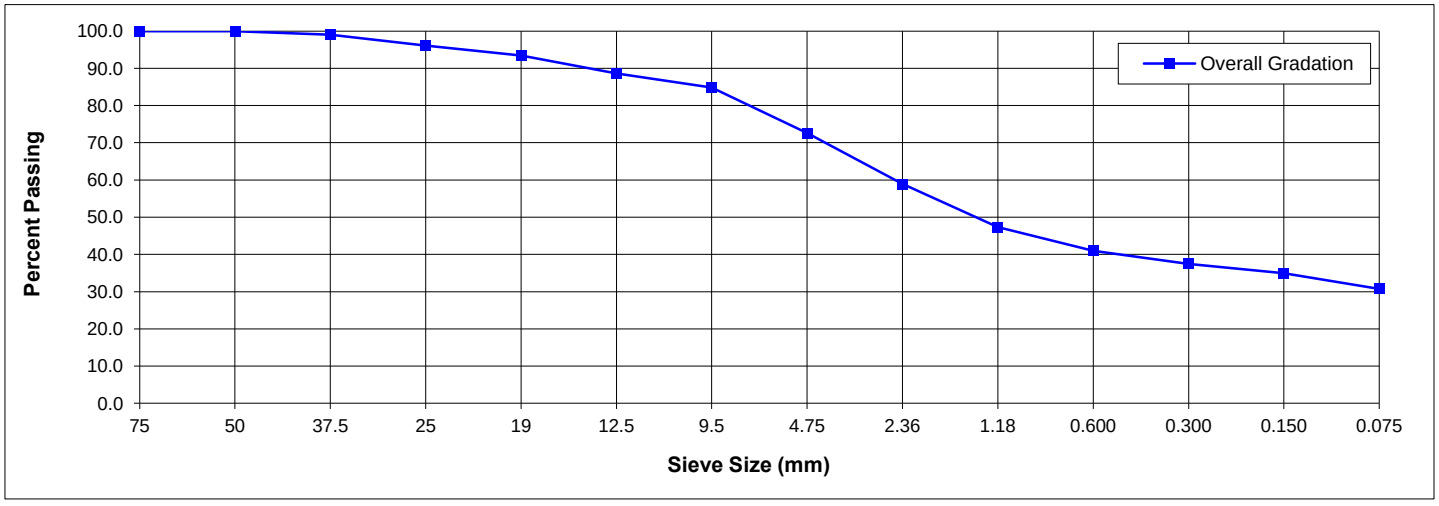
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**Section 3 Colluvium**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: December 15, 2011
DATE TESTED: December 16, 2012

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
75	0.0	100.0	0.0			
50	0.0	100.0	0.0			
37.5	0.9	99.1	3.5			
25	2.9	96.1	10.7			
19	2.7	93.4	9.8			
12.5	4.8	88.6	17.5			
9.5	3.8	84.8	13.9			
4.75	12.2	72.6	44.7			
2.36	13.7	58.9		18.8		
1.18	11.6	47.3		15.9		
0.600	6.3	41.0		8.7		
0.300	3.5	37.5		4.8		
0.150	2.5	34.9		3.5		
0.075	4.2	30.7		5.8		
PAN	30.7	0		42.4		
Total	100.0		100.0	100.0		



Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RESISTANCE OF COARSE AGGREGATE TO DEGRADATION BY ABRASION IN THE MICRO-DEVAL APPARATUS

ASTM D 6928

January 18, 2012
Project number: 11-1415-0013/1000

TETRA TECH
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
U.S.A.

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**Section 3 Colluvium**
Source:	**Eagle Gold, Yukon**

Date sampled: Not Given
Date tested: January 16, 2012

Sampled by: Client
Tested by: VN

Grading	Section 8.2 – 19x16, 16x12.5, 12.5x9.5mm
Loss at conclusion of test (%)	**16.6**

Validation Test Data: Control Aggregate (Drain Bros. stone)	
Test date	January 10, 2012
Percent loss	12.7%
Valid range	11.4 – 14.8%

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

Golder Associates Ltd. - Burnaby Laboratory

4280 Still Creek Drive

Burnaby, B.C. Canada V5C 6C8

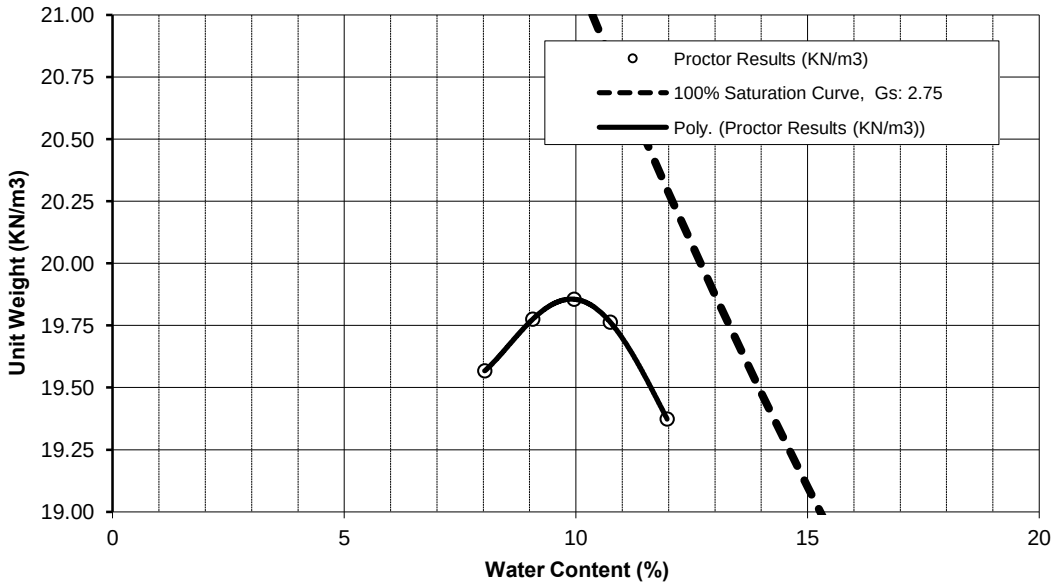
Compaction of Soil Using Standard Effort

Reference ASTM D 698-07

Client:	Tetra Tech	**Sample No.:**	Section 3 Colluvium
Project:	Aggregate Testing	**Sample Location:**	
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013/1000	**Lab ID No:**	211
Effort Type:	Standard	**Visual Description:**	-
Test Method:	C	**Type of Rammer:**	Mechanical
Preparation Method:	Moist	**Mould Volume (m^3):**	0.002122
Remarks:			

Compaction Results

Trial No.:	1	2	3	4	5
Unit Weight (KN/m^3)	19.57	19.78	19.86	19.76	19.4
Water Content (%):	8.0	9.1	10.0	10.7	12.0



Uncorrected Optimum w (%):	10.0	**Uncorrected Unit Weight (KN/m^3)**	19.86

ASTM D 4718-87 (2007) Correction for oversize particles

Max Percent Oversize (%):	25	**Sieve Size (mm):**	4.75
Oversized Fraction		***Test Fraction***	
Percent Oversized Fraction (%):	17.0	**Percent Test Fraction (%):**	83.0
Gsc (calculated):	2.75	**Gsf (calculated):**	2.75
Water Content of Oversized (%):	16.3	**Water Content of Test (%):**	10.0

Final Results

Corrected Optimum w (%):	11.1	**Corrected Unit Weight (KN/m^3)**	20.79
		Corrected Dry Density (Kg/m3)	2119

SK	December-13-11	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-06 Method B

Project No.:	11-1415-0013/1000	**Borehole**	**Section 3 Colluvium**
Client:	Tetra Tech	**Sample No.:**	N/A
Project:	Aggregate Testing	**Depth (m):**	N/A
Location:	Eagle Gold, Yukon	**Lab Sch No:**	211

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		65.82		
Test Number		1		2
Flask Number		5		6
Air Removal Method		Vacuum		Vacuum
Mass of Flask (g)		174.83		173.38
Mass of Flask + Dry Soil (g)	M_P	266.76		270.74
Mass of Dry Soil (g)		91.66		97.03
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	731.54		733.22
Test Temperature (g)	T_t	19.40		19.40
Mass of Flask + Water (g)	$M_{\rho w,t}$	673.04		671.44
Mass of Dish + Dry Soil (g)		202.22		207.55
Mass of Dish (g)		110.56		110.52
Mass of Oven Dry Soil (g)	M_S	91.66		97.03
Temperature Coefficient	K	1.00		1.00
Density of Solids (g/cm3)	ρ_s	2.76		2.75
Specific Gravity at Test Temperature	G_t	2.77		2.76
Specific Gravity at 20ºC	$G_{20°C}$	2.77		2.76
AVERAGE SPECIFIC GRAVITY		**2.76**		

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		31.39
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	2.54
Apparent	C/(C-A)	2.71
Absorbtion (%)	(B-C)/C	4.09

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	$G_{avg\ @20°C}$	2.75

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

SK/RS	November 15, 2011	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

December 16, 2011
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

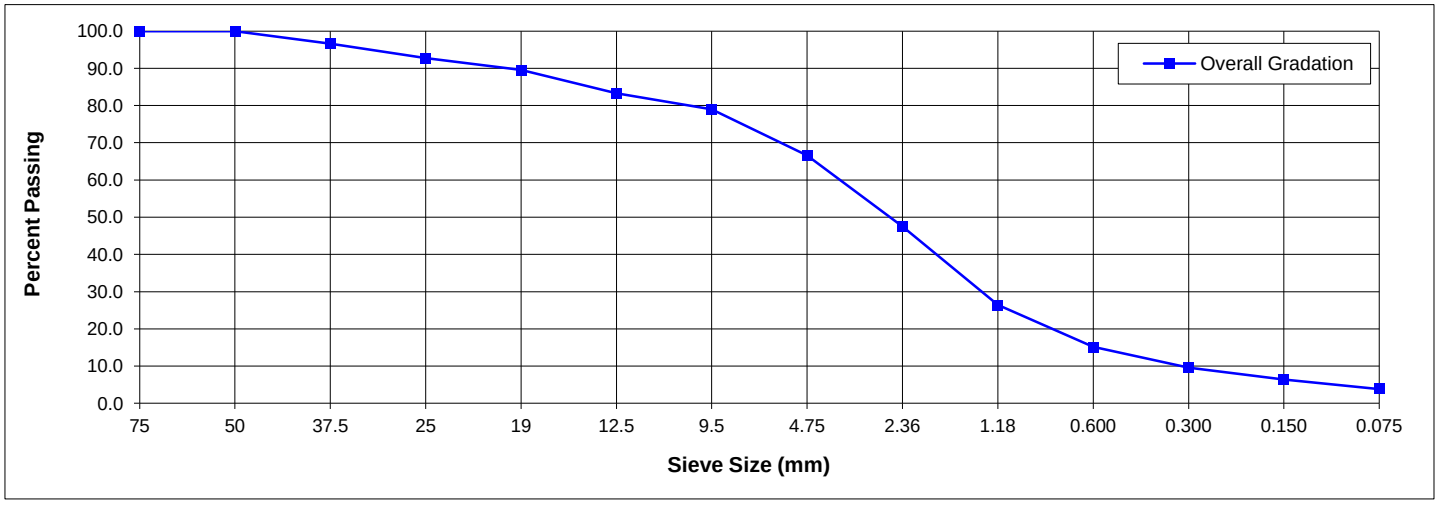
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**Section 4 Placer Tails**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: December 15, 2011
DATE TESTED: December 16, 2012

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					**MATERIAL SPECIFICATION :**	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
75	0.0	100.0	0.0			
50	0.0	100.0	0.0			
37.5	3.4	96.6	10.1			
25	3.9	92.7	11.7			
19	3.2	89.5	9.6			
12.5	6.2	83.3	18.6			
9.5	4.3	79.0	12.9			
4.75	12.4	66.6	37.2			
2.36	19.1	47.5		28.6		
1.18	21.1	26.4		31.7		
0.600	11.3	15.1		16.9		
0.300	5.6	9.6		8.3		
0.150	3.2	6.4		4.8		
0.075	2.5	3.9		3.8		
PAN	3.9	0		5.8		
Total	100.0		100.0	100.0		



Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RESISTANCE OF COARSE AGGREGATE TO DEGRADATION BY ABRASION IN THE MICRO-DEVAL APPARATUS

ASTM D 6928

January 18, 2012
Project number: 11-1415-0013/1000

TETRA TECH
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
U.S.A.

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**Section 4 Placer Tails**
Source:	**Eagle Gold, Yukon**

Date sampled: Not Given
Date tested: January 16, 2012

Sampled by: Client
Tested by: VN

Grading	Section 8.2
Loss at conclusion of test (%)	**32.1**

Validation Test Data: Control Aggregate (Drain Bros. stone)	
Test date	January 10, 2012
Percent loss	12.7%
Valid range	11.4 – 14.8%

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

Golder Associates Ltd. - Burnaby Laboratory

4280 Still Creek Drive

Burnaby, B.C. Canada V5C 6C8

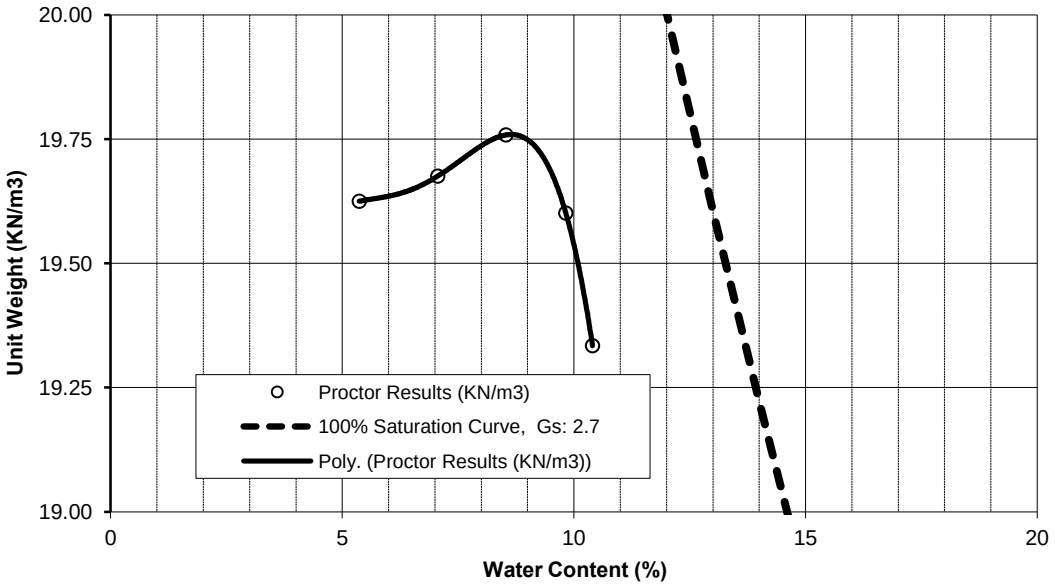
Compaction of Soil Using Standard Effort

Reference ASTM D 698-07

Client:	Tetra Tech	**Sample No.:**	Section 4 - Placer Tails
Project:	Aggregate Testing	**Sample Location:**	
Location:	Eagle Gold, Yukon	**Depth (m):**	
Project No.:	11-1415-0013/1000	**Lab ID No:**	211
Effort Type:	Standard	**Visual Description:**	-
Test Method:	C	**Type of Rammer:**	Mechanical
Preparation Method:	Moist	**Mould Volume (m^3):**	0.002122
Remarks:			

Compaction Results

Trial No.:	1	2	3	4	5
Unit Weight (KN/m^3)	19.63	19.68	19.76	19.60	19.3
Water Content (%):	5.4	7.1	8.5	9.8	10.4



Uncorrected Optimum w (%):	8.5	**Uncorrected Unit Weight (KN/m^3)**	19.80

ASTM D 4718-87 (2007) Correction for oversize particles

Max Percent Oversize (%):	20	**Sieve Size (mm):**	20.00
Oversized Fraction		***Test Fraction***	
Percent Oversized Fraction (%):	30.0	**Percent Test Fraction (%):**	70.0
Gsc (calculated):	2.70	**Gsf (calculated):**	2.70
Water Content of Oversized (%):	1.5	**Water Content of Test (%):**	8.5

Final Results

Corrected Optimum w (%):	6.4	**Corrected Unit Weight (KN/m^3)**	21.42
		Corrected Dry Density (Kg/m^3)	2183

SK, RS	December-15-11	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-06 Method B

Project No.:	11-1415-0013/1000	**Borehole**	**Section 4 Placer Tails**
Client:	Tetra Tech	**Sample No.:**	N/A
Project:	Aggregate Testing	**Depth (m):**	N/A
Location:	Eagle Gold, Yukon	**Lab Sch No:**	211

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		62.99		
Test Number		1		2
Flask Number		4		3
Air Removal Method		Vacuum		Vacuum
Mass of Flask (g)		172.71		173.97
Mass of Flask + Dry Soil (g)	M_P	286.80		285.41
Mass of Dry Soil (g)		113.77		111.24
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	742.87		742.45
Test Temperature (g)	T_t	19.00		18.90
Mass of Flask + Water (g)	$M_{\rho w,t}$	671.38		672.50
Mass of Dish + Dry Soil (g)		480.30		221.58
Mass of Dish (g)		366.53		110.34
Mass of Oven Dry Soil (g)	M_S	113.77		111.24
Temperature Coefficient	K	1.00		1.00
Density of Solids (g/cm3)	ρ_s	2.69		2.69
Specific Gravity at Test Temperature	G_t	2.70		2.70
Specific Gravity at 20ºC	$G_{20°C}$	2.70		2.70
AVERAGE SPECIFIC GRAVITY		**2.70**		

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		31.39
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	2.63
Apparent	C/(C-A)	2.70
Absorbtion (%)	(B-C)/C	1.65

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	$G_{avg\ @20°C}$	2.70

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

SK/RS	November 15, 2011	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Slake Durability of Shales and Similar Weak Rocks

Reference
ASTM D4644-08

Project No.:	11-1415-0013/1000	**Borehole:**	**Weathered Rock**
Project:	Aggregate Testing	**Sample Number:**	N/A
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Client:	Tetra Tech	**Lab ID No:**	211

Test Results

I_{d1} = Slake Durability index after 1st Cycle	97.6	%
I_{d2} = Slake Durability index after 2nd Cycle	95.6	%
I_{d3} = Slake Durability index after 3rd Cycle	94.1	%

Initial Sample Description	Final Description of Fragments in Drum
10 irregular lumps of weathered rock	I_{d1} Type II - Retained pieces consists of large and small pieces
	I_{d2} Type II - Retained pieces consists of large and small pieces
	I_{d3} Type II - Retained pieces consists of large and small pieces

Temperature ° C		Calibration	
Max	**22.2**	Machine ID	BUR010002
Min	**18.1**	Drum ID	A
Average	**20.1**	Thermometer ID	FB61328

Comments

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE



AFTER

G. Patton	December 19, 2011	LP	December 23,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

POINT LOAD STRENGTH INDEX TEST

Reference
ASTM D5731 - 08

Project No	11-1415-0013/1000	Sch. #	211
Client	Tetra Tech	Machine ID	BUR010024
Project	Aggregate Testing		
Location	Eagle Gold, Yukon		

Lump Test

Test #	Borehole No.	Sa#	Depth m	D mm	W mm	Guage Reading kN	Load P MN	$D_e^2 = D^2$ mm^2	$I_s = P/D_e^2$ MPa	$F = (D_e/50)^{0.45}$	$I_{s(50)}$ MPa	Type	Direction	Remarks
1	Section 5	1	Combined	30.00	52.40	2.053	0.00205	900.0	2.28	0.795	**1.81**	L	p	
2	Section 5	2	Combined	38.32	71.01	21.987	0.02199	1468.4	14.97	0.887	**13.28**	L	p	Sample was very strong - hard to cut into block shape
3	Section 5	3	Combined	31.19	51.98	4.253	0.00425	972.8	4.37	0.809	**3.54**	L	p	
4	Section 5	4	Combined	30.99	58.98	5.113	0.00511	960.4	5.32	0.806	**4.29**	L	p	
5	Section 5	5	Combined	39.69	59.61	5.130	0.00513	1575.3	3.26	0.901	**2.94**	L	p	
6	Section 5	6	Combined	32.81	48.90	2.289	0.00229	1076.5	2.13	0.827	**1.76**	L	p	
7	Section 5	7	Combined	32.62	69.34	1.428	0.00143	1064.1	1.34	0.825	**1.11**	L	p	
8	Section 5	8	Combined	48.39	61.74	1.48	0.00148	2341.4	0.63	0.985	**0.62**	L	\\	
9	Section 5	9	Combined	33.27	56.93	2.63	0.00263	1106.9	2.38	0.833	**1.98**	L	p	
10	Section 5	10	Combined	32.11	62.75	3.83	0.00383	1031.1	3.71	0.819	**3.04**	L	p	
11	Section 5	11	Combined	27.85	81.18	4.97	0.00497	775.6	6.41	0.768	**4.92**	L	\\	

$I_{s(50)}$ = Size Corrected Point Load Strength
$I_{s(50)} = FI_s$

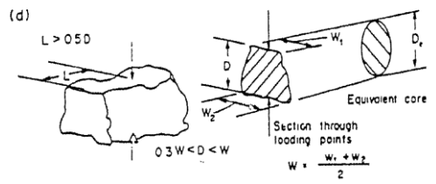
I_s = Uncorrected Point Load Strength
$I_s = P/D_e^2$

F = Size Correction Factor
$F = (D_e/50)^{0.45}$

D_e = equivalent core diameter (mm)
$D_e^2 = D^2$ (mm^2)

Direction
\\ = parallel
p = perpendicular to planes of weakness

Lump Test



G. Patton	1/5/2012	LP	January 17,2012
Tested By	Date	Checked By	Date

PARTICLE SIZE ANALYSIS OF SOILS

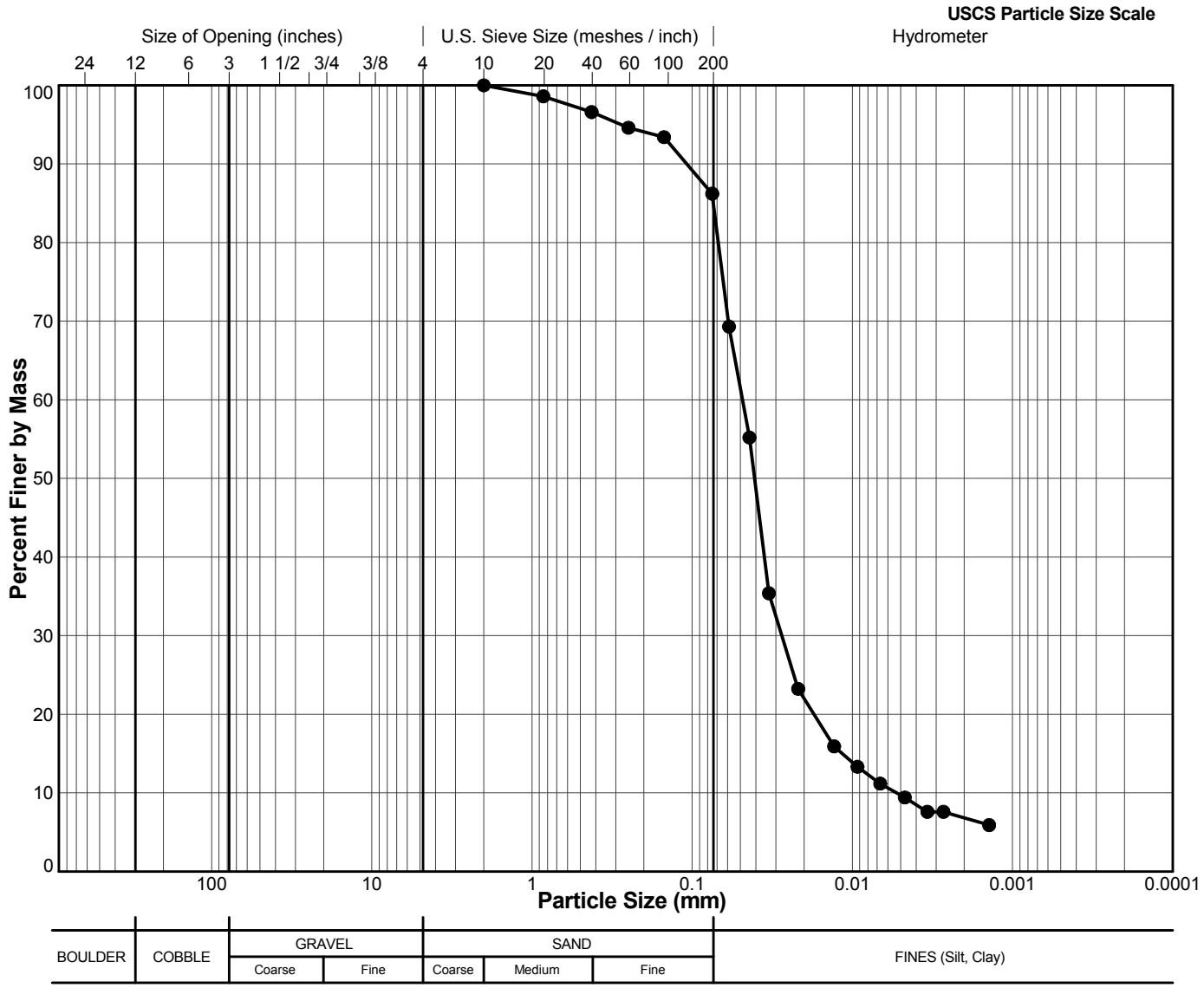
Reference(s)
ASTM D 422-63 (2007)

Client: Tetra Tech	**ID: Section 2 Silt**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 2	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



SK	**05/12/2011**	**LP**	**21/12/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/12/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

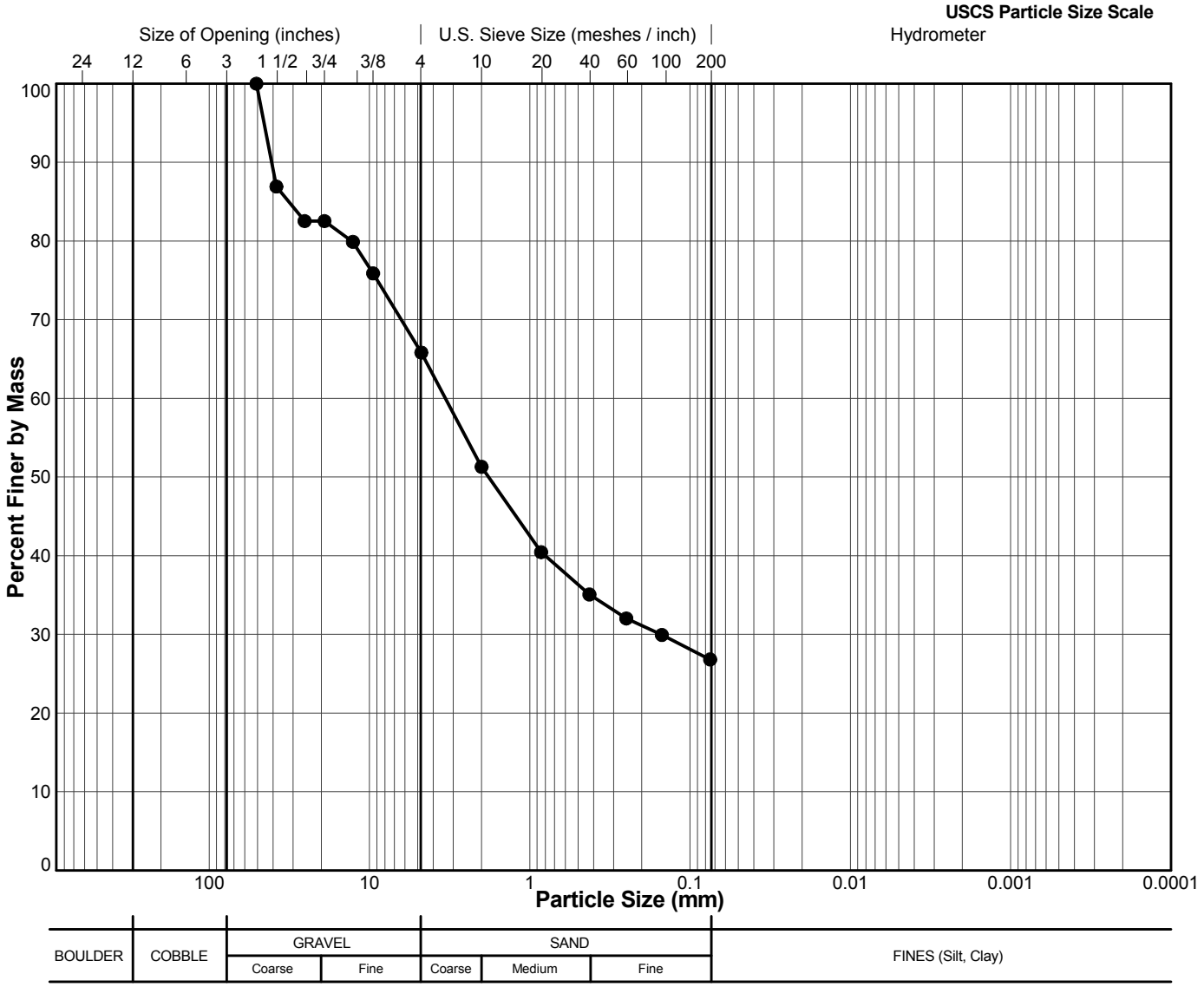
Reference(s)
ASTM D 422-63 (2007)

Client: Tetra Tech	**ID: Section 3 Colluvium**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



SK	**08/12/2011**	**LP**	**21/12/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/12/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

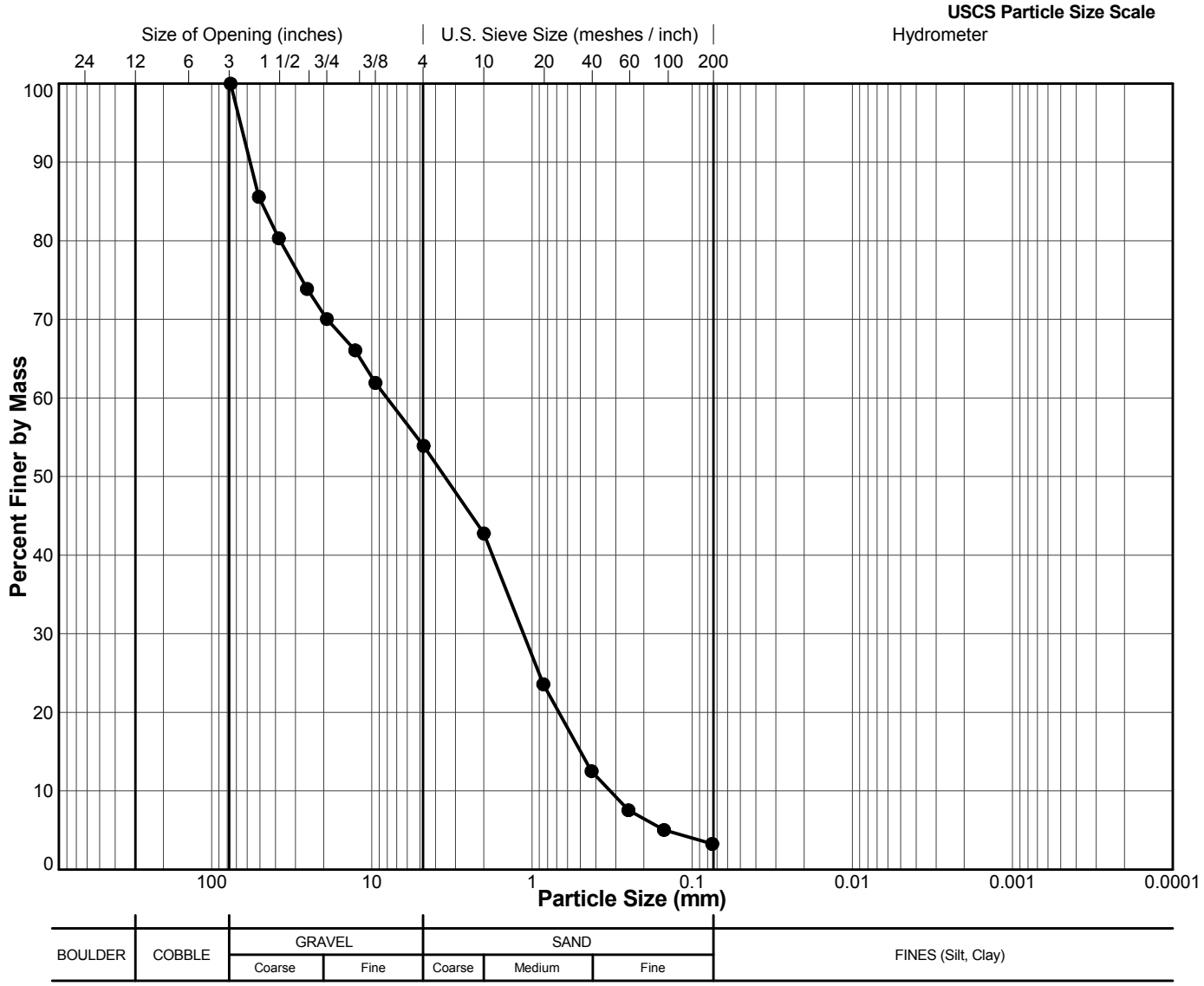
Reference(s)
ASTM D 422-63 (2007)

Client: Tetra Tech	**ID: Section 4 Placer Tails**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 76.2	

Method: Split, Washed



		LP	**21/12/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/12/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

PARTICLE SIZE ANALYSIS OF SOILS

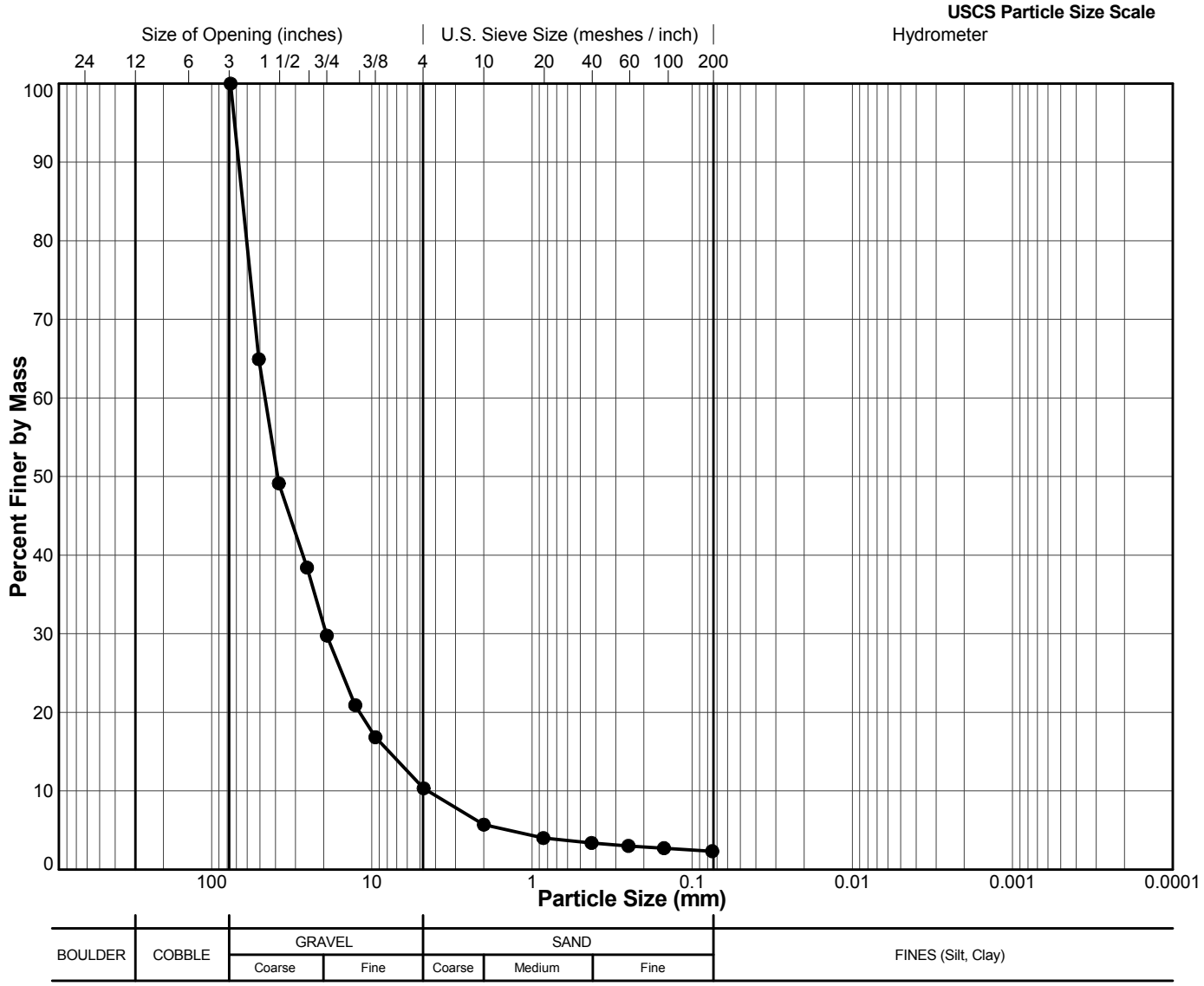
Reference(s)
ASTM D 422-63 (2007)

Client: Tetra Tech	**ID: Section 5 Weathered Rock**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 76.2	

Method: Split, Washed



SK	**15/12/2011**	**LP**	**21/12/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/12/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

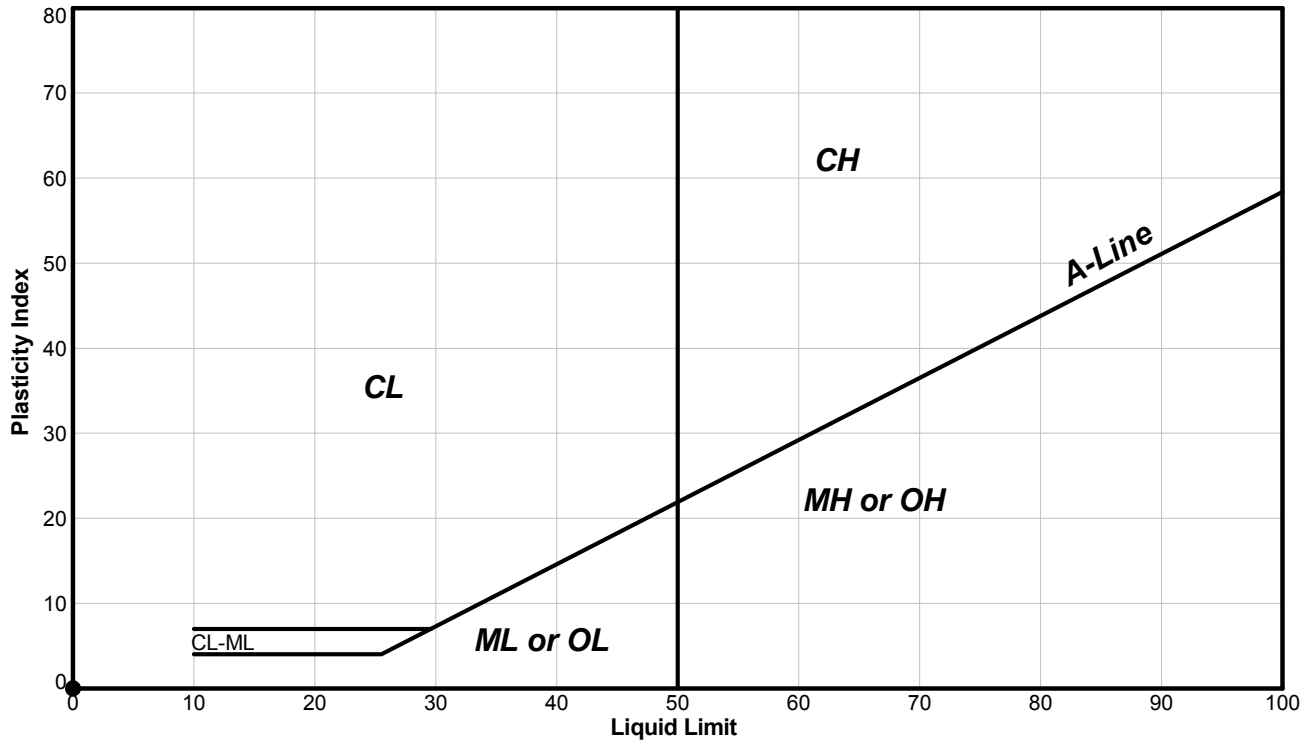
Client: Tetra Tech	**ID: Section 2 Silt**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	Section 2 Silt	N/A	0.00	0.00	97	NP	NP	NP	21.1	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	05/12/2011	LP	21/12/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/12/11

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

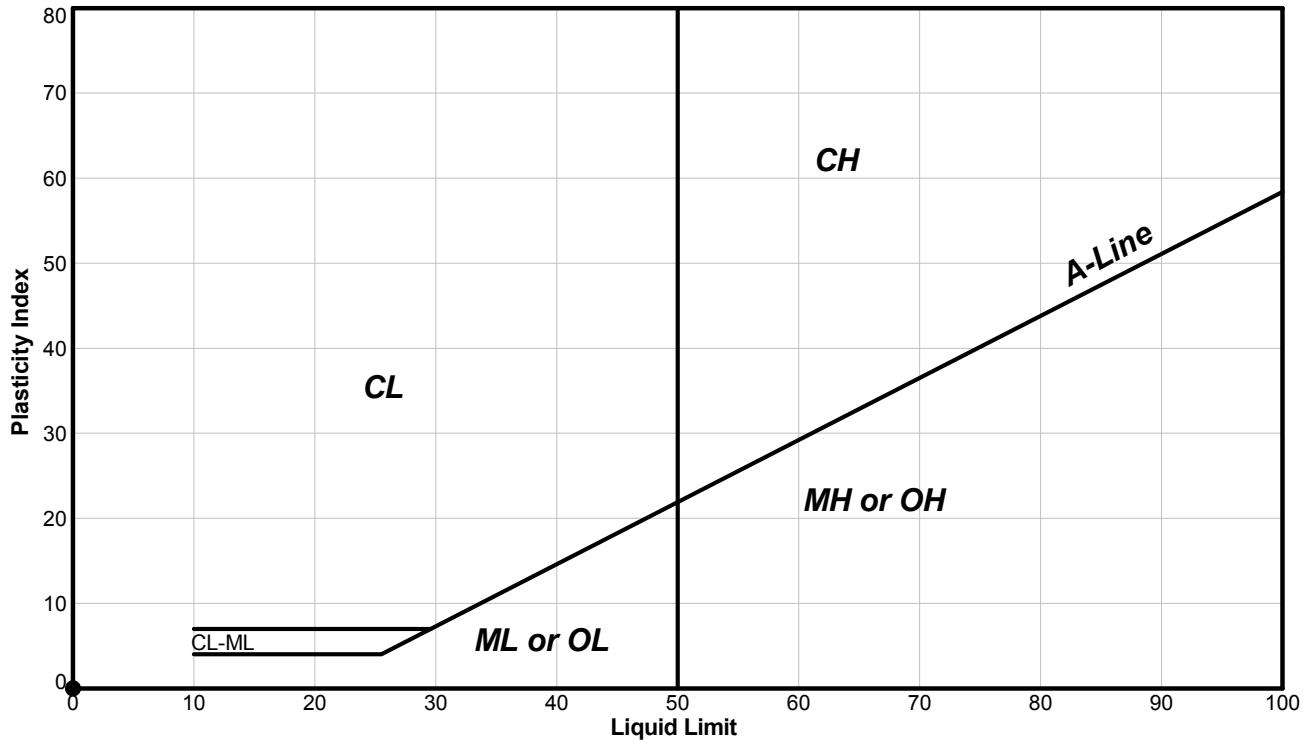
Client: Tetra Tech	**ID: Section 3 Colluvium**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	Section 3 Colluvium	N/A	0.00	0.00	35	NP	NP	NP	6.8	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	05/12/2011	LP	21/12/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/12/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

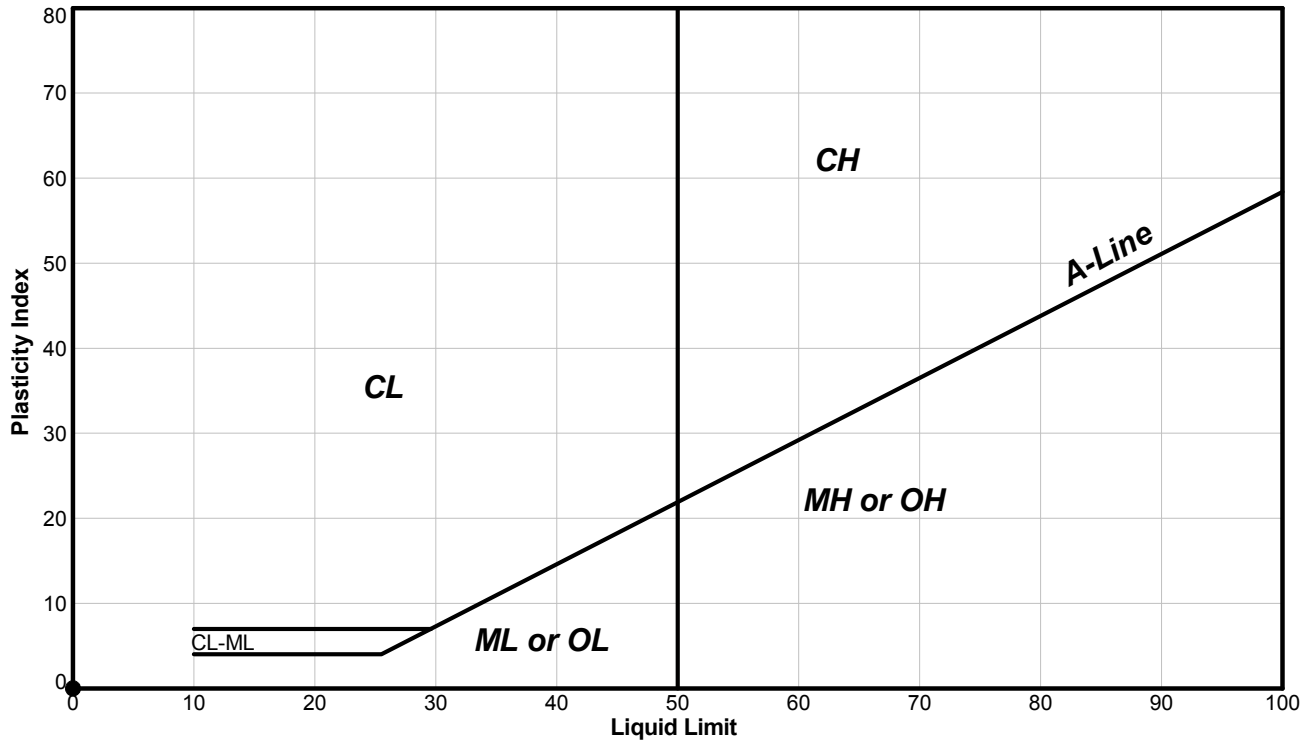
Client: Tetra Tech	**ID: Section 4 Placer Tails**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point	**Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	Section 4 Placer Tails	N/A	0.00	0.00	12	NP	NP	NP	2.1	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	05/12/2011	LP	21/12/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB SKim 21/12/11

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

APPENDIX M
LABORATORY TESTING RESULTS PLOTS AND TABLES

LABORATORY TESTING SUMMARIES

1.0 INTRODUCTION

Laboratory testing was completed on selected samples to characterize both soil and rock materials. Soil testing included index testing (moisture content, Atterberg limits, grain size and specific gravity) as well as proctor testing and permeability testing on potential borrow materials, and aggregate testing on potential aggregate sources. Rock testing included both, unconfined compressive strength (UCS) testing and Brazilian tensile strength (BTS) testing.

Rock testing was completed by Golder Associates of Burnaby, BC. Soil testing was completed by Golder Associates and GeoNorth Engineering Ltd, of Prince George, BC. Aggregate testing was completed by GeoNorth Engineering, Metro Testing Group of Burnaby, BC and Exova, of Edmonton, AB.

2.0 REQUESTED TESTING

The soil tests requested are tabulated in Table M-1, the rock tests requested are tabulated in Table M-2 and the aggregate tests requested are tabulated in Table M-3.

3.0 TESTING RESULTS

The grain size and hydrometer results are tabulated in Table M-4. The moisture content results are tabulated in Table M-5. The Atterberg limit results are tabulated in Table M-6. The specific gravity results are tabulated in Table M-7. The sulphate ion results are tabulated in Table M-8. The modified proctor and permeability results are tabulated in Table M-9. The UCS and BTS results are tabulated in Table M-10.

Plasticity charts for colluvium and other overburden soil samples are shown in figures M-1 and M-2 respectively.

Table M-1. Soil Samples Requested for Testing

Hole ID	Sample Number	Sample Depth From (m)	Sample Depth To (m)	Sample Type	Moisture Content	3" Minus Grain Size	Hydrometer	Atterberg Limits	Specific Gravity - soil	Modified Proctor	Permeability Testing	Sulphate in Soil
					ASTM 2216	ASTM C136	ASTM 422	ASTM 4318	ASTM 854	ASTM 698	ASTM D5856	CSA A23.2-3B
Test Pits												
TP-BGC11-50	1	2.8	3.0	GB	1	1	-	-	1	-	-	-
TP-BGC11-50	2	3.3	3.9	GB	1	1	-	-	-	-	-	-
TP-BGC11-51	1	0.2	1.44	GB	1	1	1	1	-	-	-	-
TP-BGC11-51	2	2.4	2.8	GB	1	1	-	-	-	-	-	1
TP-BGC11-51	3	4.2	4.5	GB	1	1	-	-	-	-	-	-
TP-BGC11-52	1	3.3	3.5	GB	1	1	-	-	-	-	-	-
TP-BGC11-53	1	2	2.2	GB	1	1	-	-	-	-	-	-
TP-BGC11-54	1	0.4	0.6	GB	1	1	1	1	-	-	-	-
TP-BGC11-55	1	0.4	0.6	GB	1	1	1	1	-	-	-	-
TP-BGC11-55	2	1.9	2.0	GB	1	1	-	-	-	-	-	-
TP-BGC11-57	1	0.5	1.1	GB	1	1	1	1	-	-	-	-
TP-BGC11-58	1	0.7	0.7	GB	1	1	1	1	-	-	-	-
TP-BGC11-58	2	2	2.0	GB	1	1	-	-	1	-	-	-
TP-BGC11-59	1	0.4	0.6	GB	1	1	1	1	-	-	-	-
TP-BGC11-60	1	0.7	0.9	GB	1	1	1	1	-	-	-	1
TP-BGC11-61	1	0.7	0.8	GB	1	1	1	1	-	-	-	-
TP-BGC11-61	2	1.7	1.9	GB	1	1	-	-	-	-	-	-
TP-BGC11-62	1	0.9	1.0	GB	1	1	1	1	-	-	-	-
TP-BGC11-62	2	3.5	3.7	GB	1	1	1	1	-	-	-	-
TP-BGC11-63	1	0.5	0.7	GB	1	1	1	-	-	-	-	-
TP-BGC11-64	1	1.5	1.6	GB	1	1	-	1	-	-	-	-
TP-BGC11-65	1	0.4	0.5	GB	1	1	-	-	-	-	-	-
TP-BGC11-66	1	1.3	1.3	GB	1	1	-	-	-	-	-	-
TP-BGC11-66	2	1.8	1.8	GB	1	1	1	1	-	-	-	-
TP-BGC11-67	1	0.7	0.9	GB	1	1	1	-	1	-	-	-
TP-BGC11-68	1	1.6	1.8	GB	1	1	-	-	-	-	-	-
TP-BGC11-69	1	1.7	1.9	GB	1	1	1	1	-	-	-	-
TP-BGC11-69	2	2.8	2.9	GB	1	1	1	1	-	-	-	-
TP-BGC11-71	1	1.3	1.6	GB	1	1	1	1	-	-	-	-
TP-BGC11-72	1	2.4	2.6	GB	1	1	-	-	-	-	-	-
TP-BGC11-72	2	0.8	1.0	GB	1	1	1	1	-	-	-	-
TP-BGC11-73	1	0.8	1.0	GB	1	1	1	1	-	-	-	-
TP-BGC11-74	1	1.2	1.4	GB	1	1	1	1	-	-	-	-
TP-BGC11-74	2	3	3.0	GB	1	1	1	1	-	-	-	-
TP-BGC11-74	3	4.5	4.5	GB	1	1	1	1	-	-	-	-
TP-BGC11-76	1	0.4	0.6	GB	1	1	1	-	-	-	-	-
TP-BGC11-77	1	0.4	0.5	GB	1	1	1	1	-	-	-	-
TP-BGC11-79	1	0.4	0.6	GB	1	1	1	1	-	-	-	-
TP-BGC11-79	2	1.2	1.3	GB	1	1	-	-	-	-	-	-
TP-BGC11-81	1	0.7	1.0	GB	1	1	1	-	-	-	-	-
TP-BGC11-82	1	4.7	4.9	GB	1	1	1	1	-	-	-	-
TP-BGC11-82	2	3	3.3	GB	1	1	-	1	-	-	-	-
TP-BGC11-82	3	6.7	7.0	GB	1	1	1	1	-	-	-	-
TP-BGC11-82	4	0.7	1.1	GB	1	1	-	1	-	-	-	-
TP-BGC11-82	5	1.9	2.1	GB	1	1	-	1	-	-	-	-
TP-BGC11-83	1	0.6	0.8	GB	1	1	1	1	-	-	-	-
TP-BGC11-84	1	0.4	0.6	GB	1	1	1	-	-	-	-	1
TP-BGC11-84	2	2.5	2.5	GB	1	1	1	1	-	-	-	-
TP-BGC11-85	1	1	1.0	GB	1	1	1	1	-	-	-	-
TP-BGC11-87	1	0.6	0.8	GB	1	1	-	-	-	-	-	-
TP-BGC11-88	1	1.5	1.8	GB	1	1	1	1	-	-	-	-
TP-BGC11-89	1	0.4	0.6	GB	1	1	-	-	-	-	-	-
TP-BGC11-89	2	1.3	1.5	GB	1	1	1	1	-	-	-	-
TP-BGC11-90	1	0..8	1.0	GB	1	1	-	-	-	-	-	-
TP-BGC11-90	2	3.5	3.6	GB	1	1	1	1	-	-	-	-
TP-BGC11-91	1	0.8	1.0	GB	1	1	1	1	-	-	-	-
TP-BGC11-91	2	1.6	1.8	GB	1	1	1	1	-	-	-	-
TP-BGC11-94	1	1.2	1.3	GB	1	1	1	1	-	-	-	-

Hole ID	Sample Number	Sample Depth From (m)	Sample Depth To (m)	Sample Type	Moisture Content	3" Minus Grain Size	Hydrometer	Atterberg Limits	Specific Gravity - soil	Modified Proctor	Permeability Testing	Sulphate in Soil
					ASTM 2216	ASTM C136	ASTM 422	ASTM 4318	ASTM 854	ASTM 698	ASTM D5856	CSA A23.2-3B
TP-BGC11-95	1	0.9	1.1	GB	1	1	-	-	-	-	-	-
TP-BGC11-95	2	2	3.0	GB	1	1	-	-	-	-	-	-
TP-BGC11-96	1	0.7	0.9	GB	1	1	-	-	-	-	-	-
TP-BGC11-96	2	1.3	1.5	GB	1	1	1	1	-	-	-	-
TP-BGC11-96	3	1.8	2.0	GB	1	1	-	-	-	-	-	-
TP-BGC11-103	1	4.5	4.5	GB	1	1	-	-	-	-	-	-
TP-BGC11-104	1	1.2	1.6	GB	1	1	-	-	-	-	-	-
TP-BGC11-106	1	0.8	1.5	GB	1	-	-	-	-	-	-	-
TP-BGC11-107	1	2.8	3.0	GB	1	1	1	-	-	-	-	-
TP-BGC11-108	1	0.9	1.2	GB	1	1	-	-	-	-	-	-
TP-BGC11-111	1	0.9	1.1	GB	1	-	-	-	-	-	-	-
TP-BGC11-112	1	1.3	1.4	GB	1	1	-	-	-	-	-	-
TP-BGC11-116	2	2.2	2.3	GB	1	1	-	1	-	-	-	-
TP-BGC11-119	1	0.9	1.1	GB	1	-	-	1	-	1	1	-
TP-BGC11-120	1	3.8	4.0	GB	1	-	-	1	-	1	1	-
TP-BGC11-121	1	2.9	3.1	GB	1	-	-	1	-	1	1	-
TP-BGC11-122	1	5.4	5.8	GB	1	-	-	1	-	1	1	-
TP-BGC11-124	1	6.2	6.4	GB	1	1	-	1	-	-	-	-
TP-BGC11-126	1	1.7	2.2	GB	1	1	-	-	-	-	-	-
TP-BGC11-128	1	2.5	3.0	GB	1	1	1	-	-	-	-	-
TP-BGC11-129	1	6.6	6.8	GB	1	1	-	1	-	-	-	-
TP-BGC11-130	1	5.8	6.0	GB	1	1	-	1	-	-	-	-
TP-BGC11-131	1	3.2	3.5	GB	1	1	-	1	-	-	-	-
TP-BGC11-133	1	4.3	4.4	GB	1	1	-	-	-	-	-	-
TP-BGC11-140	1	1	1.2	GB	1	1	-	1	-	-	-	-
Boreholes												
BH-BGC11-39	SPT1	1.15	1.6	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT2	1.6	2.1	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT3	2.25	2.75	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT4	2.75	3.2	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT5	4.6	5.05	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT6	5.53	5.98	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT7	6.22	6.67	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT8	7.16	7.61	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT9	7.75	8.20	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT10	8.71	9.16	SPT	1	1	-	-	-	-	-	-
BH-BGC11-39	SPT11	9.25	9.70	SPT	1	1	-	-	-	-	-	-
BH-BGC11-40A	1	18.78	18.83	GB	1	-	-	-	-	-	-	-
BH-BGC11-42	2	1.8	2.27	GB	1	1	1	1	-	-	-	-
BH-BGC11-42	4	5	5.32	GB	1	-	-	-	-	-	-	-
BH-BGC11-42	5	6.4	6.84	GB	1	1	1	1	1	-	-	-
BH-BGC11-42	7	9.4	9.88	GB	1	1	-	-	-	-	-	-
BH-BGC11-42	8	10.6	11.0	GB	1	-	-	-	-	-	-	-
BH-BGC11-42	12	13.3	13.65	GB	1	1	-	-	-	-	-	-
BH-BGC11-42	15	15.25	15.4	GB	1	-	-	-	-	-	-	-
BH-BGC11-42	16	15.6	15.80	GB	1	-	-	-	-	-	-	-
BH-BGC11-42	20	19.7	20.0	GB	1	1	1	-	-	-	-	-
BH-BGC11-42	22	21.55	21.9	GB	1	1	1	-	-	-	-	-
BH-BGC11-42	23	23	23.4	GB	1	-	-	-	-	-	-	-
BH-BGC11-42	S26	27.6	28.0	SPT	1	1	-	-	-	-	-	-
BH-BGC11-44	S1	0.2	0.4	GB	1	1	1	1	-	-	-	-
BH-BGC11-44	S3	1.6	2.0	GB	1	1	1	1	-	-	-	-
BH-BGC11-44	S5	4.8	5.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-44	S7	6.3	6.6	GB	1	1	1	1	-	-	-	-
BH-BGC11-44	S11	9.6	9.9	GB	1	1	1	1	-	-	-	-
BH-BGC11-44	SPT1	2.27	2.72	SPT	1	-	-	-	-	-	-	-
BH-BGC11-44	SPT2	3.79	4.24	SPT	1	-	-	1	-	-	-	-
BH-BGC11-44	SPT5	8.38	8.85	SPT	1	-	-	-	-	-	-	-
BH-BGC11-44	SPT11	14.49	14.79	SPT	1	-	-	1	-	-	-	-
BH-BGC11-47	G3	2	2.3	GB	1	1	1	1	-	-	-	-

Hole ID	Sample Number	Sample Depth From (m)	Sample Depth To (m)	Sample Type	Moisture Content	3" Minus Grain Size	Hydrometer	Atterberg Limits	Specific Gravity - soil	Modified Proctor	Permeability Testing	Sulphate in Soil
					ASTM 2216	ASTM C136	ASTM 422	ASTM 4318	ASTM 854	ASTM 698	ASTM D5856	CSA A23.2-3B
BH-BGC11-47	G10	11.8	12.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-47	SPT1	0.75	1.2	SPT	1	1	1	1	-	-	-	-
BH-BGC11-47	SPT4	5.33	5.9	SPT	1	1	-	-	-	-	-	-
BH-BGC11-47	SPT5	6.85	7.3	SPT	1	-	-	-	-	-	-	-
BH-BGC11-47	SPT6	8.38	8.6	SPT	1	1	1	-	-	-	-	-
BH-BGC11-49	G4	3.4	3.6	GB	1	1	1	1	-	-	-	-
BH-BGC11-49	G6	6.4	6.6	GB	1	1	1	1	-	-	-	-
BH-BGC11-49	G8	9.4	9.6	GB	1	1	1	1	-	-	-	-
BH-BGC11-49	G10	12.4	12.6	GB	1	1	1	1	-	-	-	-
BH-BGC11-49	SPT1	0.76	1.2	GB	1	-	-	-	-	-	-	-
BH-BGC11-49	SPT2	2.28	2.7	GB	1	1	1	1	-	-	-	-
BH-BGC11-51	G6	7.9	8.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-51	G8	10.9	11.1	GB	1	-	-	-	-	-	-	-
BH-BGC11-51	G10	13.9	14.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-51	G12	17	17.2	GB	1	-	-	-	-	-	-	-
BH-BGC11-51	G14	20.1	20.3	GB	1	1	-	-	-	-	-	-
BH-BGC11-51	G17	24.7	24.9	GB	1	-	-	-	-	-	-	-
BH-BGC11-51	SPT1	0.76	1.2	SPT	1	-	-	1	-	-	-	-
BH-BGC11-51	SPT2	2.28	2.7	SPT	1	-	-	-	-	-	-	-
BH-BGC11-51	SPT3	3.8	4.3	SPT	1	-	-	1	-	-	-	-
BH-BGC11-51	SPT5	9.9	10.3	SPT	1	-	-	-	-	-	-	-
BH-BGC11-51	SPT4	5.33	5.8	SPT	1	-	-	-	-	-	-	-
BH-BGC11-53	G2	1.9	2.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-53	G3	3.2	3.5	GB	1	-	-	-	-	-	-	-
BH-BGC11-53	G4	4.9	5.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-53	G6	7.9	8.1	GB	1	1	-	-	-	-	-	-
BH-BGC11-53	G8	10.9	11.1	GB	1	-	-	-	-	-	-	-
BH-BGC11-53	SPT1	0.76	1.2	SPT	1	-	-	-	-	-	-	-
BH-BGC11-53	SPT2	2.28	2.7	SPT	1	1	1	1	-	-	-	-
BH-BGC11-53	SPT3	3.8	4.3	SPT	1	-	-	-	-	-	-	-
BH-BGC11-53	SPT4	6.85	7.3	SPT	1	1	1	1	-	-	-	-
BH-BGC11-53	SPT5	9.9	10.4	SPT	1	-	-	-	-	-	-	-
BH-BGC11-54	G1	29.97	30.0	Gouge	1	-	-	1	-	-	-	-
BH-BGC11-55	G4	4.9	5.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-55	G5	6.3	6.5	GB	1	-	-	-	-	-	-	-
BH-BGC11-55	SPT1	0.76	1.2	SPT	1	1	-	-	-	-	-	-
BH-BGC11-55	SPT2	2.28	2.7	SPT	1	-	-	-	-	-	-	-
BH-BGC11-55	SPT6	8.38	8.8	SPT	1	-	-	1	-	-	-	-
BH-BGC11-56	G2	1.9	2.1	GB	1	1	-	-	-	-	-	-
BH-BGC11-56	SPT1	0.76	1.2	SPT	1	-	-	-	-	-	-	-
BH-BGC11-56	SPT3	3.8	4.3	SPT	1	-	-	1	-	-	-	-
BH-BGC11-56	SPT4	5.33	5.5	SPT	1	-	-	1	-	-	-	-
BH-BGC11-56	SPT5	6.85	7.2	SPT	1	-	-	-	-	-	-	-
BH-BGC11-57	SPT1	2.28	2.7	SPT	1	-	-	-	-	-	-	-
BH-BGC11-57	SPT2	3.8	4.3	SPT	1	1	1	1	-	-	-	-
BH-BGC11-57	SPT3	5.33	5.8	SPT	1	-	-	-	-	-	-	-
BH-BGC11-57	SPT4	6.85	7.1	SPT	1	1	1	1	-	-	-	-
BH-BGC11-58	G2	1.9	2.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-58	G4	3.2	3.6	GB	1	1	1	1	-	-	-	-
BH-BGC11-58	G6	4.4	4.6	GB	1	1	1	1	-	-	-	-
BH-BGC11-58	G8	5.4	5.5	GB	1	1	1	1	-	-	-	-
BH-BGC11-58	G10	7.9	8.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-60	G3	2.7	2.8	GB	1	1	1	1	-	-	-	-
BH-BGC11-60	G5	3.7	3.8	GB	1	1	1	1	-	-	-	-
BH-BGC11-60	G6	4.9	5.1	GB	1	-	-	-	-	-	-	-
BH-BGC11-60	G7	6.3	6.6	GB	1	1	1	1	-	-	-	-
BH-BGC11-60	SPT2	6.85	7.0	SPT	1	1	1	-	-	-	-	-
BH-BGC11-63	G-2	1.9	2.1	GB	1	1	1	1	-	-	-	-
BH-BGC11-63	G-5	3.9	4.0	GB	1	1	1	1	-	-	-	-
BH-BGC11-63	G-6	5.9	6.1	GB	1	-	-	-	-	-	-	-

Hole ID	Sample Number	Sample Depth From (m)	Sample Depth To (m)	Sample Type	Moisture Content	3" Minus Grain Size	Hydrometer	Atterberg Limits	Specific Gravity - soil	Modified Proctor	Permeability Testing	Sulphate in Soil
					ASTM 2216	ASTM C136	ASTM 422	ASTM 4318	ASTM 854	ASTM 698	ASTM D5856	CSA A23.2-3B
BH-BGC11-63	G-10	11.6	11.7	GB	1	-	-	-	-	-	-	-
BH-BGC11-63	G-12	16.2	16.3	GB	1	1	1	1	-	-	-	-
BH-BGC11-65	SPT1	0.76	1.2	SPT	1	1	-	-	-	-	-	-
BH-BGC11-65	SPT2	1.52	2.0	SPT	1	1	-	-	-	-	-	-
BH-BGC11-65	SPT3	2.28	2.7	SPT	1	1	-	-	-	-	-	-
BH-BGC11-65	SPT4	3.04	3.5	SPT	1	1	-	-	-	-	-	-
BH-BGC11-65	SPT5	3.8	4.2	SPT	1	1	-	-	-	-	-	-
BH-BGC11-65	SPT6	4.56	5.0	SPT	1	1	-	-	-	-	-	-
BH-BGC11-65	SPT7	5.33	5.8	SPT	1	1	-	-	-	-	-	-
BH-BGC11-65	SPT8	6.09	6.5	SPT	1	1	-	-	-	-	-	-
Steiner Outcrop												
BGC-Steiner	-	-	-	-	-	1	-	-	-	-	-	-

Table M-2. Rock Samples Requested for Testing

Final Test Hole Number	Sample Number	Sample Depth From (m)	Sample Depth to (m)	UCS with Strain Measurement	Brazilian Tensile Strength	Specific Gravity - Rock
				ASTM D7012	ASTM D3967	C127
BH-BGC11-29	1	27.46	27.77	-	2	1
BH-BGC11-34	1	36.6	36.86	1	2	1
BH-BGC11-40A	2	30.98	31.3	1	2	1
BH-BGC11-40B	UCS1	21.81	22.06	1	2	1
BH-BGC11-43	1	4.24	4.48	1	2	1
BH-BGC11-45	UCS	17.8	18.04	1	2	1
BH-BGC11-46	UCS	13.11	13.65	1	2	1
BH-BGC11-62	UCS	28.59	28.84	1	1	1
BH-BGC11-69	UCS1	12.26	12.54	1	2	1

Table M-3. Aggregate Samples Requested for Testing

Final Test Hole Number	Sample Number	SOIL TYPE	Relative Density and Absorption, fine aggregate	Sulphate in Soil	Petrographic No. Coarse	Clay Lumps	Low Density Material	Material Finer than 80 µm, fine aggregate	Flat and Elongated Particles	Micro Deval		Freeze Thaw	LA Abrasion	$MgSO_4$ Soundness		Detection of Alkali-Silica Reactive Aggregate by Accelerated Expansion of Mortar Bars
										Coarse Aggregate	Fine Aggregate		Small Coarse Aggregate	Coarse Aggregate	Fine Aggregate	
			CSA A23.2-6A	CSA A23.2-3B	CSA A23.2-15A	CSA A23.2-3A	CSA A23.2-4A	CSA A23.2-2A &5A	CSA A23.2-13A	CSA A23.2-29A	CSA A23.2-23A	CSA A23.2-24A	CSA A23.2-16A	CSA A23.2-9A	CSA A23.2-9A	CSA A23.2-25A
CONC-BGC11-GRD	S1	Form one aggregate sample from these 10 buckets. Sample need to be combined, then crushed and/or screened to produce fine and coarse aggregate for testing	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CONC-BGC11-GRD	S2															
CONC-BGC11-GRD	S3															
CONC-BGC11-GRD	S4															
CONC-BGC11-GRD	S5															
CONC-BGC11-SSED	S1															
CONC-BGC11-SSED	S2															
CONC-BGC11-SSED	S3															
CONC-BGC11-SSED	S4															
CONC-BGC11-SSED	S5															
CONC-BGC11-01	S1	Form one aggregate sample from these 10 buckets. Sample need to be combined, then crushed and/or screened to produce fine and coarse aggregate for testing	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CONC-BGC11-01	S2															
CONC-BGC11-02	S1															
CONC-BGC11-02	S2															
CONC-BGC11-03	S1															
CONC-BGC11-03	S2															
CONC-BGC11-04	S1															
CONC-BGC11-04	S2															
CONC-BGC11-16	S1															
CONC-BGC11-16	S2															
BGC Steiner			1	0	0	0	0	0	0	1	0	0	0	0	0	0

Table M-4. Grain Size and Hydrometer Results

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Cobbles (%)[1]	Gravel (%)[2]	Sand (%)[3]	Silt (%)[4]	Clay (%)[5]	Fines (%)	USCS Classification	Lithology Unit
Test Pits											
TP-BGC11-50	1	2.8	3.0	-	84	11	-	-	5	GW	COLLUVIUM
TP-BGC11-50	2	3.3	3.6	-	67	23	-	-	10	GW-GM/SW-SM	COLLUVIUM
TP-BGC11-51	1	0.2	1.4	-	32	24	34	10	44	GM-SM	COLLUVIUM
TP-BGC11-51	2	2.4	2.8	-	50	23	-	-	27	GM/SM	COLLUVIUM
TP-BGC11-51	3	4.2	4.5	-	60	34	-	-	6	GW-GM	COLLUVIUM
TP-BGC11-52	1	3.3	3.5	30	63	6	-	-	1	GW	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-53	1	2.0	2.2	-	79	18	-	-	3	GW	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-54	1	0.4	0.6	-	57	18	19	6	25	GM	COLLUVIUM
TP-BGC11-55	1	0.4	0.6	-	57	19	20	4	24	GM	COLLUVIUM
TP-BGC11-55	2	1.9	2.0	-	80	13	-	-	7	GW-GM	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-57	1	0.5	1.1	-	50	18	27	5	32	GM	COLLUVIUM
TP-BGC11-58	1	0.7	0.8	-	36	37	23	4	27	SM-GM	COLLUVIUM
TP-BGC11-58	2	2.0	2.1	-	69	25	-	-	6	GW-GM	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-59	1	0.4	0.6	-	67	20	12	1	13	GM	COLLUVIUM
TP-BGC11-59	1	0.4	0.6	-	67	20	12	1	13	GM	COLLUVIUM
TP-BGC11-60	1	0.7	0.9	-	20	25	53	2	55	ML	COLLUVIUM
TP-BGC11-61	1	0.7	0.8	-	30	32	36	2	38	SM-GM	COLLUVIUM
TP-BGC11-61	2	1.7	1.9	-	55	29	-	-	16	GM	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-62	1	0.9	1.0	-	33	23	40	4	44	GM-SM	COLLUVIUM
TP-BGC11-62	2	3.5	3.7	-	33	39	22	6	28	SM-GM/SC-GC	COLLUVIUM
TP-BGC11-63	1	0.5	0.7	-	53	23	20	4	24	GM	COLLUVIUM
TP-BGC11-64	1	1.5	1.6	-	26	60	-	-	14	SM	COLLUVIUM
TP-BGC11-65	1	0.4	0.5	-	49	36	-	-	15	GM-SM	COLLUVIUM
TP-BGC11-66	1	1.3	1.4	-	12	63	-	-	25	SM-GM	COLLUVIUM
TP-BGC11-66	2	1.8	1.9	-	2	32	51	15	66	CL	COLLUVIUM
TP-BGC11-67	1	0.7	0.9	-	45	19	28	8	36	GM-SM	COLLUVIUM
TP-BGC11-68	1	1.6	1.8	-	44	38	-	-	18	GM?	COLLUVIUM
TP-BGC11-69	1	1.7	1.9	-	-	7	90	3	93	ML	COLLUVIUM
TP-BGC11-69	2	2.8	2.9	-	47	31	19	3	22	GM-SM	COLLUVIUM
TP-BGC11-71	1	1.3	1.6	-	28	41	26	5	31	SM	COLLUVIUM
TP-BGC11-72	1	2.4	2.6	-	68	25	-	-	7	GW-GM	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-72	2	0.8	1.0	-	35	46	12	7	19	SM-GM	COLLUVIUM
TP-BGC11-73	1	0.8	1.0	-	17	50	31	2	33	SM	COLLUVIUM
TP-BGC11-74	1	1.2	1.4	-	39	26	28	7	35	GM-SM	COLLUVIUM
TP-BGC11-74	2	3.0	3.1	-	-	3	83	14	97	ML	COLLUVIUM
TP-BGC11-74	3	4.5	4.6	-	20	30	44	6	50	SM	COLLUVIUM
TP-BGC11-76	1	0.4	0.6	-	18	20	54	8	62	ML	COLLUVIUM
TP-BGC11-77	1	0.4	0.5	-	22	34	31	13	44	SM	COLLUVIUM
TP-BGC11-79	1	0.4	0.6	-	41	48	8	3	11	SW-SM/GW-GM	COLLUVIUM?
TP-BGC11-79	2	1.2	1.3	-	1	72	-	-	27	SM	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-81	1	0.7	1.0	-	65	24	10	1	11	GW-GM	COLLUVIUM
TP-BGC11-82	1	4.7	4.9	-	-	5	90	5	95	ML	ALLUVIUM
TP-BGC11-82	2	3.0	3.3	-	7	21	-	-	72	ML-SM	ALLUVIUM
TP-BGC11-82	3	6.7	7.0	-	2	20	74	4	78	ML	ALLUVIUM
TP-BGC11-82	4	0.7	1.1	-	-	20	-	-	80	ML	ALLUVIUM?
TP-BGC11-82	5	1.9	2.1	-	-	25	-	-	75	ML	ALLUVIUM
TP-BGC11-83	1	0.6	0.8	-	33	29	31	7	38	GM-SM	COLLUVIUM
TP-BGC11-84	1	0.4	0.6	-	-	20	34	46	80	ML	COLLUVIUM
TP-BGC11-84	2	2.3	2.5	-	2	4	84	10	94	ML	COLLUVIUM
TP-BGC11-85	1	0.7	1.1	-	7	42	40	11	51	ML	COLLUVIUM
TP-BGC11-87	1	0.6	0.8	-	26	68	-	-	6	SP-SW	COLLUVIUM
TP-BGC11-88	1	1.5	1.8	-	27	39	23	11	34	SM	COLLUVIUM
TP-BGC11-89	1	0.4	0.6	-	78	21	-	-	1	GW	COLLUVIUM
TP-BGC11-89	2	1.3	1.5	-	24	32	36	8	44	SM	COLLUVIUM
TP-BGC11-90	1	0.8	1.0	-	11	23	-	-	66	ML	COLLUVIUM
TP-BGC11-90	2	3.5	3.6	-	-	4	90	6	96	ML	COLLUVIUM
TP-BGC11-91	1	0.8	1.0	-	7	23	60	10	71	ML	COLLUVIUM
TP-BGC11-91	2	1.6	1.8	-	52	33	12	3	15	GM	COLLUVIUM
TP-BGC11-92	1	0.6	0.8	-	-	7	81	12	93	ML	COLLUVIUM

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Cobbles (%)[1]	Gravel (%)[2]	Sand (%)[3]	Silt (%)[4]	Clay (%)[5]	Fines (%)	USCS Classification	Lithology Unit
TP-BGC11-94	1	1.2	1.3	-	22	34	34	10	44	SM	COLLUVIUM
TP-BGC11-94	2	2.3	2.5	-	21	38	-	-	41	SM	COLLUVIUM
TP-BGC11-95	1	0.9	1.1	-	10	65	-	-	25	SM	WEATHERED INTRUSIVE ROCK
TP-BGC11-95	2	2.0	3.0	-	1	75	-	-	24	SM	WEATHERED INTRUSIVE ROCK
TP-BGC11-96	1	0.7	0.9	-	26	60	-	-	14	SM	WEATHERED INTRUSIVE ROCK
TP-BGC11-96	2	1.3	1.5	-	3	32	54	11	65	ML	WEATHERED INTRUSIVE ROCK
TP-BGC11-96	3	1.8	2.0	-	36	49	-	-	15	SM/GM	WEATHERED INTRUSIVE ROCK
TP-BGC11-103	1	4.4	4.8	-	36	48	-	-	5	SW/GW	TILL
TP-BGC11-104	1	1.2	1.6	-	60	33	-	-	7	GW	TILL
TP-BGC11-107	1	2.7	3.0	-	25	41	30	4	34	SM	COLLUVIUM
TP-BGC11-108	1	0.9	1.2	-	37	37	-	-	26	GM-SM	COLLUVIUM
TP-BGC11-112	1	1.3	1.4	-	48	33	-	-	19	GM-SM	COLLUVIUM
TP-BGC11-116	2	2.2	2.3	-	49	36	-	-	15	GC	COLLUVIUM
TP-BGC11-124	1	6.2	6.4	-	21	29	-	-	50	ML	COLLUVIUM
TP-BGC11-126	1	1.7	2.2	-	52	30	-	-	18	GC-SC/GM-SM	COLLUVIUM
TP-BGC11-128	1	2.5	3.0	-	7	32	61	0	61	ML	COLLUVIUM
TP-BGC11-129	1	6.6	6.8	-	16	31	-	-	53	ML	COLLUVIUM
TP-BGC11-130	1	5.8	6.0	-	35	43	-	-	22	SM-GM/SC-GC	COLLUVIUM
TP-BGC11-131	1	3.2	3.5	-	45	38	-	-	17	GM-SM	DEBRIS FLOW?
TP-BGC11-133	1	4.3	4.4	-	51	34	-	-	15	GM	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-140	1	1.0	1.2	-	21	34	-	-	45	ML	COLLUVIUM
Boreholes											
BH-BGC11-39	SPT1	1.2	1.6	-	0	5	-	-	95	ML	PLACER TAILINGS
BH-BGC11-39	SPT2	1.6	2.1	-	0	8	-	-	92	ML	PLACER TAILINGS
BH-BGC11-39	SPT3	2.3	2.8	-	27	28	-	-	45	SM-GM	PLACER TAILINGS
BH-BGC11-39	SPT4	2.8	3.2	-	48	33	-	-	19	GM	PLACER TAILINGS
BH-BGC11-39	SPT5	4.6	5.1	-	38	44	-	-	18	SM	PLACER TAILINGS
BH-BGC11-39	SPT6	5.5	6.0	-	25	61	-	-	14	SM	PLACER TAILINGS
BH-BGC11-39	SPT7	6.2	6.7	-	2	78	-	-	20	SM	PLACER TAILINGS
BH-BGC11-39	SPT8	7.2	7.6	-	0	81	-	-	19	SM	PLACER TAILINGS
BH-BGC11-39	SPT9	7.8	8.2	-	39	48	-	-	13	SM	PLACER TAILINGS
BH-BGC11-39	SPT10	8.7	9.2	-	2	82	-	-	16	SM	PLACER TAILINGS
BH-BGC11-39	SPT11	9.3	9.7	-	2	84	-	-	14	SM	PLACER TAILINGS
BH-BGC11-42	2	1.8	2.3	-	7	59	24	10	34	SM	ICE RICH COLLUVIUM
BH-BGC11-42	5	6.4	6.8	-	6	55	27	12	39	SM	ICE RICH COLLUVIUM
BH-BGC11-42	7	9.4	9.9	-	5	61	-	-	34	SM	ICE RICH COLLUVIUM
BH-BGC11-42	12	13.3	13.7	-	31	60	-	-	9	SW-GW	ICE RICH COLLUVIUM
BH-BGC11-42	20	19.7	20.0	-	10	64	16	10	26	SM	ICE RICH COLLUVIUM
BH-BGC11-42	22	21.6	21.9	-	4	66	18	12	30	SM	ICE RICH COLLUVIUM
BH-BGC11-42	S26	27.6	28.0	-	19	59	-	-	22	SM	ICE RICH COLLUVIUM
BH-BGC11-44	S1	0.2	0.4	-	20	35	32	13	45	SM	ALLUVIUM
BH-BGC11-44	S3	1.6	2.0	-	3	10	72	15	87	ML	ALLUVIUM
BH-BGC11-44	S5	4.8	5.1	-	33	22	35	10	45	GC-SC	ALLUVIUM
BH-BGC11-44	S7	6.3	6.6	-	29	22	49	0	49	GC-SC/GM-SM	ALLUVIUM
BH-BGC11-44	S11	9.6	9.9	-	20	40	24	16	40	GC-SC	ALLUVIUM?
BH-BGC11-47	G3	2.0	2.3	-	0	8	78	14	92	ML	ALLUVIUM?
BH-BGC11-47	G10	11.8	12.1	-	15	46	39	0	39	SC	ALLUVIUM?
BH-BGC11-47	SPT1	0.8	1.2	-	1	8	91	0	91	CL	ALLUVIUM?
BH-BGC11-47	SPT4	5.3	5.9	-	26	45	-	-	29	SM-GM	ALLUVIUM?
BH-BGC11-47	SPT6	8.4	8.6	-	13	38	49	0	49	SM	ALLUVIUM?
BH-BGC11-49	G4	3.4	3.6	-	28	42	26	4	30	SM	ALLUVIUM?
BH-BGC11-49	G6	6.4	6.6	-	33	34	31	2	33	SM-GM	ALLUVIUM?
BH-BGC11-49	G8	9.4	9.6	-	6	69	16	9	25	SM	ALLUVIUM?
BH-BGC11-49	G10	12.4	12.6	-	22	36	29	13	42	SM	ALLUVIUM?
BH-BGC11-49	SPT2	2.3	2.7	-	7	23	58	12	70	CL	ALLUVIUM?
BH-BGC11-51	G6	7.9	8.1	-	14	27	50	9	59	ML	ALLUVIUM
BH-BGC11-51	G10	13.9	14.1	-	21	53	26	0	26	SM	ALLUVIUM
BH-BGC11-51	G14	20.1	20.3	-	11	63	-	-	26	SW	ALLUVIUM
BH-BGC11-53	G2	1.9	2.1	-	19	40	38	3	41	SC	TILL
BH-BGC11-53	G4	4.9	5.1	-	41	44	14	1	15	SC-GC	TILL
BH-BGC11-53	G6	7.9	8.1	-	31	47	-	-	22	SM	TILL

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Cobbles (%)[1]	Gravel (%)[2]	Sand (%)[3]	Silt (%)[4]	Clay (%)[5]	Fines (%)	USCS Classification	Lithology Unit
BH-BGC11-53	SPT2	2.3	2.7	-	22	41	28	9	37	SC	TILL
BH-BGC11-53	SPT4	6.9	7.3	-	8	76	13	3	16	SC-GC	TILL
BH-BGC11-55	G4	4.9	5.1	-	20	41	36	3	39	SC	DEBRIS FLOW
BH-BGC11-55	SPT1	0.8	1.2	-	38	37	-	-	25	GM-SM	COLLUVIUM
BH-BGC11-56	G2	1.9	2.1	-	40	37	-	-	23	GM-SM	COLLUVIUM
BH-BGC11-57	SPT2	3.8	4.3	-	19	49	28	4	32	SC	COLLUVIUM
BH-BGC11-57	SPT4	6.9	7.1	-	27	42	23	8	31	SC-SM	COLLUVIUM
BH-BGC11-58	G2	1.9	2.1	-	11	44	40	5	45	SM	COLLUVIUM
BH-BGC11-58	G4	3.2	3.6	-	23	51	26	0	26	SM	COLLUVIUM
BH-BGC11-58	G6	4.4	4.6	-	29	54	16	1	17	SM	COLLUVIUM
BH-BGC11-58	G8	5.4	5.5	-	37	35	26	2	28	GM-SM	COLLUVIUM
BH-BGC11-58	G10	7.9	8.1	-	15	51	32	2	34	SM	COLLUVIUM
BH-BGC11-60	G3	2.7	2.8	-	20	42	25	13	38	SC	COLLUVIUM
BH-BGC11-60	G5	3.7	3.8	-	21	45	25	9	34	SC	COLLUVIUM
BH-BGC11-60	G7	6.3	6.6	-	43	30	17	10	27	SC	COLLUVIUM
BH-BGC11-60	SPT2	6.9	7.0	-	39	31	19	11	30	SC	COLLUVIUM
BH-BGC11-63	G-2	1.9	2.1	-	1	54	25	20	45	SC	ICE RICH COLLUVIUM
BH-BGC11-63	G-5	3.9	4.0	-	0	54	33	13	46	SC	ICE RICH COLLUVIUM
BH-BGC11-63	G-9	10.2	10.3	-	1	57	20	22	42	SM	ICE RICH COLLUVIUM
BH-BGC11-63	G-12	16.2	16.3	-	12	59	19	10	29	SC	ICE RICH COLLUVIUM
BH-BGC11-65	SPT1	0.8	1.2	-	26	60	-	-	14	SM	PLACER TAILINGS
BH-BGC11-65	SPT2	1.5	2.0	-	40	48	-	-	12	SM	PLACER TAILINGS
BH-BGC11-65	SPT3	2.3	2.7	-	53	38	-	-	9	GW-SW	PLACER TAILINGS
BH-BGC11-65	SPT4	3.0	3.5	-	63	29	-	-	8	GW-SW	PLACER TAILINGS
BH-BGC11-65	SPT5	3.8	4.2	-	76	19	-	-	5	GW-SW	PLACER TAILINGS
BH-BGC11-65	SPT6	4.6	5.0	-	40	44	-	-	16	SM-GM	PLACER TAILINGS
BH-BGC11-65	SPT7	5.3	5.8	-	64	26	-	-	10	GW-SW	PLACER TAILINGS
BH-BGC11-65	SPT8	6.1	6.5	-	53	38	-	-	9	GW-SW	PLACER TAILINGS
Steiner Outcrop											
BGC-Steiner	-	-	-	-	72	25	-	-	3	GW	AGGREGATE

NOTES:
1. Cobbles is considered to be particles larger than 3 inches (76.2 mm).
2. Gravel is considered to be particles smaller than 3 inches (76.2 mm) and larger than the #4 sieve (4.75 mm).
3. Sand is considered to be particles smaller than the #4 sieve (4.75 mm) and larger than the #200 sieve (0.075 mm).
4. Silt is considered to be particles smaller than the #200 sieve (0.075 mm) and larger than 0.002 mm.
5. Clay is considered to be any particles smaller than 0.002 mm.

Table M-5. Moisture Content Results

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Moisture Content (%)	Lithology Unit
Test Pits					
TP-BGC11-50	1	2.8	3.0	6	COLLUVIUM
TP-BGC11-50	2	3.3	3.6	7	COLLUVIUM
TP-BGC11-51	1	0.2	1.4	13	COLLUVIUM
TP-BGC11-51	2	2.4	2.8	7	COLLUVIUM
TP-BGC11-51	3	4.2	4.5	4	COLLUVIUM
TP-BGC11-52	1	3.3	3.5	3	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-53	1	2.0	2.2	6	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-54	1	0.4	0.6	9	COLLUVIUM
TP-BGC11-55	1	0.4	0.6	7	COLLUVIUM
TP-BGC11-55	2	1.9	2.0	6	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-57	1	0.5	1.1	8	COLLUVIUM
TP-BGC11-58	1	0.7	0.8	9	COLLUVIUM
TP-BGC11-58	2	2.0	2.1	6	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-59	1	0.4	0.6	7	COLLUVIUM
TP-BGC11-60	1	0.7	0.9	25	COLLUVIUM
TP-BGC11-61	1	0.7	0.8	12	COLLUVIUM
TP-BGC11-61	2	1.7	1.9	21	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-62	1	0.9	1.0	11	COLLUVIUM
TP-BGC11-62	2	3.5	3.7	9	COLLUVIUM
TP-BGC11-63	1	0.5	0.7	7	COLLUVIUM
TP-BGC11-64	1	1.5	1.6	5	COLLUVIUM
TP-BGC11-65	1	0.4	0.5	7	COLLUVIUM
TP-BGC11-66	1	1.3	1.4	11	COLLUVIUM
TP-BGC11-66	2	1.8	1.9	17	COLLUVIUM
TP-BGC11-67	1	0.7	0.9	7	COLLUVIUM
TP-BGC11-68	1	1.6	1.8	9	COLLUVIUM
TP-BGC11-69	1	1.7	1.9	30	COLLUVIUM
TP-BGC11-69	2	2.8	2.9	7	COLLUVIUM
TP-BGC11-71	1	1.3	1.6	14	COLLUVIUM
TP-BGC11-72	1	2.4	2.6	5	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-72	2	0.8	1.0	14	COLLUVIUM
TP-BGC11-73	1	0.8	1.0	8	COLLUVIUM
TP-BGC11-74	1	1.2	1.4	12	COLLUVIUM
TP-BGC11-74	2	3.0	3.1	36	COLLUVIUM
TP-BGC11-74	3	4.5	4.6	15	COLLUVIUM
TP-BGC11-76	1	0.4	0.6	16	COLLUVIUM
TP-BGC11-77	1	0.4	0.5	27	COLLUVIUM
TP-BGC11-79	1	0.4	0.6	10	COLLUVIUM?
TP-BGC11-79	2	1.2	1.3	16	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-81	1	0.7	1.0	17	COLLUVIUM
TP-BGC11-82	1	4.7	4.9	12	ALLUVIUM
TP-BGC11-82	2	3.0	3.3	10	ALLUVIUM
TP-BGC11-82	3	6.7	7.0	40	ALLUVIUM
TP-BGC11-82	4	0.7	1.1	29	ALLUVIUM?
TP-BGC11-82	5	1.9	2.1	27	ALLUVIUM
TP-BGC11-83	1	0.6	0.8	20	COLLUVIUM
TP-BGC11-84	1	0.4	0.6	18	COLLUVIUM
TP-BGC11-84	2	2.3	2.5	29	COLLUVIUM
TP-BGC11-85	1	0.7	1.1	17	COLLUVIUM
TP-BGC11-87	1	0.6	0.8	11	COLLUVIUM
TP-BGC11-88	1	1.5	1.8	13	COLLUVIUM
TP-BGC11-89	1	0.4	0.6	2	COLLUVIUM
TP-BGC11-89	2	1.3	1.5	14	COLLUVIUM
TP-BGC11-90	1	0.8	1.0	13	COLLUVIUM
TP-BGC11-90	2	3.5	3.6	23	COLLUVIUM
TP-BGC11-91	1	0.8	1.0	49	COLLUVIUM
TP-BGC11-91	2	1.6	1.8	6	COLLUVIUM
TP-BGC11-92	1	0.6	0.8	64	COLLUVIUM
TP-BGC11-94	1	1.2	1.3	16	COLLUVIUM
TP-BGC11-94	2	2.3	2.5	11	COLLUVIUM
TP-BGC11-95	1	0.9	1.1	13	WEATHERED INTRUSIVE ROCK
TP-BGC11-95	2	2.0	3.0	22	WEATHERED INTRUSIVE ROCK

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Moisture Content (%)	Lithology Unit
TP-BGC11-96	1	0.7	0.9	8	WEATHERED INTRUSIVE ROCK
TP-BGC11-96	2	1.3	1.5	20	WEATHERED INTRUSIVE ROCK
TP-BGC11-96	3	1.8	2.0	9	WEATHERED INTRUSIVE ROCK
TP-BGC11-103	1	4.4	4.8	3	TILL
TP-BGC11-104	1	1.2	1.6	7	TILL
TP-BGC11-106	1	0.8	1.5	11	COLLUVIUM
TP-BGC11-107	1	2.7	3.0	17	COLLUVIUM
TP-BGC11-108	1	0.9	1.2	10	COLLUVIUM
TP-BGC11-111	1	0.9	1.1	17	COLLUVIUM
TP-BGC11-112	1	1.3	1.4	14	COLLUVIUM
TP-BGC11-116	2	2.2	2.3	8	COLLUVIUM
TP-BGC11-119	1	0.9	1.1	29	ALLUVIUM?
TP-BGC11-120	1	3.8	4.0	29	ALLUVIUM?
TP-BGC11-121	1	2.9	3.1	25	ALLUVIUM?
TP-BGC11-122	1	5.4	5.8	19	PLACER TAILINGS
TP-BGC11-124	1	6.2	6.4	21	COLLUVIUM
TP-BGC11-126	1	1.7	2.2	12	COLLUVIUM
TP-BGC11-128	1	2.5	3.0	27	COLLUVIUM
TP-BGC11-129	1	6.6	6.8	23	COLLUVIUM
TP-BGC11-130	1	5.8	6.0	7	COLLUVIUM
TP-BGC11-131	1	3.2	3.5	8	DEBRIS FLOW?
TP-BGC11-133	1	4.3	4.4	9	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-140	1	1.0	1.2	16	COLLUVIUM
Boreholes					
BH-BGC11-39	SPT1	1.2	1.6	34	PLACER TAILINGS
BH-BGC11-39	SPT2	1.6	2.1	31	PLACER TAILINGS
BH-BGC11-39	SPT3	2.3	2.8	17	PLACER TAILINGS
BH-BGC11-39	SPT4	2.8	3.2	4	PLACER TAILINGS
BH-BGC11-39	SPT5	4.6	5.1	2	PLACER TAILINGS
BH-BGC11-39	SPT6	5.5	6.0	4	PLACER TAILINGS
BH-BGC11-39	SPT7	6.2	6.7	7	PLACER TAILINGS
BH-BGC11-39	SPT8	7.2	7.6	7	PLACER TAILINGS
BH-BGC11-39	SPT9	7.8	8.2	4	PLACER TAILINGS
BH-BGC11-39	SPT10	8.7	9.2	15	PLACER TAILINGS
BH-BGC11-39	SPT11	9.3	9.7	17	PLACER TAILINGS
BH-BGC11-40A	1	18.8	18.8	13	FAULT ZONE
BH-BGC11-42	2	1.8	2.3	17	ICE RICH COLLUVIUM
BH-BGC11-42	4	5.0	5.3	14	ICE RICH COLLUVIUM
BH-BGC11-42	5	6.4	6.8	14	ICE RICH COLLUVIUM
BH-BGC11-42	7	9.4	9.9	12	ICE RICH COLLUVIUM
BH-BGC11-42	8	10.6	11.0	16	ICE RICH COLLUVIUM
BH-BGC11-42	12	13.3	13.7	12	ICE RICH COLLUVIUM
BH-BGC11-42	15	15.3	15.4	7	ICE RICH COLLUVIUM
BH-BGC11-42	16	15.6	15.8	9	ICE RICH COLLUVIUM
BH-BGC11-42	20	19.7	20.0	18	ICE RICH COLLUVIUM
BH-BGC11-42	22	21.6	21.9	19	ICE RICH COLLUVIUM
BH-BGC11-42	23	23.0	23.4	15	ICE RICH COLLUVIUM
BH-BGC11-42	S26	27.6	28.0	15	ICE RICH COLLUVIUM
BH-BGC11-44	S1	0.2	0.4	14	ALLUVIUM
BH-BGC11-44	S3	1.6	2.0	23	ALLUVIUM
BH-BGC11-44	S5	4.8	5.1	14	ALLUVIUM
BH-BGC11-44	S7	6.3	6.6	24	ALLUVIUM
BH-BGC11-44	S11	9.6	9.9	17	ALLUVIUM?
BH-BGC11-44	SPT1	2.3	2.7	85	ALLUVIUM?
BH-BGC11-44	SPT2	3.8	4.2	25	ALLUVIUM?
BH-BGC11-44	SPT5	8.4	8.9	17	ALLUVIUM?
BH-BGC11-44	SPT10	13.0	13.4	12	ALLUVIUM?
BH-BGC11-44	SPT11	14.5	14.8	14	ALLUVIUM?
BH-BGC11-47	G3	2.0	2.3	27	ALLUVIUM?
BH-BGC11-47	G4	2.8	3.0	5	ALLUVIUM?
BH-BGC11-47	G10	11.8	12.1	11	ALLUVIUM?
BH-BGC11-47	SPT1	0.8	1.2	26	ALLUVIUM?
BH-BGC11-47	SPT4	5.3	5.9	10	ALLUVIUM?
BH-BGC11-47	SPT5	6.9	7.3	13	ALLUVIUM?
BH-BGC11-47	SPT6	8.4	8.6	12	ALLUVIUM?
BH-BGC11-49	G4	3.4	3.6	12	ALLUVIUM?
BH-BGC11-49	G6	6.4	6.6	13	ALLUVIUM?

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Moisture Content (%)	Lithology Unit
BH-BGC11-49	G8	9.4	9.6	26	ALLUVIUM?
BH-BGC11-49	G10	12.4	12.6	12	ALLUVIUM?
BH-BGC11-49	SPT1	0.8	1.2	11	ALLUVIUM?
BH-BGC11-49	SPT2	2.3	2.7	20	ALLUVIUM?
BH-BGC11-51	G6	7.9	8.1	17	ALLUVIUM
BH-BGC11-51	G8	10.9	11.1	14	ALLUVIUM
BH-BGC11-51	G10	13.9	14.1	11	ALLUVIUM
BH-BGC11-51	G12	17.0	17.2	11	ALLUVIUM
BH-BGC11-51	G14	20.1	20.3	11	ALLUVIUM
BH-BGC11-51	G17	24.7	24.9	7	ALLUVIUM
BH-BGC11-51	SPT1	0.8	1.2	12	ALLUVIUM
BH-BGC11-51	SPT2	2.3	2.7	10	ALLUVIUM
BH-BGC11-51	SPT3	3.8	4.3	29	ALLUVIUM
BH-BGC11-51	SPT4	5.3	5.8	9	ALLUVIUM
BH-BGC11-51	SPT5	9.9	10.3	20	ALLUVIUM
BH-BGC11-53	G2	1.9	2.1	11	TILL
BH-BGC11-53	G3	3.2	3.5	8	TILL
BH-BGC11-53	G4	4.9	5.1	4	TILL
BH-BGC11-53	G6	7.9	8.1	5	TILL
BH-BGC11-53	G8	10.9	11.1	3	TILL
BH-BGC11-53	SPT1	0.8	1.2	12	TILL
BH-BGC11-53	SPT2	2.3	2.7	10	TILL
BH-BGC11-53	SPT3	3.8	4.3	4	TILL
BH-BGC11-53	SPT4	6.9	7.3	3	TILL
BH-BGC11-53	SPT5	9.9	10.4	5	TILL
BH-BGC11-54	G1	30.0	30.0	8	WEATHERED METASEDIMENTARY ROCK
BH-BGC11-55	G4	4.9	5.1	11	DEBRIS FLOW
BH-BGC11-55	G5	6.3	6.5	12	DEBRIS FLOW
BH-BGC11-55	SPT1	0.8	1.2	9	COLLUVIUM
BH-BGC11-55	SPT2	2.3	2.7	10	COLLUVIUM
BH-BGC11-55	SPT6	8.4	8.8	7	DEBRIS FLOW
BH-BGC11-56	G2	1.9	2.1	6	COLLUVIUM
BH-BGC11-56	SPT1	0.8	1.2	5	COLLUVIUM
BH-BGC11-56	SPT3	3.8	4.3	9	COLLUVIUM
BH-BGC11-56	SPT4	5.3	5.5	7	COLLUVIUM
BH-BGC11-56	SPT5	6.9	7.2	5	COLLUVIUM
BH-BGC11-57	SPT1	2.3	2.7	10	COLLUVIUM
BH-BGC11-57	SPT2	3.8	4.3	9	COLLUVIUM
BH-BGC11-57	SPT3	5.3	5.8	10	COLLUVIUM
BH-BGC11-57	SPT4	6.9	7.1	8	COLLUVIUM
BH-BGC11-58	G2	1.9	2.1	17	COLLUVIUM
BH-BGC11-58	G4	3.2	3.6	11	COLLUVIUM
BH-BGC11-58	G6	4.4	4.6	11	COLLUVIUM
BH-BGC11-58	G8	5.4	5.5	6	COLLUVIUM
BH-BGC11-58	G10	7.9	8.1	9	COLLUVIUM
BH-BGC11-60	G3	2.7	2.8	10	COLLUVIUM
BH-BGC11-60	G5	3.7	3.8	9	COLLUVIUM
BH-BGC11-60	G6	4.9	5.1	7	COLLUVIUM
BH-BGC11-60	G7	6.3	6.6	7	COLLUVIUM
BH-BGC11-60	SPT2	6.9	7.0	6	COLLUVIUM
BH-BGC11-63	G-2	1.9	2.1	25	ICE RICH COLLUVIUM
BH-BGC11-63	G-3	2.9	3.0	19	ICE RICH COLLUVIUM
BH-BGC11-63	G-5	3.9	4.0	27	ICE RICH COLLUVIUM
BH-BGC11-63	G-6	5.9	6.1	27	ICE RICH COLLUVIUM
BH-BGC11-63	G-9	10.2	10.3	29	ICE RICH COLLUVIUM
BH-BGC11-63	G-10	11.6	11.7	17	ICE RICH COLLUVIUM
BH-BGC11-63	G-12	16.2	16.3	25	ICE RICH COLLUVIUM
BH-BGC11-65	SPT1	0.8	1.2	3	PLACER TAILINGS
BH-BGC11-65	SPT2	1.5	2.0	3	PLACER TAILINGS
BH-BGC11-65	SPT3	2.3	2.7	2	PLACER TAILINGS
BH-BGC11-65	SPT4	3.0	3.5	2	PLACER TAILINGS
BH-BGC11-65	SPT5	3.8	4.2	1	PLACER TAILINGS
BH-BGC11-65	SPT6	4.6	5.0	5	PLACER TAILINGS
BH-BGC11-65	SPT7	5.3	5.8	5	PLACER TAILINGS
BH-BGC11-65	SPT8	6.1	6.5	9	PLACER TAILINGS

Table M-6. Atterberg Limit Results

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	Fines Classification	Lithology Unit
Test Pits								
TP-BGC11-51	1	0.2	1.4	27	22	5	ML	COLLUVIUM
TP-BGC11-54	1	0.4	0.6	21	20	1	ML	COLLUVIUM
TP-BGC11-55	1	0.4	0.6	-	-	-	Non-plastic	COLLUVIUM
TP-BGC11-57	1	0.5	1.1	28	23	5	ML	COLLUVIUM
TP-BGC11-58	1	0.7	0.8	27	23	4	ML	COLLUVIUM
TP-BGC11-59	1	0.4	0.6	24	23	1	ML	COLLUVIUM
TP-BGC11-60	1	0.7	0.9	27	26	1	ML	COLLUVIUM
TP-BGC11-61	1	0.7	0.8	24	21	3	ML	COLLUVIUM
TP-BGC11-62	1	0.9	1.0	-	-	-	Non-plastic	COLLUVIUM
TP-BGC11-62	2	3.5	3.7	21	16	5	CL-ML	COLLUVIUM
TP-BGC11-64	1	1.5	1.6	-	-	-	Non-plastic	COLLUVIUM
TP-BGC11-66	2	1.8	1.9	29	19	10	CL	COLLUVIUM
TP-BGC11-69	1	1.7	1.9	-	-	-	Non-plastic	COLLUVIUM
TP-BGC11-69	2	2.8	2.9	23	17	6	CL-ML	COLLUVIUM
TP-BGC11-71	1	1.3	1.6	28	22	6	CL-ML	COLLUVIUM
TP-BGC11-72	2	0.8	1.0	31	24	7	ML	COLLUVIUM
TP-BGC11-73	1	0.8	1.0	-	-	-	Non-plastic	COLLUVIUM
TP-BGC11-74	1	1.2	1.4	30	25	5	ML	COLLUVIUM
TP-BGC11-74	2	3.0	3.1	33	30	3	ML	COLLUVIUM
TP-BGC11-74	3	4.5	4.6	28	22	6	CL-ML	COLLUVIUM
TP-BGC11-77	1	0.4	0.5	46	29	17	ML	COLLUVIUM
TP-BGC11-79	1	0.4	0.6	26	25	1	ML	COLLUVIUM?
TP-BGC11-82	1	4.7	4.9	-	-	-	Non-plastic	ALLUVIUM
TP-BGC11-82	2	3.0	3.3	30	27	3	ML	ALLUVIUM
TP-BGC11-82	3	6.7	7.0	-	-	-	Non-plastic	ALLUVIUM
TP-BGC11-82	4	0.7	1.1	32	28	4	ML	ALLUVIUM?
TP-BGC11-82	5	1.9	2.1	28	23	5	ML	ALLUVIUM
TP-BGC11-83	1	0.6	0.8	55	44	11	MH	COLLUVIUM
TP-BGC11-84	2	2.3	2.5	29	26	3	ML	COLLUVIUM
TP-BGC11-85	1	0.7	1.1	23	22	1	ML	COLLUVIUM
TP-BGC11-88	1	1.5	1.8	26	19	7	CL-ML	COLLUVIUM
TP-BGC11-89	2	1.3	1.5	23	21	2	ML	COLLUVIUM
TP-BGC11-90	2	3.5	3.6	24	22	2	ML	COLLUVIUM
TP-BGC11-91	1	0.8	1.0	42	35	7	ML	COLLUVIUM
TP-BGC11-91	2	1.6	1.8	-	-	-	Non-plastic	COLLUVIUM
TP-BGC11-92	1	0.6	0.8	45	42	3	ML	COLLUVIUM
TP-BGC11-94	1	1.2	1.3	27	24	3	ML	COLLUVIUM
TP-BGC11-96	2	1.3	1.5	26	22	4	ML	WEATHERED INTRUSIVE ROCK
TP-BGC11-116	2	2.2	2.3	20	18	3	CL	COLLUVIUM
TP-BGC11-119	1	0.9	1.1	27	23	4	ML	ALLUVIUM?
TP-BGC11-120	1	3.8	4.0	33	24	9	ML	ALLUVIUM?
TP-BGC11-121	1	2.9	3.1	29	20	8	CL	ALLUVIUM?
TP-BGC11-122	1	5.4	5.8	25	18	7	CL	PLACER TAILINGS
TP-BGC11-124	1	6.2	6.4	32	28	4	ML	COLLUVIUM
TP-BGC11-129	1	6.6	6.8	27	22	5	ML	COLLUVIUM
TP-BGC11-130	1	5.8	6.0	-	-	-	Non-plastic	COLLUVIUM
TP-BGC11-131	1	3.2	3.5	-	-	-	Non-plastic	DEBRIS FLOW?
TP-BGC11-140	1	1.0	1.2	24	21	2	ML	COLLUVIUM
Boreholes								
BH-BGC11-42	2	1.8	2.3	30	23	7	ML	ICE RICH COLLUVIUM
BH-BGC11-42	5	6.4	6.8	27	18	9	CL	ICE RICH COLLUVIUM
BH-BGC11-44	S1	0.2	0.4	26	20	6	CL	ALLUVIUM
BH-BGC11-44	S3	1.6	2.0	-	-	-	Non-plastic	ALLUVIUM
BH-BGC11-44	S5	4.8	5.1	20	19	1	CL	ALLUVIUM
BH-BGC11-44	S7	6.3	6.6	23	21	3	CL	ALLUVIUM
BH-BGC11-44	S11	9.6	9.9	21	15	6	CL	ALLUVIUM?
BH-BGC11-44	SPT2	3.8	4.2	-	-	-	Non-plastic	ALLUVIUM?
BH-BGC11-44	SPT10	13.0	13.4	22	15	6	CL	ALLUVIUM?
BH-BGC11-44	SPT11	14.5	14.8	22	17	5	CL	ALLUVIUM?
BH-BGC11-47	G3	2.0	2.3	23	21	2	ML	ALLUVIUM?

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	Fines Classification	Lithology Unit
BH-BGC11-47	G10	11.8	12.1	19	15	3	CL	ALLUVIUM?
BH-BGC11-47	SPT1	0.8	1.2	22	19	3	CL	ALLUVIUM?
BH-BGC11-49	G4	3.4	3.6	20	17	3	CL	ALLUVIUM?
BH-BGC11-49	G6	6.4	6.6	21	17	4	CL	ALLUVIUM?
BH-BGC11-49	G8	9.4	9.6	-	-	-	Non-plastic	ALLUVIUM?
BH-BGC11-49	G10	12.4	12.6	22	18	4	CL	ALLUVIUM?
BH-BGC11-49	SPT2	2.3	2.7	23	19	4	CL	ALLUVIUM?
BH-BGC11-51	G6	7.9	8.1	28	20	7	CL	ALLUVIUM
BH-BGC11-51	G10	13.9	14.1	19	16	3	CL	ALLUVIUM
BH-BGC11-51	SPT1	0.8	1.2	27	20	7	CL	ALLUVIUM
BH-BGC11-51	SPT3	3.8	4.3	34	34	0	ML	ALLUVIUM
BH-BGC11-53	G2	1.9	2.1	27	17	9	CL	TILL
BH-BGC11-53	G4	4.9	5.1	22	16	6	CL	TILL
BH-BGC11-53	SPT2	2.3	2.7	24	18	6	CL	TILL
BH-BGC11-53	SPT4	6.9	7.3	-	-	-	Non-plastic	TILL
BH-BGC11-54	G1	30.0	30.0	20	16	4	CL	WEATHERED METASEDIMENTARY ROCK
BH-BGC11-55	G4	4.9	5.1	22	15	7	CL	DEBRIS FLOW
BH-BGC11-55	SPT6	8.4	8.8	26	23	3	ML	DEBRIS FLOW
BH-BGC11-56	SPT3	3.8	4.3	-	-	-	Non-plastic	COLLUVIUM
BH-BGC11-56	SPT4	5.3	5.5	22	18	4	CL	COLLUVIUM
BH-BGC11-57	SPT2	3.8	4.3	20	14	6	CL	COLLUVIUM
BH-BGC11-57	SPT4	6.9	7.1	22	20	2	CL	COLLUVIUM
BH-BGC11-58	G2	1.9	2.1	21	17	4	CL	COLLUVIUM
BH-BGC11-58	G4	3.2	3.6	-	-	-	Non-plastic	COLLUVIUM
BH-BGC11-58	G6	4.4	4.6	-	-	-	Non-plastic	COLLUVIUM
BH-BGC11-58	G8	5.4	5.5	19	16	3	CL	COLLUVIUM
BH-BGC11-58	G10	7.9	8.1	-	-	-	Non-plastic	COLLUVIUM
BH-BGC11-60	G3	2.7	2.8	21	16	6	CL	COLLUVIUM
BH-BGC11-60	G5	3.7	3.8	18	17	1	CL	COLLUVIUM
BH-BGC11-60	G7	6.3	6.6	21	20	2	CL	COLLUVIUM
BH-BGC11-63	G-2	1.9	2.1	46	24	25	CI[1]	ICE RICH COLLUVIUM
BH-BGC11-63	G-5	3.9	4.0	39	24	15	CI[1]	ICE RICH COLLUVIUM
BH-BGC11-63	G-9	10.2	10.3	44	27	17	ML	ICE RICH COLLUVIUM
BH-BGC11-63	G-12	16.2	16.3	31	20	11	CI[1]	ICE RICH COLLUVIUM

NOTES:

"CI" values reported by GeoNorth for 30<Liquid Limit<50.

Table M-7. Specific Gravity Results

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Specific Gravity Rock			Specific Gravity Soil				Lithology Unit
				Oven Dry	SSD[1]	Apparent	Oven Dry (Coarse)	SSD[1] (Coarse)	Apparent (Coarse)	Average (Fine)	
TP-BGC11-50	1	2.8	3.0	-	-	-	2.61	2.75	3.03	2.8	COLLUVIUM
TP-BGC11-58	2	2.0	2.1	-	-	-	-	-	-	2.84	WEATHERED METASEDIMENTARY ROCK
TP-BGC11-67	1	0.7	0.9	-	-	-	-	-	-	2.72	COLLUVIUM
BH-BGC11-29	1	27.5	27.8	2.71	2.73	2.77	-	-	-	-	METASEDIMENTARY ROCK
BH-BGC11-34	1	36.6	36.9	2.56	2.64	2.78	-	-	-	-	METASEDIMENTARY ROCK
BH-BGC11-40A	2	31.0	31.3	2.67	2.68	2.7	-	-	-	-	METASEDIMENTARY ROCK
BH-BGC11-40B	UCS1	21.8	22.1	2.74	2.75	2.78	-	-	-	-	METASEDIMENTARY ROCK
BH-BGC11-43	1	4.2	4.5	2.71	2.71	2.73	-	-	-	-	INTRUSIVE ROCK
BH-BGC11-45	UCS	17.8	18.0	2.76	2.78	2.81	-	-	-	-	METASEDIMENTARY ROCK
BH-BGC11-46	UCS	13.1	13.7	2.69	2.7	2.72	-	-	-	-	INTRUSIVE ROCK
BH-BGC11-62	UCS	28.6	28.8	2.59	2.63	2.69	-	-	-	-	METASEDIMENTARY ROCK
BH-BGC11-69	UCS1	12.3	12.5	2.52	2.59	2.7	-	-	-	-	METASEDIMENTARY ROCK
BH-BGC11-42	5	6.4	6.8	-	-	-	2.53	2.58	2.65	-	ICE RICH COLLUVIUM

NOTES:

SSD = Saturated surface dry.

Table M-8. Sulphate Ion Results

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Total Sulphate Ion Content (%)	Lithology Unit
TP-BGC11-51	2	2.4	2.8	0.13	COLLUVIUM
TP-BGC11-60	1	0.7	0.9	0.07	COLLUVIUM
TP-BGC11-84	1	0.4	0.6	0.07	COLLUVIUM

NOTES:
1. Detection limit for the test is 0.005%.

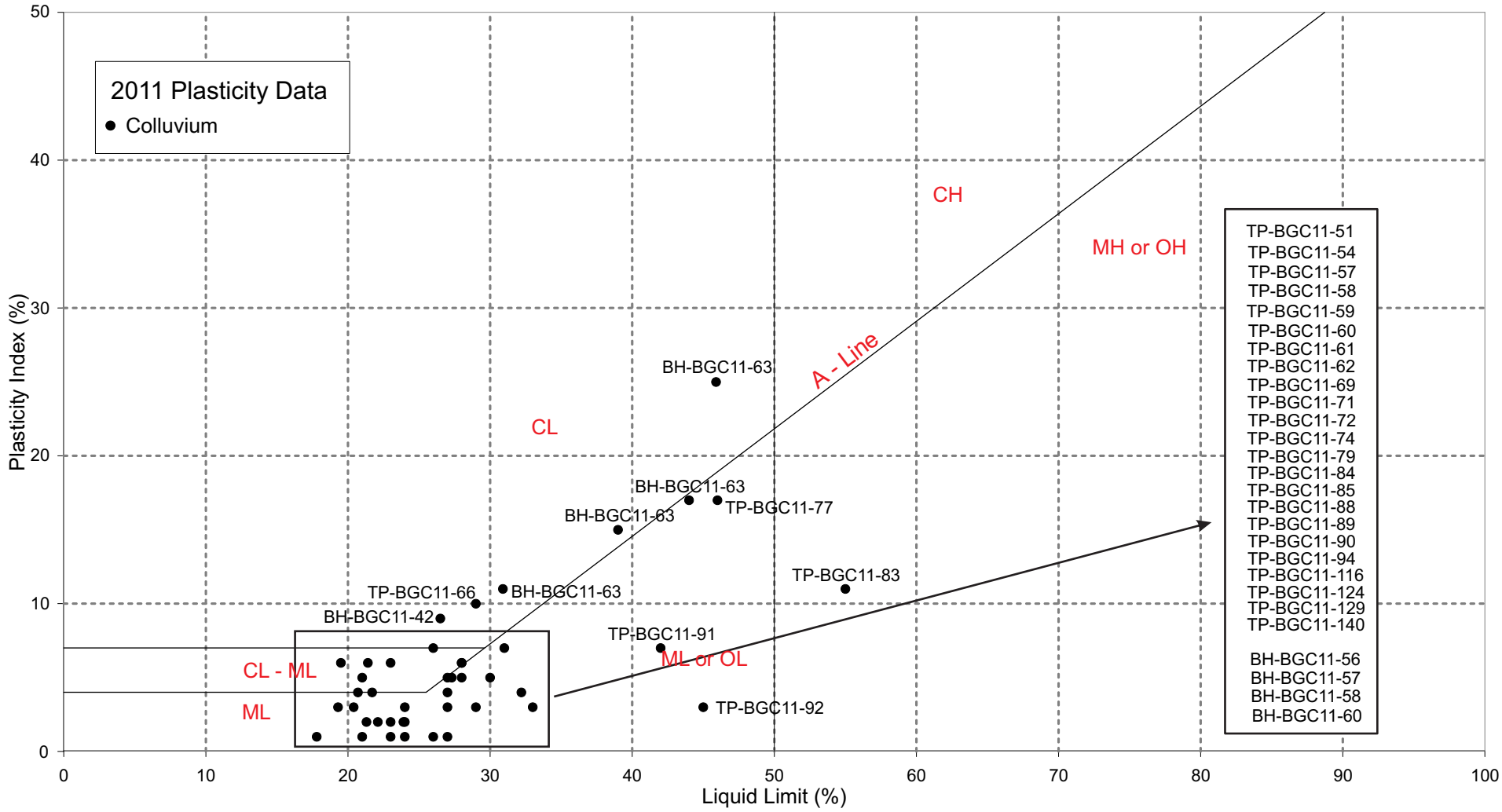
Table M-9. Modified Proctor and Permeability Results

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Permeability (m/s)	Modified Proctor		Lithology Unit
					Maximum Dry Density (kg/m^3)	Optimum Moisture Content (%)	
TP-BGC11-119	1	0.9	1.1	4.2E-10	1780	13.5	ALLUVIUM?
TP-BGC11-120	1	3.8	4	6.5E-10	1840	13	ALLUVIUM?
TP-BGC11-121	1	2.9	3.1	4E-10	1940	12	ALLUVIUM?
TP-BGC11-122	1	5.4	5.8	3.15E-10	2110	9	PLACER TAILINGS

Table M-10. Unconfined Compressive Strength Test and Brazilian Tensile Strength Test Results

Hole ID	Sample Number	Depth From (m)	Depth To (m)	UCS (MPa)	Young's Modulus (GPa)	Poisson Ratio	Brazilian Tensile		Lithology Unit
							Test 1 (MPa)	Test 2 (MPa)	
BH-BGC11-29	1	27.5	27.8	-	-	-	5.6	3.2	METASEDIMENTARY ROCK
BH-BGC11-34	1	36.6	36.9	53.4	46.3	0.12	9.2	11.8	METASEDIMENTARY ROCK
BH-BGC11-40A	2	31.0	31.3	164.2	51.6	0.15	13	12.2	METASEDIMENTARY ROCK
BH-BGC11-40B	UCS1	21.8	22.1	86.5	3.9	0.2	11.3	13	METASEDIMENTARY ROCK
BH-BGC11-43	1	4.2	4.5	210.1	46.8	0.21	15.6	14	INTRUSIVE ROCK
BH-BGC11-45	UCS	17.8	18.0	52.6	31.1	0.17	13.6	11.6	METASEDIMENTARY ROCK
BH-BGC11-46	UCS	13.1	13.7	154.7	56.3	0.27	15	15.3	INTRUSIVE ROCK
BH-BGC11-62	UCS	28.6	28.8	22.5	11.4	0.09	5.4	-	METASEDIMENTARY ROCK
BH-BGC11-69	UCS1	12.3	12.5	45.1	27.1	0.13	2.8	6.3	METASEDIMENTARY ROCK

FIGURES



SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	CA	GH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

PROJECT: EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: Plasticity Chart
Colluvium samples from 2011 field program

CLIENT: VICTORIA GOLD CORP.

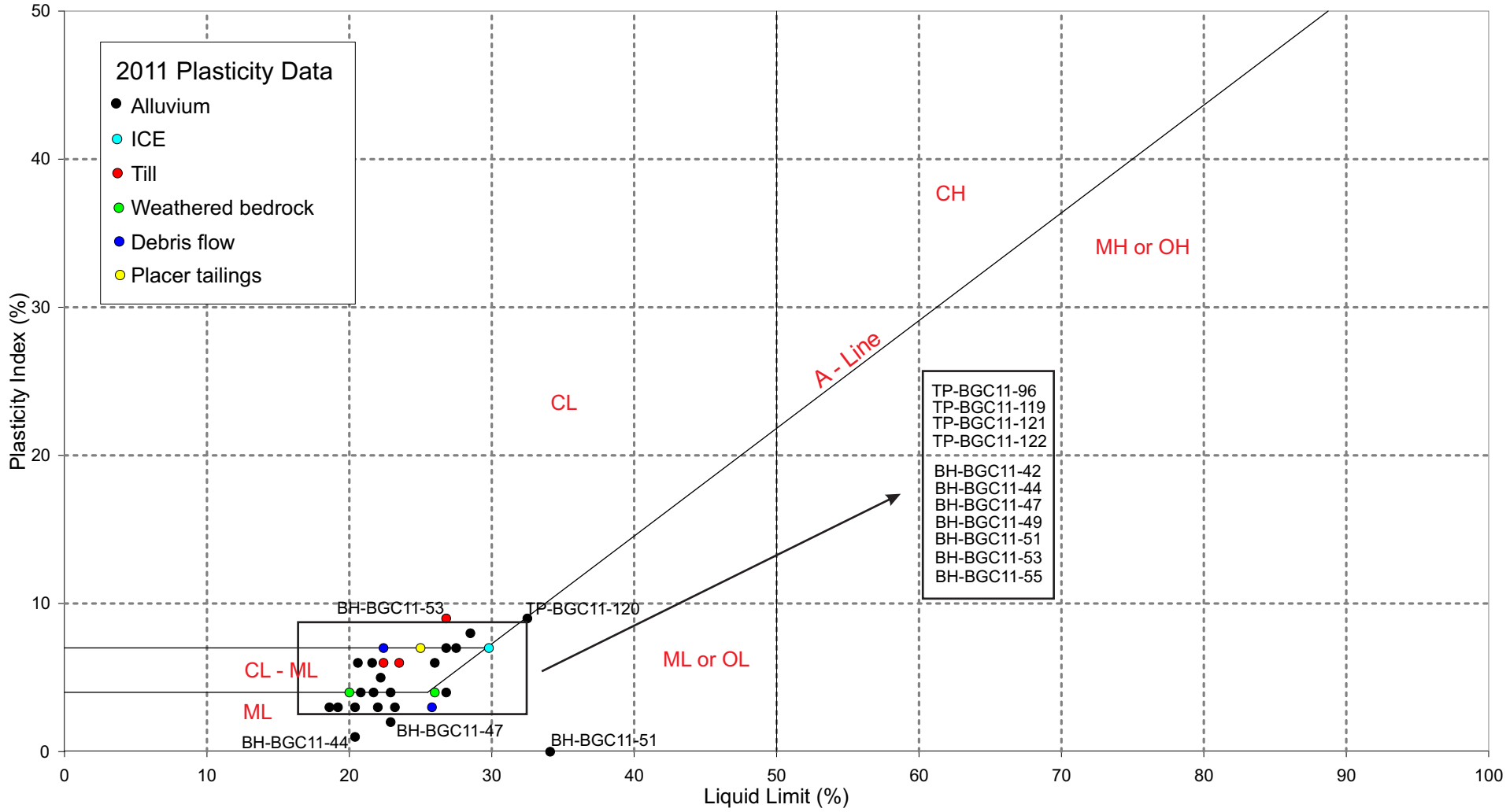
PROJECT No.: 0792-006

DWG No.: M-1

REV.: 0

FIGURE TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT"

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix M Laboratory Tabular and Graphical Summaries\All EGP Atterbergs 1 plot.pdf



SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	JAN 2012	CA	GH	DW	PQ

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

PROJECT: EAGLE GOLD PROJECT
2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: Plasticity Chart
Other overburden soils from 2011 field program

CLIENT: VICTORIA GOLD CORP.

PROJECT No.: 0792-006

DWG No.: M-2

REV.: 0

FIGURE TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT"

N:\BGC\Projects\0792 Victoria Gold\006 EG Infrastructure 2011\06 Reporting\01 Data Report\03 Working Appendices\Appendix M Laboratory Tabular and Graphical Summaries\All EGP Atterbergs 1 plot.pdf

APPENDIX N
POINT LOAD TESTING

POINT LOAD TESTING

1.0 INTRODUCTION

Point load testing was carried out during the site investigation program to estimate the intact rock strength of the Metasedimentary and Intrusive bedrock. This appendix documents the findings of the point load testing undertaken during the 2011 mine site infrastructure geotechnical investigations for the Eagle Gold project.

2.0 TESTING DETAILS

All point load tests were carried out by BGC personnel on site, at the Dublin Gulch exploration camp, using a PIL-7 model point load tester manufactured by Roctest. The suggested method for determining point load strength (ISRM, 1985) was followed for all tests. Three hundred and twenty core samples of rock obtained by diamond drilling were tested; of those tests, 117 were invalid, as outlined by ISRM (1985), due to incomplete development of the fracture surface. Therefore, 203 valid tests were performed.

The details of all point load tests are reported in Tables N-1 to N-27.

3.0 REFERENCES

International Society for Rock Mechanics (ISRM). 1985. Suggested Method for Determining Point Load Strength. Int. J. Rock Mech. Min. Sci. & Geomech. Abstr. Vol 22, No. 2, pp. 51-60.

Table N-1: BH-BGC11-24 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
2.2	SSED	D	130	61.1	63.5	4.4	0.00417	63.5	--	1.03	1.11	1.2	V	
5.12	SSED	D	220	61.1	63.5	6.7	0.00635	63.5	--	1.58	1.11	1.8	IN	Not through platens
8.05	SSED	D	130	61.1	63.5	11.14	0.01056	63.5	--	2.62	1.11	2.9	V	
8.72	SSED	D	120	61.1	63.5	2.2	0.00209	63.5	--	0.52	1.11	0.6	IN	5 mm offset from platens
10.36	SSED	D	145	61.1	63.5	1.94	0.00184	63.5	--	0.46	1.11	0.5	V	
10.9	SSED	D	240	61.1	63.5	2.96	0.00281	63.5	--	0.70	1.11	0.8	V	
11.63	SSED	D	230	61.1	63.5	4.86	0.00461	63.5	--	1.14	1.11	1.3	V	
11.81	SSED	A	33.5	63.5	33.5	2.83	0.00268	--	52.0	0.99	1.02	1.0	IN	Not through platens
12.87	SSED	D	120	61.1	63.5	1.44	0.00137	63.5	--	0.34	1.11	0.4	V	
13.64	SSED	A	57.5	63.5	57.5	18.55	0.01759	--	68.2	3.78	1.15	4.3	IN	Not through platens
15.75	SSED	D	130	61.1	63.5	4.84	0.00459	63.5	--	1.14	1.11	1.3	V	
16.67	SSED	D	160	61.1	63.5	2.12	0.00201	63.5	--	0.50	1.11	0.6	V	
19.88	SSED	D	220	61.1	63.5	1.72	0.00163	63.5	--	0.40	1.11	0.5	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-2: BH-BGC11-25 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
								$D_e=D$ [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
3.4	SSED	D	260	61.1	63.5	11.08	0.01050	63.5	--	2.60	1.11	2.9	V	
4.01	SSED	D	140	61.1	63.5	7.48	0.00709	63.5	--	1.76	1.11	2.0	IN	Fracture 10 mm from platens
6.33	SSED	D	120	61.1	63.5	7.69	0.00729	63.5	--	1.81	1.11	2.0	IN	Fracture off platens
7.11	SSED	D	100	61.1	63.5	7.86	0.00745	63.5	--	1.85	1.11	2.1	V	
8.07	SSED	D	190	61.1	63.5	7.82	0.00741	63.5	--	1.84	1.11	2.0	V	
9.98	SSED	D	120	61.1	63.5	0.74	0.00070	63.5	--	0.17	1.11	0.2	IN	Fracture to eskers
10.88	SSED	A	48	63.5	48	3.89	0.00369	--	62.3	0.95	1.10	1.0	IN	Fracture 10 mm from platens
12	SSED	D	100	61.1	63.5	3.3	0.00313	63.5	--	0.78	1.11	0.9	V	
13.43	SSED	A	48	63.5	48	4.13	0.00392	--	62.3	1.01	1.10	1.1	IN	Fracture off platens
15.75	SSED	D	100	61.1	63.5	8.8	0.00834	63.5	--	2.07	1.11	2.3	V	
20.28	SSED	A	44	63.5	44	1.73	0.00164	--	59.6	0.46	1.08	0.5	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-3: BH-BGC11-26 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_S=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{S(50)}=F(I_S)$ [MPa] (note 8)	Invalid/Valid	Comments
								$D_e=D$ [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
0.95	SSED	A	58	63.5	58	10.72	0.01016	--	68.5	2.17	1.15	2.5	IN	3 mm offset from platen
12.37	SSED	D	83	61.1	63.5	16.49	0.01563	63.5	--	3.88	1.11	4.3	V	
19.56	SSED	A	390	63.5	39	8.14	0.00772	--	56.2	2.45	1.05	2.6	IN	8 mm offset from platen
20.42	SSED	A	51.5	63.5	51.5	5.93	0.00562	--	64.5	1.35	1.12	1.5	V	
20.61	SSED	A	58	63.5	58	15.62	0.01481	--	68.5	3.16	1.15	3.6	IN	Did not line up with platen
22.74	SSED	A	59.5	63.5	59.5	4.67	0.00443	--	69.4	0.92	1.16	1.1	V	
23.39	SSED	D	300	61.1	63.5	5.51	0.00522	63.5	--	1.30	1.11	1.4	V	
28.26	SSED	D	118	61.1	63.5	4.34	0.00411	63.0	--	1.04	1.11	1.1	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_S= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{S(50)}$ = Corrected point load strength.

Table N-4: BH-BGC11-27 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid/Valid	Comments
13.5	SSED	A	55	63.5	55	12.34	0.01170	--	66.7	2.63	1.14	3.0	V	
14.67	SSED	A	51	63.5	51	13.25	0.01256	--	64.2	3.05	1.12	3.4	IN	
17.22	SSED	D	95	63.5	63.5	3.17	0.00301	63.5	--	0.75	1.11	0.8	V	
20.24	SSED	A	52	63.5	52	5.91	0.00560	--	64.8	1.33	1.12	1.5	V	
22.05	SSED	D	230	63.5	63.5	2.83	0.00268	63.5	--	0.67	1.11	0.7	IN	
24.52	SSED	A	56	63.5	56	12.05	0.01142	--	67.3	2.52	1.14	2.9	V	
25.64	SSED	D	65	63.5	63.5	5.2	0.00493	63.5	--	1.22	1.11	1.4	IN	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-5: BH-BGC11-28 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
								$D_e=D$ [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
5.57	SSED	D	88	63.5	63.5	1.19	0.00113	63.5	--	0.28	1.11	0.3	V	
8.25	SSED	A	58	63.5	58	4.56	0.00432	--	68.5	0.92	1.15	1.1	IN	
10.64	SSED	D	112	63.5	63.5	11.92	0.01130	63.5	--	2.80	1.11	3.1	V	
16.85	SSED	D	180	63.5	63.5	3.6	0.00341	63.5	--	0.85	1.11	0.9	V	
17.75	SSED	A	63.5	54	54	2.54	0.00241	--	60.9	0.65	1.09	0.7	IN	
20.16	SSED	D	155	63.5	63.5	11.68	0.01107	63.5	--	2.75	1.11	3.1	V	
21.62	SSED	A	52	63.5	52	4.5	0.00427	--	64.8	1.01	1.12	1.1	IN	
22.4	SSED	D	138	63.5	63.5	4.07	0.00386	63.5	--	0.96	1.11	1.1	V	
25.2	SSED	D	147	63.5	63.5	3.85	0.00365	63.5	--	0.91	1.11	1.0	V	
25.55	SSED	A	48	63.5	63.5	1.83	0.00173	--	71.7	0.34	1.18	0.4	IN	
25.64	SSED	D	112	63.5	63.5	1.28	0.00121	63.5	--	0.30	1.11	0.3	V	
27.8	SSED	D	244	63.5	63.5	4.1	0.00389	63.5	--	0.96	1.11	1.1	V	
28.52	SSED	D	87	63.5	63.5	9.83	0.00932	63.5	--	2.31	1.11	2.6	V	
33.08	SSED	D	125	63.5	63.5	18.85	0.01787	63.5	--	4.43	1.11	4.9	IN	
34.48	SSED	D	88	63.5	63.5	5.74	0.00544	63.5	--	1.35	1.11	1.5	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-6: BH-BGC11-29 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) $D_e=D$ [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
14.85	SSED	D	68	63.5	63.5	7.69	0.00729	63.5	--	1.81	1.11	2.0	V	
17.25	SSED	D	96	63.5	62.5	13.43	0.01273	62.5	--	3.26	1.11	3.6	IN	Broke 1 cm away from second platen
19.82	SSED	A	48	63.5	48	2.15	0.00204	--	62.3	0.53	1.10	0.6	V	Broke along existing microfissure
21.8	SSED	D	128	63.5	63.5	5.04	0.00478	63.5	--	1.18	1.11	1.3	V	
23.24	SSED	D	113	63.5	63.5	3.48	0.00330	63.5	--	0.82	1.11	0.9	V	Split along ??? And vertically
25.95	SSED	D	115	63.5	63.5	12.53	0.01188	63.5	--	2.95	1.11	3.3	V	
27.32	SSED	D	102	63.5	63.5	1.87	0.00177	63.5	--	0.44	1.11	0.5	V	
27.81	SSED	D	79	63.5	63.5	1.19	0.00113	63.5	--	0.28	1.11	0.3	V	
30.87	SSED	D	220	63.5	63.5	8.08	0.00766	63.5	--	1.90	1.11	2.1	V	
32.5	SSED	D	140	63.5	63.5	45.5	0.04313	63.5	--	10.70	1.11	11.9	V	Picked out of SIL altered axis
34.8	SSED	A	78	63.5	63.5	3.5	0.00332	--	71.7	0.65	1.18	0.8	IN	Foliation bed would break the one after the other by sheet
34.8	SSED	D	72	63.5	80	1.78	0.00169	63.5	--	0.42	1.24	0.3	V	
36.74	SSED	D	89	63.5	63.5	2.14	0.00203	63.5	--	0.50	1.11	0.6	V	
38.2	SSED	A	69	63.5	69	24.88	0.02359	--	74.7	4.23	1.20	5.1	IN	
38.2	SSED	D	69	63.5	63.5	16.1	0.01526	63.5	--	3.79	1.11	4.2	V	
39.38	SSED	D	150	63.5	63.5	1.62	0.00154	63.5	--	0.38	1.11	0.4	V	
40.82	SSED	A	55	63.5	55	20.55	0.01948	--	66.7	4.38	1.14	5.0	IN	Chipped out

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-7: BH-BGC11-30 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
2.95	SSED	A	81	62.5	81	6.19	0.00587	--	80.3	0.91	1.24	1.1	IN	Wedge slipped out along foliation plane
11.38	SSED	D	95	63.5	63.5	5.13	0.00486	63.5	--	1.21	1.11	1.3	V	Slight offset with plattens alignment due to shape of foliation
22.8	SSED	D	97	63	61.5	1.6	0.00152	61.5	--	0.40	1.10	0.4	V	
22.83	SSED	A	54	63.5	54	5.27	0.00500	--	66.1	1.14	1.13	1.3	IN	Chipped out along foliation plane
24.3	SSED	D	110	63.5	63.5	2.92	0.00277	63.5	--	0.69	1.11	0.8	V	
30.76	SSED	D	185	63.5	63.5	3.45	0.00327	63.5	--	0.81	1.11	0.9	V	
31.5	SSED	D	215	63.5	63.5	6.75	0.00640	63.5	--	1.59	1.11	1.8	IN	Offset between plattens/fracture planes
34.95	SSED	D	95	63.5	63.5	2.92	0.00277	63.5	--	0.69	1.11	0.8	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-8: BH-BGC11-31 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
								$D_e=D$ [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
28.65	SSED	D	65	61.5	61.5	0.95	0.00090	61.5	--	0.24	1.10	0.3	V	
28.86	SSED	D	70	61	61	1.07	0.00101	61	--	0.27	1.09	0.3	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-9: BH-BGC11-33 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
								$D_e=D$ [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
19.97	SSED	D	97	63.5	62.8	1.9	0.00200	62.8	--	0.51	1.11	0.5	V	
24.33	SSED	D	105	63.5	63.5	4.46	0.00400	63.50000	--	0.99	1.11	1.2	IN	Offset between plattens alignment and failure plane
37.03	SSED	A	46	63.5	46	1.09	0.00100	--	61.0	0.27	1.09	0.3	IN	Chipped out
37.61	SSED	D	102	63.5	63.5	1.07	0.00100	63.50000	--	0.25	1.11	0.3	V	
38	SSED	A	48	63.5	48.5	1.09	0.00100	--	62.6	0.26	1.11	0.3	IN	Chipped out/slid along foliation

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-10: BH-BGC11-34 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_S=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{S(50)}=F(I_S)$ [MPa] (note 8)	Invalid /Valid	Comments
								$D_e=D$ [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
23.96	SSED	D	110	63.5	63.5	0.86	0.00082	63.5	--	0.20	1.11	0.2	IN	
27.43	SSED	D	100	63.5	63.5	2.27	0.00215	63.5	--	0.53	1.11	0.6	V	
28.63	SSED	D	150	63.5	63.5	2.2	0.00209	63.5	--	0.52	1.11	0.6	V	
30.22	SSED	A	63.5	40	40	5.13	0.00486	--	45.1	2.39	0.95	2.3	IN	
31.43	SSED	D	110	63.5	63.5	1.41	0.00134	63.5	--	0.33	1.11	0.4	V	
33.17	SSED	D	230	63.5	63.5	1.69	0.00160	63.5	--	0.40	1.11	0.4	IN	Fractured 2.5 cm away from platen along vein
36.42	SSED	D	160	63.5	63.5	5.3	0.00502	63.5	--	1.25	1.11	1.4	V	
36.58	SSED	A	63.5	20	20	5.8	0.00550	--	22.6	10.80	0.70	7.5	IN	Chipped out
36.98	SSED	D	180	63.5	63.5	7.86	0.00745	63.5	--	1.85	1.11	2.1	V	
37.58	SSED	A	63.5	20	20	44.14	0.04184	--	22.6	82.16	0.70	57.4	IN	Breaking upper rock disks

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_S= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-11: BH-BGC11-35 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
12.36	SSED	D	71	61.1	63.5	1.45	0.00137	63.5	--	0.34	1.11	0.4	IN	4 mm off
26.01	SSED	D	158	61.1	63.5	26.83	0.02543	63.5	--	6.31	1.11	7.0	V	High quartz content, surrounding materials much weaker
29.49	SSED	D	117	61.1	63.5	1.34	0.00127	63.5	--	0.32	1.11	0.4	IN	Way off
30.33	SSED	D	164	61.1	63.5	1.71	0.00162	63.5	--	0.40	1.11	0.4	V	
19.87	SSED	A	63.5	52	52	3.21	0.00304	--	58.7	0.88	1.07	0.9	V	
31.77	SSED	D	129	61.1	63.5	3.28	0.00311	63.5	--	0.77	1.11	0.9	IN	18 mm off
34.31	SSED	D	86	61.1	63.5	1.58	0.00150	63.5	--	0.37	1.11	0.4	V	
36.32	SSED	A	63.5	50	50	4.51	0.00428	--	56.4	1.34	1.06	1.4	IN	Edges chipped off
42.62	SSED	D	97	61.1	63.5	23.34	0.02213	63.5	--	5.49	1.11	6.1	V	High in quartz, poor recover in this area so likely this is not representative

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-12: BH-BGC11-36 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) $D_e=D$ [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
5.18	SSED	D	82	61.1	63.5	3.29	0.00312	63.5	--	0.77	1.11	0.9	V	
6.96	SSED	D	105	61.1	63.5	3.49	0.00331	63.5	--	0.82	1.11	0.9	IN	
7.43	SSED	A	63.5	53	53	30.05	0.02849	--	59.8	7.97	1.08	8.6	V	
11.63	SSED	A	63.5	55.5	55.5	2.44	0.00114	--	63.5	0.28	1.11	0.3	IN	Corner chipped off
11.38	SSED	D	96	61.1	63.5	1.2	0.00231	63.5	--	0.57	1.11	0.7	V	
14.47	SSED	D	118	61.1	63.5	3.01	0.00285	63.5	--	0.71	1.11	0.8	IN	2 mm off
17.39	SSED	D	95	61.1	63.5	2.09	0.00198	63.5	--	0.49	1.11	0.5	V	
23.08	SSED	D	149	61.1	63.5	4.64	0.00440	63.5	--	1.09	1.11	1.2	V	
28.28	SSED	D	115	61.1	63.5	1.76	0.00167	63.5	--	0.41	1.11	0.5	IN	Edge crumbled
28.97	SSED	D	120	61.1	63.5	2.51	0.00238	63.5	--	0.59	1.11	0.7	IN	12 mm off
31.7	SSED	A	63.5	54.5	54.5	6.4	0.00607	--	61.5	1.60	1.10	1.8	IN	Chipped off
35.3	SSED	D	134	63.5	63.5	1.18	0.00112	63.5	--	0.28	1.11	0.3	V	
37.05	SSED	D	215	63.5	63.5	4.08	0.00387	63.5	--	0.96	1.11	1.1	V	
38.75	SSED	D	174	63.5	63.5	3.43	0.00325	63.5	--	0.81	1.11	0.9	V	
39.28	SSED	D	210	63.5	63.5	3.38	0.00320	63.5	--	0.79	1.11	0.9	V	Failed along existing microfacture
44.14	SSED	D	87	63.5	63.5	15.57	0.01476	63.5	--	3.66	1.11	4.1	V	Slightly offset between platen alignment and failure plane
48.5	SSED	A	63.5	42.5	42.5	3.18	0.00301	--	48.0	1.31	0.98	1.3	V	Failed along mechanical fracture
48.57	SSED	D	66	63.5	63.5	8.36	0.00793	63.5	--	1.97	1.11	2.2	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-13: BH-BGC11-37 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) $D_e=D$ [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
4.1	SSED	A	75	63.5	75	6.43	0.00610	--	77.9	1.01	1.22	1.2	IN	Failed along existing fracture
5.47	SSED	D	76	63.5	63.5	5.73	0.00543	63.5	--	1.35	1.11	1.5	V	
7.65	SSED	D	143	63.5	63.5	18.43	0.01747	63.5	--	4.33	1.11	4.8	V	
8.5	SSED	A	35	63.5	35	6.81	0.00646	--	53.2	2.28	1.03	2.3	IN	Failed along existing fracture
11.3	SSED	A	50	63.5	50	9.8	0.00929	--	63.6	2.30	1.11	2.6	V	
15.34	SSED	D	82	63.5	63.5	9.85	0.00934	63.5	--	2.32	1.11	2.6	IN	Offset between platen alignment and failure plane
16.19	SSED	D	195	63.5	63.5	12.46	0.01181	63.5	--	2.93	1.11	3.3	IN	Offset between platen alignment and failure plane
21.5	SSED	D	69	63.5	63.5	21.94	0.02080	63.5	--	5.16	1.11	5.7	V	Formented but runs through both platens
22.5	SSED	D	135	63.5	63.5	1.1	0.00104	63.5	--	0.26	1.11	0.3	V	
25.95	SSED	A	61.5	63.5	61.5	10.4	0.00986	--	70.5	1.98	1.17	2.3	IN	Chipped out
26.65	SSED	D	160	63.5	63.5	12.6	0.01194	63.5	--	2.96	1.11	3.3	V	
30.07	SSED	A	41	63.5	41	5.54	0.00525	--	57.6	1.58	1.07	1.7	V	
34.15	SSED	D	104	63.5	63.5	2.11	0.00200	63.5	--	0.50	1.11	0.6	V	
38.04	SSED	D	142	63.5	63.5	2.26	0.00214	63.5	--	0.53	1.11	0.6	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-14: BH-BGC11-38 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
								$D_e=D$ [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
13.35	SSED	D	180	63.5	63.5	7.09	0.00672	63.5	--	1.67	1.11	1.9	V	
21.75	SSED	D	130	63.5	63.5	0.9	0.00085	63.5	--	0.21	1.11	0.2	V	Failed along foliation
23.85	SSED	D	110	63.5	63.5	0.603	0.00057	63.5	--	0.14	1.11	0.2	V	
25.75	SSED	D	170	63.5	63.5	5.2	0.00493	63.5	--	1.22	1.11	1.4	V	
31.04	SSED	D	140	63.5	63.5	6.15	0.00583	63.5	--	1.45	1.11	1.6	V	
36.64	SSED	D	210	63.5	63.5	4.22	0.00400	63.5	--	0.99	1.11	1.1	V	Failed along foliation
36.86	SSED	D	230	63.5	63.5	5.36	0.00508	63.5	--	1.26	1.11	1.4	IN	
40.21	SSED	D	100	63.5	63.5	1.22	0.00116	63.5	--	0.29	1.11	0.3	V	
44.65	SSED	D	120	63.5	63.5	2.82	0.00267	63.5	--	0.66	1.11	0.7	IN	Along foliation
43.87	SSED	D	190	63.5	63.5	5.33	0.00505	63.5	--	1.25	1.11	1.4	IN	Along foliation
44.06	SSED	D	100	63.5	63.5	2.35	0.00223	63.5	--	0.55	1.11	0.6	V	Failed along foliation
14.99	SSED	A	60	63.5	60	2.14	0.00203	--	69.6	0.42	1.16	0.5	IN	Partly along foliation
21.68	SSED	A	65	63.5	65	2.18	0.00207	--	72.5	0.39	1.18	0.5	IN	Crumbled, pieces broke off

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-15: BH-BGC11-40A Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) $D_e=D$ [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
7.62	SSED	D	150	63.5	63.5	5.4	0.00512	63.5	--	1.27	1.11	1.4	IN	Broke along joint, not all the way though sample
10.2	SSED	D	175	63.5	62	4.16	0.00394	62.0	--	1.03	1.10	1.1	V	
11.86	SSED	A	74	63.5	58	41.14	0.03900	--	68.5	8.32	1.15	9.6	V	Failure plane very rough but running through platens
12.39	SSED	D	160	63.5	63.5	14.275	0.01353	63.5	--	3.36	1.11	3.7	V	
15.96	SSED	D	140	63.5	63.5	16.3	0.01545	63.5	--	3.83	1.11	4.3	IN	Broke along fracture parallel to axis, not through whole diameter
18.5	SSED	D	110	63.5	63.5	14.39	0.01364	63.5	--	3.38	1.11	3.8	IN	12mm offset between failure plane and platen axis
21.53	SSED	D	135	63.5	63.5	1.72	0.00163	63.5	--	0.40	1.11	0.5	V	
22.49	SSED	D	135	63.5	63.5	7.66	0.00726	63.5	--	1.80	1.11	2.0	V	
23.8	SSED	A	49	63.5	44	17.13	0.01624	--	59.6	4.56	1.08	4.9	IN	Chipepd out
25.26	SSED	D	25.26	63.5	63.5	2.03	0.00192	63.5	--	0.48	1.11	0.5	V	
26.2	SSED	D	112	63.5	63.5	1.04	0.00099	63.5	--	0.24	1.11	0.3	IN	Offest between platens axis and failure plane
27.77	SSED	A	49	63.5	49	1.74	0.00165	--	62.9	0.42	1.11	0.5	IN	Chipped out
28.6	SSED	D	130	63.5	63.5	3.78	0.00358	63.5	--	0.89	1.11	1.0	V	
30.27	SSED	D	148	63.5	63.5	8.07	0.00765	63.5	--	1.90	1.11	2.1	V	
30.87	SSED	D	190	63.5	63.5	10.67	0.01012	63.5	--	2.51	1.11	2.8	V	
31.39	SSED	D	137	63.5	63.5	6.86	0.00650	63.5	--	1.61	1.11	1.8	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-16: BH-BGC11-40B

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
12.85	SSED	D	75	63.5	63.5	12.7	0.01204	63.5	--	2.99	1.11	3.3	V	
12.92	SSED	A	55	63.5	63.5	21.43	0.02032	--	71.7	3.96	1.18	4.7	IN	Chipped out
13.35	SSED	D	105	63.5	63.5	2.85	0.00270	63.5	--	0.67	1.11	0.7	V	
16.93	SSED	D	141	63.5	63.5	3.85	0.00365	63.5	--	0.91	1.11	1.0	V	Broke along foliation and along existing microfracture
19.16	SSED	D	197	63.5	63.5	15.94	0.01511	63.5	--	3.75	1.11	4.2	V	
21.68	SSED	D	225	63.5	63.5	19.5	0.01849	63.5	--	4.58	1.11	5.1	IN	Broke 3cm away from axis of platens
22.11	SSED	D	110	63.5	63.5	4.55	0.00431	63.5	--	1.07	1.11	1.2	IN	Broke along existing microfracture
25	SSED	A	47	63.5	63.5	3.96	0.00375	--	71.7	0.73	1.18	0.9	IN	Chipped
25.42	SSED	D	170	63.5	63.5	7.9	0.00749	63.5	--	1.86	1.11	2.1	V	
30.37	SSED	D	195	63.5	63.5	8.04	0.00762	63.5	--	1.89	1.11	2.1	V	
30.97	SSED	D	180	63.5	63.5	2.03	0.00192	63.5	--	0.48	1.11	0.5	V	Along foliation
31.67	SSED	A	80	63.5	80	2.13	0.00202	--	80.4	0.31	1.24	0.4	V	Failed in three pieces
37.47	SSED	A	70	63.5	70	2.08	0.00197	--	75.2	0.35	1.20	0.4	IN	Layer slipped off along foliation plane
38.19	SSED	D	190	63.5	63.5	24.92	0.02362	63.5	--	5.86	1.11	6.5	V	Half is intrusive, still foliated
38.83	SSED	D	170	63.5	63.5	5.1	0.00483	63.5	--	1.20	1.11	1.3	V	Failed along foliation
39.75	SSED	A	60	63.5	60	0.96	0.00091	--	69.6	0.19	1.16	0.2	IN	Piece slid off along foliation
43.71	SSED	D	150	63.5	63.5	1.35	0.00128	63.5	--	0.32	1.11	0.4	V	Along foliation
45.66	SSED	D	140	63.5	63.5	13.29	0.01260	63.5	--	3.12	1.11	3.5	V	Along foliation

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-17: BH-BGC11-43 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
								$D_e=D$ [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
4.05	SINT	D	165	63.5	63.5	29.55	0.02801	63.5	--	6.95	1.11	7.7	V	
4.16	SINT	D	140	63.5	63.5	41.37	0.03922	63.5	--	9.73	1.11	10.8	V	
4.59	SINT	D	125	63.5	63.5	28.48	0.02700	63.5	--	6.70	1.11	7.5	V	
4.97	SINT	D	140	63.5	63.5	38.6	0.03659	63.5	--	9.08	1.11	10.1	V	
6.6	SINT	D	175	63.5	63.5	35.96	0.03409	63.5	--	8.45	1.11	9.4	V	
13.41	SINT	D	210	63.5	63.5	40.66	0.03855	63.5	--	9.56	1.11	10.6	V	
14.95	SINT	D	160	63.5	63.5	21.69	0.02056	63.5	--	5.10	1.11	5.7	IN	Broke along axis after chipping several times
16.06	SINT	D	185	63.5	63.5	37.03	0.03510	63.5	--	8.71	1.11	9.7	V	
20.63	SSED	A	50	63.5	56	23.55	0.02233	--	67.3	4.93	1.14	5.6	V?	Load axis wasn't along center of core, but break was along load axis
20.65	SSED	D	150	63.5	63.5	12.47	0.01182	63.5	--	2.93	1.11	3.3	IN	Along foliation
22.17	SSED	D	165	63.5	63.5	12.89	0.01222	63.5	--	3.03	1.11	3.4	IN	Along foliation
23.47	SSED	D	185	63.5	63.5	33.29	0.03156	63.5	--	7.83	1.11	8.7	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-18: BH-BGC11-45 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
5.36	SSED	D	97	63.5	63.5	0.72	0.00068	63.5	--	0.17	1.11	0.2	V	
5.7	SSED	A	43	63.5	43.5	3.47	0.00329	--	59.3	0.94	1.08	1.0	IN	Did not break through platten, chipped out
6.22	SSED	D	65	63.5	63.5	16.7	0.01583	63.5	--	3.93	1.11	4.4	V	
7.2	SSED	D	84	63.5	63.5	18.34	0.01739	63.5	--	4.31	1.11	4.8	V	
8.1	SSED	D	260	63.5	63.5	19.72	0.01869	63.5	--	4.64	1.11	5.2	V	
8.43	SSED	A	60	63.5	57	13.44	0.01274	--	67.9	2.76	1.15	3.2	IN	Chipped out parallel to fabric
10.99	SSED	A	55	63.5	55	6.81	0.00646	--	66.7	1.45	1.14	1.7	IN	Chipped out at bottom
11.08	SSED	D	120	63.5	63.5	3.97	0.00376	63.5	--	0.93	1.11	1.0	V	
11.38	SSED	D	150	63.5	63.5	3.73	0.00354	63.5	--	0.88	1.11	1.0	V	
11.42	SSED	A	77	63.5	77	8.23	0.00780	--	78.9	1.25	1.23	1.5	IN	Chipped out at top
12.63	SSED	D	170	63.5	63.5	4.19	0.00397	63.5	--	0.99	1.11	1.1	V	
13.79	SSED	A	60	63.5	47	7.26	0.00688	--	61.6	1.81	1.10	2.0	V	
14.09	SSED	D	120	63.5	63.5	4.2	0.00398	63.5	--	0.99	1.11	1.1	IN	
17.32	SSED	D	120	63.5	63.5	12.1	0.01147	63.5	--	2.84	1.11	3.2	V	UCS sample 17.38 to 17.64
18.21	SSED	A	80	63.5	63.5	9.48	0.00899	--	71.7	1.75	1.18	2.1	V	
18.61	SSED	D	160	63.5	63.5	6.09	0.00577	63.5	--	1.43	1.11	1.6	V	
19.96	SSED	A	45	63.5	44.5	20.26	0.01921	--	60.0	5.34	1.09	5.8	IN	Maxed out, no more travel
20.18	SSED	D	80	63.5	63.5	70.6	0.06693	63.5	--	16.60	1.11	18.5	V	
20.3	SSED	A	66	63.5	56	13.97	0.01324	--	67.3	2.93	1.14	3.3	IN	Chipped out at top

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-19: BH-BGC11-46 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_S=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
4.62	INT	D	120	63.5	63.5	23.09	0.02189	63.5	--	5.43	1.11	6.0	V	40% of break surface stained
6.08	INT	D	220	63.5	63.5	11.53	0.01093	63.5	--	2.71	1.11	3.0	V	40% of break surface stained
7.68	INT	D	138	63.5	63.5	28.57	0.02708	63.5	--	6.72	1.11	7.5	IN	Did not break
10.18	INT	D	198	63.5	63.5	21.48	0.02036	63.5	--	5.05	1.11	5.6	IN	Chipped at platen
12.94	INT	D	303	63.5	63.5	2.63	0.00249	63.5	--	0.62	1.11	0.7	V	Break along plane of weakness
13.05	INT	D	147	63.5	63.5	39.38	0.03733	63.5	--	9.26	1.11	10.3	V	Broke in intact
14.39	INT	D	153	63.5	63.5	35.44	0.03360	63.5	--	8.33	1.11	9.3	V	
15.79	INT	D	252	63.5	63.5	10.33	0.00979	63.5	--	2.43	1.11	2.7	V	60% iron staining on surface of break
18.01	INT	D	196	63.5	63.5	7.35	0.00697	63.5	--	1.73	1.11	1.9	V	Along iron infilled joint 2mm thick
18.84	SSED	D	138	63.5	63.5	11.36	0.01077	63.5	--	2.67	1.11	3.0	V	80% iron staining along surface of break
19.84	SSED	D	183	63.5	63.5	24.61	0.02333	63.5	--	5.79	1.11	6.4	V	Fresh break

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-20: BH-BGC11-48 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_S=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
13.41	SINT	D	82	63.5	63.5	1.45	0.00137	63.5	--	0.34	1.11	0.4	V	Broke along plane 25 degrees, 100% red iron staining
13.69	SINT	D	113	63.5	63.5	3.54	0.00336	63.5	--	0.83	1.11	0.9	V	100% iron stained face
17.11	SSED	D	263	63.5	63.5	1.06	0.00100	63.5	--	0.25	1.11	0.3	V	Broke along 3 paths, all valid
24.22	SSED	D	156	63.5	63.5	0.73	0.00069	63.5	--	0.17	1.11	0.2	V	Broke along 3 paths, all valid
30.47	SSED	D	228	63.5	63.5	2.45	0.00232	63.5	--	0.58	1.11	0.6	IN	Broke and slipped along plane of weakness

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_S= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-21: BH-BGC11-50 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
16.61	SSED	D	130	63.5	63.5	4.88	0.00463	63.5	--	1.15	1.11	1.3	V	Along foliation
18.1	SSED	D	135	63.5	63.5	2.13	0.00202	63.5	--	0.50	1.11	0.6	IN	Along foliation
18.19	SSED	A	34	63.5	34	4.42	0.00419	--	52.4	1.52	1.02	1.6	IN	Crumbled at point of load
22.58	SSED	D	150	63.5	63.5	23.44	0.02222	63.5	--	5.51	1.11	6.1	V	
24.9	SSED	D	195	63.5	63.5	18.09	0.01715	63.5	--	4.25	1.11	4.7	V	
25.23	SSED	D	220	63.5	63.5	15.65	0.01484	63.5	--	3.68	1.11	4.1	V	Along foliation
26.93	SSED	D	175	63.5	63.5	9.26	0.00878	63.5	--	2.18	1.11	2.4	IN	Along foliation
28.8	SSED	D	120	63.5	63.5	21.18	0.02008	63.5	--	4.98	1.11	5.5	V	
30.32	SSED	D	160	63.5	63.5	12.37	0.01173	63.5	--	2.91	1.11	3.2	IN	Fracture 3 mm offset from bottom platen
30.64	SSED	D	173	63.5	63.5	13.29	0.01260	63.5	--	3.12	1.11	3.5	IN	Fracture 7mm offset from bottom platen
34.43	SSED	D	180	63.5	63.5	17.31	0.01641	63.5	--	4.07	1.11	4.5	IN	Along foliation
35.12	SSED	D	165	63.5	63.5	12.43	0.01178	63.5	--	2.92	1.11	3.3	V	Along foliation
36.5	SSED	D	145	63.5	63.5	4.87	0.00462	63.5	--	1.14	1.11	1.3	IN	Along foliation
38.76	SSED	D	135	63.5	63.5	8.35	0.00792	63.5	--	1.96	1.11	2.2	V	Along foliation
40.49	SINT	D	200	63.5	63.5	28.56	0.02707	63.5	--	6.71	1.11	7.5	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-22: BH-BGC11-52 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
14.54	SSED	A	63	63.5	56	7.26	0.00688	--	67.3	1.52	1.14	1.7	V	
15.73	SSED	D	109	63.5	63.5	8.45	0.00801	63.5	--	1.99	1.11	2.2	V	
17.84	SSED	D	248	63.5	63.5	17.88	0.01695	63.5	--	4.20	1.11	4.7	V	
17.87	SSED	A	46	63.5	46	21.09	0.01999	--	61.0	5.38	1.09	5.9	IN	Break almost to bottom platen (4mm)
19.66	SSED	D	83	63.5	63.5	3.5	0.00332	63.5	--	0.82	1.11	0.9	V	
21.37	SSED	A	57	63.5	53	5.83	0.00553	--	65.5	1.29	1.13	1.5	IN	Chipped out
21.88	SSED	D	162	63.5	63.5	1.23	0.00117	63.5	--	0.29	1.11	0.3	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-23: BH-BGC11-54 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
7.62	SSED	D	124	63.5	63.5	3.76	0.00356	63.5	--	0.88	1.11	1.0	IN	Broke along oblique existing fracture
8.93	SSED	A	55	63.5	51.5	3.65	0.00346	--	64.5	0.83	1.12	0.9	V	Ran through plattens but followed step ped plane along existing fracs
21.08	SSED	A	51	63.5	51	1.05	0.00100	--	64.2	0.24	1.12	0.3	IN	Chipped off
22.2	SSED	D	75	63.5	63.5	1.06	0.00100	63.5	--	0.25	1.11	0.3	V	
23.9	SSED	D	155	63.5	63.5	1.13	0.00107	63.5	--	0.27	1.11	0.3	V	
27.91	SSED	D	77	63.5	61	1.41	0.00134	61.0	--	0.36	1.09	0.4	V	
32.36	SSED	D	91	63.5	61	0.94	0.00089	61.0	--	0.24	1.09	0.3	V	
34.92	SSED	D	98.5	63.5	60.5	0.97	0.00092	60.5	--	0.25	1.09	0.3	V	Along foliation
38.03	SSED	D	75	62	62	1.73	0.00164	62.0	--	0.43	1.10	0.5	IN	Broke along existing microfracture
39.21	SSED	D	93.7	62.5	62.5	0.96	0.00091	62.5	--	0.23	1.11	0.3	V	
40.3	SSED	D	140	61	61	1.09	0.00103	61.0	--	0.28	1.09	0.3	V	
40.65	SSED	D	91	61	61	0.95	0.00090	61.0	--	0.24	1.09	0.3	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-24: BH-BGC11-59 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
7.02	SSED	A	40	63.5	36	4.74	0.00449	--	54.0	1.54	1.03	1.6	V	Broke into several pieces - difficult to tell if broke at platens
11.06	SSED	D	190	63.5	63.5	1.4	0.00133	63.5	--	0.33	1.11	0.4	IN	Along foliation; 6mm offset from one of the platens
12	SSED	D	150	63.5	63.5	3.13	0.00297	63.5	--	0.74	1.11	0.8	IN	Along foliation; 15mm offset from one platen, FE stained fracture
18.9	SSED	D	210	63.5	63.5	4.82	0.00457	63.5	--	1.13	1.11	1.3	IN	Partially along foliation
19.79	SSED	D	230	63.5	63.5	1.36	0.00129	63.5	--	0.32	1.11	0.4	V	Along foliation
20.84	SSED	D	130	63.5	63.5	0.99	0.00094	63.5	--	0.23	1.11	0.3	V	Along healed fracture
21.01	SSED	A	40	63.5	35	3.63	0.00344	--	53.2	1.22	1.03	1.3	IN	Crumbled at platens
29.13	SSED	D	125	63.5	63.5	1.37	0.00130	63.5	--	0.32	1.11	0.4	IN	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_S= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-25: BH-BGC11-62 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_S=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{S(50)}=F(I_S)$ [MPa] (note 8)	Invalid /Valid	Comments
								$D_e=D$ [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
3.28	SSED	D	86	63.5	63.5	2.24	0.00212	63.5	--	0.53	1.11	0.6	V	Along foliation
5.4	SSED	D	97	63.5	63.5	4.84	0.00459	63.5	--	1.14	1.11	1.3	V	Along foliation
5.82	SSED	D	85	63.5	63.5	3.65	0.00346	63.5	--	0.86	1.11	1.0	V	Along foliation
7.05	SSED	A	54	63.5	52.5	3.21	0.00304	--	65.15107	0.72	1.13	0.8	IN	Chipped off the side
7.84	SSED	A	55	63.5	55	2.82	0.00267	--	66.68425	0.60	1.14	0.7	IN	4 mm offset between failure plane and area of platen
7.87	SSED	D	140	63.5	60	0.9	0.00085	60.0	--	0.24	1.09	0.3	V	Along foliation
11.16	SSED	D	84	63.5	63.5	4.22	0.00400	63.5	--	0.99	1.11	1.1	V	
13.46	SSED	A	52	63.5	52	4.62	0.00438	--	64.84009	1.04	1.12	1.2	V	
15.51	SSED	D	130	63.5	63.5	4.37	0.00414	63.5	--	1.03	1.11	1.1	IN	Along foliation 1 cm offset
17.55	SSED	A	54	63.5	54	6.51	0.00617	--	66.07525	1.41	1.13	1.6	IN	Chipped off the side
22.55	SSED	A	72	63.5	72	6.03	0.00572	--	76.29712	0.98	1.21	1.2	IN	Rough stepped failure path by side
23.47	SSED	D	142	63.5	63.5	2.35	0.00223	63.5	--	0.55	1.11	0.6	V	Along foliation
24.95	SSED	D	91	63.5	63.5	1.63	0.00155	63.5	--	0.38	1.11	0.4	IN	Chipped off along foliation
28.5	SSED	D	162	63.5	63.5	1.15	0.00109	63.5	--	0.27	1.11	0.3	V	Rock also crumbled on one side
28.92	SSED	A	63	63.5	59	7.12	0.00675	--	69.06658	1.41	1.16	1.6	V	All foliation beds sheared under compressive stress
32.6	SSED	D	126	63.5	63.5	4.53	0.00429	63.5	--	1.07	1.11	1.2	V	
33.44	SSED	A	50	63.5	48	18.18	0.01723	--	62.29634	4.44	1.10	4.9	IN	Chipped off the side
34.75	SSED	D	105	63.5	63.5	2.39	0.00227	63.5	--	0.56	1.11	0.6	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_S= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{S(50)}$ = Corrected point load strength.

Table N-26: BH-BGC11-64 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) D_e=D [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
16.66	INT	D	140	63.5	61.7	2.05	0.00194	61.7	--	0.51	1.10	0.6	IN	Broke in many pieces
34.96	INT	D	145	63.5	63.5	4.84	0.00459	63.5	--	1.14	1.11	1.3	V	
46.36	INT	D	110	63.5	63.9	2.22	0.00210	63.9	--	0.52	1.12	0.6	IN	Broke along other weakness plane

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-27: BH-BGC11-66 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D) $D_e=D$ [mm] (note 4)	Axial Test (Type A) $D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
6.4	INT	D	150	63.5	63.5	2.39	0.00227	63.5	--	0.56	1.11	0.6	IN	Broke along existing micro fractures
6.74	INT	D	185	63.5	63.5	9.81	0.00930	63.5	--	2.31	1.11	2.6	IN	Offset
11.92	INT	D	180	63.5	63	14.72	0.01395	63	--	3.52	1.11	3.9	V	
12.52	INT	D	74	63.5	62	4.55	0.00431	62	--	1.12	1.10	1.2	V	Broke in multiple pieces
15.32	INT	D	140	63.5	63.5	20.79	0.01971	63.5	--	4.89	1.11	5.4	IN	Chipped by lower platen
17.36	INT	D	250	63.5	63.5	26.11	0.02475	63.5	--	6.14	1.11	6.8	V	
18.72	INT	D	196	63.5	63.5	14.99	0.01421	63.5	--	3.52	1.11	3.9	IN	Broke along existing fracture
18.76	INT	D	196	63.5	63.5	20.73	0.01965	63.5	--	4.87	1.11	5.4	IN	Chipped by lower platen
23.35	INT	D	150	63.5	63.5	26.18	0.02482	63.5	--	6.16	1.11	6.9	V	
24.08	INT	D	205	63.5	63.5	29.48	0.02795	63.5	--	6.93	1.11	7.7	V	
27.15	INT	D	106	63.5	63.5	22.77	0.02159	63.5	--	5.35	1.11	6.0	V	
28.18	INT	D	212	63.5	63.5	30.89	0.02928	63.5	--	7.26	1.11	8.1	V	
30.72	INT	D	145	63.5	63.5	22.56	0.02139	63.5	--	5.30	1.11	5.9	IN	Chipped out
32.38	INT	D	220	63.5	63.5	2.45	0.00232	63.5	--	0.58	1.11	0.6	V	Along existing fracture plane
32.42	INT	D	105	63.5	63.5	23.78	0.02254	63.5	--	5.59	1.11	6.2	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

Table N-28: BH-BGC11-69 Point Load Tests

Sample Depth	Rock Type[1]	Test Type[2]	Sample Length, L [mm]	Sample Width, W [mm]	Distance between platens, D [mm]	Gauge Reading [MPa]	Failure Load, P [MN] (note 3)	Diametral Test (Type D)	Axial Test (Type A)	$I_s=P/D_e^2$ [MPa] (note 6)	$F=(D_e/50)^{0.45}$ (note 7)	$I_{s(50)}=F(I_s)$ [MPa] (note 8)	Invalid /Valid	Comments
								D_e=D [mm] (note 4)	$D_e=\sqrt{(4A/\pi)}$ [mm] (notes 4 and 5)					
6.05	SSED	D	80	63.5	63.5	1.48	0.00140	63.5	--	0.35	1.11	0.4	IN	Broke along existing fracture
6.85	SSED	A	43.5	63.5	43.5	1.81	0.00172	--	59.3	0.49	1.08	0.5	IN	Chipped off side
7.4	SSED	D	124	63.5	63.5	3.53	0.00335	63.5	--	0.83	1.11	0.9	V	Rough surface
11.6	SSED	D	212	63.5	63.5	3.47	0.00329	63.5	--	0.82	1.11	0.9	IN	Broke along existing fracture
12.13	SSED	D	129	63.5	63.5	2.94	0.00279	63.5	--	0.69	1.11	0.8	IN	Chipped at top
12.68	SSED	D	201	63.5	63.5	3.05	0.00289	63.5	--	0.72	1.11	0.8	V	
13.33	SSED	D	175	63.5	63.5	4.03	0.00382	63.5	--	0.95	1.11	1.1	IN	Chipped at top
15.36	SSED	D	115	63.5	63.5	1.44	0.00137	63.5	--	0.34	1.11	0.4	V	
18.78	SSED	A	48	63.5	42.5	7.32	0.00694	--	58.6	2.02	1.07	2.2	V	
18.95	SSED	D	196	63.5	63.5	6.85	0.00649	63.5	--	1.61	1.11	1.8	V	
21	SSED	D	100	63.5	63.5	1.15	0.00109	63.5	--	0.27	1.11	0.3	V	

1. Rock types: SSED: Surface weathered metasedimentary rocks; SINT: Surface weathered intrusive rocks; INT: Intrusive rocks.
2. Test types: D=Diametral, A=Axial, L=Lump.
3. P = Gauge reading in MPa * 0.000948.
4. D_e= Equivalent core diameter.
5. A=W*D.
6. I_s= Uncorrected point load strength.
7. F= Size correction factor.
8. $I_{s(50)}$ = Corrected point load strength.

APPENDIX O
PLACER TAILINGS INVENTORY

1.0 INTRODUCTION

1.1. Purpose

This appendix describes a visual reconnaissance of the reworked valley bottom materials ("placer tailings") in the vicinity of the Eagle Gold project. These materials were examined to develop opinions as to their potential for use as construction materials in development of the proposed mine.

1.2. Background

The Eagle Gold project area has been exploited by placer mining since about 1897. This historical activity has resulted in substantial volumes of reworked overburden materials (placer tailings) in valley bottoms in the region. A significant proportion of the Dublin Gulch valley bottom is filled with placer tailings, which are in places over 20 m thick. Similarly, the reach of Haggart Creek immediately adjacent to, and south of, the project area contains deposits of placer tailings.

The placer tailings consist of highly variable materials, with a wide range of grain size and density. The materials range from isolated deposits of cobbles and boulders, to gravelly sand or sandy gravel, to loose silty sand or soft sandy silt. The latter materials appear to be confined to specific areas, which are inferred from aerial photographs to have been sediment control ponds.

The placer tailings present potential constraints to development, since they are variably loose and potentially liquefiable where they exist below the water table, and are therefore not a suitable foundation for heavy structures. However, the placer tailings materials excavated in the course of foundation preparation may comprise a useful construction material, as a potential source for general fill, structural fill, concrete aggregate or heap overliner material, if suitably selected and processed through screening, crushing, and/or washing.

Suitability of the placer tailings for use as a select fill material will depend, largely, on grain size, and to a lesser degree on mineralogy and associated durability. Placer tailings with excessive fines (i.e. silt and clay) are not expected to be economically suitable for re-use. Where fines content is lower, the sand and gravel fraction is expected to be generally suitable for use as general fill, and potentially suitable for structural fill. The oversize fraction, defined in this section as all clasts greater than 75 mm, are frequently comprised of sound, durable rock. It is expected that this oversize fraction, if screened from the tailings, can be crushed to produce structural fill, and, pending the completion of laboratory testing, to also serve as a durable material for concrete aggregate and/or heap overliner.

This appendix documents a reconnaissance level survey of the placer tailings in Dublin Gulch and within the Haggart Creek valley from its confluence with Dublin Gulch to approximately 3 km south. This appendix presents visual observations of material texture as inferred from the ground surface. Intrusive investigation would be required to confirm the vertical extent of observed materials, and laboratory testing is required to confirm material properties. Some

subsurface data are available for the placer tailings in Dublin Gulch, as reported by BGC (2009 and 2011). Additional subsurface data at select test hole locations within the Dublin Gulch placer tailings are presented elsewhere in this report. There are no subsurface data available for the Haggart Creek placer tailings.

2.0 VISUAL RECONNAISSANCE

2.1. Spatial Limits of Reconnaissance

This component of the 2011 field investigations focused on placer tailings within a reasonable haul distance of the primary components of the planned project (i.e. up to about 2 km from the proposed truck shop pad). Exposed materials were classified visually at discrete, pre-selected points, including 26 locations in the Dublin Gulch valley bottom, and 34 in the Haggart Creek valley bottom. The locations of observation points are shown in Drawing 10.

2.2. Visual Classification of Surficial Materials

The observation points were selected at a number of locations, uniformly distributed across areas containing disturbed materials, as evident in available high resolution aerial photography. At each selected observation point, surficial materials were classified in accordance with standard soil descriptions, and further classified according to the Unified Soil Classification System (USCS). Finally, the approximate proportion of materials that would be retained on a 75 mm screen was estimated at each location.

Note that the classification is based on materials exposed at the immediate ground surface or at shallow depth as exposed by shallow digging. The observed texture may be different than that at depth.

3.0 DATA RESULTS

3.1. Dublin Gulch Area and Haggart Creek Placer Tailings

Visual observations of surficial materials in the Dublin Gulch valley bottom are summarized in Table O-1, and visual observations of surficial materials in the Haggart Creek valley bottom are summarized in Table O-2, below.

Table O-1. Material Observations in the Dublin Gulch Valley Bottom

Observation Point	Northing (m)	Easting (m)	Soil Description	USCS	Estimated % >75 mm
DG-0	7101354	459740	SAND, gravelly, trace to some silt, trace to some cobbles and boulders	SW	10-15
DG-1	7101270	459784	SAND and GRAVEL, cobbly, some boulders, trace silt	GW	40-50
DG-2	7101229	459716	SAND and GRAVEL, cobbly, some boulders, trace silt	GW	30-40
DG-3	7101162	459629	GRAVEL, sandy, cobbly, trace to some boulders, trace silt	GW	20-30
DG-4	7101225	459483	BOULDERS, mixed with silty sand, trace gravel	GP	50
DG-5	7101114	459484	GRAVEL, sandy, some cobbles and boulders, trace silt	GW	15-20
DG-6	7101069	459377	GRAVEL, sandy, some cobbles and boulders, trace silt	GW	15-10
DG-7	7101143	459336	SAND, silty, trace gravel, trace to some cobbles	SM	10
DG-9	7101034	459187	GRAVEL, sandy, some cobbles and boulders	GW	10-15
DG-10	7100972	459183	Area overgrown with brush; several boulders protruding at surface of inferred gravelly sand matrix	N/A	4-5
DG-11	7100889	459171	SAND, silty, trace gravel	SM	< 5
DG-12	7100883	459034	SAND, gravelly, some silt, occasional cobbles and boulders	SW	< 10

DG-13	7100950	458974	SAND, some silt, some gravel, trace cobbles and boulders	SW	< 5
DG-14	7100862	458915	SAND, silty, some gravel	SM	< 2
DG-15	7100962	458938	SAND, gravelly, trace silt	SW	1-2
DG-16	7100944	458849	GRAVEL, sandy, cobbly, occasional boulders, trace silt	GW	25
DG-17	7100949	458725	SAND and GRAVEL, trace silt, trace to some cobbles and boulders	GW	< 10
DG-18	7100889	458662	SAND, silty, some gravel	SM	1
DG-19	7100795	458734	GRAVEL, sandy, trace to some silt	GW	< 1
DG-20	7100793	458644	SAND and GRAVEL, silty	SW	< 1
DG-21	7100944	458603	SAND and GRAVEL, trace to some silt, occasional cobbles and boulders	GW	< 5
DG-22	7100959	458536	SAND, gravelly, trace silt, occasional cobbles and boulders	GW	< 5
DG-23	7101028	458506	SAND, silty, trace gravel	SM	< 1
DG-24	7100995	458417	SAND, silty, trace gravel	SM	< 1
DG-42	7099934	458289	GRAVEL, sandy, trace silt	GW	15-20
DG-47	7100891	459092	GRAVEL, cobbly, occasional boulders	GP	25

Table O-2. Material Observations in the Haggart Creek Valley Bottom.

Observation Point	Northing (m)	Easting (m)	Soil Description	USCS	Estimated % >75 mm
HC-0	7098254	458420	GRAVEL, sandy, trace to some silt, trace cobbles and boulders	GW	5-10
HC-1	7098287	458418	GRAVEL, sandy, trace to some silt, trace cobbles and boulders	GW	5-10
HC-2	7098315	458357	GRAVEL, sandy, trace to some silt, trace cobbles and boulders	GW	5-10
HC-3	7098321	458396	GRAVEL, sandy, trace to some silt, trace cobbles and boulders	GW	< 5
HC-4	7098456	458364	SAND, gravelly, trace silt, trace cobbles and boulders	SW	< 1-2
HC-5	7098480	458324	GRAVEL, sandy, cobbly, trace boulders	GW	> 15-20
HC-6	7098528	458412	SAND and GRAVEL, trace to some silt, trace cobbles and boulders	SW	2-3
HC-7	7098567	458380	SAND and GRAVEL, trace to some silt, trace cobbles and boulders	SW	2-3
HC-8	7098537	458312	GRAVEL, sandy, trace silt, trace cobbles and boulders	GW	< 5
HC-9	7098574	458294	SAND, gravelly, trace silt, trace cobbles and boulders	SW	< 5
HC-10	7098605	458400	SAND and GRAVEL, trace to some silt, trace cobbles and boulders	SW	2-3
HC-11	7098611	458306	SAND, gravelly, trace silt, trace cobbles and boulders	SW	< 2-3
HC-12	7098669	458255	GRAVEL, sandy, trace silt, trace cobbles and boulders	GW	< 2-3

HC-13	7098713	458285	GRAVEL, sandy, trace silt, trace cobbles and boulders	GW	< 5
HC-14	7098780	458295	GRAVEL, cobbly, trace boulders	GP	30-40
HC-15	7098812	458336	GRAVEL, cobbly, trace boulders	GP	30-40
HC-16	7098853	458333	GRAVEL, cobbly, some sand, trace boulders	GW	15-20
HC-17	7098907	458359	SAND, gravelly, trace silt, trace cobbles and boulders	SW	< 5
HC-18	7098964	458350	SAND, gravelly, trace to some silt	SW	< 1
HC-19	7099079	458274	SAND and GRAVEL, some silt, trace cobbles and boulders	SW	< 2-3
HC-20	7099121	458322	GRAVEL and SAND, some silt	GW	< 1-2
HC-21	7099167	458334	GRAVEL and SAND, some silt	GW	< 1-2
HC-22	7099192	458256	SAND, gravelly, some silt to silty	SW	< 2
HC-23	7099251	458257	SAND and SILT, gravelly, trace cobbles and boulders	SM	N/A
HC-24	7099267	458352	SAND, silty, some gravel	SM	< 1
HC-25	7099292	458379	no suitable materials; only thin cover of reworked silty material over undisturbed till	N/A	N/A
HC-26	7099323	458281	SAND and SILT, gravelly, trace cobbles and boulders	SM	N/A
HC-27	7099876	458323	SAND and GRAVEL, trace to some silt, trace cobbles and boulders	SW	< 4-5

HC-28	7099885	458261	SAND and GRAVEL, trace to some silt, trace cobbles and boulders	SW	< 4-5
HC-30	7100456	458222	negligible exploitable material	N/A	N/A
HC-31	7100856	458165	negligible exploitable material	N/A	N/A
HC-32	7100910	458124	in floodplain, not exploitable	N/A	N/A
HC-33	7101019	458099	not exploitable due to low elevation and proximity to Haggart Creek	N/A	N/A
HC-34	7101048	458156	not exploitable due to low elevation and proximity to Haggart Creek	N/A	N/A

4.0 PHOTOGRAPHS

Selected photographs of surficial materials within the Dublin Gulch and Haggart Creek valley bottoms are presented in the following pages. The photograph captions indicate the USCS classification of the observed material, as follows:

- SM – silty sand;
- SW – well graded sand;
- GP – poorly graded gravel; and
- GW – well graded gravel.

5.0 REFERENCES

BGC Engineering Inc. 2010. Site Facilities Geotechnical Investigation Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.

BGC Engineering Inc. 2011. Eagle Gold Project 2010 Geotechnical Investigation for Mine Site Infrastructure Factual Data Report, Victoria Gold Corporation.



DG-0 - SW.



DG-1 - GW



DG-2 - GW



DG-3 - GW



DG-4 - GP



DG-5 – GW



DG-6 - GW



DG-7 - SM



DG-9 - GW



DG-11 – SM



DG-12 - SW



DG-13 - SW



DG-14 - SM



DG-15 - SW



DG-16 - GW



DG-17 - SW



DG-18 - SW



DG-19 - SW



DG-20 - SW



DG-21 - GW



DG-22 - GW



DG-23 - SM



DG-24 - SM



DG-47 - GP



HC-0 - GW



HC-1 - GW



HC-2 - GW



HC-3 - GW



HC-4 - SW



HC-5 - GW



HC-6 - SW



HC-7 - SW



HC-8 - GW



HC-9 - SW



HC-10 - SW



HC-11 - SW



HC-12 - GW



HC-13 - GW



HC-14 - GP



HC-15 - GP



HC-16 - GW



HC-17 - SW



HC-18 - SW



HC-19 - sw



HC-20 - GW



HC-21 - GW



HC-22 - SW



HC-23 - SM



HC-24 - SM



HC-26 – SM



HC-27 - SW



HC-28 - SW

APPENDIX A-2
2012 GEOTECHNICAL INVESTIGATION

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

VICTORIA GOLD CORPORATION

EAGLE GOLD PROJECT
DUBLIN GULCH, YUKON

2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

FINAL

PROJECT NO:	0792-009	DISTRIBUTION:	
DATE:	November 30, 2012	VICTORIA GOLD:	2 copies
DOCUMENT NO:		BGC:	1 copy

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
#500-1045 Howe Street
Vancouver, B.C.
Canada V6Z 2A9
Tel: 604.684.5900
Fax: 604.684.5909

November 30, 2012
Project No: 0792-009

Mark Ayranto, Vice President, Development
Victoria Gold Corporation
584 – Bentall #4
1055 Dunsmuir Street, PO Box 49215
Vancouver, BC, V7X 1K8

Dear Mr. Ayranto,

Re: Eagle Gold Project: 2012 Geotechnical Investigation For Mine Site Infrastructure Factual Data Report – Final Report

Please find attached the final version of the aforementioned report. This report builds upon the previous draft issued October 18, 2012, and contains the addition of laboratory data pertaining to investigation completed in September 2012. Should you have any questions or comments, please do not hesitate to contact the undersigned.

Yours sincerely,

BGC ENGINEERING INC.
per:

Daniela Welkner, M.Sc.
Senior Geological Specialist

EXECUTIVE SUMMARY

This report summarizes the findings of geotechnical site investigation work conducted in late June, July and September 2012, as well as readings from selected piezometers and thermistors from October 2012, at the Eagle Gold Project, at Dublin Gulch, located near Mayo, Yukon. Several areas on site were previously explored as part of pre-feasibility and feasibility studies for development of an open pit heap leach gold mine. Investigations were conducted to address geotechnical data gaps identified in the feasibility study and permitting process for the current proposed open pit heap leach gold mine with regard to mine site infrastructure; specifically the proposed crushers, truck shop, topsoil stockpiles and Dublin Gulch diversion channel.

This geotechnical investigation program involved the excavation of forty test pits, advancement of five diamond drill holes and six auger holes, completion of six plate load tests and mapping of five outcrops (natural exposures and existing road cuts) to characterize subsurface conditions relevant for the foundation and earthworks design of the project. Readings of piezometers and thermistors installed in this and previous programs were also collected. Samples were taken from selected test pits and boreholes for index testing of soil and strength testing of rock and rock discontinuities. A bulk sample of placer tailings was also collected for potential testing for use as concrete aggregate. This report presents factual data only, and does not include engineering interpretation of the data nor engineering recommendations in relation to the proposed mine facilities.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i
TABLE OF CONTENTS ii
LIST OF TABLES iii
LIST OF DRAWINGS iv
LIST OF APPENDICES iv
LIMITATIONS v
1.0 INTRODUCTION 1
1.1. Background 1
1.2. Project Description 1
1.3. Previous Investigations 1
1.4. Scope of Work 4
2.0 SITE CONDITIONS 5
2.1. Surficial Geology 5
2.2. Bedrock Geology 5
3.0 GEOTECHNICAL INVESTIGATION ACTIVITIES 7
3.1. Overview 7
3.2. Outcrop Mapping 8
3.3. Test Pitting 8
3.4. Geotechnical Borehole Drilling 8
3.4.1. Diamond Drilling 9
3.4.2. Auger Drilling 9
3.5. Field Testing 10
3.5.1. Standard Penetration Testing (SPT) 10
3.5.2. Plate Load Testing 10
3.5.3. Thermistors 10
3.6. Groundwater Investigation 11
3.6.1. Groundwater Levels 11
3.6.1.1. Standpipe Piezometers 11
3.6.1.2. Vibrating Wire Piezometers (VWPs) 11
3.6.2. Seep Observations 11
3.7. Sampling and Laboratory Testing 11
3.7.1. Soil Testing 11
3.7.2. Rock Strength Testing 12
3.7.2.1. Unconfined Compressive Strength, Brazilian Tensile Strength and Direct Shear 12
3.7.2.2. Point Load Testing 13
3.7.3. Aggregate Testing 13

4.0 GEOTECHNICAL INVESTIGATION DATA SUMMARY 14
4.1. Plate Load Testing 14
4.2. Frozen Ground and Ground Temperatures 14
4.3. Water Levels 15
4.4. Point Load Testing 19
5.0 OBSERVED SUBSURFACE CONDITIONS 21
5.1. Crushers 21
5.2. Truck Shop 21
5.3. Topsoil Stockpiles 22
5.4. Dublin Gulch Diversion Channel (DGDC) 23
6.0 CLOSURE 25
REFERENCES 26

LIST OF TABLES

Table 3-1. Summary of Laboratory Soil Index Testing Completed 12
Table 3-2. Summary of Laboratory Rock Testing Completed 12
Table 3-3. Interpreted Metasedimentary Rock Discontinuity Strengths from Direct Shear Testing 13
Table 4-1. Summary of Plate Load Test Results 14
Table 4-2. Summary of 2012 Ground Temperature Reaings from Thermistors 15
Table 4-3. Summary of 2012 Water Level Readings from Standpipe and Vibrating Wire Piezometers, and Pumping Wells 16
Table 4-4. Summary of Point Load Test Results by Rock Type 20

LIST OF DRAWINGS

Drawing 01 General Site Location
Drawing 02 Proposed General Arrangement
Drawing 03 Historical Field Investigations (1995 – 2011)
Drawing 04 Surficial Geology
Drawing 05 Test Hole and Outcrop Map Location Plan
Drawing 06 Plate Load Test Location Map
Drawing 07 Groundwater and Surface Water Observations
Drawing 08 Placer Tailings Sampling Locations
Drawing 09 Frozen Ground Observations

LIST OF APPENDICES

APPENDIX A TERMINOLOGY FOR OUTCROP MAPPING AND TEST HOLE LOGS
APPENDIX B OUTCROP MAPPING
APPENDIX C TEST PIT LOGS
APPENDIX D TEST PIT PHOTOS
APPENDIX E BOREHOLE LOGS
APPENDIX F BOREHOLE PHOTOS
APPENDIX G STANDARD PENETRATION TESTING
APPENDIX H PLATE LOAD TESTS
APPENDIX I THERMISTORS AND GROUND TEMPERATURES
APPENDIX J GROUNDWATER OBSERVATIONS
APPENDIX K LABORATORY REPORTS
APPENDIX L LABORATORY TESTING SUMMARIES
APPENDIX M POINT LOAD TESTING
APPENDIX N PLACER TAILINGS SAMPLING

LIMITATIONS

BGC Engineering Inc. (BGC) prepared this document for the account of Victoria Gold Corporation (Victoria). The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves, all documents and drawings are submitted for the confidential information of our client for a specific project. Authorization for any use and/or publication of this document or any data, statements, conclusions or abstracts from or regarding our documents and drawings, through any form of print or electronic media, including without limitation, posting or reproduction of same on any website, is reserved pending BGC's written approval. If this document is issued in an electronic format, an original paper copy is on file at BGC and that copy is the primary reference with precedence over any electronic copy of the document, or any extracts from our documents published by others.

1.0 INTRODUCTION

1.1. Background

Victoria Gold Corporation (Victoria) is initiating detailed design for development of the proposed Eagle Gold mine at Dublin Gulch, Yukon. The proposed mine is an open pit, heap leach gold mine. BGC Engineering Inc. (BGC) was contracted by Victoria to complete geotechnical investigations for mine site infrastructure to address geotechnical data gaps identified in the feasibility study and as part of the permitting process. This report presents factual data resulting from the geotechnical investigations performed in late June, July, and September 2012; in addition to readings from selected piezometers and thermistors from October 2012. This work was conducted to investigate subsurface conditions at the proposed locations for mine site infrastructure including the crushers, the truck shop, the topsoil stockpiles, the Dublin Gulch diversion channel (DGDC) and other ancillary facilities.

1.2. Project Description

The Eagle Gold property is located approximately 45 km north-northeast of Mayo, and 15 km northwest of Elsa, as illustrated in Drawing 01. The mine will comprise an open pit and a heap leach pad; haul roads; waste rock storage areas; process plant; crushers and conveyors; truck shop; camp; water diversion structure; process water ponds; drainage ditches; sediment control structures and various ancillary facilities.

The current layout for the proposed mine facilities, as received from Wardrop Engineering Inc. (WEI) on March 28, 2012, is illustrated in Drawing 02. This layout was the basis for the field investigation plan.

1.3. Previous Investigations

Site conditions at Eagle Gold have been partially described in several reports as follows, and Drawing 03 shows the location of the historic holes within the area of interest:

- Knight Piésold. 1996a. Report on 1995 Geotechnical Investigations for Four Potential Heap Leach Facility Site Alternatives, First Dynasty Mines, Dublin Gulch Property.
- Knight Piésold, 1996b. Report on Feasibility Design of the Mine Waste Rock Storage Area, First Dynasty Mines, Dublin Gulch Property.
- Sitka Corp, 1996. Field Investigation Data Report, Dublin Gulch Project, New Millennium Mining.
- GeoEnviro Engineering, 1996. Hydrogeological Characterization and Assessment, Dublin Gulch Project, New Millennium Mining.
- BGC Engineering Inc. 2010a. 2009 Site Facilities Geotechnical Investigation Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.

- Stantec. 2011. Project Proposal for Executive Committee Review. Pursuant to the Yukon Environmental and Socio-Economic Assessment Act. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2010b. Pre-feasibility Open Pit Slope Design. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2011. 2010 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2012a. 2011 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2012b. 2011 Geotechnical Investigation for Mine Site Infrastructure, Foundation Report. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2012c. Feasibility Study of Open Pit Slope Design. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2012d. Geotechnical Assessment and design of the Waste Rock Storage Areas. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2012e. Lower Dublin Gulch Valley Aquifer Tests. Eagle Gold Project, Victoria Gold Corporation.
- BGC Engineering Inc. 2012f. Open Pit Pumping Tests. Eagle Gold Project, Victoria Gold Corporation.
- Tetra Tech 2012a. Technical Report - Feasibility Study Eagle Gold Project, Yukon. April 2012.
- Tetra Tech 2012b. Supplemental Information Report (SIR). Yukon Environmental and Socio-Economic Assessment Board.

Knight Piésold completed a feasibility level geotechnical study to evaluate the surficial materials and bedrock conditions at four potential heap leach pad locations, two potential waste rock storage areas, and the open pit. Groundwater wells and two thermistors were installed in selected drill holes at that time. Test pitting and diamond drilling were completed from June to September 1995 at upper Bawn Bay Gulch, lower Dublin Gulch, the north side of Lynx Creek, and at the confluence of Haggart and Lynx Creeks.

In 1996, Sitka Corp completed test pits and diamond drill holes in Bawn Boy Gulch, Eagle Pup, Stewart Gulch, and Platinum Gulch for preliminary design of the heap leach and waste rock facilities. Auger holes were drilled in Gill Gulch to evaluate it as a potential borrow source of suitable fine material for use as a liner for the heap leach facility. Monitoring wells were installed in Bawn Boy Gulch and Eagle Pup. Eight thermistor strings were installed.

In 2009, BGC was engaged by Victoria to gather factual data describing subsurface conditions at the proposed heap leach and waste rock storage facility locations (BGC 2010a). The work involved the excavation of sixty-nine test pits and advancement of seven boreholes. Thermistor strings were installed in three boreholes to gather temperature data. Dynamic cone penetration profiles were obtained at two borehole locations to obtain

information about material density. Dynamic cone soundings were attempted in two other holes and met with refusal. Groundwater monitoring wells were installed by Stantec in two of the seven BGC boreholes. Stantec supervised the logging and installation of several other monitoring wells around the site. In addition, BGC completed site investigation and pre-feasibility level design of slopes for the open pit. This included drilling five boreholes within the footprint of the proposed open pit (BGC 2010b).

In 2011, Stantec presented a Project Proposal which included general site conditions such as regional geology, physiography, drainage, climate and seismicity. Air-photo based terrain mapping and an evaluation of geological hazards affecting the project area were also described in this report.

In 2010, BGC was engaged by Victoria to conduct a geotechnical site investigation program in support of the feasibility study for proposed mine site infrastructure (BGC 2011). A total of forty-nine test pits and twenty-five drill holes were completed to characterize the overburden material and bedrock conditions. Additionally, three cut slopes were mapped, and core from one condemnation hole drilled by Victoria was logged for geotechnical purposes. Laboratory index testing was completed on selected samples. Various other lab tests were also completed on bulk samples of placer tailings being considered for potential use as select fill or aggregate. In addition, BGC completed site investigation to support feasibility level design of slopes for the proposed open pit. This involved drilling five boreholes within the footprint of the proposed open pit (BGC 2012c).

In 2011, BGC was engaged to complete a geotechnical site investigation program to address gaps in the data required to support feasibility level design of the proposed mine site infrastructure. A total of forty-six boreholes (29 diamond drill holes and 17 auger holes) were completed to characterize overburden material and bedrock conditions. Ninety-six test pits were completed to characterize overburden material and in some cases, delineate the depth to bedrock. In addition, fifty-nine outcrops, consisting of both natural exposures and drill pad or road cuts were mapped to characterize overburden material and bedrock conditions relevant to mine site infrastructure. Fourteen plate load tests were completed at the proposed plant site and crushers to characterize the stiffness of foundation materials. Piezometers and thermistors were installed in selected boreholes and in-situ permeability testing was conducted in selected installed piezometers. Samples were taken from selected test pits and boreholes for soil index testing and rock strength testing. Bulk samples of placer tailings and rock from outcrops within the pit area were analyzed for potential use as aggregate and structural fill. BGC issued a foundation assessment report (BGC 2012b) in January 2012 providing feasibility level engineering recommendations for mine site infrastructure.

Also in 2011, BGC completed site investigation to support feasibility level design of slopes for the proposed open pit which involved drilling three boreholes within the footprint of the pit (BGC 2012c). In February 2012 BGC issued a geotechnical assessment and design of the waste rock storage areas which includes foundation and waste rock characterisation, stability

analyses and rock drain design (BGC 2012f). Also in 2011, BGC installed three pumping wells, two in Dublin Gulch and one in the proposed open pit, and six monitoring wells. Pumping tests were completed in the installed pumping wells. Two memoranda were issued outlining the results of the pumping tests in the lower valley (BGC 2012d) and the proposed open pit (BGC 2012e).

In 2012, Tetra Tech Inc., prepared a Feasibility Study (Tetra Tech 2012a) for the project which included design input from BGC as noted above. In addition, Tetra Tech Inc., prepared a Supplemental Information Report (Tetra Tech 2012b) for the Yukon Environmental Site Assessment Board to update the Project Proposal prepared by Stantec in 2011.

1.4. Scope of Work

BGC was engaged by Victoria to provide further geotechnical investigation work to address specific geotechnical data gaps identified in the feasibility study and permitting process. This site investigation program was conducted to further investigate subsurface conditions at the crushers, the truck shop, the topsoil stockpiles, the DGDC and other ancillary facilities. The investigation program was conducted in late June, July and September 2012; selected piezometers and thermistors were read in October 2012. The field activities involved the excavation of forty test pits, advancement of five diamond drill holes and six auger holes, completion of six plate load tests and mapping of five outcrops (natural exposures and existing road cuts) to characterize subsurface conditions relevant for foundation and earthworks design. Readings of vibrating wire piezometers, standpipe piezometers and thermistors installed in this and previous programs were also collected. Samples were taken from selected test pits and boreholes for index testing of soil and strength testing of rock and rock discontinuities. Bulk samples of placer tailings were also collected for analysis for potential use as concrete aggregate; BGC understands that Victoria will arrange testing on this bulk sample.

This report presents factual data only, and does not include engineering interpretation of the data nor engineering recommendations in relation to the proposed mine facilities.

2.0 SITE CONDITIONS

2.1. Surficial Geology

The surficial geology of the Dublin Gulch area has been mapped by Bond (1998) and is illustrated in Drawing 04. Pleistocene and Holocene colluvial deposits are abundant in the project area and generally consist of diamicton, gravel, shattered bedrock, and lenses of sand and silt derived from bedrock and surficial materials by a variety of chemical and physical weathering processes. Transport of surface material occurs as creep, sheetwash, and mass wasting and is common on slopes in the area.

Glacial till is infrequently observed because the valley is aligned transverse to the regional Cordilleran ice flow and where present, has been disturbed by historical placer mining. Where till does occur, it is generally either a clayey or silty sand matrix with some proportion of larger clasts up to cobble size. A till blanket has been mapped along the east side of Haggart Creek, south of its confluence with Dublin Gulch.

The valley bottom is dominated by alluvium and placer mining tailings (i.e. materials reworked by placer mining). The Haggart Creek Valley to the west of the project site is filled with a mix of alluvial deposits and placer tailings.

The project site is located in a region of discontinuous permafrost. Frozen ground distribution within the project area is controlled by factors such as soil texture, soil moisture, aspect, vegetation and snow depth. Frozen ground occurs typically on north- and east-facing slopes at higher elevations, and within poorly drained valley bottoms. The distribution of frozen ground is highly variable across the site.

Frozen ground, when observed, is generally encountered immediately below the organic cover. Ground temperatures were measured in thermistors installed on site by Knight Piesold, Sitka Corp and BGC. The measured ground temperatures showed the frozen ground to be relatively warm when observed, typically between 0°C and -1°C.

2.2. Bedrock Geology

The Eagle Gold mineral deposit is located at the narrowest extent of the Potato Hills stock which outcrops above Haggart Creek and consists of a medium-grained phaneritic granodiorite intrusive dated at approximately 93 million years (Smit et al. 1995). The stock is elongated 70°E and is roughly 2 km wide by 5.5 km long (Smit et al. 1995). The host rock in the Dublin Gulch area is primarily clastic metasedimentary rock from the Upper Proterozoic to Lower Cambrian assigned to the Hyland Group. The metasedimentary clastic rocks consist of intercalated and deformed quartzites and phyllites, and to a lesser degree, schists and carbonates. A hornfels thermal aureole surrounds the intrusion within which the Hyland Group rocks have been altered and contact metamorphosed. The coarse clastic components of the Hyland Group have been altered to quartz-biotite, the argillaceous components to sericite-biotite-chlorite schist, and the carbonates to marble, wollastonite-

quartz skarn and pyroxenite skarn. The aureole extends about 300 m to 1000 m outward from the intrusion along the ground surface (Stephens 2004).

3.0 GEOTECHNICAL INVESTIGATION ACTIVITIES

3.1. Overview

The field work for this project was conducted in late June, July and September 2012; selected piezometers and thermistors were read in October 2012. The site investigation involved a number of different components which are listed below and are described in detail in the following sub-sections and corresponding appendices:

- Mapping of natural cut slopes and existing cut roads;
- Excavation of test pits;
- Geotechnical borehole drilling using triple tube diamond drill coring, solid stem auger and CRREL (Cold Regions Research and Engineering Laboratory) barrel coring;
- Field Testing:
  - Standard Penetration Testing (SPT);
  - Plate load testing;
  - Thermistor installation and readings, and ground ice classification;
  - Point load testing;
- Groundwater observations:
  - Installation and reading of standpipe piezometers;
  - Reading of vibrating wire piezometers (VWP);
  - Seep observations;
- Laboratory Testing:
  - Soil index testing; and
  - Intact rock and rock discontinuity strength testing.

The geographic coordinates and elevations of boreholes completed in July 2012 were surveyed using a differential GPS by Underhill Geomatics Ltd., of Whitehorse, Yukon, in August and September 2012. The geographic coordinates and elevations of boreholes completed in September 2012, and 2012 test pits and plate load tests, were surveyed by BGC staff following completion using a hand held GPS unit and should be considered approximate.

Visual classification and description of overburden materials was done following the procedures outlined in Appendix A, which are a modification of the Unified Soil Classification System (USCS, ASTM D2487), using the Standard Practice for Description and Identification of Soils (ASTM D2488) and the procedures presented by the Canadian Foundation Engineering Manual (CFEM 2006). Frozen soils were classified in general accordance with ASTM D4083. Rock mass characterization was done following International Society for Rock Mechanics (ISRM) (1981) and other industry recognized classification systems such as Rock Mass Rating (RMR, Bienawski 1976) and Geological Strength Index (GSI, Hoek and

Marinos, 2000; Cai et al., 2004). Appendix A provides a legend defining the parameters used to describe soil and rock.

3.2. Outcrop Mapping

Five natural outcrops and road cuts were mapped and are presented in Appendix B. The location of these outcrops is shown on Drawing 05. Table B-1 summarizes the rock mass characteristics of the outcrops.

The information gathered during the outcrop mapping included an overburden characterization (soil description and classification) and detailed lithological and structural description of the bedrock, together with a rock mass characterization.

3.3. Test Pitting

Forty test pits were excavated using a 325D CAT excavator operated by Ewings of Mayo, Yukon. Test pit locations are illustrated on Drawing 05 and test pit logs are included in Appendix C and are summarized in Table C-1. Selected test pit photographs are included in Appendix D.

The primary focus of the test pitting program was to characterize the subsurface conditions of the proposed topsoil storage stockpiles located on the slopes above the south side of Dublin Gulch. Test pits were excavated below each plate load testing location to characterize the material tested, and in other ancillary facilities to characterize subsurface conditions. Disturbed soil samples were collected for laboratory index testing to further characterize encountered materials and confirm field descriptions of materials observed.

Relative density of materials was inferred from excavator performance and visual inspection of test pit walls. When frozen ground was encountered, ice type and content were noted. When excavating in frozen ground, a ripper tooth was used in combination with the toothed bucket to increase the depth of frozen ground that could be excavated; and therefore better characterize the thickness of frozen ground. Test pits were terminated due to refusal on bedrock or frozen ground, sloughing or collapse of side walls, or due to the limits of excavator reach.

3.4. Geotechnical Borehole Drilling

The purpose of the borehole drilling was to determine overburden thickness and to characterize subsurface conditions at selected facility locations. Two types of drilling were used during this investigation, diamond and auger drilling. The diamond drilling was focused on determining depth to, and competence of, bedrock in the vicinity of the proposed crushers and truck shop. The auger drilling was focused on determining thickness of frozen ground, the extent of ice rich frozen ground and characterizing subsurface conditions in the vicinity of the DGDC.

3.4.1. Diamond Drilling

A total of five diamond drill holes were drilled within the area of the proposed crushers and truck shop. Diamond drill hole locations are illustrated on Drawing 05 and diamond drill hole logs are included in Appendix E and summarized in Table E-1. Selected diamond drill core photographs are included in Appendix F.

Diamond drilling was conducted by New Age Drilling of Whitehorse, Yukon using a skid mounted diamond drill rig equipped with HQ3 drill gear. The drill used a triple-tube core barrel, in which the inner tube was isolated from the drill fluid and had a longitudinally split sleeve. The split sleeve allowed the core to be recovered and viewed in a relatively undisturbed state. The diamond holes were typically drilled with a mix of water and polymer as drilling fluid.

Standpipe piezometers were installed in four of the five diamond drill holes and one hole was fully grouted following the failure of a standpipe piezometer installation. Standpipe piezometers were completed using 2” (51 mm) PVC, and included a 10 ft (3 m) slotted pipe screened interval near the bottom of the hole. A medium quartz sand was used as the sand pack material, then the installation was plugged with bentonite, grouted to the surface using a cement-bentonite grout and capped with bentonite. If there was sufficient water in the standpipe piezometers, they were developed after completion. Details of piezometer installations and well development are presented in Appendix J.

3.4.2. Auger Drilling

A total of six auger holes were completed within the area of the proposed DGDC. Auger drill hole locations are illustrated on Drawing 05 and auger drill hole logs are included in Appendix E and summarized in Table E-1. Selected photographs from auger drilling are included in Appendix F.

Auger drilling was conducted by Midnight Sun Drilling Co. Ltd. of Whitehorse, Yukon using a MARL 4CT track mounted auger rig. Three drilling techniques, solid stem augering, hollow stem augering and coring with the CRREL barrel, were used depending on the purpose of the drilling and nature of the formation. Solid stem augering was used for the majority of the drilling with grab samples obtained from the auger flights. The CRREL barrel was used for core sampling of frozen ground and highly to completely weathered rock. Hollow stem augering was used to complete one hole for installation of a standpipe piezometer. SPT testing was completed in unfrozen overburden and highly to completed weathered rock to measure in-situ relative density of the material.

Standpipe piezometers were installed in four of the auger holes. At BH-BGC12-85 a second hole was completed approximately 1 m from the original hole, using hollow stem auger, to complete the installation of a standpipe piezometer following collapse of the original hole. Installation of standpipe piezometers followed the same methodology as outlined above for diamond drill holes, except bentonite chips were used to seal the holes instead of cement-bentonite grout. Thermistors were installed in three of the auger holes. Thermistor strings

were installed inside 2” (51 mm) PVC casing or insid 2” (51 mm) PVC standpipe piezometers.

3.5. Field Testing

3.5.1. Standard Penetration Testing (SPT)

Standard Penetration Testing (SPT, ASTM D4366-05) was completed in four of the six auger holes to measure in-situ relative density of the soils. SPT testing was completed using standard equipment including a 38 mm (1 1/2 ”) inside diameter split spoon, a 63.5 kg (140 lb) automatic trip hammer and a 762 mm (30”) drop height. Uncorrected, raw SPT N values are plotted on the borehole logs in Appendix E.

Energy measurements were made during SPT testing at Eagle Gold in 2011 to determine the efficiency of the hammer (BGC 2012a). Hammer efficiency was measured to be approximately 77% of theoretical standard energy (BGC 2012a). The same drill rig and SPT testing equipment were used during this program so the energy measurements collected in 2011 are applicable to testing completed during this program. SPT N values were corrected to SPT $(N)_{60}$ values from these energy measurements. Details of SPT testing are presented in Appendix G.

3.5.2. Plate Load Testing

Plate load tests were carried out by BGC personnel to assess the stiffness properties of anticipated foundation materials. Plate load tests were conducted on two platforms constructed for this purpose at the proposed secondary crusher area (Drawing 06). A single plate size (0.76 m) was used. The purpose of this testing program was to measure the modulus of subgrade reaction of foundation materials anticipated in the crushers area.

A detailed description of the test methodology is presented in Appendix H and a summary of test locations, characteristics and results is presented in Tables H-1 and H-2 and graphically in Figures H-1 through H-6.

3.5.3. Thermistors

Three thermistor strings were installed within the footprint in of the DGDC; two in holes with observed frozen ground and a one in a hole without observed frozen ground as a check of field temperature observations. Installation details are presented in Appendix I.

A total of ten thermistor strings installed by BGC in 2009, 2010 and 2011 are also currently in operation. Thermistors were read several times during the course of this site investigation program. Readings collected during the current and previous investigations are presented in Appendix I. Installation details for previously installed thermistors are summarized in Appendix J of BGC’s 2011 site investigation report (BGC 2012a).

3.6. Groundwater Investigation

3.6.1. Groundwater Levels

Groundwater observations were made throughout the site and consisted of measuring water levels in standpipe and vibrating wire piezometers installed in 2011 and 2012 by BGC; and, recording details of surface seepage locations noted on an opportunity basis. Details of the groundwater investigation can be found in Appendix J. Ground and seepage observations are illustrated in Drawing 07.

3.6.1.1. Standpipe Piezometers

Standpipe piezometers were installed to enable observations of groundwater elevations. During the current investigation, slotted PVC standpipe piezometers were installed (Drawing 07) in eight holes as discussed in Sections 3.4.1 and 3.4.2. Water levels in selected standpipes installed by BGC in 2011 (BGC 2012a) were read in late June. Piezometers installed in 2011 and 2012 were read throughout this investigation program.

3.6.1.2. Vibrating Wire Piezometers (VWPs)

Two VWPs were installed during the 2011 site investigation (BGC 2012a). Water levels in VWPs installed by BGC in 2011 were read several times during this site investigation program.

3.6.2. Seep Observations

Three surface seepage locations were observed. The spatial coordinates of each seep were noted and the approximate seepage rate was estimated. Greater detail on the observations can be found in Table J-3 in Appendix J, and the locations are shown in Drawing 07.

3.7. Sampling and Laboratory Testing

Laboratory testing of soil and rock samples was completed at Golder Associates' laboratory in Burnaby, British Columbia. Laboratory reports are included in Appendix K and tabulated summaries of results are included in Appendix L. Testing included soil index testing and rock strength testing.

Samples of placer tailings collected by BGC staff for aggregate testing have not been tested. Testing will be requested by Victoria.

3.7.1. Soil Testing

Grab samples for soil testing were recovered from test pit walls, auger flights and CRREL barrel coring. Also, a single fault gouge sample was collected from diamond drilling core in borehole BH-BGC12-75.

Table 3-1 below provides a summary of laboratory soil index tests completed. Soil index testing of disturbed soil samples was conducted to further characterize the encountered

materials and to confirm field descriptions. Some moisture content results from samples collected in frozen ground in September 2012 auger holes were lower than expected given field observations of ice content. Some free water may have leaked during shipping and as a result some moisture contents may under represent the actual in-situ moisture content.

Table 3-1. Summary of Laboratory Soil Index Testing Completed

Laboratory Test	Testing Standard	Number of Tests Completed
Grain size	ASTM C136	31
Moisture Content	ASTM 2216	96
Hydrometer	ASTM 422	17
Atterberg Limits	ASTM 4318	14
Specific Gravity - Soil	ASTM 854	4

3.7.2. Rock Strength Testing

3.7.2.1. Unconfined Compressive Strength, Brazilian Tensile Strength and Direct Shear

Six rock core samples from the three boreholes at the proposed crushers (BH-BGC12-75, -76, -79) were selected for laboratory testing of Unconfined Compressive Strength (UCS) with strain measurements, Brazilian Tensile Strength (BTS), and Specific Gravity (SG). Three rock core samples, consisting of discontinuities along foliation, from two of the boreholes at the proposed crushers (BH-BGC-12-76, -79) were also selected for direct shear testing of discontinuity strength. One sample from BH-BGC12-75 was broken during shipping and could not be tested for UCS or BTS testing. One sample from BH-BGC12-76 had only sufficient material to complete one BTS rather than the usual two tests. Table 3-2 provides a summary of laboratory tests performed on rock samples. Intact rock and discontinuity strength testing were completed to assist in the development of strength parameters for future design work.

Table 3-2. Summary of Laboratory Rock Testing Completed

Laboratory Test	Testing Standard	Number of Tests
Unconfined Compressive Strength with Strain Measurement	ASTM D7012	5
Brazilian Tensile Strength	ASTM D3967	9
Specific Gravity - Rock	C127	6
Direct Shear - Rock	ASTM D5607	3

Direct shear testing results were interpreted to develop peak and residual joint strengths (see Appendix L). These strength parameters are summarized in Table 3-3.

Table 3-3. Interpreted Metasedimentary Rock Discontinuity Strengths from Direct Shear Testing

	Phi (º)
Peak Strength	38
Residual Strength	29

3.7.2.2. Point Load Testing

During the 2012 site investigation program a total of 153 core samples of rock were tested using a point load tester to estimate the intact rock strength of the metasedimentary rock. These samples were taken from rock core obtained from five diamond drill holes at the site. From the 153 tests, 77 were invalid, as outlined by ISRM (1985), due to incomplete development of the fracture surface. Therefore, 76 valid tests were performed. The overall poor quality of rock recovered from the diamond drill holes contributed to the number of invalid tests. For more details on the point load testing procedure and a record of the results refer to Appendix M.

3.7.3. Aggregate Testing

As requested by Victoria, a bulk sample, consisting of fifteen 20 litre pails of placer tailings was collected from within the footprint of the proposed heap leach embankment and events ponds, for testing for potential use as concrete aggregate. BGC understands that Victoria will arrange testing. Sampling locations are shown in Drawing 08. Photos of sampling locations and a brief description of the materials present at each sampling location are included in Appendix N.

4.0 GEOTECHNICAL INVESTIGATION DATA SUMMARY

4.1. Plate Load Testing

Detailed results of the plate load testing are presented in Appendix H. Key results from the testing are summarized in Table 4-1, below. Plate load testing locations are shown on Drawing 06. Test pits were excavated below each plate load testing location. Vertical subgrade reaction moduli presented in Table 4-1 are based upon a linear overall fit to the measured load-displacement data (Appendix H), and should be re-evaluated for specific stress ranges being considered in foundation design.

Table 4-1. Summary of Plate Load Test Results

Facility	Test #	Test Pit #	Depth Below Existing Ground Surface (m)	Vertical Subgrade Reaction Modulus (kPa/mm)	
				Virgin Curve, k_v	Rebound Curve, $k_{v(u-r)}$
Secondary Crusher	PT-BGC12-15	TP-BGC12-179A	4.5	135	290
Secondary Crusher	PT-BGC12-16	TP-BGC12-179B	4	120	270
Secondary Crusher	PT-BGC12-17	TP-BGC12-179C	3	335	600
Secondary Crusher	PT-BGC12-18	TP-BGC12-180A	4.5	250	385
Secondary Crusher	PT-BGC12-19	TP-BGC12-180B	4.5	270	430
Secondary Crusher	PT-BGC12-20	TP-BGC12-180C	3	275	500

4.2. Frozen Ground and Ground Temperatures

Frozen ground was encountered in 21 of the 40 test pits excavated in 2012 and in three of the six auger holes completed in 2012. The presence of frozen ground was determined by observations of ice content and measured ground temperatures. Locations of frozen ground observations are shown on Drawing 09.

Detailed observations of ground temperature measurements in thermistors are presented in Appendix I. Frozen temperatures were measured at depths ranging from surface to greater than 25 m, and frozen ground was typically between 0°C and -1°C (Table 4-2). Readings were generally collected in summer months and ground temperatures typically decreased with depth.

Table 4-2. Summary of 2012 Ground Temperature Reaings from Thermistors

Borehole	Location	2012 Date of Reading	Depth of Frozen Ground (m)	Overall Temperature Range Measured (°C)
BH-BGC09-STU-3	Stuttle Gulch	July 18, September 18, September 27	7 m to >10 m	-0.2 to 12.0
BH-BGC09-STU-4	Stuttle Gulch	July 18, September 18, September 27	4 m to >10 m	-0.2 to 10.4
BH-BGC09-AG-3[1]	Ann Gulch	July 17, September 19, September 27	Unfrozen	0.5
BH-BGC10-07	Stuttle Gulch	July 17, September 19	7 m	0.0 to 12.9
BH-BGC11-42	Eagle Pup (Proposed Waste Rock Storage Area)	July 17, September 19, September 28	5 m to >25 m	-0.3 to 9.3
BH-BGC11-44	Steiner Area	July 17, September 19, September 28	≥ 7 m	-0.1 to 11.6
BH-BGC11-51	Steiner Area	July 18, September 19, September 28	15 m to >25 m	-0.1 to 13.5
BH-BGC11-57	Steiner Area (Proposed Truck Shop)	July 18, September 18, September 25	1.5 m to >10 m	-0.1 to 10.8
BH-BGC11-58	Steiner Area (Proposed Truck Shop)	July 18, September 18, September 27	1.5 m to >10 m	-0.5 to 10.7
BH-BGC11-63	Eagle Pup (Proposed Waste Rock Storage Area)	July 17, September 19, September 28	2 m to >25 m	-0.2 to 7.7
BH-BGC12-80	Stuttle Gulch (Proposed Diversion Channel)	October 16	0 m to >10 m	0 to -0.6
BH-BGC12-81	Stuttle Gulch (Proposed Diversion Channel)	October 16	0 m to >10 m	0 to -0.4
BH-BGC12-83	Eagle Pup (Proposed Diversion Channel)	October 16	Unfrozen	0 to 3.6

[1] Thermistor consists of a single thermocouple at 10m depth.

4.3. Water Levels

Detailed observations of groundwater are presented in Appendix J. Groundwater elevations observed at piezometers in 2012 are summarized in Table 4-3 below and shown on Drawing 07.

Table 4-3. Summary of 2012 Water Level Readings from Standpipe and Vibrating Wire Piezometers, and Pumping Wells

Hole ID	Bottom of Screen/ Depth of Vibrating Wire Tip (mbgs)	Elevation (masl)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC11-26	18.3	1139.6	28-Jun-12	16.6	Standpipe
			19-Jul-12	15.1	
			24-Jul-12	15.3	
			29-Sep-12	18.5	
BH-BGC11-29	20	1045.3	26-Jun-12	8.2	Standpipe
			19-Jul-12	8.4	
			29-Sep-12	10.4	
BH-BGC11-30	30.7	952	26-Jun-12	15.3	Standpipe
			19-Jul-12	15.8	
			28-Sep-12	17.1	
BH-BGC11-32	23.1	818.7	28-Jun-12	10.6	Standpipe
			19-Jul-12	10.8	
			27-Sep-12	10.8	
			15-Oct-12	10.8	
			28-Oct-12	11.1	
BH-BGC11-33	40.0	833	26-Jun-12	4.0	Standpipe
			19-Jul-12	4.0	
			27-Sep-12	3.3	
			15-Oct-12	4.0	
			28-Oct-12	4.2	
BH-BGC11-34	33.7	848.3	26-Jun-12	8.3	Standpipe
			19-Jul-12	8.4	
			27-Sep-12	8.4	
BH-BGC11-35	48.3	986.3	19-Jul-12	22.4	Standpipe
			24-Jul-12	22.3	
			19-Sep-12	21.9	
			28-Sep-12	20.9	
BH-BGC11-36	18.8	1002.5	19-Jul-12	21.0	Standpipe
			24-Jul-12	21.3	
			19-Sep-12	22.7	
			28-Sep-12	22.7	

Hole ID	Bottom of Screen/ Depth of Vibrating Wire Tip (mbgs)	Elevation (masl)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC11-38	48.6	1013	19-Jul-12	25.7	Standpipe
			19-Sep-12	25.8	
			28-Sep-12	25.8	
BH-BGC11-39	18.6	796.6	28-Jun-12	9.0	Standpipe
			19-Jul-12	9.3	
			27-Sep-12	10.5	
			25-Aug-11	8.5	
BH-BGC11-40B	44.0	1049.8	27-Jun-12	8.8	Standpipe
			19-Jul-12	8.8	
			19-Sep-12	10.9	
			27-Sep-12	10.8	
BH-BGC11-45	19.9	1354.4	19-Jul-12	11.4	Standpipe
			24-Jul-12	11.9	
			28-Sep-12	17.2	
BH-BGC11-46	17.5	1246.1	19-Jul-12	16.3	Standpipe
			24-Jul-12	16.3	
			27-Sep-12	17.5	
BH-BGC11-48	32.3	1140.0	27-Sep-12	31.1	Standpipe
BH-BGC11-52	21.8	909	26-Jun-12	4.1	Standpipe
			19-Jul-12	4.1	
			19-Sep-12	4.2	
			28-Sep-12	4.4	
BH-BGC11-54	38.4	883.8	17-Jul-12	11.0	Vibrating Wire
			26-Jul-12	10.9	
			19-Sep-12	10.8	
			29-Sep-12	10.7	
			16-Oct-12	10.8	
			25-Oct-12	10.7	
BH-BGC11-55	12.7	881	26-Jun-12	DRY	Standpipe
			19-Jul-12	DRY	
			19-Sep-12	DRY	
			27-Sep-12	DRY	

Hole ID	Bottom of Screen/ Depth of Vibrating Wire Tip (mbgs)	Elevation (masl)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC11-57	9.9	859.2	28-Jun-12	DRY	Standpipe
			19-Jul-12	DRY	
			18-Sep-12	DRY	
BH-BGC11-59	29.1	883.7	26-Jun-12	29.4	Standpipe
			19-Jul-12	29.3	
			19-Sep-12	29.3	
			28-Sep-12	29.5	
BH-BGC11-60	8.6	859.2	26-Jun-12	DRY	Standpipe
			19-Jul-12	DRY	
			19-Sep-12	DRY	
			27-Sep-12	DRY	
BH-BGC11-62	34.2	1017.9	19-Jul-12	22.8	Standpipe
			24-Jul-12	23.2	
			19-Sep-12	24.7	
			28-Sep-12	24.7	
BH-BGC11-63	26.3	1100.7	17-Jul-12	19.9	Vibrating Wire
			26-Jul-12	20.0	
			19-Sep-12	25.3	
			28-Sep-12	DRY	
BH-BGC11-64	46.7	1044.1	28-Jun-12	11.1	Standpipe
			21-Jul-12	10.6	
BH-BGC11-72	17.5	782	19-Jul-12	1.7	Standpipe
			15-Oct-12	1.5	
			28-Oct-12	2.5	
BH-BGC11-74	29	789.1	19-Jul-12	7.6	Standpipe
			15-Oct-12	8.5	
			28-Oct-12	9.1	
BH-BGC12-75	47.3	1034	21-Jul-12	20.5	Standpipe
			19-Sep-12	23.4	
			27-Sep-12	23.5	

Hole ID	Bottom of Screen/ Depth of Vibrating Wire Tip (mbgs)	Elevation (masl)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC12-76	40.3	1032	20-Jul-12	24.2	Standpipe
			19-Sep-12	26.4	
			27-Sep-12	26.5	
BH-BGC12-77	19.5	873	19-Jul-12	18.4	Standpipe
			18-Sep-12	DRY	
			27-Sep-12	DRY	
BH-BGC12-78	20.7	883	19-Jul-12	20.1	Standpipe
			18-Sep-12	20.0	
			27-Sep-12	21.2	
BH-BGC12-80	21.6	922	16-Sep-12	DRY	Standpipe
			18-Sep-12	DRY	
BH-BGC12-81	10.3	911	16-Sep-12	DRY	Standpipe
			18-Sep-12	DRY	
BH-BGC12-84	7.3	919	19-Sep-12	DRY	Standpipe
PW-BGC11-01	93.6	800	19-Jul-12	13.7	Pumping Well
PW-BGC11-02	140.2	1326	19-Jul-12	6.6	Pumping Well
			28-Sep-12	7.8	
PW-BGC11-03	32.3	789	19-Jul-12	6.5	Pumping Well
			27-Sep-12	6.7	

1. Holes completed in 2011 were surveyed by Underhill Geomatics Ltd. in August and September 2011 using a differential GPS, with the exception of BH-BGC11-39, which was surveyed in 2012. Holes completed in July 2012 were surveyed in August 2012 using a differential GPS by Underhill Geomatics Ltd. Holes completed in September 2012 were surveyed by BGC staff using a handheld GPS.
2. Coordinates in UTM NAD 83, Zone 8N.
3. Depths are recorded in meters below ground surface (mbgs).
4. Linear conversion used for vibrating wire piezometers.
5. PW-BGC11-01 is used as a water source for drilling throughout the winter and summer. The July 2012 water level was taken while the pump was running. PW-BGC11-02 and PW-BGC11-03 are test wells that are not currently used for water supply.

4.4. Point Load Testing

Detailed observations from point load tests are provided in Appendix N. A summary of completed and valid tests is provided in Table 4-4, below.

Table 4-4. Summary of Point Load Test Results by Rock Type

Hole ID	Metasedimentary Rock			
	Number of Tests		Is_{50} Values (MPa)	
	Valid	Invalid	Range[1]	Mean[1]
BH-BGC12-75	13	29	0.1 – 3.9	1.9
BH-BGC12-76	24	10	0.1 - 2.8	1.1
BH-BGC12-77	2	5	0.3 – 0.5	n/a
BH-BGC12-78	4	7	0.1 – 1.0	0.5
BH-BGC12-79[2]	32	26	0.4 – 11.0	3.5
Total	**75**	**77**	**0.1 – 11.0**	**2.2**

Notes:

1. Range and mean values consider only the valid tests.
2. BH-BGC12-79 also had one valid test on intrusive rock with an Is_{50} value of 6 MPa.

5.0 OBSERVED SUBSURFACE CONDITIONS

This investigation program focused on four general areas: the crushers, the truck shop, the topsoil stockpiles and the proposed DGDC. The general subsurface conditions in these areas, based on investigations completed in late June, July and September 2012, are summarized below. Additional detail of ground conditions for the truck shop, crushers and DGDC can be found in Appendix A of BGC's 2011 foundation report (BGC 2012b).

5.1. Crushers

In 2012 three diamond drill holes, twelve test pits, five outcrop maps and six plate load tests were completed in the vicinity of the proposed crushers.

Overburden materials were observed in the outcrop mapping and test pits and were typically not observed in the diamond drilling due to poor recovery. Overburden materials in the vicinity of the crushers typically consist of organics, underlain by colluvium.

Organics range in thickness from 0.1 m to 0.3 m and typically consist of moss, roots and organic silt. Organics were not observed in the drill holes completed in the vicinity of the crushers as they were removed during drill pad construction. Drill pad construction also involved placement of fill up to 4.5 m thick, this material was not recovered during drilling.

Based on observations made in test pits, colluvium in the area ranges in thickness from 0.4 m to 1.5 m and typically consists of loose gravel or gravelly sand of metasedimentary origin, with trace to some fines. No frozen ground was observed in the crushers area.

Bedrock in the crushers area is encountered at depths ranging from 0.5 m to 1.5 m from original ground surface. Rock encountered is metasedimentary and typically medium strong and slightly weathered. The rock is fractured with a fracture frequency of 10 to 20 fractures per metre, with zones of up to 100 fractures per metre. Most discontinuities are joints parallel to foliation. Rock mass rating (RMR, Bieniawski 1976) ranges from 20 to 60 and is typically 40 and generally increases with depth. Holes were drilled to a maximum depth of 50 m.

Standpipe piezometers were installed in two of the three diamond holes completed. In addition, water levels were read in piezometers installed in the area in 2011. In the vicinity of the secondary and tertiary crushers, water levels are typically 20 m to 25 m below ground surface. In the vicinity of the primary crusher, the water level is approximately 9 m to 10 m below ground surface. Seepage was not observed in the test pits in the crushers area.

The conditions encountered in the crushers area are largely consistent with those encountered in previous investigations.

5.2. Truck Shop

In the vicinity of the proposed truck shop, two diamond drill holes and three test pits were completed. No outcrop mapping or plate load testing was completed in the truck shop area.

Overburden materials were observed in the test pits and in limited recovery in the diamond drilling. Overburden materials in the vicinity of the truck shop typically consist of organics underlain by colluvium.

Organics range in thickness from 0.1 m to 0.2 m and typically consists of moss, roots and organic silt. Colluvium is found in the area up to depths of 11.5 m and typically consists of sandy, gravelly silt or sand with some silt. Clasts are typically of metasedimentary origin. Frozen ground was encountered in test pits, but not observed in the diamond drilling. Ice was observed in two of the three test pits, occurring as ice crystals and ranging from 5% to 20% ice. Two test pits ended at refusal on frozen ground, at 4 m and 6 m respectively; the frozen ground in the third pit extended only to approximately 2 m depth.

Bedrock at the two drill holes advanced near the truck shop area was found at depths of 9.5 m and 11.5 m. Rock encountered is metasedimentary and typically very weak to weak and moderately to highly weathered. The rock is fractured with a fracture frequency ranging from 20 to 40 fractures per metre, but typically 20 fractures per metre. Most discontinuities are joints parallel to foliation. Rock mass rating (RMR, Bieniawski 1976) ranges from 20 to 40 and is typically 20. Holes were drilled to depths of 20.5 m and 22 m.

Standpipe piezometers were installed in both of the diamond drill holes completed. In addition, water levels were read in piezometers installed in the area in 2011. The water table was not encountered in previously installed, shallower, standpipe piezometers. In BH-BGC12-77, the water level was dry when read in September 2012, indicating a water level greater 19.5 m below ground surface. In BH-BGC12-78, the water level was measured at 21.2 m below round surface in September 2012. Seepage was not observed in the test pits in the truck shop area.

The conditions encountered in 2012 subsurface investigations are largely consistent with those encountered in previous investigations.

5.3. Topsoil Stockpiles

There are three proposed topsoil stockpiles located on the slopes on the south side of Dublin Gulch. In the vicinity of these stockpiles 20 test pits were completed, ranging in depth from 3 m to 6 m and typically 3 m to 4 m deep. No drilling or outcrop mapping was completed in the vicinity of the proposed stockpiles.

Overburden materials in the stockpile areas typically consist of organics underlain by colluvium.

Organics range in thickness from 0.1 m to 0.3 m and are typically 0.1 m thick and generally consists of moss, roots and organic silt. Colluvium in the area is typically greater than 3 m thick and generally consists of silty, gravelly sand. Other types of colluvium encountered include silty, sandy gravel and silt with some portion of gravel or sand. Clasts are typically of metasedimentary origin. Frozen ground was encountered in 16 of the 20 test pits (see Drawing 09). Visible ice was observed in 15 of the 16 of the frozen pits. Ice typically

occurred as crystals or lenses and ranged from 10% to 40% ice. The ice content generally decreased with depth. Non-visible excess ice, generally less than 10%, was encountered in five test pits. Test pits typically ended in refusal on frozen ground, so the actual thickness of the colluvium and frozen ground is unknown, but is typically greater than 3 m.

Bedrock was encountered in one test pit (TP-BGC12-160) in the eastern most proposed topsoil storage stockpile area at a depth of 1.7 m. It consisted of very weak to weak, moderately to highly weathered metasedimentary rock.

In general, seepage was not encountered in the test pits. Seepage was observed in TP-BGC12-171 in the westernmost proposed topsoil storage stockpile between 0.5 m and 1.5 m.

Previous investigations in the vicinity of the proposed topsoil stockpiles consisted of test pits, many of which met resfusal on frozen ground within 1 m to 2 m of ground surface; a ripper tooth was not used to excavate previous test pits. The conditions encountered in the test pits completed in 2012 are largely consistent with conditions encountered in previous pits.

5.4. Dublin Gulch Diversion Channel (DGDC)

The proposed DGDC extends along the south side of the Dublin Gulch valley from upstream of the proposed Heap Leach Pad to near the confluence of Dublin Gulch and Haggart Creek. Six auger holes and one test pit were completed in September 2012 within the footprint of the eastern half of the proposed diversion. Two auger holes were completed in the upper diversion east of Eagle Pup, three auger holes were completed in the middle reach of the diversion between Eagle Pup and Stuttle Gulch and one auger hole and one test pit were completed in the lower diversion immediately west of Stuttle Gulch (Drawing 05).

Overburden materials in the diversion channel area typically consist of organics underlain by colluvium. Fill was present at two locations.

Organics range in thickness from 0.1 m to 0.3 m and are typically 0.1 m thick and generally consist of moss, roots and organic silt. Fill was encountered at two locations: east of Eagle Pup it was 0.5 m thick at BH-BGC12-83 and west of Stuttle Gulch it was 7.5 m thick at BH-BGC12-85. The fill encountered east of Eagle Pup consisted of sandy silt and the fill encountered immediately west of Stuttle Gulch consisted of silty sand and gravel and buried organics. Colluvium in the area varied in thickness from 1 m to greater than 19 m and was typically 7 m to 10 m thick. It generally consisted of sandy silt or silty sand and trace to some gravel with zones of gravelly, silty, sand. Clasts are typically of metasedimentary origin.

Frozen ground was encountered between Eagle Pup and Stuttle Gulch in the three auger holes completed in this segment. Visible ice was observed in two of the three auger holes and typically occurred as crystals, lenses and coatings on particles. Visible ice content ranged from 5% to 50% ice, and was typically 10% ice. Zones of frozen ground with no visible ice were observed in the three holes in this segment. Frozen ground extended from the ground surface to a depth of 7 m and 8 m in BH-BGC12-80 and BH-BGC12-81, and from

3 m to 8.5 m below ground surface in BH-BGC12-82. Frozen ground was not observed in the two auger holes completed east of Eagle Pup or in the test pit and auger hole completed immediately west of Stuttle Gulch.

Highly to completely weathered metasedimentary rock was encountered in five of the six auger holes at depths ranging from 4 m to 11.4 m; the sixth hole ended at the target depth of 19 m in colluvium. The highly to completely weathred rock was disturbed by the drilling process and typically recovered as sand with some silt and some gravel. SPT samples obtained in weathered rock generally showed the foliated structure of the rock (SPT N values are reported on the logs in Appendix E and details of SPT testing are reported in Appendix G).

Seepage was encountered during drilling in three of the six auger holes. In BH-BGC12-82, immediately to the west of Eagle Pup, seepage was encountered at 2.4 m and material below this depth was not saturated likely indicating perched conditions. Seepage was encountered in BH-BGC12-83 east of Eagle Pup at a depth of 18 m; material below this depth was saturated. Seepage was encountered in BH-BGC12-85 immediately west of Stuttle Gulch at a depth of 10 m and material below this depth was saturated. Piezometers in BH-BGC12-80 and BH-BGC12-81, located between Stuttle Gulch and Eagle Pup, were both dry to depths of 22 m and 10 m, respectively. The piezometer in BH-BGC12-084, located east of Eagle Pup was dry when read in September 2012, indicating a water level greater than 7.3 m below ground surface.

Previous investigation in the vicinity of the diversion channel consisted of test pits with few boreholes. Overburden conditions and depth to weathered rock, as observed in 2012, are largely similar to previous investigations. In previous investigations moderately weathered and fresher rock were encountered below colluvium; highly to completely weathered rock was encountered below colluvium in holes completed this year.

6.0 CLOSURE

We trust the above satisfies your requirements at this time. Should you have any questions or comments, please do not hesitate to contact us.

Yours sincerely,

BGC ENGINEERING INC.
per:

Kathleen Hanley, P.Eng.
Geotechnical Engineer

Reviewed by:

Amer Awad, Ph.D., P. Eng.
Senior Geotechnical Engineer

REFERENCES

American Society for Testing and Materials. Standard D4083-89 (Reapproved 2007): Standard Practice for Description of Frozen Soils (Visual-Manual Procedure). Developed by Sub-Committee D18.03. West Conshohocken, PA.

American Society for Testing and Materials. Standard D2487-11: Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). West Conshohocken, PA.

American Society for Testing and Materials. Standard D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). West Conshohocken, PA.

American Society for Testing and Materials. Sandard D4633-05. Standard Test Method for Energy Measurement for Dynamic Penetrometers. West Conshohocken, PA.

BGC Engineering Inc. 2010a. Site Facilities Geotechnical Investigation Factual Data Report - Final. Eagle Gold Project, Victoria Gold Corporatation. March 5, 2010.

BGC Engineering Inc. 2010b. Pre-feasiblity Open Pit Slope Design - Final. Eagle Gold Project, Victoria Gold Corporation. May 19, 2010.

BGC Engineering Inc. 2011. 2010 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report - Final. Eagle Gold Project, Victoria Gold Corporation. November 17, 2011.

BGC Engineering Inc. 2012a. 2011 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report - Final. Eagle Gold Project, Victoria Gold Corporation. January 20, 2012.

BGC Engineering Inc. 2012b. 2011 Geotechnical Investigation for Mine Site Infrastructure, Foundation Report - Final. Eagle Gold Project, Victoria Gold Corporation. January 31, 2012.

BGC Engineering Inc. 2012c. Feasibility Study Open Pit Slope Design - Final. Eagle Gold Project, Victoria Gold Corporation. January 20, 2012

BGC Engineering Inc. 2012d. Geotechnical Assessment and Design of the Waste Rock Storage Areas - Final. Eagle Gold Project, Victoria Gold Corporation. February 23, 2012.

BGC Engineering Inc. 2012e. Lower Dublin Gulch Valley Aquifer Tests. Eagle Gold Project, Victoria Gold Corporation. September 6, 2012.

BGC Engineering Inc. 2012f. Open Pit Pumping Tests. Eagle Gold Project, Victoria Gold Corporation. September 6, 2012.

Bieniawski, Z.T. 1976. Rock mass classification in rock engineering. In Exploration for Rock Engineering, proc. of the symp., (ed. Z.T. Bieniawski) 1, 97-106. Cape Town: Balkema.

Bond, J.D. 1998. Surficial Geology of Dublin Gulch, Central Yukon. Geoscience Map 1998-6. Indian and Northern Affairs Canada, Exploration and Geological Services Division, Yukon Region.

Cai, M., Kaiser, P.K., Uno, H., Tasaka, Y., Minami, M. International Journal of Rock Mechanics& Mining Sciences 41, 2004, p3-19.

Canadian Geotechnical Society 2006. Canadian Foundation Engineering Manual (CFEM) 4th Edition. 488 pp.

GeoEnviro Engineering. 1996. Hydrogeological Characterization and Assessment, Dublin Gulch Project, New Millennium Mining.

Hoek, E, and P G Marinos. 2000. Predicting tunnel squeezing problems in weak heterogeneous rock masses. *Tunnels and Tunnelling International* 132, no. 11: 45-51.

International Society of Rock Mechanics (ISRM). 1981. International Society for Rock Mechanics: Commission of Classification of Rocks and Rock Masses, Basic Geotechnical Description of Rock Masses. International Journal of Rock Mechanics, Mineral Science, and Geomechanics. Vol. 18, pp. 85-110.

International Society for Rock Mechanics (ISRM). 1985. Suggested Method for Determining Point Load Strength. Int. J. Rock Mech. Min. Sci. & Geomech. Abstr. Vol 22, No. 2, pp. 51-60.

Knight Piésold. 1996a. Report on 1995 Geotechnical Investigations for Four Potential Heap Leach Facility Site Alternatives, First Dynasty Mines, Dublin Gulch Property.

Knight Piésold. 1996b. Report on Feasibility Design of the Mine Waste Rock Storage Area, First Dynasty Mines, Dublin Gulch Property.

Sitka Corp. 1996. Field Investigation Data Report, Dublin Gulch Project, New Millennium Mining.

Smit, J. Sieb, M. and Swanson, C., 1995. Summary Information on the Dublin Gulch Project, Yukon Territory. In: Yukon Exploration and Geology, 1995, Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 33-36.

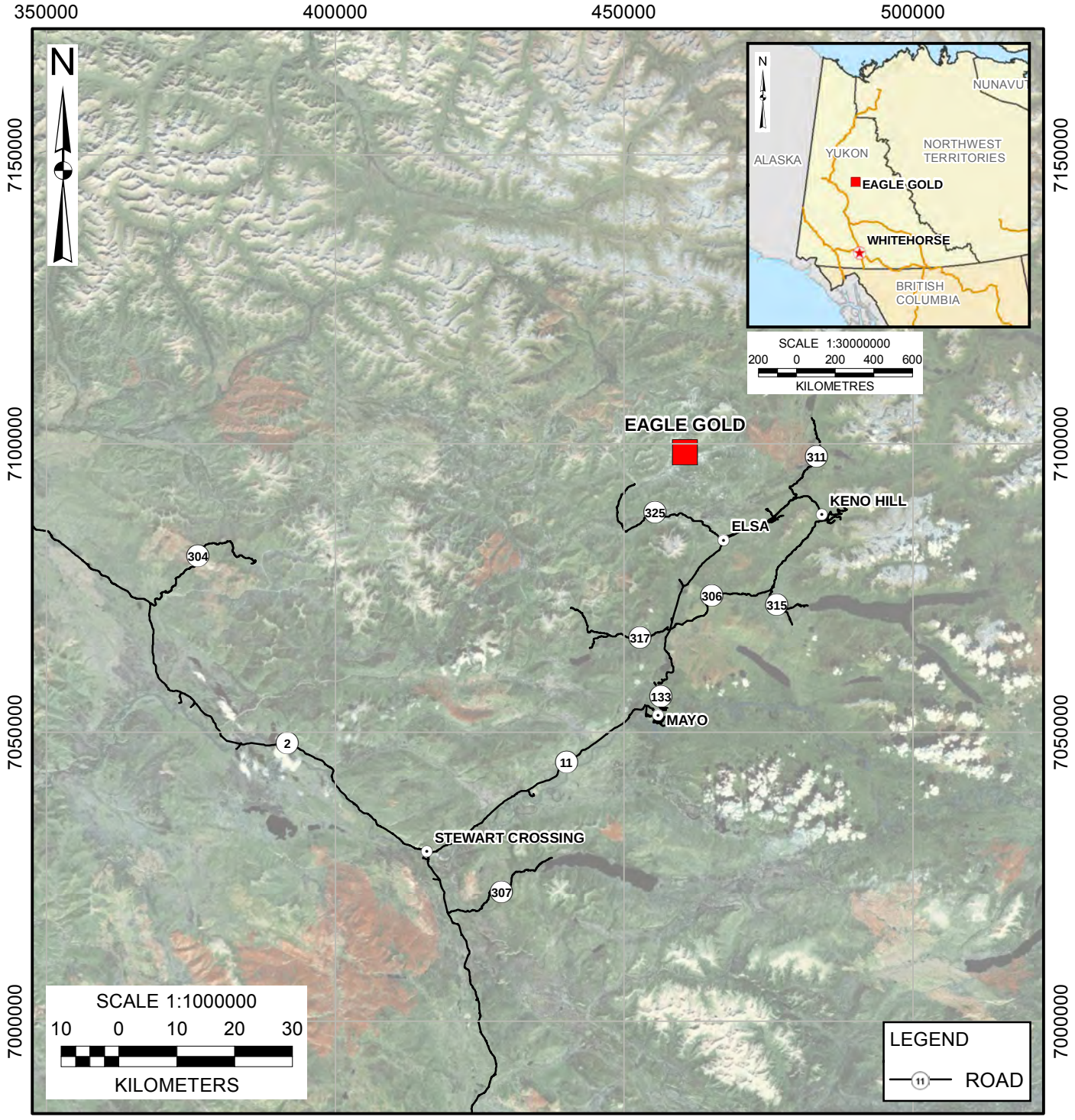
Stantec. 2011. Project Proposal for Executive Committee Review. Pursuant to the Yukon Environmental and Socio-Economic Assessment Act. Eagle Gold Project, Victoria Gold Corporation. June 2011.

Stephens, J.R., Mair, J.L., Oliver, N.H.S., Hart, C.J.R., and Baker, T., 2004. Structural and mechanical controls on intrusion-related deposits of the Tombstone Gold Belt, Yukon, Canada, with comparisons to other vein-hosted ore-deposit types. Journal of Structural Geology 26: 1025-1041.

Tetra Tech 2012a. Technical Report - Feasibility Study Eagle Gold Project, Yukon. April 2012.

Tetra Tech 2012b. Supplemental Information Report (SIR). Yukon Environmental and Socio-Economic Assessment Board. Project N0. 2010-0267. Eagle Gold Project, Victoria Gold Corporation. May 2012.

DRAWINGS



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	AS SHOWN	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	LL	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT:
VICTORIA GOLD CORPORATION

PROJECT:
EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
GENERAL SITE LOCATION

PROJECT No.:	DWG No.:	REV.:
0792009	01	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012

X:\Projects\0792 Victoria Gold\009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\01_General_Site_Location.mxd Date: Friday, November 02, 2012 Time: 8:29 AM

7103000 7102000 7101000 7100000 7099000 7098000

460000

459000

458000

N

DUBLIN GULCH

EAGLE PUP WASTE ROCK STORAGE AREA

EAGLE PUP

DUBLIN GULCH DIVERSION

OPEN PIT

PLATINUM GULCH WASTE ROCK STORAGE AREA

PRIMARY, SECONDARY, TERTIARY CRUSHERS

ANN GULCH

EAGLE PUP SEDIMENT CONTROL POND

CONVEYOR

TOPSOIL STOCKPILES

PLATINUM GULCH

HEAP LEACH FACILITY

SUTTLE GULCH

100 DAY STORAGE

PLATINUM GULCH SEDIMENT CONTROL POND

EXPLOSIVE MAGAZINES

HEAP EMBANKMENT

EVENTS PONDS

PLANT SITE AREA

LOWER DUBLIN SOUTH POND

TRUCK SHOP AREA

LAYDOWN AREA

LOWER DUBLIN NORTH POND

HAGGART CREEK

FISHER GULCH

GILL GULCH

HAGGART CREEK

SCALE 1:15000

200 0 200 400 600

METRES

NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP MARCH 28, 2012.
2. IMAGERY PROVIDED BY VICTORIA GOLD CORPORATION.

LEGEND

- PROPOSED INFRASTRUCTURE LAYOUT
- EXISTING ROAD
- STREAM

NAD 1983 UTM Zone 8N

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
A	OCT 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE:	1:15,000
DATE:	NOV 2012
DRAWN:	LL
DESIGNED:	KH
CHECKED:	DW
APPROVED:	AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

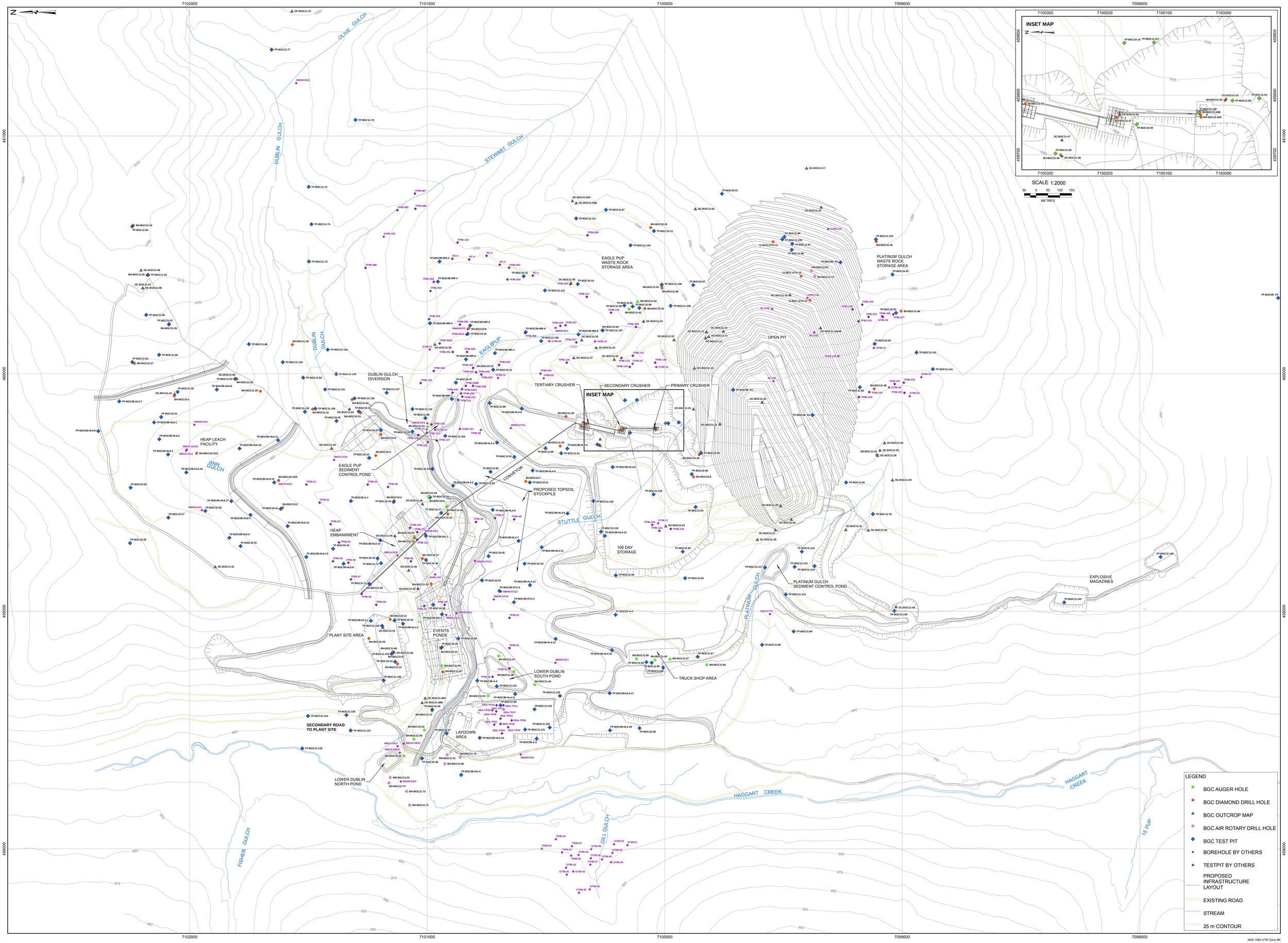
PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: PROPOSED GENERAL ARRANGEMENT

PROJECT No.:	DWG No.:	REV.:
0792009	02	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012

X:\Projects\0792 Victoria Gold\009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\02_Proposed General Arrangement.mxd Date: Tuesday, November 13, 2012 Time: 5:14 PM



NAD 1983 UTM Zone 8N

100 50 0 100 200 300
METRES

NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP MARCH 28, 2012.

REV	DATE	REVISION NOTES	DRAWN	CHECK	APPR
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
B	OCT 2012	ISSUED FOR COMMENT WITH SECOND DRAFT	LL	DW	PQ
A	SEP 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE:	AS SHOWN
DATE:	NOV 2012
DRAWN:	LL
DESIGNED:	DW
CHECKED:	DW
APPROVED:	AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

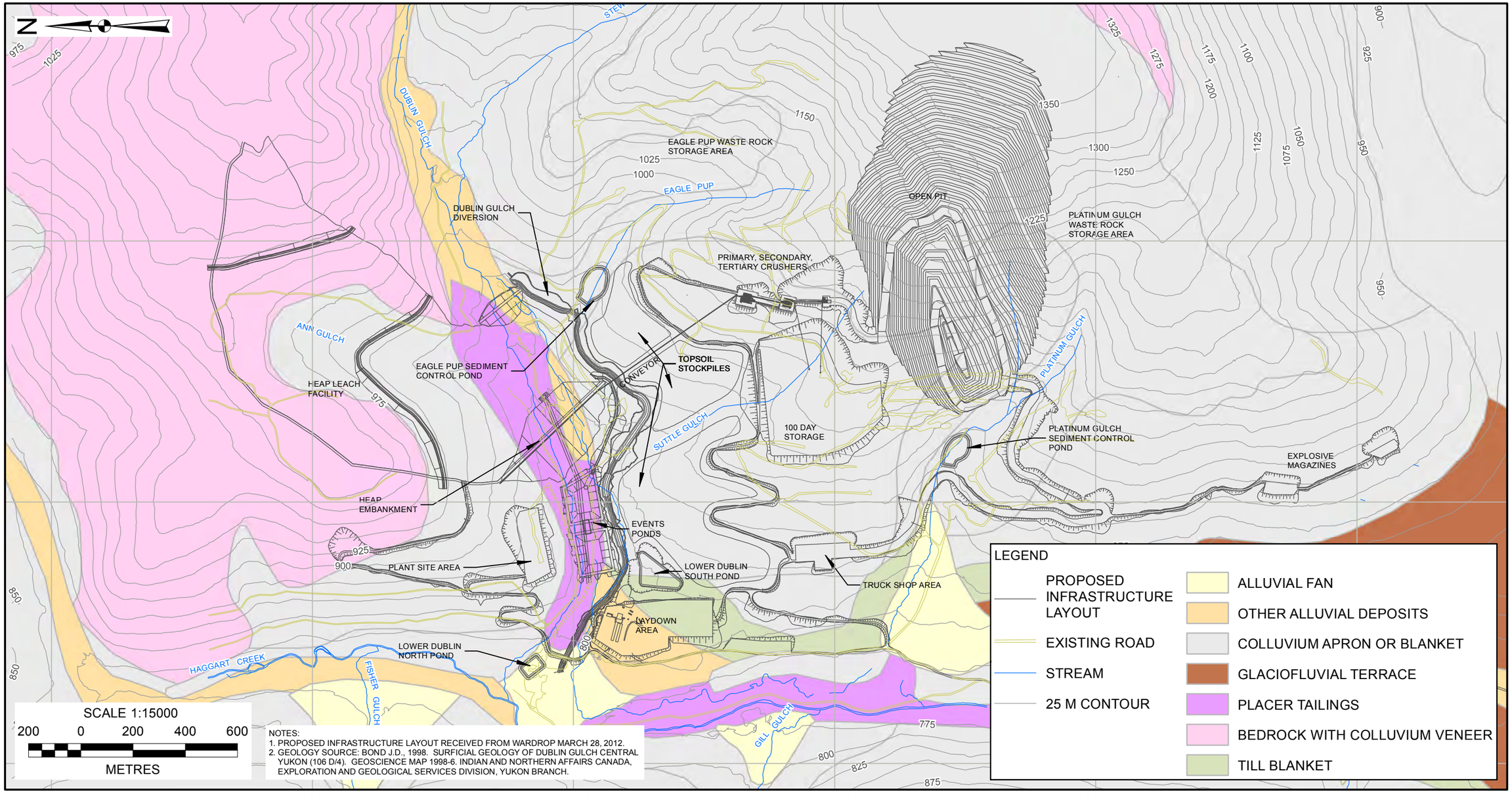
CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: HISTORICAL FIELD INVESTIGATIONS (1995 TO 2011)

PROJECT No.:	DWG No.:	REV.:
0792009	03	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012



NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP MARCH 28, 2012.
2. GEOLOGY SOURCE: BOND J.D., 1998. SURFICIAL GEOLOGY OF DUBLIN GULCH CENTRAL YUKON (106 D/4). GEOSCIENCE MAP 1998-6. INDIAN AND NORTHERN AFFAIRS CANADA, EXPLORATION AND GEOLOGICAL SERVICES DIVISION, YUKON BRANCH.

NAD 1983 UTM Zone 8N

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
A	OCT 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE:	1:15,000
DATE:	NOV 2012
DRAWN:	LL
DESIGNED:	KH
CHECKED:	DW
APPROVED:	AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

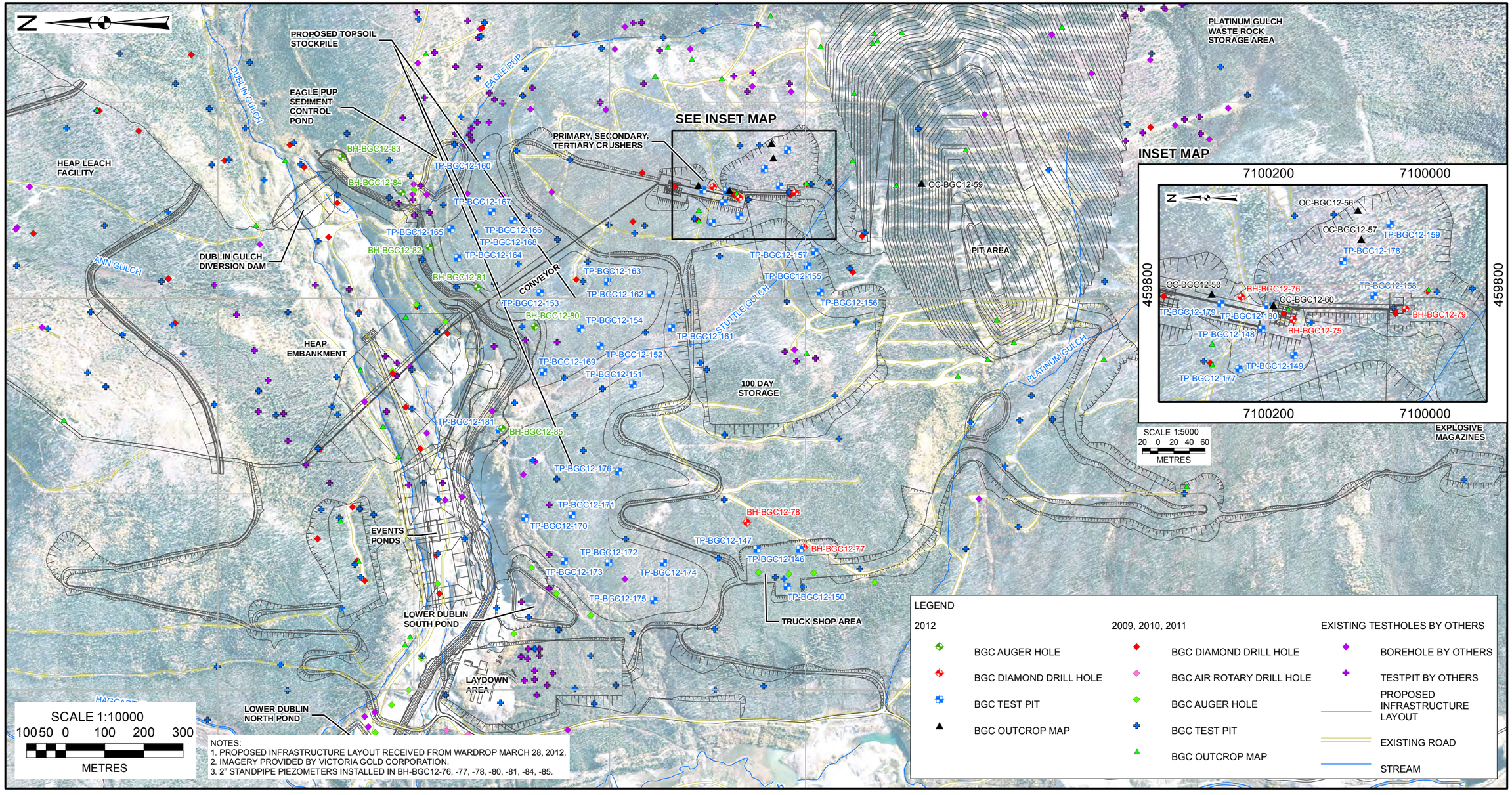
PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: SURFICIAL GEOLOGY

PROJECT No.:	DWG No.:	REV.:
0792009	04	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012

X:\Projects\0792 Victoria Gold\09\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\04_Surficial_Geology.mxd Date: Tuesday, November 13, 2012 Time: 2:38 PM



INSET MAP

NAD 1983 UTM Zone 8N

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
B	OCT 2012	ISSUED FOR COMMENT WITH SECOND DRAFT	LL	DW	PQ
A	AUG 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE: AS SHOWN
DATE: NOV 2012
DRAWN: LL
DESIGNED: KH
CHECKED: DW
APPROVED: AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

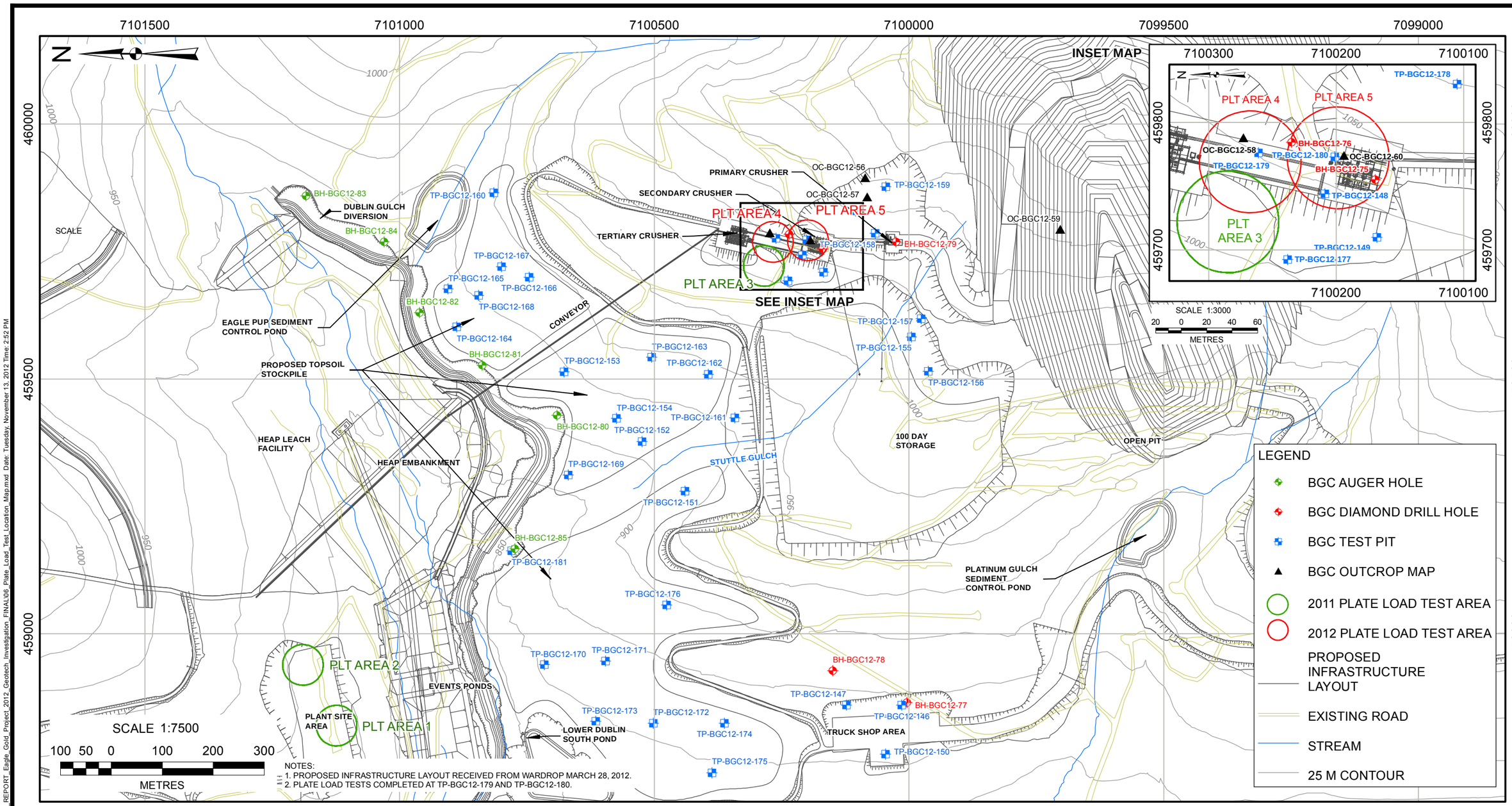
PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: TEST HOLE AND OUTCROP MAP LOCATION PLAN

PROJECT No.:	DWG No.:	REV.:
0792009	05	0

X:\Projects\0792 Victoria Gold\009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\05_Test_Hole_and_Outcrop_Map_Location_Plan.mxd Date: Tuesday, November 27, 2012 Time: 5:48 PM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
B	OCT 2012	ISSUED FOR COMMENT WITH SECOND DRAFT	LL	DW	PQ
A	AUG 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE:	AS SHOWN
DATE:	NOV 2012
DRAWN:	LL
DESIGNED:	KH
CHECKED:	DW
APPROVED:	AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

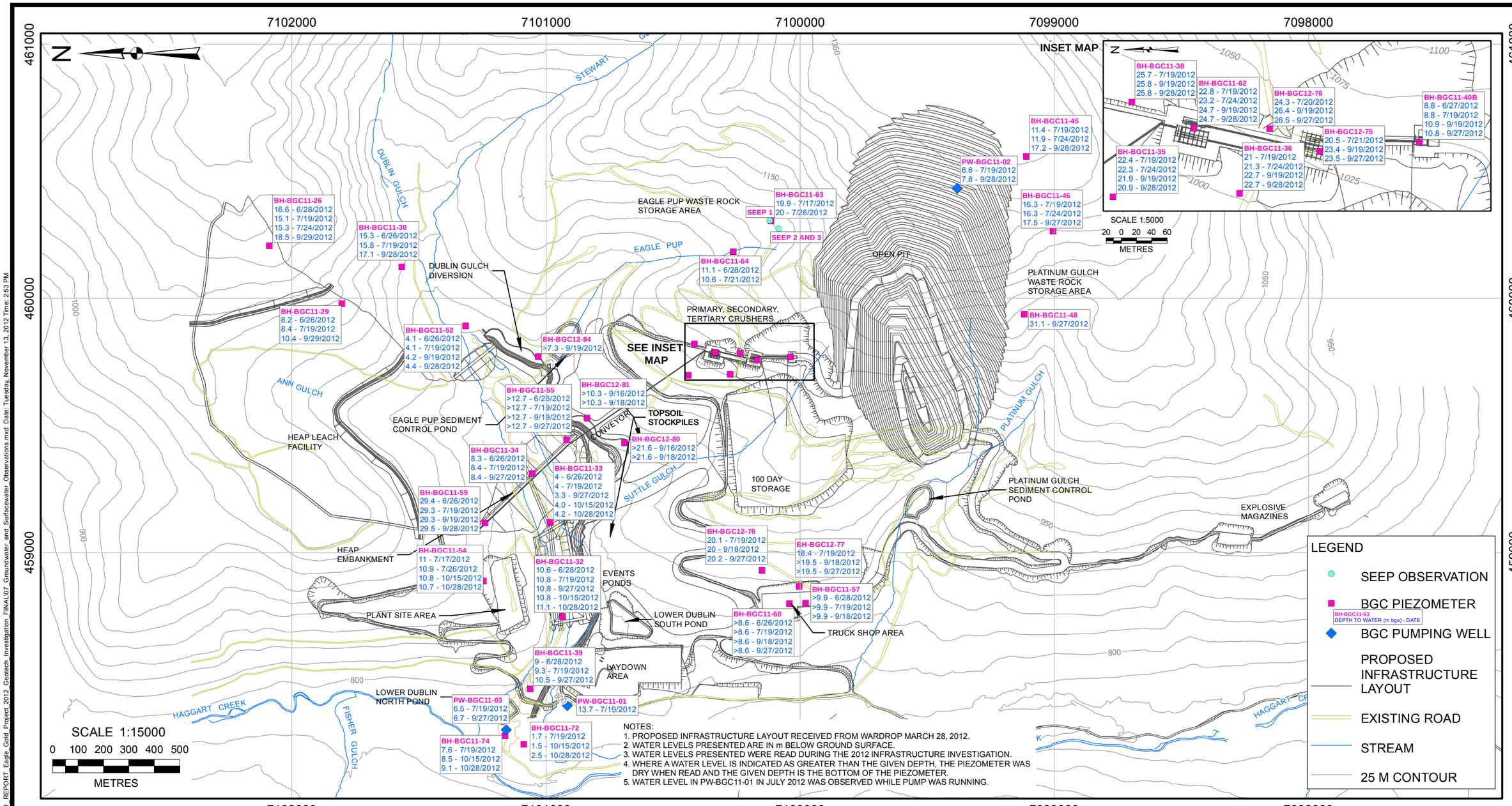
PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: PLATE LOAD TEST LOCATION MAP

PROJECT No.:	DWG No.:	REV.:
0792009	06	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012

X:\Projects\0792 Victoria Gold\009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\06_Plate_Load_Test_Location_Map.mxd Date: Tuesday, November 13, 2012 Time: 2:52 PM



X:\Projects\0792 Victoria Gold\0009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\07_Groundwater_and_Surfacewater_Observations.mxd Date: Tuesday, November 13, 2012 Time: 2:53 PM

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
B	OCT 2012	ISSUED FOR COMMENT WITH SECOND DRAFT	LL	DW	PQ
A	AUG 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE:	AS SHOWN
DATE:	NOV 2012
DRAWN:	LL
DESIGNED:	KH
CHECKED:	DW
APPROVED:	AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: GROUNDWATER AND SURFACE WATER OBSERVATIONS

PROJECT No.:	DWG No.:	REV.:
0792009	07	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012

7101500 7101000 7100500

459500

459000

N

HEAP LEACH FACILITY

HEAP EMBANKMENT

CONVEYOR

PROPOSED TOPSOIL STOCKPILE

STUTTLE GULCH

100 DAY STORAGE

EVENTS PONDS

PLANT SITE AREA

LOWER DUBLIN SOUTH POND

LAYDOWN AREA

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

SCALE 1:5000

0 100 200

METRES

NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP MARCH 28, 2012.

LEGEND

- 2012 PLACER TAILINGS SAMPLING LOCATION
- PROPOSED INFRASTRUCTURE LAYOUT
- EXISTING ROAD
- STREAM

NAD 1983 UTM Zone 8N

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
B	OCT 2012	ISSUED FOR COMMENT WITH SECOND DRAFT	LL	DW	PQ
A	AUG 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE:	1:5,000
DATE:	NOV 2012
DRAWN:	LL
DESIGNED:	KH
CHECKED:	DW
APPROVED:	AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT:
VICTORIA GOLD CORPORATION

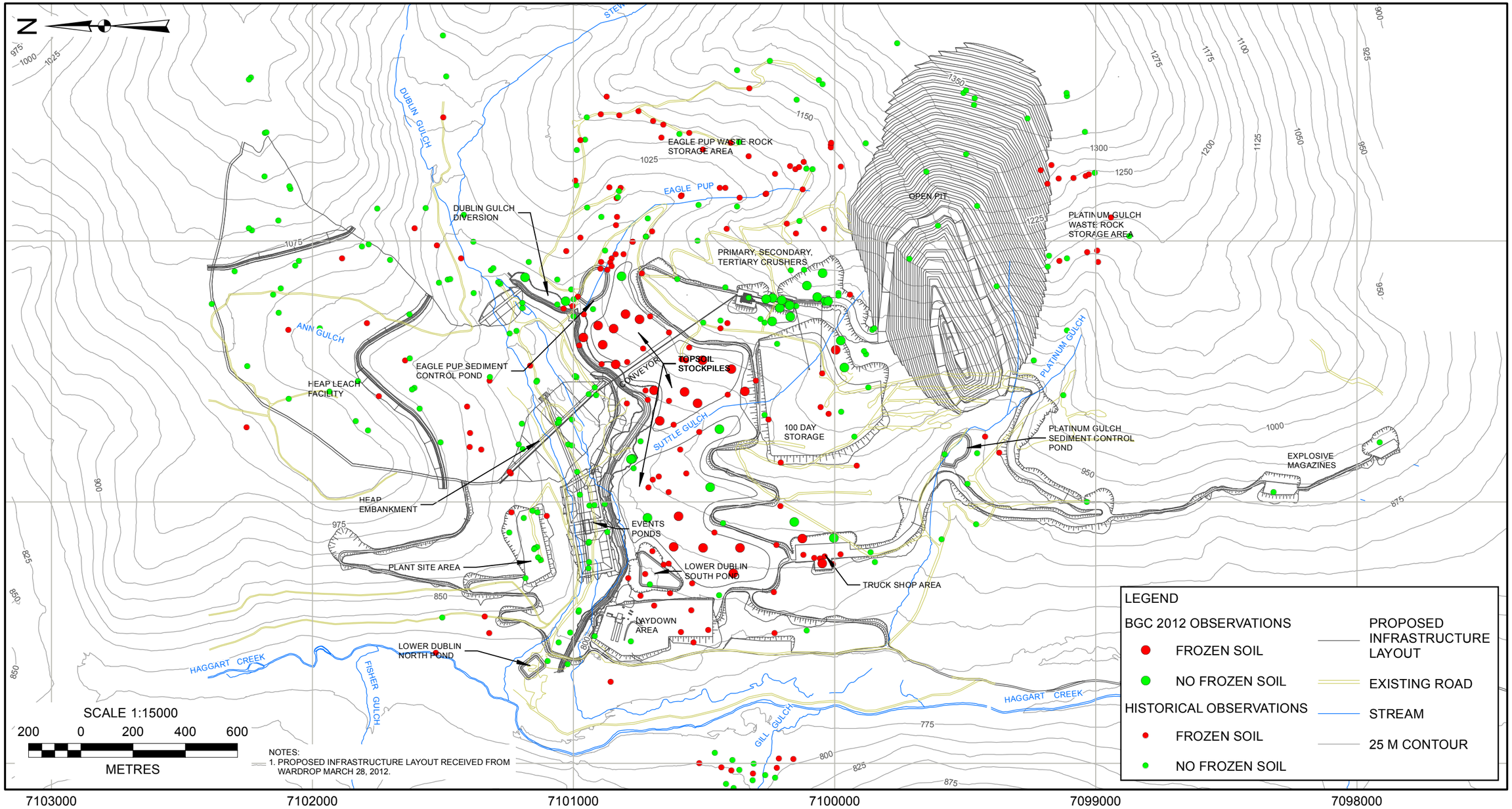
PROJECT:
EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
PLACER TAILINGS SAMPLING LOCATIONS

PROJECT No.:	DWG No.:	REV.:
0792009	08	0

X:\Projects\0792 Victoria Gold\009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\08_Placer_Tailings_Sampling_Locations.mxd Date: Tuesday, November 13, 2012 Time: 2:54 PM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012



NAD 1983 UTM Zone 8N

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
B	OCT 2012	ISSUED FOR COMMENT WITH SECOND DRAFT	LL	DW	PQ
A	AUG 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE:	1:15,000
DATE:	NOV 2012
DRAWN:	LL
DESIGNED:	KH
CHECKED:	DW
APPROVED:	AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: FROZEN GROUND OBSERVATIONS

PROJECT No.:	DWG No.:	REV.:
0792009	09	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012

X:\Projects\0792 Victoria Gold\009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\09_2011_Frozen_Ground_Observations.mxd Date: Tuesday, November 13, 2012 Time: 2:55 PM

APPENDIX A
TERMINOLOGY FOR OUTCROP MAPPING AND TEST HOLE LOGS

TERMINOLOGY FOR TEST HOLE AND OUTCROP MAPPING LOGS

1.0 INTRODUCTION

This appendix provides references used for describing the properties of soil and rock as they appear in the test hole and outcrop mapping logs included in Appendices B, C, and E and the descriptions of placer tailings material provided in Appendix N.

2.0 SOILS

This section presents the references used for the classification of soils as described in the logs. The presented descriptors have been used for logging of auger holes, the soil portion of diamond drill holes, test pits and the overburden part of the outcrops/cut slopes. References in this section have been organized so as to follow typical order of description used in BGC's standard practice. It should be noted that descriptors for fine and coarse grained soil material have been combined and presented in their general order of appearance so as to avoid redundancy. Material is described as a soil if it is a transported soil, or if it is rock weathered in place with weathering grade of highly weathered (W4, Table 14) or greater and with an Unconfined Compressive Strength (UCS) of no greater than R0, i.e. "Extremely Weak" (refer to Table 13).

Table 1. USCS Classification (ASTM D2487-11)

Major Divisions			Group Symbol	Group Name
Coarse grained soils more than 50% retained on No.200 (0.075 mm) sieve	Gravel > 50% of coarse fraction retained on No.4 (4.75 mm) sieve	Clean gravel < 5% smaller than #200 sieve	GW	Well graded gravel, fine to coarse gravel
			GP	Poorly graded gravel
		Gravel with > 12% fines	GM	Silty gravel
			GC	Clayey gravel
	Sand ≥ 50% of coarse fraction passes No.4 sieve	Clean sand	SW	Well graded sand, fine to coarse sand
			SP	Poorly-graded sand
		Sand with >12% fines	SM	Silty sand
			SC	Clayey sand
Fine grained soils more than 50% passes No.200 sieve	Silt and clay liquid limit < 50	Inorganic	ML	Silt
			CL	Clay
		Organic	OL	Organic silt, organic clay
	Silt and clay liquid limit ≥ 50	Inorganic	MH	Silt of high plasticity
			CH	Clay of high plasticity
		Organic	OH	Organic clay, organic silt
Highly organic soils			Pt	Peat

Table 2. Classification by Particle Size (ASTM D4287-11)

	Particle Size		US Standard Sieve	
Name	**Minimum (mm)**	**Maximum (mm)**	**Retained**	**Passing**
Boulders	300	> 300	12 inch	-
Cobbles	75	300	3 inch	12 inch
Gravel:				
Coarse	19	75	0.75 inch	3 inch
Fine	4.75	19	No. 4	0.75 inch
Sand:				
Coarse	2	4.75	No. 10	No. 4
Medium	0.43	2	No. 40	No. 10
Fine	0.075	0.43	No. 200	No. 40
Fines (silt or clay)	< 0.075	0.075	-	No. 200

Table 3. Proportion of Minor Components by Weight (CFEM 2006)

Proportion of Minor Components by Weight	
“and”	> 35%
“y/ey”	20% - 35%
“some”	10% - 20%
“trace”	1% - 10%



Figure 1. Gradation Classification

Table 4. Classification for Density of Granular Soils (After CFEM 2006)

Density of Granular Soils	
Description	**SPT "N"**
V. Loose	0 – 4
Loose	4 – 10
Compact	10 – 30
Dense	30 – 50
V. Dense	> 50

Table 5. Classification for Consistency of Fine Soils (After CFEM 2006)

Strength of Cohesive Soils				
Grade	**Description**	**Field Identification**	**SPT "N"**	**Undrained Shear Strength (kPa)**
S1	Very soft	Easily penetrated several centimeters by fist	< 2	< 12
S2	Soft	Easily penetrated several centimeters by thumb	2 – 4	12 – 25
S3	Firm	Can be penetrated several centimeters by thumb with moderate effort	4 – 8	25 – 50
S4	Stiff	Can be penetrated by thumb but penetrated only with great effort	8 – 15	50 – 100
S5	Very stiff	Readily indented by thumbnail	15 – 30	100 – 200
S6	Hard	Indented with difficulty by thumbnail	> 30	> 200

Table 6. Classification for Angularity of Coarse Grained Particles (ASTM D2488-09a)

Angularity of Coarse-Grained Particles	
Description	**Criteria**
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular	Particles are similar to angular description but have rounded edges
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges
Rounded	Particles have smoothly curved sides and no edges

Table 7. Classification for Particle shape (ASTM D2488-09a, CFEM 2006)

Particle Shape	
Equidimensional	Particle width, length and thickness are approximately the same
Flat	Particle width/thickness > 3
Elongated	Particles with length/width > 3
Flat and elongated	Particles meet criteria for both flat and elongated

Table 8. Classification for Plasticity of Soils (ASTM 2487-11, ASTM D2488-09a, CFEM 2006)

Plasticity of Cohesive Soils			
Description	**Silt**	**Clay**	**Criteria**
High	$W_L > 50$	$W_L > 50$	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit
Medium	-	$30 < W_L < 50$	The thread is easy to roll and not much time is required to reach the plastic limit. The lump crumbles when drier than the plastic limit.
Low	$W_L < 50$	$W_L < 30$	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Non-Plastic	NP	-	A 1/8 inch (3mm) thread cannot be rolled at any water content.

Where: W_L = Liquid Limit (%)

Table 9. Classification for Cementation of Soils (ASTM D2488-09a)

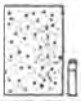
Cementation	
Description	**Criteria**
Weak	Crumbles or breaks with handling or little finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

Table 10. Classification for Soil Structure

Description	Criteria
Homogeneous	Same color and appearance throughout
Matrix Supported	Strength depends on matrix, more matrix than clasts
Clast Supported	Strength depends on clasts, more clasts than matrix

Table 11. Classification for Description of Frozen Ground (ASTM D4083-89)

ICE NOT VISIBLE

GROUP SYMBOL	SUBGROUP SYMBOLS	SUBGROUP DESCRIPTION	
N	Nf	Poorly bonded or friable	
	Nbn	No excess ice, well bonded	
	Nbe	Excess ice, well bonded	

VISIBLE ICE LESS THAN 2.5cm THICK

V	Vx	Individual ice crystals or inclusions	
	Vc	Ice coatings on particles	
	Vr	Random or irregularly oriented ice formations	
	Vs	Stratified or distinctly oriented ice formations	

VISIBLE ICE GREATER THAN 2.5cm THICK

ICE	ICE + soil type	Ice with soil inclusions	
	ICE	Ice without soil inclusions	

(Modified from Guide to Field Description of Permafrost for Engineering Purposes, NRC. Technical Memorandom 79)

NOTE 1) Dual symbols are used to indicate borderline or mixed ice classifications

2) Visual estimates of ice content as indicated or borehole logs are ± 5%

LEGEND  Soil ■ or Ice

3.0 ROCK

Rock logs were generated to present collected information for any untransported rock material that was described as highly weathered or less (≤W4, Table 14) and of an Unconfined Compressive Strength (UCS) greater than extremely weak (R0, Table 13). The following rock descriptors were used, where applicable, for the diamond drillholes core logging, for the bottom of various test pits and for the outcrops/cut slopes.

The general organization of this section follows the BGC standard logging order for rock descriptions and contains details of measurements that apply to rock mass description and cut slope logging.

Table 12. Classification for Grain Size: describes the grains size(s) present in the rock (ISRM 1981)

Term	Particle Size
Very Coarse	> 60 mm
Coarse	2 – 60 mm
Medium	0.06 – 2 mm
Fine	0.002 – 0.06 mm
Very Fine	< 0.002 mm

Table 13. Unconfined Compressive Strength / Hardness Classification for Rock (ISRM 1977)

	Grade	Description	Field Identification	UCS (MPa)	Point Load Index (MPa)
Rock Hardness	R6	Extremely Strong	Specimen can only be chipped with flat end geological hammer.	> 250	> 10
	R5	Very Strong	Specimen requires many blows with flat end geological hammer to fracture.	100-250	4-10
	R4	Strong	Specimen requires more than one blow of flat end geological hammer to fracture.	50-100	2-4
	R3	Medium Strong	Cannot be scraped or peeled with pocket knife; can be fractured with single firm blow of flat end geological hammer.	25-50	1-2
	R2	Weak	Can be peeled by a pocket knife with difficulty; shallow indentation made by firm blow with point geologic hammer.	5-25	-
	R1	Very Weak	Crumbles under firm blows with point of geological hammer.	1-5	-
	R0	Extremely Weak	Indented by thumbnail.	< 1	-

Table 14. Classification for Weathering Grades of Rock (After ISRM 1981)

Grade	Description	Field Identification
A1 / W1	Fresh and Unweathered	Parent rock showing no discoloration, loss of strength or any other weathering effects.
		Strength may be increased by some alteration types.
A2 / W2	Slightly Weathered or Altered	Rock may be slightly discolored, particularly adjacent to discontinuities, which may be open and will have slightly discolored surfaces; the intact rock may be weaker than the fresh rock.
A3 / W3	Moderately Weathered or Altered	Rock is discolored; discontinuities may be open and have discolored surfaces with alteration starting to penetrate inwards; intact rock is noticeably weaker than W1/A1 rock of the same unit.
A4 / W4	Highly Weathered or Altered	Rock is discolored; discontinuities may be open and have discolored surfaces, and the original fabric of the rock near the discontinuities may be altered; alteration penetrates deeply inwards. The ratio of original rock to weathered rock should be estimated where possible; at least 50% of the rock has been weathered to soil.
A5 / W5	Completely Weathered or Altered	Rock is discolored and decomposed/ friable or changed completely to a soil, but original fabric is visible. The properties of the soil depend in part on the nature of the parent rock.
A6 / W6	Residual Soil	Original rock fabric is completely destroyed.

Table 15. Classification for Description of Discontinuity Aperture in Rock (ISRM 1977)

Aperture	Description	
< 0.1 mm	Very tight	"Closed" features
0.1 – 0.25 mm	Tight	
0.25 – 0.5 mm	Partly open	
0.5 – 2.5 mm	Open	"Gapped" features
2.5 – 10 mm	Moderately wide	
> 10 mm	Wide	
1 – 10 cm	Very wide	"Open" features
10 – 100 cm	Extremely wide	
1 m	Cavernous	

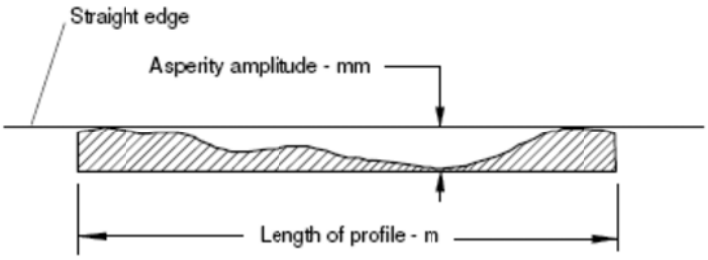


Figure 2. Descriptive Criteria for Joint Roughness Coefficient (JRC)

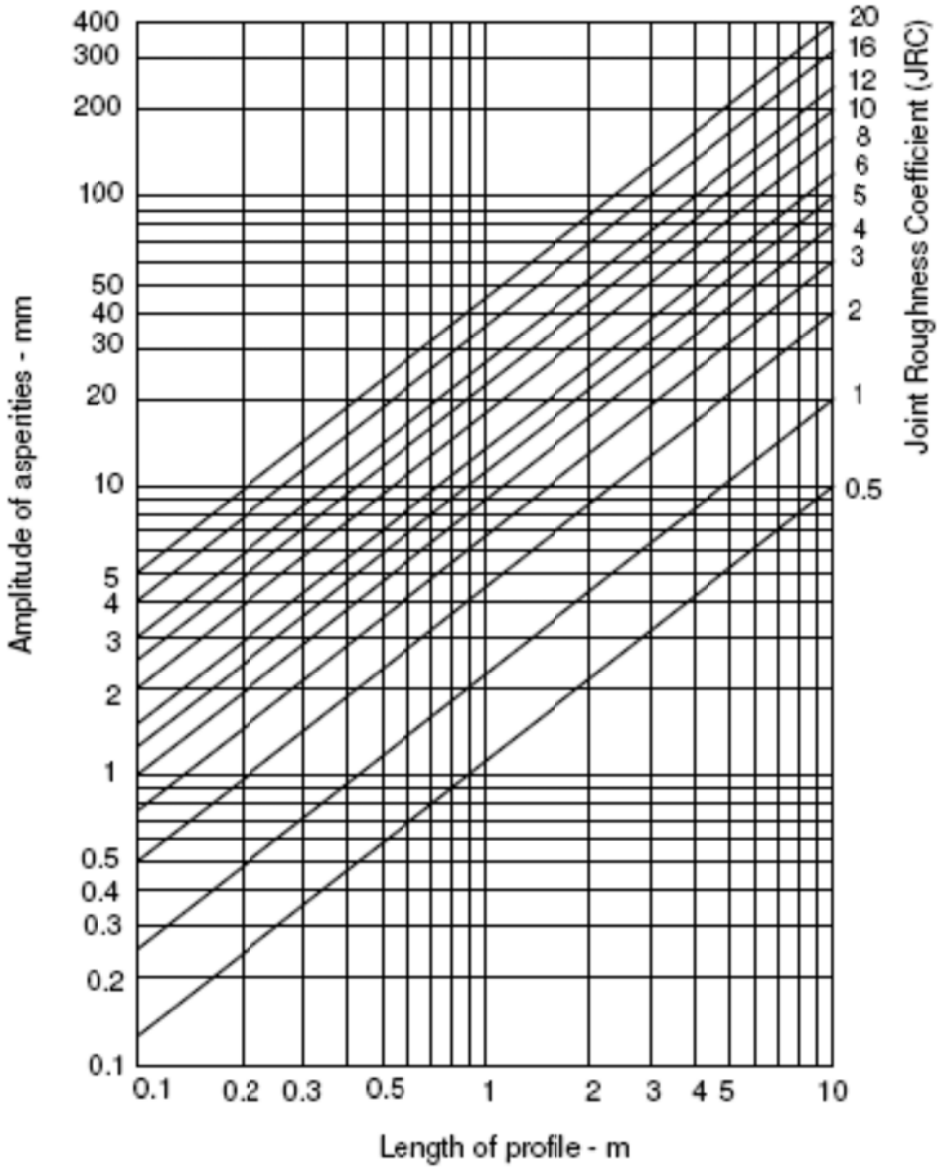


Figure 3. Chart for Determination of the Joint Roughness Coefficient (JRC) in Rock (Barton 1974)

Table 16. Classification for Discontinuity Spacing in Rock (ISRM 1977)

Description	Discontinuity Spacing
Extremely Close Spacing	< 20 mm
Very Close Spacing	20 – 60 mm
Close Spacing	60 – 200 mm
Moderate Spacing	200 – 600 mm
Wide Spacing	600 – 2000 mm
Very Wide Spacing	2000 – 6000 mm
Extremely Wide Spacing	> 6000 mm

Table 17. Classification for Persistence of Structural Set in the Rock Mass (ISRM 1977)

Description	Discontinuity Persistence
Very Low Persistence	< 1 m
Low Persistence	1 – 3 m
Medium Persistence	3 – 10 m
High Persistence	10 – 20 m
Very High Persistence	> 20 m

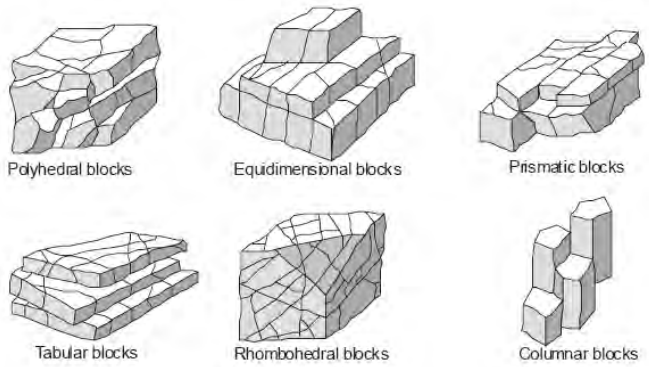


Figure 4. Classification for Block Shape in the Rock Mass Description (Dearman 1991)

Table 18. Block Shape in the Rock Mass Description (Dearman 1991)

Type of Block	Jointing Characteristics
Polyhedral blocks	Irregular jointing without arrangement into distinct sets, and of small joints
Tabular blocks	One dominant set of parallel joints, for example bedding planes, with other non-persistent joints; thickness of blocks much less than length or width
Prismatic blocks	Two dominant sets of joints, approximately orthogonal and parallel, with a third irregular set; thickness of blocks much less than length or width
Equidimensional blocks	Three dominant set of joints, approximately orthogonal, with occasional irregular joints, giving equidimensional blocks
Rhomboidal blocks	Three (or more) dominant mutually oblique sets of joints, giving oblique-shaped, equidimensional blocks
Columnar blocks	Several, usually more than three, sets of continuous, parallel joints; length much greater than other dimensions

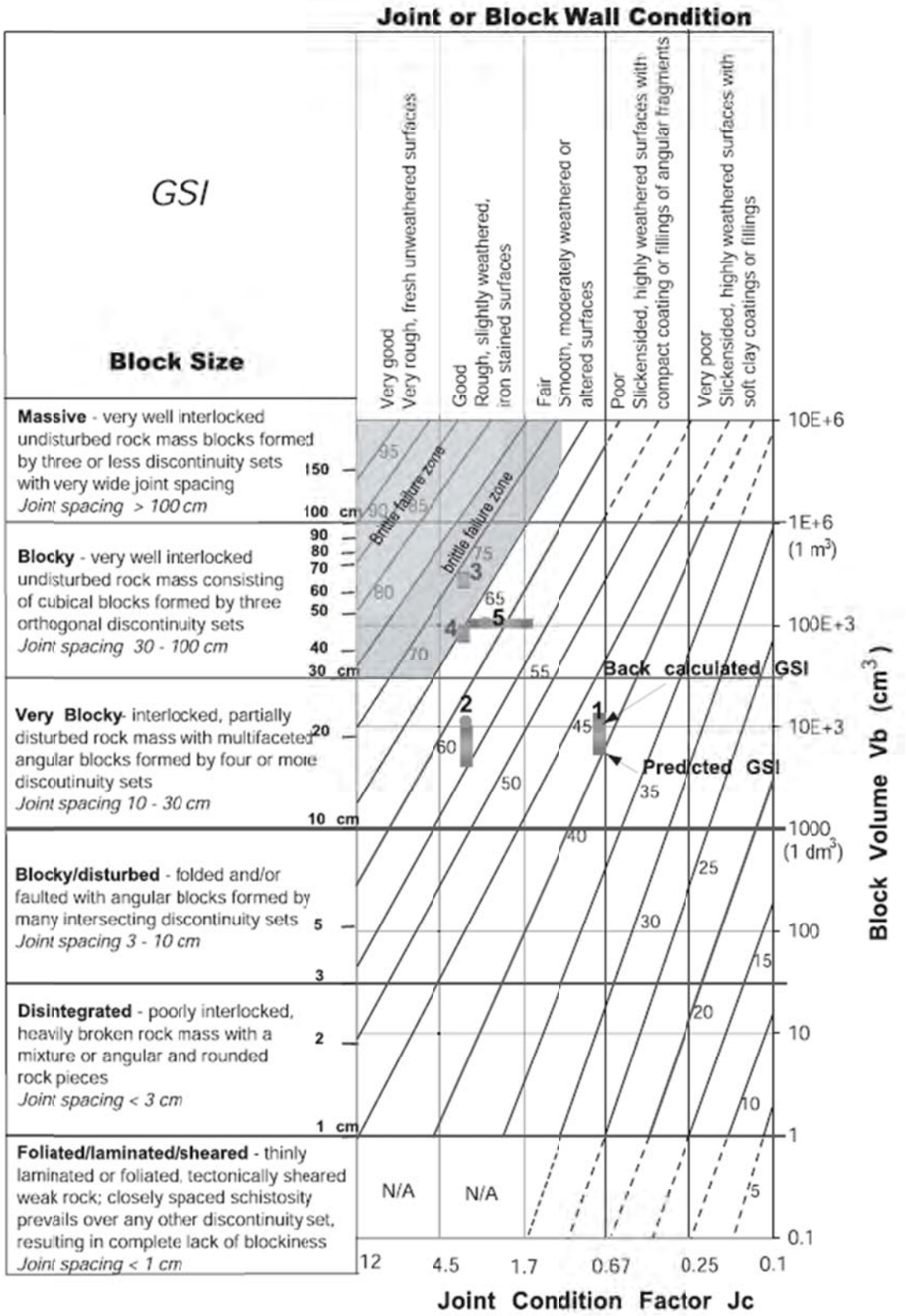


Figure 5. Chart for Geological Strength Index (GSI) Determination (Cai et al. 2004)

Rock Quality Designation (RQD) (Deere and Deere 1989):

$$RQD = \frac{\Sigma \text{ Length of core pieces} > 10 \text{ cm}}{\text{Total length of core run}} \times 100\%$$

Fracture Frequency (m): Fracture frequency is the average number of fractures per metre. This number is calculated from the number of natural discontinuities counted in each interval. When fault infill or broken rock zones were encountered, one discontinuity for each 10 mm was counted. When intervals were found to have closely spaced discontinuities too numerous to count, (discs of core or rubble) the length of the zone was divided by the average particle size to obtain the number of discontinuities, for example a 30 cm zone with average 6 cm diameter rock fragments would count as 5 discontinuities.

Average Joint Condition: A numeric index that summarizes the typical surface properties and infilling of discontinuities within an interval.

Table 19. Joint Condition

RATING	Condition of Discontinuity (RMR 1976)	BGC Notes
25	Very rough surface; not continuous; no separation; unweathered wall rock	Includes intervals with no discontinuities; JRC > 16
20	Slightly rough surfaces; separation <1 mm; slightly weathered walls	> R3 wall rock; interlocking discontinuities with 8 < JRC < 14
12	Slightly rough surfaces; separation <1 mm; highly weathered walls	< R3 wall rock and slightly rough OR > R3 planar/smooth surfaces with no infill
6	Slickensided surfaces or gouge < 5 mm thick or separation 1 to 5 mm; continuous	Veins ≤ R1 or Mohs # ≤ ~3 included as "infilling"
0	Soft gouge >5mm or separation > 5 mm; continuous joints	Veins ≤ R1 or Mohs # ≤ ~3 included as "infilling"

1. JRC (Joint Roughness Coefficient) is a numerical index representing the roughness of individual discontinuities, ranging from 1 (smooth surfaces) to 20 (rough surfaces).
2. Mohs is a measure of mineral hardness based on the ability of one mineral to scratch another, ranging from 1 (soft minerals such as talc) to 10 (hard minerals such as diamond).

Joint Wall Compressive Strength (JWCS): This parameter describes the strength of the walls of the discontinuity, following the strength grades outlined in Table 13.

Rock Mass Rating (RMR, Bieniawski, 1976):

The rock mass rating is a numeric index that represents the overall quality of the rock. It takes into account the intact strength of the rock, the RQD, the fracture frequency, the joint condition and ground water to generate a numeric index to indicate overall rock quality.

The overall quality of rock near surface at Eagle Gold is poor; as a result, the drilling process can adversely affect recovery. Where recovery was less than 50% RMR values are not

presented as the RMR would be based on information that represents less than 50% of the interval.

Cut Slopes and Outcrops:

Slope Angle: average inclination angle to a horizontal plane.

Slope Direction: average dipping direction of the face of the cut slope or outcrop.

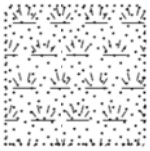
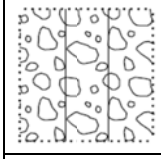
Dip: inclination angle of a rock structural set along the steepest line to a horizontal plane.

Dip direction: azimuth of the dip line, clockwise from North, local declination taken into account (23.5°E).

4.0 GRAPHIC SYMBOLS USED ON TEST HOLE LOGS

Graphic symbols are used on test hole logs to indicate the type of soil or rock encountered while drilling or test pitting (Table 20). They are also used to illustrate borehole installations (Table 21).

Table 20. Soil and Rock Graphic Symbols

Symbol	Material Type (UCSC classification)
	Organics/Rootmat
	Boulders and Cobbles
	Well graded gravel (GW)
	Poorly graded gravel (GP)
	Gravel with greater than 12% fines (GM)
	Well graded sand (SW)

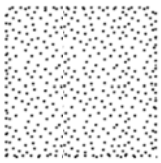
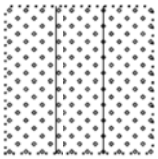
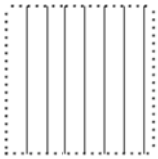
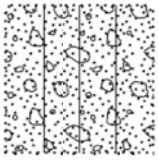
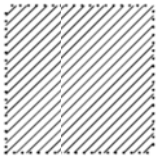
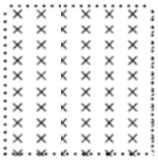
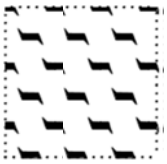
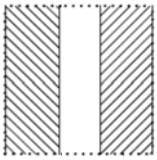
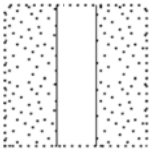
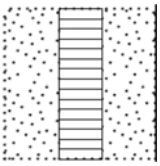
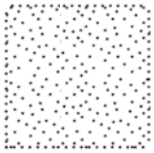
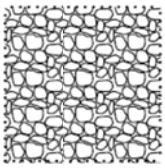
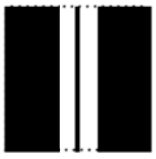
Symbol	Material Type (UCSC classification)
	Poorly graded sand (SP)
	Sand with greater than 12% fines (SM)
	Low plastic silt with less than 20% sand or gravel (ML)
	Low plastic silt with greater than 20% sand or gravel (ML)
	Low plastic clay (CL)
	Metasedimentary rock
	Granodiorite
	Fault zone within rock
	No recovery

Table 21. Installation Graphic Symbols

Symbol	Installation Type
	PVC in grout (bentonite and cement)
	PVC with bentonite seal
	Solid PVC in sand pack
	Slotted PVC in sand pack
	Sand pack
	Slough
	Full grouted (bentonite and cement)
	Thermistor bead in bentonite seal
	Thermistor cable in bentonite seal

5.0 REFERENCES

American Society for Testing and Materials. Standard D4083-89 (Reapproved 2007): Standard Practice for Description of Frozen Soils (Visual-Manual Procedure). Developed by Sub-Committee D18.03. West Conshohocken, PA.

American Society for Testing and Materials. Standard D2487-11: Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). West Conshohocken, PA.

American Society for Testing and Materials. Standard D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). West Conshohocken, PA.

Barton, N.R., Lien, R. and Lunch, J. 1974. Engineering classification of rock masses for the design of tunnel support. Rock Mechanics and Rock Engineering. 6 (4): 189-236.

Bieniawski, Z.T. 1976. Engineering classification of jointed rock masses. Trans South African Institute of Civil Engineers. 15, 335-344.

Cai, M., P.K. Kaiser, H. Uno, Y. Tasaka, M. Minami. 2004. International Journal of Rock Mechanics& Mining Sciences 41, 3-19.

Canadian Geotechnical Society 2006. Canadian Foundation Engineering Manual 4th Edition. 488 pp.

Deere D., Deere, D. 1989. Rock Quality Designation after 20 years. US Army Corp. of Engineers. 91 pp.

Dearman, W.R. 1991 Engineering Geological Mapping. Butterworth-Heinemann. 387 pp.

International Society of Roc Mechanics (ISRM). 1977. International Society for Rock Mechanics Commission of Standardization of Laboratory and Field Tests: Suggested Methods for the Quantitative Description of Discontinuities in Rock Masses. Committee on Field Tests, Document No. 4, pp. 319-368.

International Society of Roc Mechanics (ISRM). 1981. International Society for Rock Mechanics: Commission of Classification of Rocks and Rock Masses, Basic Geotechnical Description of Rock Masses. International Journal of Rock Mechanics, Mineral Science, and Geomechanics. Vol. 18, pp. 85-110.

APPENDIX B
OUTCROP MAPPING

OUTCROP MAPPING

Table B- 1. Summary of Outcrop Maps

Outcrop	UTM Coordinates (NAD 83)[1,2]		Rock Type	Strength Grade (R)[3]	Weathering Grade (W)[4]	Average Block Size (mm)	Average GSI[5]
	Easting (m)	Northing (m)					
OC-BGC12-56	459895	7100086	Quartzite	4	2	300	50
OC-BGC12-57	459858	7100082	Quartzite	4	2	300	50
OC-BGC12-58	459788	7100273	Quartzite	3	2	50	30
OC-BGC12-59	459794	7099703	Quartzite	4	2	100	50
OC-BGC12-60	459774	7100194	Quartzite	3	2	100	40

Notes:

1. Location from handheld GPS measurements.
2. Coordinates in UTM NAD 83, Zone 8N.
3. Strength Grade for rock (after ISRM 1977) – See Appendix A
4. Weathering Grade for rock (after ISRM 1981) – See Appendix A.
5. Geological Strength Index – See Appendix A.

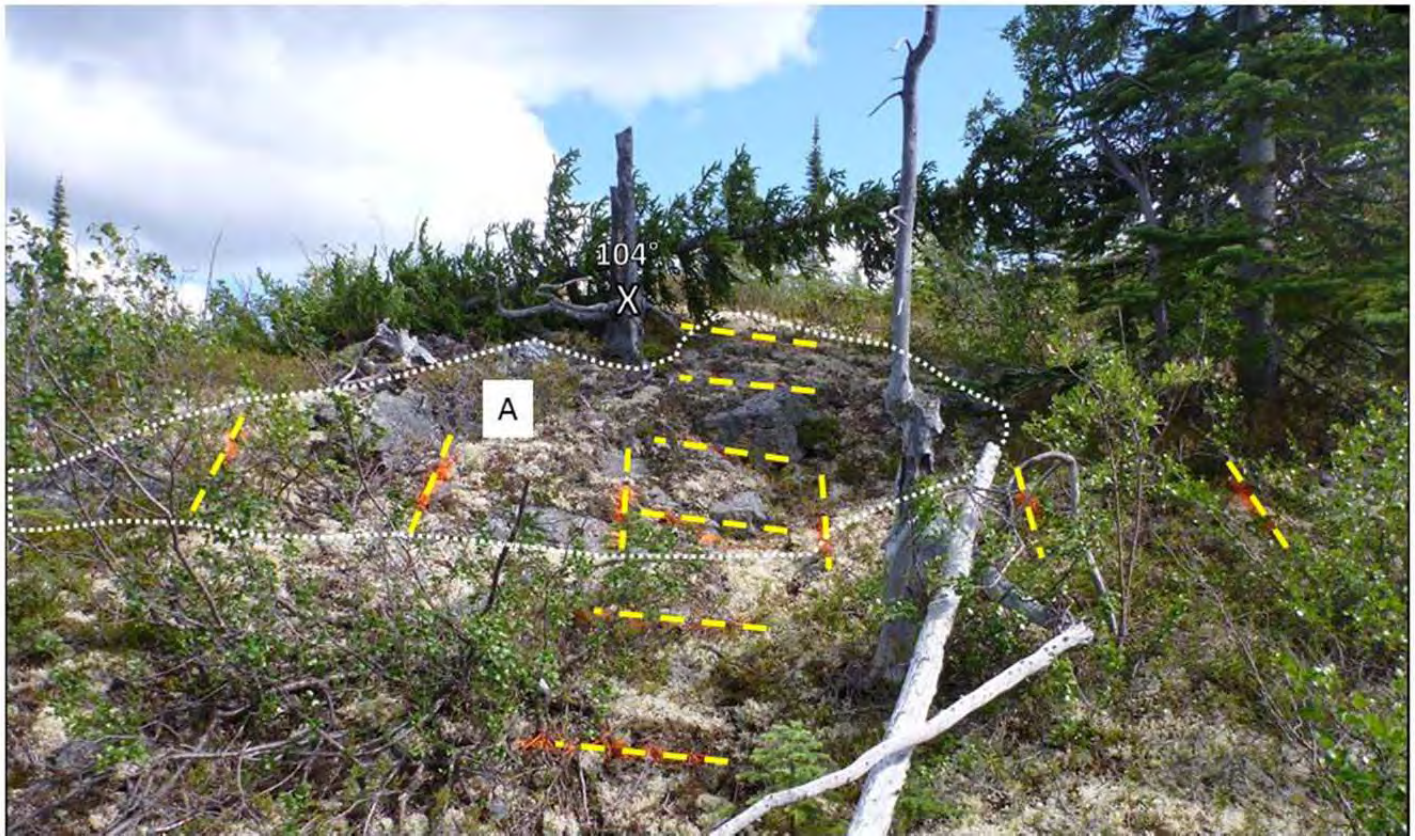
Outcrop OC-BGC12-56

Location: Stuttle Gulch
Facility: Crushers
Outcrop type: Natural

Northing: 7100086
Easting: 459895
Elevation: 1105 m
Survey type: Handheld GPS

Slope Angle: 22°
Slope Direction: 284°
Date logged: 7/25/2012
Logged by: BMM

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Dark grey, fine-grained, QUARTZITE with slight orange-yellow staining. Slightly weathered (W1.5-W2), strong (R4). Prismatic blocks 20-50 cm formed by three main sets. GSI structure = Very blocky, GSI surface = Fair-Good, GSI range = 50-55.

Outcrop OC-BGC12-56

PHOTO OF STRUCTURE



DISCONTINUITY TABLE

Set	Orientation Range[1]		Aperture (mm)	Infill	JRC	JWCS	Spacing (m)	Persistence (m)	Type[2]
	Dip (°)	DD (°)							
1	24-29	262-302	0-1	None	12	R4	0.2	2+	JO
2	67-81	094-101	0-1	None	12	R4	0.9	1+	J
3	82-83	164-170	0-1	None	6	R4	0.4	2+	J

Notes:
1. DD = Dip direction
2. JO = Joint along foliation; J = Joint

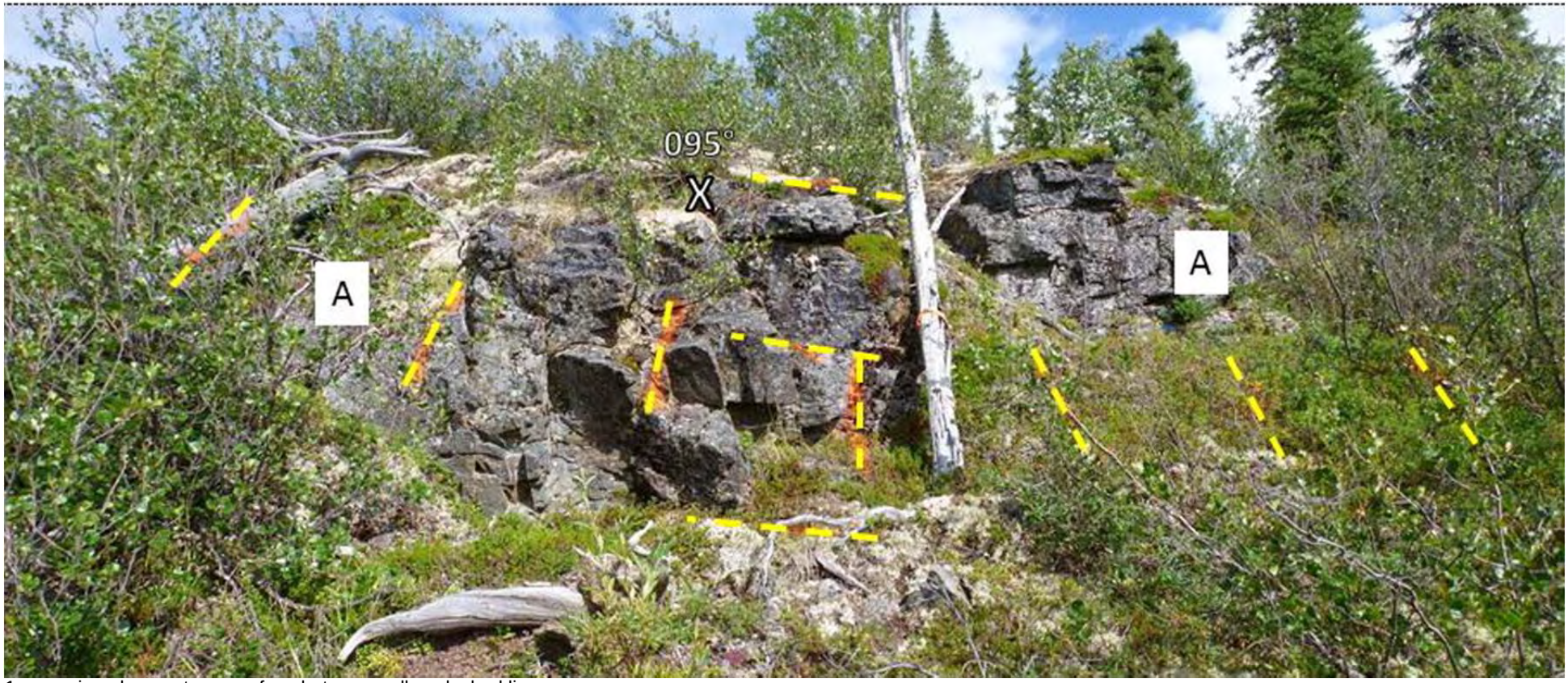
Outcrop OC-BGC12-57

Location: Stuttle Gulch
Facility: Crushers
Outcrop type: Natural

Northing: 7100082
Easting: 459858
Elevation: 1103 m
Survey type: Handheld GPS

Slope Angle: 26°
Slope Direction: 275°
Date logged: 7/25/2012
Logged by: BMM

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Dark grey, fine-grained, QUARTZITE with slight orange-yellow staining. Slightly weathered (W1.5-W2), strong (R4). Prismatic blocks 20-50 cm formed by three main sets. GSI structure = Very blocky, GSI surface = Good, GSI range = 50-55.

Outcrop OC-BGC12-57

PHOTO OF STRUCTURE



DISCONTINUITY TABLE

Set	Orientation Range[1]		Aperture	Infill[2]	JRC	JWCS	Spacing	Persistence	Type[3]
	Dip (°)	DD (°)	(mm)				(m)	(m)	
1	32-36	264-274	0-1	None	12-16	R4	0.2	1+	JO
2	58-78	099-110	0-2	Cx	10-12	R4	0.2	1+	J
3	75-85	154-162	0-2	None	12-16	R4	0.3	2+	J

Notes:
1. DD = Dip direction
2. Cx = Crushed rock
3. JO = Joint along foliation; J = Joint

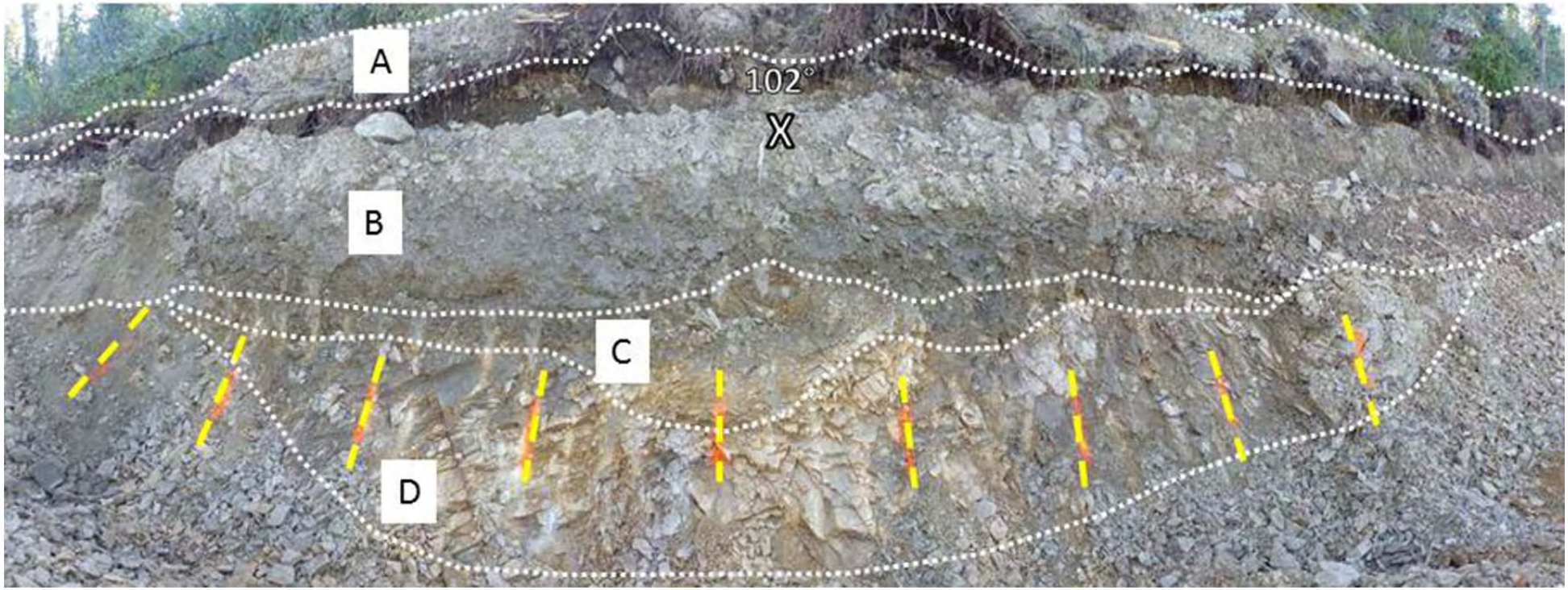
Outcrop OC-BGC12-58

Location: Stuttle Gulch
Facility: Crushers
Outcrop type: Man-made (road cut)

Northing: 7100273
Easting: 459788
Elevation: 1033 m
Survey type: Handheld GPS

Slope Angle: 70°
Slope Direction: 282°
Date logged: 7/26/2012
Logged by: BMM

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Moss, root mat, and organic silt. [TOPSOIL]

B: GRAVEL (GM): Fine to coarse, some sand, some silt, trace cobbles, trace boulders, angular, maximum particle size 300 mm, dark grey, moist. [COLLUVIUM]

C: Dark orangish-brownish grey, fine-grained, QUARTZITE. Moderately to highly weathered (W3-W4), very weak (R1). GSI structure = Disintegrated, GSI surface = Very poor, GSI range = <15.

D: Dark orangish-brownish grey, fine-grained, QUARTZITE. Slightly weathered (W2), medium strong (R3). Prismatic blocks 5-10 cm formed by 3 main sets. GSI structure = Extremely blocky, GSI surface = Fair, GSI range = 30-35.

Outcrop OC-BGC12-58

PHOTO OF STRUCTURE



DISCONTINUITY TABLE

Set	Orientation Range[1]		Aperture (mm)	Infill	JRC	JWCS	Spacing (m)	Persistence (m)	Type[2]
	Dip (°)	DD (°)							
1	34-38	283-298	0-1	None	6-8	R3	0.02-0.05	0.5+	JO
2	66-72	086-110	0-1	None	10	R3	0.1	2	J
3	75-77	154-174	0-1	None	10	R3	0.15	1.5+	J

Notes:
1. DD = Dip direction
2. JO = Joint along foliation; J = Joint

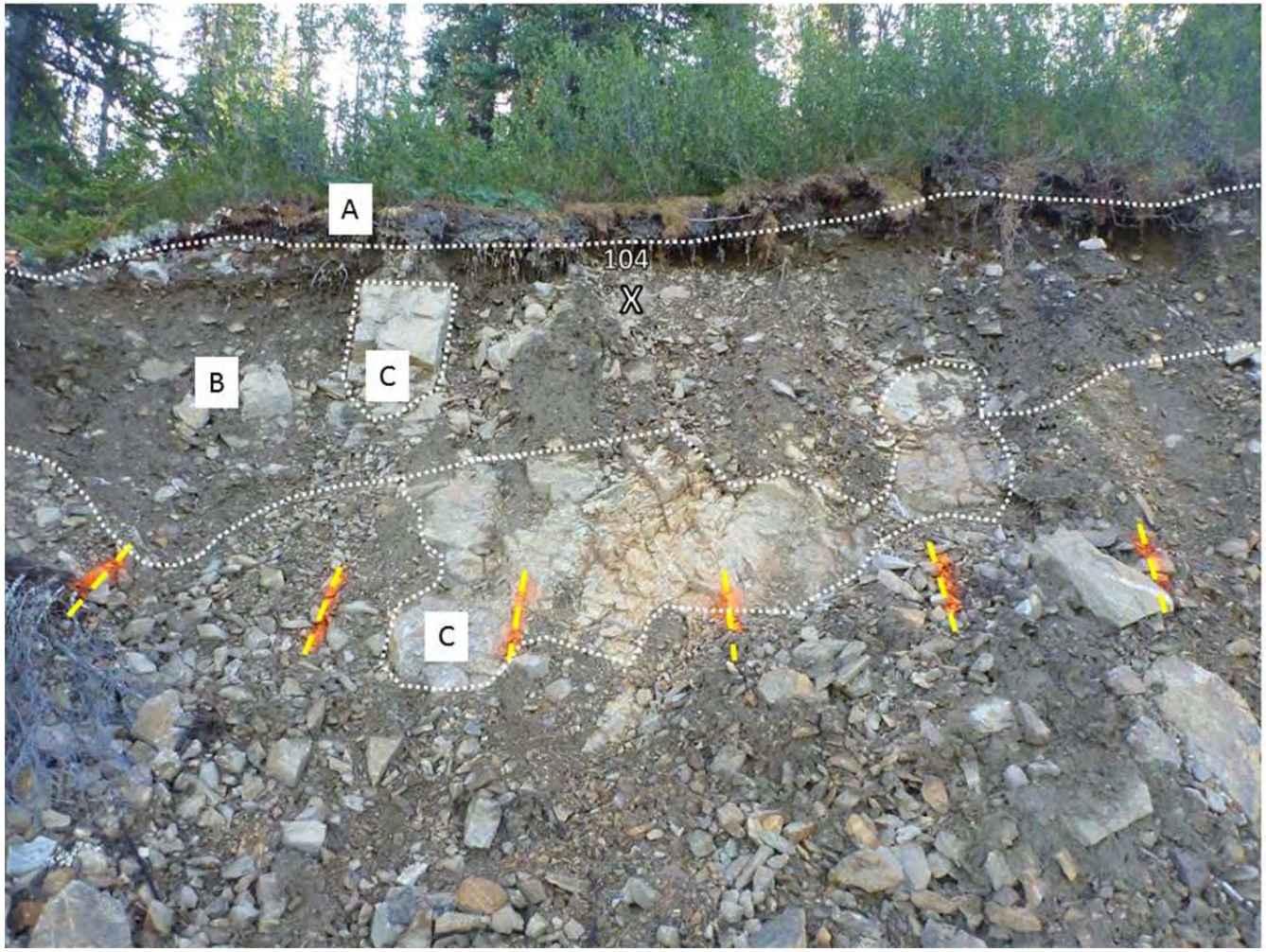
Outcrop OC-BGC12-59

Location: Stuttle Gulch
Facility: Pit Area
Outcrop type: Man-made (road cut)

Northing: 7099703
Easting: 459794
Elevation: 1114 m
Survey type: Handheld GPS

Slope Angle: 42°
Slope Direction: 284°
Date logged: 7/26/2012
Logged by: BMM

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Moss, root mat, and organic silt. [TOPSOIL]

B: GRAVEL (GM): Fine to coarse, some sand, some silt, trace cobbles, angular, maximum particle size 200 mm, dark grey, moist. [COLLUVIUM]

C: Dark orangish-yellowish grey, fine-grained, siliceous QUARTZITE with trace quartz stringers. Slightly weathered (W1.5-W2), strong (R4-R4.5). Equidimensional to prismatic blocks 10-20 cm formed by 3 main sets. GSI structure = Very blocky, GSI surface = Good, GSI range = 45-55.

Outcrop OC-BGC12-59

PHOTO OF STRUCTURE



DISCONTINUITY TABLE

Set	Orientation Range[1]		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type[2]
	Dip (°)	DD (°)	(mm)				(m)	(m)	
1	32-40	266-284	0-1	None	8	R4	0.1-0.15	1+	JO
2	53-58	100-108	0-1	None	8	R4	0.1-0.2	2+	J
3	82-86	152-157	0-1	None	8	R3	0.15	2	J

Notes:
1. DD = Dip direction
2. JO = Joint along foliation; J = Joint

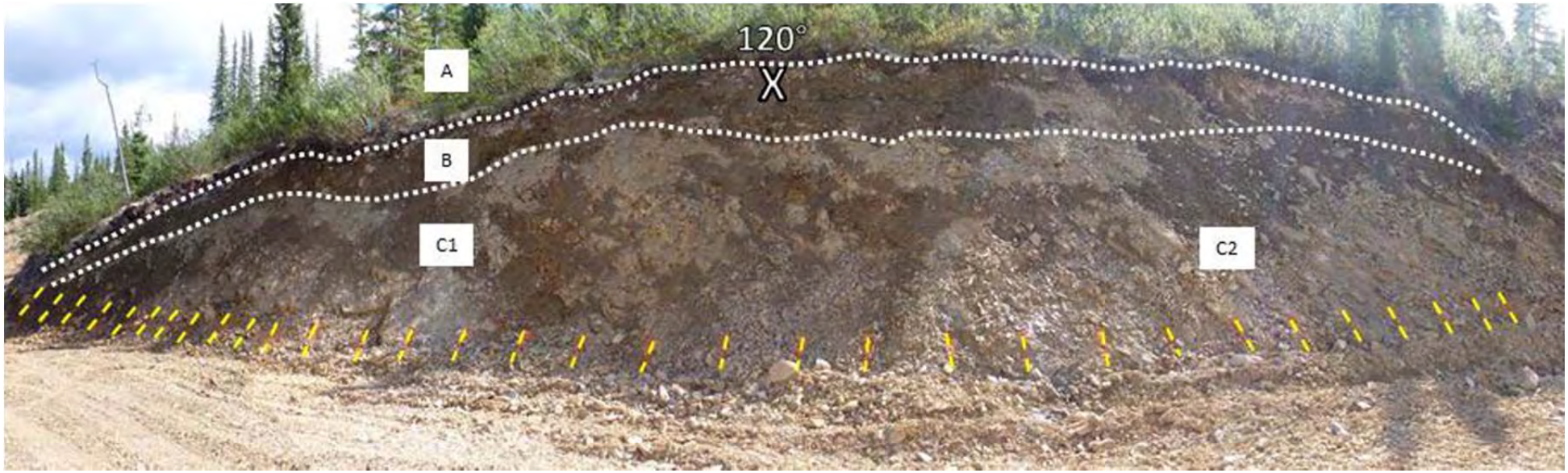
Outcrop OC-BGC12-60

Location: Stuttle Gulch
Facility: Crushers
Outcrop type: Man-made (road cut)

Northing: 7100194
Easting: 459774
Elevation: 1051 m
Survey type: Handheld GPS

Slope Angle: 40°
Slope Direction: 300°
Date logged: 7/26/2012
Logged by: BMM

PHOTO OF OUTCROP



1m spacing along outcrop surface between yellow dashed lines.

DESCRIPTION OF MATERIALS

A: Moss, root mat, and organic silt and sand. [TOPSOIL]

B: SAND (SM): Fine to coarse, gravelly, some silt, trace cobbles, maximum particle size 250 mm, dark grey, moist. [COLLUVIUM]

C1: Dark orangish-yellowish grey, fine-grained, QUARTZITE. Slightly weathered (W2), medium strong (R3). Equidimensional to prismatic blocks 10 cm formed by 3 main sets. GSI structure = Extremely blocky, GSI surface = Fair, GSI range = 30-35.

C2: Dark orangish-yellowish grey, fine to medium grained, siliceous, QUARTZITE. Slightly weathered (W2), medium strong to stong (R3-R4). Prismatic blocks 10-30 cm formed by 3 main sets. GSI structure = Very blocky, GSI surface = Good, GSI range = 45-55.

Outcrop OC-BGC12-60

PHOTO OF STRUCTURE





DISCONTINUITY TABLE

Set	Orientation Range[1]		Aperture	Infill	JRC	JWCS	Spacing	Persistence	Type[2]
	Dip (°)	DD (°)	(mm)				(m)	(m)	
1	22-28	262-290	0-1	None	8-10	R3.5	0.1	1+	JO
2	75-86	092-095	0-1	None	12-16	R3.5	0.3	3+	J
3	78-89	158-166	0-1	None	8-12	R3.5	0.1-0.15	4+	J

Notes:
1. DD = Dip direction
2. JO = Joint along foliation; J = Joint

APPENDIX C
TEST PIT LOGS

TEST PIT LOGS

Table C-1. Summary of Test Pits

Hole ID	Easting (m)	Northing (m)	Elevation (masl)	Final Depth (m)
TP-BGC12-146	458860	7100014	883	6.0
TP-BGC12-147	458860	7100123	880	4.0
TP-BGC12-148	459744	7100209	1022	3.3
TP-BGC12-149	459710	7100168	1018	4.0
TP-BGC12-150	458764	7100046	853	3.0
TP-BGC12-151	459280	7100440	913	4.2
TP-BGC12-152	459378	7100524	907	3.6
TP-BGC12-153	459514	7100677	931	4.0
TP-BGC12-154	459422	7100574	914	4.2
TP-BGC12-155	459583	7099995	1015	4.0
TP-BGC12-156	459515	7099962	1015	3.2
TP-BGC12-157	459618	7099976	1030	4.2
TP-BGC12-158	459786	7100066	1063	3.0
TP-BGC12-159	459877	7100045	1095	2.1
TP-BGC12-160	459865	7100815	948	5.7
TP-BGC12-161	459424	7100342	930	3.7
TP-BGC12-162	459510	7100394	953	3.5
TP-BGC12-163	459542	7100505	929	3.0
TP-BGC12-164	459602	7100888	922	3.8
TP-BGC12-165	459677	7100905	920	3.5
TP-BGC12-166	459700	7100746	950	3.5
TP-BGC12-167	459720	7100800	938	3.9
TP-BGC12-168	459664	7100845	926	3.5
TP-BGC12-169	459312	7100669	903	3.1
TP-BGC12-170	458939	7100716	853	6.0
TP-BGC12-171	458947	7100596	865	3.2
TP-BGC12-172	458824	7100502	855	3.5
TP-BGC12-173	458828	7100615	847	4.6
TP-BGC12-174	458825	7100362	873	4.0
TP-BGC12-175	458728	7100387	846	3.3
TP-BGC12-176	459057	7100476	896	5.5

Hole ID	Easting (m)	Northing (m)	Elevation (masl)	Final Depth (m)
TP-BGC12-177	459693	7100238	1004	1.8
TP-BGC12-178	459830	7100105	1082	1.7
TP-BGC12-179A	459771	7100256	1025	1.2
TP-BGC12-179B	459776	7100261	1026	1.2
TP-BGC12-179C	459782	7100264	1027	1.2
TP-BGC12-180A	459773	7100201	1034	1.3
TP-BGC12-180B	459768	7100193	1034	1.0
TP-BGC12-180C	459767	7100187	1034	1.2
TP-BGC12-181	459163	7100780	861	5.5

Notes:
1. Test pit locations surveyed by BGC staff using a handheld GPS.
2. Coordinates in UTM NAD 83, Zone 8N.

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-146

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 458,860E, 7,100,014N

GROUND ELEVATION (m): 883

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 26 Jun 12

FINISH DATE: 26 Jun 12

FINAL DEPTH OF PIT (m): 6.0

LOGGED BY: PQ/AA

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/TOPSOIL/ROOTMAT
					SILT (ML) Sandy, trace to some gravel, trace organics, trace cobbles, trace boulders, moist, brown, frozen, well bonded with no excess ice (Nbn), clasts tend to be angular fragments of metasedimentary rock, with rare granodiorite fragments. [COLLUVIUM]
1	G	G1			
2	G	G2			SILT (ML) Sandy, trace to some organics, moist, grey-brown, frozen, friable (no excess ice), Nf. [COLLUVIUM]
					SAND (SM) Fine, some silt, some gravel, trace cobbles, moist, brown, cold but not obviously frozen (completely friable), clasts are angular metasediments. [COLLUVIUM]
3	G	G3			3.0 - 3.2 m; Sample G3: grain size analysis, 28% gravel, 48% sand, 24% fines.
4					Below 4.0 m; becomes gravelly.
5					Below 4.5 m; trace boulders.
6					END OF PIT AT 6.0 m (MAX REACH/REFUSAL ON BOULDERS?) Notes: -Weathered metasedimentary rock/boulders at base of pit.
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-147

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 458,860E, 7,100,123N

GROUND ELEVATION (m): 880

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 26 Jun 12

FINISH DATE: 26 Jun 12

FINAL DEPTH OF PIT (m): 4.0

LOGGED BY: PQ/AA

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/TOPSOIL/ROOTMAT
	G	G1			SILT (ML) Sandy, gravelly, trace organics, trace cobbles, low plastic, moist, brown, frozen, well bonded, rare pockets of visible ice (crystals) near the surface, becoming common below 1 m, after which large ice crystals and ice bands are common, with up to 15% - 20% ice, and average 5% - 10% ice, clasts are angular fragments of metasedimentary rock. [COLLUVIUM]
1	G	G2			
2					
3	G	G3			3.0 - 3.2 m; Sample G3: grain size analysis, 12% gravel, 43% sand, 45% fines; specific gravity analysis, 2.64 (average).
4					END OF PIT AT 4.0 m (REFUSAL ON FROZEN GROUND) Note: -single tooth ripper was repeatedly used to aid in the toothed bucket digging.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-148

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,744E, 7,100,209N
GROUND ELEVATION (m): 1,022
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 16 Jul 12
FINISH DATE: 16 Jul 12
FINAL DEPTH OF PIT (m): 3.3
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					GRAVEL AND COBBLES Coarse gravel, uniformly graded, loose, max particle size = 200 mm, flat, some elongated, angular, reddish brown, no odour, moist, homogeneous, no cementation, clasts are metasedimentary. [COLLUVIUM]
1					GRAVEL (GM) Fine to coarse gravel, some sand (primarily fine), some silt, trace cobbles, well graded, loose, maximum particle size = 200 mm, angular, flat, some elongated, brown, no odour, homogeneous, no cementation, clasts are metasedimentary, low plastic fines. [COLLUVIUM]
	G	G1			
2			2		METASEDIMENTARY ROCK Red, grey, medium strong (R3), slightly weathered (W2), foliated, fine grained, three joint sets visible, one parallel to foliation that is approximately parallel to the slope, the other two approximately perpendicular to each other and foliation, joints are planar and smooth with iron staining, foliation fracture spacing approximately 10 mm to 50 mm, excavated as fine to coarse GRAVEL (GW) trace to some cobbles up to 200 mm, trace sand, trace silt. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
3					END OF PIT AT 3.3 m (REFUSAL ON BEDROCK) Note: -pit excavated upslope.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

○

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-149

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,710E, 7,100,168N

GROUND ELEVATION (m): 1,018

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 16 Jul 12

FINISH DATE: 16 Jul 12

FINAL DEPTH OF PIT (m): 4.0

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					GRAVEL (GM) Fine to coarse gravel, some sand (primarly fine), some silt, trace cobbles, well graded, loose, maximum particle size = 200 mm, angular, flat, some elongated, reddish brown, no odour, moist, clasts are generally oriented parallel to slope, no cementation, clasts are metasedimentary, low plastic fines. [COLLUVIUM]
1					Below 1.4 m; Some cobbles.
2					METASEDIMENTARY ROCK Red, grey, medium strong (R3), slightly weathered (W2), foliated, fine grained, three joint sets visible, one parallel to foliation that is approximately parallel to the slope, the other two approximately perpendicular to each other and foliation, joints are planar and smooth, foliation spacing approximately 10 mm to 50 mm, other joint spacing approximately 50 mm to 300 mm, iron staining on joint surfaces, primarily quartzite with zone of phyllite on upslope face of pit, excavated as coarse GRAVEL (GP), some cobbles, trace cobbles up to 300 mm, trace silt, trace sand, clasts are angular, flat (parallel to foliation) with some elongated. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
3			2		
4					END OF PIT AT 4.0 m (REFUSAL ON BEDROCK) Notes: -pit oriented perpendicular to slope.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-150

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 458,764E, 7,100,046N

GROUND ELEVATION (m): 853

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 17 Jul 12

FINISH DATE: 17 Jul 12

FINAL DEPTH OF PIT (m): 3.0

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
	G	G1			SILT (ML) Gravelly (fine to coarse), some sand, low plastic, brown, homogeneous, clasts are angular, flat, metasedimentary, frozen, 10% - 20% ice, Vx. [COLLUVIUM]
3					END OF PIT AT 3.0 m (REFUSAL ON FROZEN GROUND) Notes: -thawed ground sloughing into the pit. -pit excavated with toothed bucket; below 0.8 m excavated with ripper tooth.

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-151

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,280E, 7,100,440N
GROUND ELEVATION (m): 913
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 18 Jul 12
FINISH DATE: 18 Jul 12
FINAL DEPTH OF PIT (m): 4.2
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SW) fine to coarse sand, and gravel, trace silt, trace cobbles, well graded, loose, maximum particle size = 150 mm, equidimensional, angular to subangular, trace rounded (especially cobbles), reddish brown, no odour, moist, homogeneous, no cementation, clasts are metasedimentary. [COLLUVIUM]
1	G	G1			1.1 - 1.2 m; Sample G1: grain size analysis, 43% gravel, 53% sand, 4% fines.
2					
3					
4					
					END OF PIT AT 4.2 m (MAX REACH/SLOUGHING) Notes: -pit oriented perpendicular to slope and sloughing from uphill side starting at 2.2 m - excavation becomes more difficult at base of pit
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-152

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,378E, 7,100,524N
GROUND ELEVATION (m): 907
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 18 Jul 12
FINISH DATE: 18 Jul 12
FINAL DEPTH OF PIT (m): 3.6
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					GRAVEL (GM) fine to coarse gravel, silty, some sand, trace cobbles, maximum particle size = 100 mm, flat, some elongated, angular, dark greyish brown, homogeneous, clasts are metasedimentary, frozen, ice occurs as Vs, Vx, 20% - 25%, lenses up to 20 mm thick, ice is clear. [COLLUVIUM]
1	G	G1			
2					Below 2.3 m; light brown.
3					
					END OF PIT AT 3.6 m (REFUSAL ON FROZEN GROUND) Note: - pit excavated with both toothed bucket and ripper tooth.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-153

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,514E, 7,100,677N
GROUND ELEVATION (m): 931
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 18 Jul 12
FINISH DATE: 18 Jul 12
FINAL DEPTH OF PIT (m): 4.0
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SILT some sand, some gravel, non-plastic, grey, homogeneous, frozen, ice occurs as Vs, Vx, with 1 mm to 30 mm lenses, approximately 30% - 40% ice, thicker ice lenses are approximately parallel to ground surface. [COLLUVIUM]
1	G	G1			1.25 - 1.35 m; Sample G1: grain size analysis, 4% sand, 96% fines.
					SAND (SM) fine to coarse sand, silty, gravelly, trace cobbles, maximum particle size = 100 mm, subangular to angular, homogeneous, brown, clasts are metasedimentary, frozen, ice occurs as Nbe, Vx, approximately 10% - 20% ice, easier ripping than silt above. [COLLUVIUM]
2	G	G2			
3					
4					END OF PIT AT 4.0 m (REFUSAL ON FROZEN GROUND) Note: - excavated with both toothed bucket and ripper tooth.
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-154

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,422E, 7,100,574N

GROUND ELEVATION (m): 914

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 19 Jul 12

FINISH DATE: 19 Jul 12

FINAL DEPTH OF PIT (m): 4.2

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) fine to coarse sand, silty, gravelly, trace cobbles, maximum particle size = 200 mm, sand is subangular to subrounded, gravel and cobbles are subangular to angular, light brown, homogeneous, clasts are primarily metasediments with occasional granodiorite, frozen, ice occurs as Nbe, Vx, approximately 10% ice. [COLLUVIUM]
3					SILT (ML) clayey, trace gravel, low plastic, light grey, homogeneous, gravel is angular to subangular and metasedimentary, frozen, ice occurs as Vx, Vs, approximately 10% - 20% ice, ice lenses are 1 mm to 3 mm thick. [COLLUVIUM]
	G	G1			3.75 - 3.85 m; Sample G1: grain size analysis, 3% sand, 97% fines; specific gravity analysis, 2.73 (average).
4					SAND (SM) fine to coarse sand, silty, gravelly, trace cobbles, maximum particle size = 200 mm, sand is subangular to subrounded, gravel and cobbles are subangular to angular, light brown, homogeneous, clasts are primarily metasediments with occasional granodiorite, frozen, ice occurs as Nbe, Vx, approximately 10% ice. [COLLUVIUM]
5					END OF PIT AT 4.2 m (REFUSAL ON FROZEN GROUND) Notes: - excavated with both ripper tooth and toothed bucket.
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_p% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-155

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,583E, 7,099,995N

GROUND ELEVATION (m): 1,015

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 19 Jul 12

FINISH DATE: 19 Jul 12

FINAL DEPTH OF PIT (m): 4.0

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) fine to coarse sand, gravelly, silty, trace cobbles, maximum particle size = 100 mm, flat, some elongated (especially gravel), angular, brown, homogeneous, with clasts oriented approximately parallel to slope, clasts are metasedimentary, frozen, Vs, Vx, approximately 10% - 20% ice, ice lenses are 1 mm to 3 mm thick. [COLLUVIUM]
1	G	G1			
					SILT (ML) some sand, some gravel, low plastic, grey, homogeneous, frozen, ice occurs as Vs, Vx, approximately 10% - 30% ice, lenses 1 mm to 3 mm thick, crystals up to 30 mm, sand and gravel are angular to subangular, metasedimentary, maximum particle size = 75 mm. [COLLUVIUM]
2	G	G2			GRAVEL (GM) fine to coarse gravel, sandy, silty, trace cobbles, maximum particle size = 100 mm, flat, some elongated, angular, light brown, homogeneous, clasts are metasedimentary, frozen, Vx, Vc, approximately 10% ice, sand sized ice crystals. [COLLUVIUM] 2.35 - 2.45 m; Sample G2: grain size analysis, 47% gravel, 28% sand, 25% fines. Below 3.5 m; Nbe, Vc, approximately 10% ice.
3					
4					END OF PIT AT 4.0 m (REFUSAL ON FROZEN GROUND) Note: - excavated with both toothed bucket and ripper tooth.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_p% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-156

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,515E, 7,099,962N

GROUND ELEVATION (m): 1,015

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 20 Jul 12

FINISH DATE: 20 Jul 12

FINAL DEPTH OF PIT (m): 3.2

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					COBBLES trace to some gravel, uniformly graded, very loose, maximum particle size = 200 mm, flat, some elongated, angular, red (iron staining), no odour, moist, clasts oriented parallel to slope, no cementation, metasedimentary clasts. [COLLUVIUM]
1	G	G1			GRAVEL (GM) fine to coarse gravel, sandy, some silt, trace cobbles, loose, maximum particle size = 150 mm, flat, some elongated, gravel and cobbles are angular, sand is subangular, brown, no odour, moist, homogeneous with clasts oriented parallel to slope, no cementation, clasts are metasedimentary [COLLUVIUM]
2			2		METASEDIMENTARY ROCK grey, medium strong (R3), slightly weathered (W2), foliated, fine grained, two joint sets visible, one set is parallel to foliation which is approximately parallel to the slope and one perpendicular to foliation and dipping into the slope, joint surfaces are planar and smooth and some have iron staining, foliation spacing is approximately 10 mm to 30 mm, spacing of second set is approximately 100 mm to 200 mm; excavted with toothed bucket as fine to coarse GRAVEL (GW) some sand, some cobbles, well graded, maximum particle size = 150 mm, flat, some elongated, angular. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
3					END OF PIT AT 3.2 m (REFUSAL ON BEDROCK)
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-157

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,618E, 7,099,976N

GROUND ELEVATION (m): 1,030

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 20 Jul 12

FINISH DATE: 20 Jul 12

FINAL DEPTH OF PIT (m): 4.2

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					COBBLES uniformly graded, very loose, maximum particle size = 200 mm, flat, elongated, angular, red (iron staining), moist, oriented parallel to slope, metasedimentary. [COLLUVIUM]
1	G	G1			GRAVEL (GW) fine to coarse gravel, sandy, trace silt, trace cobbles, well graded, loose, maximum particle size = 200 mm, flat, some elongated, angular, reddish brown, no odour, moist, homogeneous, with some clasts oriented parallel to slope, no cementation, metasedimentary clasts (quartzite with iron staining). [COLLUVIUM] 1.15 - 1.25 m - Sample G1: grain size analysis, 53% gravel, 32% sand, 15% fines.
2					
3			2		METASEDIMENTARY ROCK grey, medium strong (R3), slightly weathered (W2), foliated, fine grained, two joint sets visible, one set is parallel to foliation which is approximately parallel to the slope and one steeply dipping and perpendicular to the slope, joint surfaces are planar and smooth, some with iron staining, foliation fracture spacing 10 mm to 50 mm, second joint set fracture spacing 50 mm, excavated with toothed bucket as fine to coarse GRAVEL (GW), some cobbles, some sand, well graded, maximum particle size = 100 mm, some flat and elongated, angular. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
4					
					END OF PIT AT 4.2 m (REFUSAL ON BEDROCK)
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — ○ — — — — × W_L%

W%

20 40 60 80

○★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-158

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,786E, 7,100,066N

GROUND ELEVATION (m): 1,063

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 20 Jul 12

FINISH DATE: 20 Jul 12

FINAL DEPTH OF PIT (m): 3.0

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) fine sand, some cobbles, some gravel, some silt, trace boulders, gap graded, loose, maximum particle size = 400 mm, equidimensional, gravel, cobbles and boulders are flat, some elongated, angular to subangular, reddish brown, no odour, moist, homogeneous, no cementation, metasedimentary clasts. [COLLUVIUM]
1					
			2.5		METASEDIMENTARY ROCK grey with iron staining, medium strong (R3), slightly to moderately weathered (W2.5), foliated, fine grained, three joint sets visible, one is parallel to foliation and approximately parallel to slope, other two are perpendicular to each other and foliation, foliation fracture spacing 10 mm to 50 mm, other joint spacing 50 mm to 100 mm, joint surfaces are planar and smooth, excavated with toothed bucket as COBBLES, gravelly, some sand, some boulders, gap graded, maximum particle size = 400 mm, equidimensional, angular. [SLIGHTLY TO MODERATELY WEATHERED METASEDIMENTARY ROCK]
2					
3					END OF PIT AT 3.0 m (REFUSAL ON BEDROCK)
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

W%

20 40 60 80

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-159

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,877E, 7,100,045N

GROUND ELEVATION (m): 1,095

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 20 Jul 12

FINISH DATE: 20 Jul 12

FINAL DEPTH OF PIT (m): 2.1

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					COBBLES AND GRAVEL uniformly graded, very loose, maximum particle size = 100 mm, flat and equidimensional, angular, typically oriented parallel to slope, reddish brown, iron staining, metasedimentary clasts. [COLLUVIUM]
1			2		SAND (SM) fine to medium sand, gravelly, silty, trace cobbles, loose, maximum particle size = 100 mm, flat, some elongated, angular, reddish brown, no odour, moist, homogeneous, no cementation, metasedimentary clasts, rootlets to 0.4 m. [COLLUVIUM]
2					METASEDIMENTARY ROCK grey, black, medium strong (R3), slightly weathered (W2), foliated, fine grained, three joint sets visible, one parallel to foliation, two perpendicular to foliation and each other, foliation spacing approximately 1 mm to 10 mm, but fractured at 10 mm to 100 mm, other joint spacing 50 mm to 100 mm, joint surfaces are planar and smooth, some iron staining on non foliation joint surfaces, quartz veins; excavated with toothed bucket as COBBLES AND GRAVEL, some sand, trace boulders, well graded, maximum particle size = 400 mm, some equidimensional, some flat, angular. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
3					END OF PIT AT 2.1 m (REFUSAL ON BEDROCK)
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-160

LOCATION: Eagle Pup

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,865E, 7,100,815N

GROUND ELEVATION (m): 948

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 20 Jul 12

FINISH DATE: 20 Jul 12

FINAL DEPTH OF PIT (m): 5.7

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
	G	G1			GRAVEL (GM) fine to coarse gravel, sandy, some silt, trace cobbles, well graded, loose, maximum particle size = 100 mm, equidimensional, some flat, angular to subangular, reddish brown grading to light brown with depth, no odour, moist, homogeneous, some clasts oriented parallel to slope, no cementation, clasts are metasedimentary, roots to 0.5 m. [COLLUVIUM] 0.95 - 1.05 m; Sample G1: grain size analysis, 51% gravel, 33% sand, 16% fines.
1					
2			3.5		METASEDIMENTARY ROCK red (iron staining), very weak to weak (R1/R2), moderately to highly weathered (W3/W4), foliated, fine grained, foliation appears to be approximately horizontal, foliation spacing 1 mm to 10 mm, fracture spacing 10 mm to 50 mm, no other joint sets discernable, joint surfaces are planar and smooth with talc on some joint surfaces; excavated with toothed bucked as fine to coarse SAND (SW) gravelly, trace silt, trace cobbles, well graded, maximum particle size = 100 mm, sand is equidimensional, some gravel is flat, angular to subangular, light oranish white, sloughing to 3 m depth. [MODERATELY TO HIGHLY WEATHERED METASEDIMENTARY ROCK] Below 3.0 m; reddish grey, medium strong (R3), slightly to moderately weathered (W2/W3).
3					
4			2.5		
5					
6					END OF PIT AT 5.7 m (MAX REACH/SLOUGHING)
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-161

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,424E, 7,100,342N

GROUND ELEVATION (m): 930

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 21 Jul 12

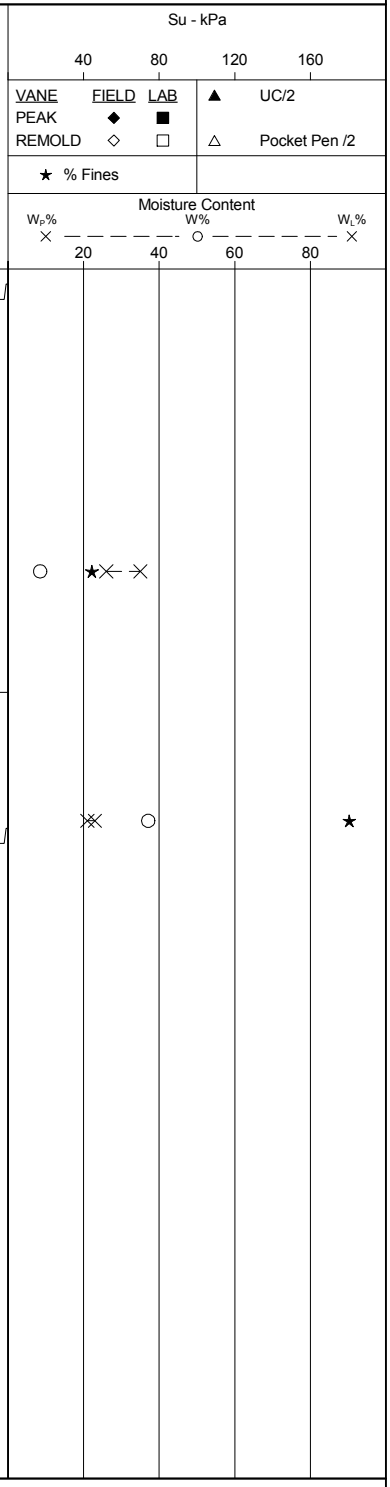
FINISH DATE: 21 Jul 12

FINAL DEPTH OF PIT (m): 3.7

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SILT (ML) gravelly, some sand, trace cobbles, low plastic, soft, greyish brown, no odour, moist to wet, homogeneous, no cementation, equidimensional, some flat, angular, clasts are metasedimentary, grades to silty gravel with depth. [COLLUVIUM]
1					Below 0.5 m; frozen, zones of Nbe and zones of Vx, Vx occuring as medium sand sized crystals, 5% - 10% ice.
2	G	G1			1.95 - 2.05 m; Sample G1: grain size analysis, 60% gravel, 18% sand, 22% fines.
3					SILT trace gravel, trace sand, trace clay, non-plastic, greyish black, no odour, homogeneous, gravel is subangular to subrounded, frozen, Nbn. [COLLUVIUM]
	G	G2			3.6 - 3.7 m; Sample G2: grain size analysis, 1% gravel, 9% sand, 90% fines.
4					END OF PIT AT 3.7 m (REFUSAL ON FROZEN GROUND) Notes: -pit oriented perpendicular to slope -pit excavated with ripper tooth and toothed bucket
5					
6					
7					
8					



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-162

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,510E, 7,100,394N
GROUND ELEVATION (m): 953
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 21 Jul 12
FINISH DATE: 21 Jul 12
FINAL DEPTH OF PIT (m): 3.5
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SILT (ML) sandy, gravelly, trace cobbles, low plastic, grey, no odour, homogeneous, clasts are metasedimentary, equidimensional, angular to subangular, maximum particle size = 100 mm, occasional rounded clasts, occasional granodiorite clasts, frozen, Vx, 30% - 40% ice as up to medium gravel sized crystals but typically as coarse sand sized crystals, ice is white. [COLLUVIUM]
2	G	G1			SAND (SM) fine to coarse sand, silty, gravelly, trace cobbles, maximum particle size = 100 mm, equidimensional, some flat, subangular to subrounded, light brown, no odour, homogeneous, clasts are metasedimentary, frozen, Vx as sand and gravel sized crystals, 5% - 10% ice, ice is white. [COLLUVIUM]
3					END OF PIT AT 3.5 m (REFUSAL ON FROZEN GROUND) Notes: -pit oriented perpendicular to slope -pit excavated with ripper tooth and toothed bucket
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-163

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,542E, 7,100,505N
GROUND ELEVATION (m): 929
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 21 Jul 12
FINISH DATE: 21 Jul 12
FINAL DEPTH OF PIT (m): 3.0
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) fine to coarse sand, and gravel, some silt, trace cobbles, well graded, maximum particle size = 150 mm, equidimensional, some flat and elongated gravel and cobbles, angular to subangular, light brown, no odour, homogeneous, clasts are metasedimentary, frozen, Vs, approximately 20% ice, lenses up to 2 mm thick. [COLLUVIUM]
1					Below 0.5 m; Vx, approximately 20% ice, sand and gravel sized crystals, ice is white.
2	G	G1			1.95 - 2.05 m; Sample G1, grain size analysis, 43% gravel, 35% sand, 22% fines.
3					END OF PIT AT 3.0 m (REFUSAL ON FROZEN GROUND) Notes: -pit oriented perpendicular to slope -pit excavated with ripper tooth and toothed bucket
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-164

LOCATION: Eagle Pup

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,602E, 7,100,888N
GROUND ELEVATION (m): 922
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 21 Jul 12
FINISH DATE: 21 Jul 12
FINAL DEPTH OF PIT (m): 3.8
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SILT (ML) gravelly, some sand, low plastic, grey, no odour, homogeneous, clasts are metasedimentary, some equidimensional, some flat, angular to subangular, maximum particle size = 75 mm, frozen, Vs, Vx, approximately 20% - 30% ice, occurs as sand and gravel sized crystals and lenses 1 mm to 2 mm thick, ground temperature = -0.3°C. [COLLUVIUM]
1					
2					
	G	G1			Below 2.7 m; ice is typically Vs, 1 mm to 2 mm thick lenses and 10% - 20% ice, ice is clear.
3					
4					END OF PIT AT 3.8 m (REFUSAL ON FROZEN GROUND) Notes: -pit excavated uphill -pit excavated with ripper tooth and toothed bucket
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-165

LOCATION: Eagle Pup

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,677E, 7,100,905N

GROUND ELEVATION (m): 920

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 22 Jul 12

FINISH DATE: 22 Jul 12

FINAL DEPTH OF PIT (m): 3.5

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) and silt, fine sand, trace medium sand, trace gravel, loose, maximum particle size = 50 mm, equidimensional, some flat, angular, greyish brown, moist, no odour, homogeneous, no cementation, low plastic silt, clasts are metasedimentary. [COLLUVIUM]
1					SAND (SP) fine sand, trace cobbles, trace gravel, trace silt, uniformly graded, maximum particle size = 200 mm, equidimensional, some flat, subangular to subrounded, reddish brown, no odour, homogeneous, metasedimentary, frozen, Nbn, temperature = -0.1°C. [COLLUVIUM]
2					SAND (SW) fine to coarse sand, and gravel, trace silt, trace cobbles, well graded, maximum particle size = 300 mm, equidimensional, some flat, angular to subangular, light brown, homogeneous, no odour, clasts are metasedimentary, trace granodiorite clasts, frozen, Nbn. [COLLUVIUM]
3	G	G1			3.4 - 3.5 m; Sample G1: grain size analysis, 49% gravel, 34% sand, 17% fines.
					END OF PIT AT 3.5 m (REFUSAL ON FROZEN GROUND) Notes: -pit excavated uphill -pit excavated with ripper tooth and toothed bucket
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-166

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,700E, 7,100,746N
GROUND ELEVATION (m): 950
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 22 Jul 12
FINISH DATE: 22 Jul 12
FINAL DEPTH OF PIT (m): 3.5
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) fine to coarse sand, some gravel, some silt, well graded, maximum particle size = 75 mm, equidimensional, some flat, angular to subangular, grey, homogeneous, no odour, clasts are metasedimentary, frozen, Vx, Vs, approximately 40% ice, lenses up to 30 mm thick, sand and gravel sized crystals, ice is mostly white, some clear. [COLLUVIUM]
2	G	G1			SAND (SM) fine to coarse sand, gravelly, some silt, trace cobbles, well graded, maximum particle size = 100 mm, flat, some equidimensional, angular to subangular, light brown, no odour, homogeneous, clasts are metasedimentary, frozen, Nbn. [COLLUVIUM]
3					
4					END OF PIT AT 3.5 m (REFUSAL ON FROZEN GROUND) Notes: -pit excavated uphill -pit excavated with ripper tooth and toothed bucket
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-167

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,720E, 7,100,800N

GROUND ELEVATION (m): 938

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 22 Jul 12

FINISH DATE: 22 Jul 12

FINAL DEPTH OF PIT (m): 3.9

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SILT (ML) some sand, trace gravel, low plastic, grey, no odour, homogeneous, clasts are metasedimentary, equidimensional, some flat, angular to subangular, frozen, Vs, approximately 40% ice, lenses 1 mm to 2 mm thick. [COLLUVIUM]
1					SILT (ML) sandy, some gravel, low plastic, light brown, no odour, homogeneous, clasts are metasedimentary, equidimensional, some flat, angular to subangular, frozen, Vx, Vs, approximately 10% ice, ice lenses 2 mm to 5 mm thick sand sized crystals. [COLLUVIUM]
2					
3	G	G1			2.75 - 2.85 m; Sample G1: grain size analysis, 6% gravel, 29% sand, 65% fines. Below 2.8 m; gravelly, primarily Vx, ice occurs as sand sized crystals, approximately 5% - 10% ice.
4					END OF PIT AT 3.9 m (REFUSAL ON FROZEN GROUND) Notes: -pit excavated uphill -pit excavated with ripper tooth and toothed bucket
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

× ○ ×

20 40 60 80

○ ★

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-168

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,664E, 7,100,845N
GROUND ELEVATION (m): 926
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 22 Jul 12
FINISH DATE: 22 Jul 12
FINAL DEPTH OF PIT (m): 3.5
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SILT (ML) sandy (fine to coarse), some gravel, low plastic, grey, no odour, homogeneous, coarse material is metasedimentary, equidimensional, some flat, angular to subangular, frozen, Vx, Vs, approximately 30% - 40% ice, lenses 1 mm to 3 mm thick, sand sized crystals, ice is white, some clear. [COLLUVIUM]
1					
2					SILT some fine sand, some gravel, non-plastic, light brown, no odour, homogeneous, no cementation, clasts are equidimensional, some flat, angular to subangular, metasedimentary, maximum particle size = 75 mm, frozen, Nbn. [COLLUVIUM]
	G	G1			2.45 - 2.55 m; Sample G1: grain size analysis, 5% gravel, 18% sand, 77% fines.
3					
4					END OF PIT AT 3.5 m (REFUSAL ON FROZEN GROUND) Notes: - pit excavated with ripper tooth and toothed bucket
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-169

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,312E, 7,100,669N
GROUND ELEVATION (m): 903
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 22 Jul 12
FINISH DATE: 22 Jul 12
FINAL DEPTH OF PIT (m): 3.1
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SILT (ML) sandy, gravelly, trace cobbles, low plastic, soft, greyish brown, no odour, moist, homogeneous, maximum particle size = 200 mm, clasts are metasedimentary, occasional granodiorite clasts, equidimensional, some flat, angular to subangular. [COLLUVIUM]
1					SAND (SM) fine to coarse sand, gravelly, silty, trace cobbles, maximum particle size = 100 mm, flat, angular, grey, some clasts reddish brown, homogeneous, metasedimentary clasts, frozen, temperature = -0.3°C, Vs,Vx, approximately 40% - 50% ice, lenses 1 mm to 50 mm, typically 1 mm to 5 mm, sand and gravel sized crystals, layers of buried organics approximatley 50 mm to 100 mm thick throughout unit. [COLLUVIUM] Below 2.3 m; ice content decreases to approximately 20% - 30%.
2					
2.8	G	G1			2.8 m; Sample G1: grain size analysis, 57% gravel, 26% sand, 17% fines.
3					GRAVEL AND SAND (GM/SM) fine to coarse sand and gravel, silty, trace cobbles, maximum particle size = 100 mm, equidimensional, some flat, subangular to angular, light brown, homogeneous, clasts are red, grey and metasedimentary, frozen, Vx, approximately 10% - 20% ice, sand sized crystals. [COLLUVIUM]
4					END OF PIT AT 3.1 m (REFUSAL ON FROZEN GROUND) Notes: -pit excavated uphill -pit excavated with ripper tooth and toothed bucket
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-170

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 458,939E, 7,100,716N

GROUND ELEVATION (m): 853

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 23 Jul 12

FINISH DATE: 23 Jul 12

FINAL DEPTH OF PIT (m): 6.0

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) fine sand, silty, trace gravel, loose, maximum particle size = 75 mm, equidimensional, some flat, grey, no odour, moist, homogeneous, low plastic fines. [COLLUVIUM/FILL?]
2					SAND (SM) fine to coarse sand, some silt, trace gravel, trace boulders, loose, maximum particle size = 300 mm, equidimensional, some flat, angular to subangular, moist, grey and red (iron staining), homogeneous, no cementation. [COLLUVIUM/FILL?]
3					SAND (SW) fine to coarse sand, gravelly, cobbley, trace silt, trace boulders, well graded, loose, maximum particle size = 300 mm, flat, some equidimensional, angular to subangular, red (iron staining), no odour, moist, homogeneous, no cementation, clasts are metasedimentary. [COLLUVIUM/FILL?]
4					SAND (SM) fine to coarse sand, some silt, trace gravel, trace boulders, loose, maximum particle size = 300 mm, equidimensional, some flat, angular to subangular, moist, grey and red (iron staining), homogeneous, no cementation. [COLLUVIUM/FILL?]
5					SAND (SW) fine to coarse sand, gravelly, cobbley, trace silt, trace boulders, well graded, loose, maximum particle size = 300 mm, flat, some equidimensional, angular to subangular, red (iron staining), no odour, moist, homogeneous, no cementation, clasts are metasedimentary. [COLLUVIUM/FILL?]
6	G	G1			SILT (ML) sandy, some clay, trace gravel, low plastic, firm, grey, no odour, moist, homogeneous, no cementation, gravel is metasedimentary, equidimensional, some flat, subangular, clasts are mostly black. [ALLUVIUM?] 5.9 - 6.0 m; Sample G1: grain size analysis, 15% gravel, 30% sand, 55% fines.
					END OF PIT AT 6.0 m (MAX REACH/SLOUGHING) Notes: -pit excavated into bank of old CAT track.
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-171

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 458,947E, 7,100,596N

GROUND ELEVATION (m): 865

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 23 Jul 12

FINISH DATE: 23 Jul 12

FINAL DEPTH OF PIT (m): 3.2

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION	Su - kPa (40, 80, 120, 160) / VANE FIELD LAB / PEAK ◆ ■ / REMOLD ◇ □ / ▲ UC/2 / △ Pocket Pen /2 / ★ % Fines / Moisture Content W_P% W% W_L% (20, 40, 60, 80)
0					ORGANICS/ROOTMAT	
					SAND (SM) fine to coarse sand, gravelly, some silt, trace cobbles, well graded, loose, maximum particle size = 100 mm, equidimensional, some flat, angular to subangular, light brown, no odour, moist to wet, homogeneous, no cementation, clasts are primarily metasedimentary, occasional granodiorite. [COLLUVIUM] Between 0.5 m - 1.5 m; seepage from upslope side of pit. Below 1.1 m; frozen, Nbn.	
1	G	G1				○
2					Below 1.8 m; trace boulders, maximum particle size = 500 mm, frozen, Nbe, 5% - 10% excess ice.	
3	G	G2			2.75 - 2.85 m; Sample G2: grain size analysis, 28% gravel, 44% sand, 28% fines. At 3.2 m; spoil pile temperature = -1.1°C.	○ ★
					END OF PIT AT 3.2 m (REFUSAL ON FROZEN GROUND) Notes: -pit oriented perpendicular to slope -pit excavated with ripper tooth and toothed bucket	
4						
5						
6						
7						
8						

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-172

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 458,824E, 7,100,502N

GROUND ELEVATION (m): 855

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 23 Jul 12

FINISH DATE: 23 Jul 12

FINAL DEPTH OF PIT (m): 3.5

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) fine to coarse sand, gravelly, some silt, well graded, loose, maximum particle size = 75 mm, equidimensional, some flat, angular to subangular, light brown, moist, homogeneous. [COLLUVIUM]
1					Below 0.4 m; frozen, Vx, approximately 10% - 20% ice, sand sized ice crystals.
2	G	G1			At 2.1 m; spoil pile temperature = 0°C.
3					SAND (SM) fine sand, silty, gravelly, gap graded, maximum particle size = 75 mm, equidimensional, subangular to subrounded, grey, homogeneous, no odour, frozen, Nbn. [COLLUVIUM]
					END OF PIT AT 3.5 m (REFUSAL ON FROZEN GROUND) Notes: -pit oriented perpendicular to slope -pit excavated with ripper tooth and toothed bucket
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-173

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458,828E, 7,100,615N
GROUND ELEVATION (m): 847
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 23 Jul 12
FINISH DATE: 23 Jul 12
FINAL DEPTH OF PIT (m): 4.6
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
0 – 3.4					GRAVEL (GM) fine to coarse gravel, sandy, silty, trace cobbles, trace boulders, maximum particle size = 300 mm, flat, some elongated, angular, some cobbles and boulders are rounded to subrounded, greyish brown, no odour, homogeneous, clasts metasedimentary, frozen, Vx, Vs, approximately 10% - 20% ice, sand sized ice crystals, lensess 1 mm to 5 mm thick; grades to SAND (SM) gravelly and frozen, Nbe, with depth. [COLLUVIUM]
3.4	G	G1			
3.4 – 4.6					SAND (SM) fine to coarse sand, and gravel, some silt, trace cobbles, well graded, loose to compact, maximum particle size = 100 mm, equidimensional, some flat, angular to subangular, occasional cobbles are subrounded, reddish brown, moist, homogeneous, clasts are metasedimentary. [COLLUVIUM] 4.5 - 4.6 m; Sample G2: grain size analysis, 48% gravel, 35% sand, 17% fines; specific gravity analysis, 2.82 (average).
4.5	G	G2			
4.6					END OF PIT AT 4.6 m (MAX REACH) Notes: -pit excavated down hill. -pit excavated with ripper tooth and toothed bucket.

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-174

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458,825E, 7,100,362N
GROUND ELEVATION (m): 873
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 24 Jul 12
FINISH DATE: 24 Jul 12
FINAL DEPTH OF PIT (m): 4.0
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
1					SAND (SM) fine to coarse sand, some silt, some gravel, well graded, maximum particle size = 75 mm, flat, some equidimensional, angular to subangular, greyish brown, no odour, homogeneous, clasts are metasedimentary, frozen, Vx, Vs, ice lenses are 3 mm to 10 mm, sand and gravel sized ice crystals, ice is typically white, some clear, approximately 40% ice, ice content decreases with depth, temperature = -0.2°C. [COLLUVIUM]
2					
3	G	G1			Below 2.8 m; light brown, Nbe, <10% excess ice, spoil pile temperature = -0.3°C.
4					END OF PIT AT 4 m (REFUSAL ON FROZEN GROUND) Notes: -pit oriented perpendicular to slope -pit excavated with ripper tooth and toothed bucket.
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

○

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-175

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458,728E, 7,100,387N
GROUND ELEVATION (m): 846
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 24 Jul 12
FINISH DATE: 24 Jul 12
FINAL DEPTH OF PIT (m): 3.3
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
1					SAND (SM) fine to coarse sand, some silt, some gravel, well graded, maximum particle size = 75 mm, equidimensional, some flat, angular to subangular, greyish brown, no odour, homogeneous, clasts are metasedimentary, frozen, Vs, approximately 40% ice, lenses are 3 mm to 10 mm thick, some clear, some white, oriented approximately parallel to slope, temperature = 0°C. [COLLUVIUM]
2	G	G1			SAND (SW) fine to coarse sand, gravelly, trace to some silt, trace to some cobbles, well graded, maximum particle size = 100 mm, equidimensional, some flat, angular to subangular, reddish brown, no odour, homogeneous, clasts are primarily metasedimentary, occasional granodiorite, frozen, Nbe, <5% excess ice, spoil pile temperature = -0.1°C. [COLLUVIUM] 2.6 - 2.7 m; Sample G1: grain size analysis, 36% gravel, 45% sand, 19% fines.
3					END OF PIT AT 3.3 m (REFUSAL ON FROZEN GROUND) Notes: -pit oriented perpendicular to slope -pit excavated with ripper tooth and toothed bucket.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-176

LOCATION: Steiner Area

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,057E, 7,100,476N
GROUND ELEVATION (m): 896
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 24 Jul 12
FINISH DATE: 24 Jul 12
FINAL DEPTH OF PIT (m): 5.5
LOGGED BY: KH
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) fine to coarse sand, gravelly, some silt, trace cobbles, trace boulders, loose, maximum particle size = 400 mm, flat, some elongated, angular to subangular, light brown, no odour, moist, homogeneous, no cementation, clasts are metasedimentary. [COLLUVIUM]
1	G	G1			1.2 - 1.3 m; Sample G1: grain size analysis, 54% gravel, 25% sand, 21% fines.
2					
3					
4					
5					
6					END OF PIT AT 5.5 m (MAX REACH) Notes: - pit excavated up hill. - side walls sloughing.
7					
8					

Su - kPa
40 80 120 160

	FIELD	LAB	
VANE			▲ UC/2
PEAK	◆	■	
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-177

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,693E, 7,100,238N

GROUND ELEVATION (m): 1,004

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 24 Jul 12

FINISH DATE: 24 Jul 12

FINAL DEPTH OF PIT (m): 1.8

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					GRAVEL (GW) fine to coarse gravel, sandy, trace cobbles, well graded, loose, maximum particle size = 100 mm, equidimensional, sand and fine gravel are flat, angular, iron stained, moist, clast supported, no cementation, clasts are metasedimentary. [COLLUVIUM]
1			4		METASEDIMENTARY ROCK reddish brown, very weak (R1), highly weathered (W4), foliated, fine grained, no joint sets discernable; excavated as fine to medium SAND (SP) cobbley, some boulders, trace silt, poorly graded, maximum particle size = 400 mm, equidimensional, some flat and elongated, angular to subangular, moist, no odour, no cementation. [HIGHLY WEATHERED METASEDIMENTARY BEDROCK]
2			2		METASEDIMENTARY ROCK red (iron staining), medium strong (R3), slightly weathered (W2), foliated, fine grained, two sets visible, one parallel to foliation approximately parallel to slope, spacing approximately 10 mm to 50 mm, one perpendicular to foliation and slope, spacing approximately 50 mm to 100 mm, joint surfaces are planar and smooth; excavated with toothed bucket as fine to coarse GRAVEL (GW) cobbley, some sand, trace boulders, maximum particle size = 500 mm, equidimensional, some flat and elongated, angular. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
3					END OF PIT AT 1.8 m (REFUSAL ON BEDROCK) Notes: -pit oriented perpendicular to slope.
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-178

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,830E, 7,100,105N

GROUND ELEVATION (m): 1,082

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 25 Jul 12

FINISH DATE: 25 Jul 12

FINAL DEPTH OF PIT (m): 1.7

LOGGED BY: KH

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					COBBLES AND GRAVEL well graded, loose, maximum particle size = 200 mm, equidimensional, some flat, angular, red (iron staining), homogeneous, no odour, moist, clasts are metasedimentary, roots. [COLLUVIUM]
1			4		SAND (SM) fine to coarse sand, gravelly, some silt, trace cobbles, well graded, loose, maximum particle size = 100 mm, equidimensional, some flat, angular, light reddish brown, homogeneous, clasts are metasedimentary, roots to 0.5 m. [COLLUVIUM]
			2		METASEDIMENTARY ROCK reddish brown, very weak (R1), highly weathered (W4), foliated, fine grained, no joint sets discernable, excavated as fine SAND AND COBBLES trace silt, trace gravel, gap graded, maximum particle size = 200 mm, equidimensional and flat, angular, brown with iron staining on clast surfaces, moist, no odour, no cementation. [HIGHLY WEATHERED METASEDIMENTARY ROCK]
2					METASEDIMENTARY ROCK reddish brown, medium strong (R3), slightly weathered (W2), fine grained, foliated, one set parallel to foliation and approximately parallel to slope, fracture spacing approximately 10 mm to 50 mm, two additional cross cutting sets, both steeply dipping into slope at approximately 45° to each other, fracture spacing approximately 50 mm to 100 mm, joint surfaces are planar and smooth and iron stained; excavated as fine to coarse GRAVEL (GW) some cobbles, some sand, maximum particle size = 200 mm, flat, some equidimensional, angular. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
3					
4					END OF PIT AT 1.7 m (REFUSAL ON BEDROCK) Notes: -pit oriented perpendicular to slope.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-179A

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,771E, 7,100,256N

GROUND ELEVATION (m): 1,025

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 25 Jul 12

FINISH DATE: 25 Jul 12

FINAL DEPTH OF PIT (m): 1.2

LOGGED BY: BMM

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0			2		METASEDIMENTARY ROCK brownish orange, medium strong (R3), slightly weathered (W2), fine grained, foliated, very blocky to extremely blocky, GSI ranging from 30 to 35, three dominant joint sets: one set parallel to foliation, fracture spacing 10 mm to 30 mm, surfaces are smooth and slightly weathered, JRC ranging from 6-8, dip ranging from 30-40°, dip direction ranging from 310-318°; first cross joint, fracture spacing 50 mm to 100 mm, surfaces are smooth and slightly weathered, JRC ranging from 6-8, dip ranging from 65-74°, dip direction ranging from 148-158°; second cross joint, fracture spacing 50 mm to 200 mm, surfaces are rough and slightly weathered, JRC ranging from 10-12, dip ranging from 62-67°, dip direction ranging from 075-084°. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
1					
2					END OF PIT AT 1.2 m (TARGET DEPTH) Notes: - Pit excavated beneath plate test pad PLT-BGC12-15. - Pit initiated approximately 4.5 m below the original ground surface.
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% × — — — — — ○ — — — — — × W_L%

W%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-179B

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,776E, 7,100,261N

GROUND ELEVATION (m): 1,026

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 25 Jul 12

FINISH DATE: 25 Jul 12

FINAL DEPTH OF PIT (m): 1.2

LOGGED BY: BMM

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0			2		METASEDIMENTARY ROCK brownish orange, medium strong (R3), slightly weathered (W2), fine grained, foliated, very blocky to extremely blocky, GSI ranging from 30 to 35, three dominant joint sets: one set parallel to foliation, fracture spacing 10 mm to 30 mm, surfaces are smooth and slightly weathered, JRC ranging from 6-8, dip ranging from 17-19°, dip direction ranging from 250-277°; first cross joint, fracture spacing 50 mm to 200 mm, surfaces are rough and slightly weathered, JRC ranging from 8-10, dip ranging from 65-70°, dip direction ranging from 170-173°; second cross joint, fracture spacing 150 mm to 200 mm, surfaces are rough and slightly weathered, JRC ranging from 10-12, dip ranging from 60-68°, dip direction ranging from 074-092°. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK] END OF PIT AT 1.2 m (TARGET DEPTH) Notes: - Pit excavated beneath plate test pad PLT-BGC12-16. - Pit initiated approximately 4 m below the original ground surface.
1					
2					
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

TEST PIT # TP-BGC12-179C

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009
LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,782E, 7,100,264N
GROUND ELEVATION (m): 1,027
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 25 Jul 12
FINISH DATE: 25 Jul 12
FINAL DEPTH OF PIT (m): 1.2
LOGGED BY: BMM
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0			2		METASEDIMENTARY ROCK brownish orange, medium strong (R3), slightly weathered (W2), fine grained, foliated, very blocky, GSI ranging from 35 to 40, three dominant joint sets: one set parallel to foliation, fracture spacing 50 mm to 150 mm, surfaces are smooth and slightly weathered, JRC ranging from 6-8, dip ranging from 33-42°, dip direction ranging from 296-310°; first cross joint, fracture spacing 150 mm to 300 mm, surfaces are rough and slightly weathered, JRC ranging from 8-10, dip ranging from 69-76°, dip direction ranging from 163-176°; second cross joint, fracture spacing 150 mm to 200 mm, surfaces are rough and slightly weathered, JRC ranging from 12-16, dip ranging from 41-45°, dip direction ranging from 095-115°. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
1					
2					END OF PIT AT 1.2 m (TARGET DEPTH) Notes: - Pit excavated beneath plate test pad PLT-BGC12-17. - Pit initiated approximately 3 m below the original ground surface.
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-180A

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,773E, 7,100,201N

GROUND ELEVATION (m): 1,034

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 25 Jul 12

FINISH DATE: 25 Jul 12

FINAL DEPTH OF PIT (m): 1.3

LOGGED BY: BMM

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0			2		METASEDIMENTARY ROCK orangish brownish grey, medium strong (R3), slightly weathered (W2), fine grained, foliated, very blocky to extremely blocky, GSI ranging from 30 to 45, three dominant joint sets: one set parallel to foliation, fracture spacing 10 mm to 50 mm, surfaces are rough and slightly weathered, JRC ranging from 8-10, dip ranging from 29-38°, dip direction ranging from 273-287°; first cross joint, fracture spacing 50 mm to 200 mm, surfaces are rough and slightly weathered, JRC ranging from 10-12, dip ranging from 80-85°, dip direction ranging from 144-161°; second cross joint, fracture spacing 50 mm to 200 mm, surfaces are rough and slightly weathered, JRC ranging from 12-16, dip ranging from 75-79°, dip direction ranging from 240-280°. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
1					
2					END OF PIT AT 1.3 m (TARGET DEPTH) Notes: - Pit excavated beneath plate test pad PLT-BGC12-18. - Pit initiated approximately 4.5 m below the original ground surface.
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

TEST PIT # TP-BGC12-180B

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,768E, 7,100,193N

GROUND ELEVATION (m): 1,034

DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT

OPERATOR: EWING

START DATE: 25 Jul 12

FINISH DATE: 25 Jul 12

FINAL DEPTH OF PIT (m): 1.0

LOGGED BY: BMM

REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0			2		METASEDIMENTARY ROCK dark orangish grey, medium strong (R3), slightly weathered (W2), fine grained, foliated, very blocky, GSI ranging from 35 to 40, three dominant joint sets: one set parallel to foliation, fracture spacing 20 mm to 50 mm, surfaces are smooth and slightly weathered, JRC ranging from 6-8, dip ranging from 37-39°, dip direction ranging from 280-305°; first cross joint, fracture spacing 50 mm to 200 mm, surfaces are rough and slightly weathered, JRC ranging from 8-10, dip ranging from 76-87°, dip direction ranging from 139-147°; second cross joint, fracture spacing 100 mm to 200 mm, surfaces are rough and slightly weathered, JRC ranging from 10-12, dip ranging from 69-83°, dip direction ranging from 235-238°. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK]
1					
2					END OF PIT AT 1.0 m (TARGET DEPTH) Notes: - Pit excavated beneath plate test pad PLT-BGC12-19. - Pit initiated approximately 4.5 m below the original ground surface.
3					
4					
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/13/2012

TEST PIT # TP-BGC12-180C

PROJECT: Eagle Gold Project - Infrastructure
PROJECT NO.: 0792-009
LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,767E, 7,100,187N
GROUND ELEVATION (m): 1,034
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 25 Jul 12
FINISH DATE: 25 Jul 12
FINAL DEPTH OF PIT (m): 1.2
LOGGED BY: BMM
REVIEWED BY: DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0			2		METASEDIMENTARY ROCK orangish greyish white, medium strong to strong (R3.5), slightly weathered (W2), fine grained, siliceous, blocky to very blocky, GSI ranging from 50 to 55, two dominant joint sets: first set, fracture spacing 100 mm to 200 mm, surfaces are rough and slightly weathered, JRC ranging from 10-12, dip ranging from 20-34°, dip direction ranging from 304-322°; second set, fracture spacing 200 mm to 300 mm, surfaces are rough and slightly weathered, JRC ranging from 10-12, dip ranging from 78-84°, dip direction ranging from 156-161°. [SLIGHTLY WEATHERED METASEDIMENTARY ROCK] END OF PIT AT 1.2 m (TARGET DEPTH) Notes: - Pit excavated beneath plate test pad PLT-BGC12-20. - Pit initiated approximately 5 m below the original ground surface.
1					
2					
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

TEST PIT # TP-BGC12-181

LOCATION: Stuttle Gulch

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,163E, 7,100,780N
GROUND ELEVATION (m): 861
DATUM: UTM NAD 83

EXCAVATOR: 325DL CAT
OPERATOR: EWING

START DATE: 19 Sep 12
FINISH DATE: 19 Sep 12
FINAL DEPTH OF PIT (m): 5.5
LOGGED BY: KH
REVIEWED BY: DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS/ROOTMAT
					SAND (SM) fine to coarse sand, silty, some gravel, trace cobbles, very loose to loose, maximum particle size = 100 mm, equidimensional, some flat, angular to subangular, brown, zones of reddish brown and greyish brown, organic odour, dry to moist, matrix supported, no cementation, clasts are metasedimentary, trace rootlets to 1.4 m, buried organics in zones up to 100 mm across and discontinuous layers up to 100 mm thick, trace woody debris. [FILL]
1		G1			
2					Below 2 m - trace cobbles, maximum particle size = 200 mm.
3					
		G2			SILT (ML) sandy (fine to coarse), some gravel, trace cobbles, low plastic, firm, grey with iron oxide staining, organic odour, moist, matrix supported, no cementation, clasts are metasedimentary, equidimensional, some flat, angular to subangular, maximum particle size = 100 mm, trace woody debris. [FILL]
4		G3			Below 3.5 m - alternating layers, approximately 200 mm to 300 mm thick of SILT as described above and fine to coarse SAND (SW), some gravel, trace silt, trace cobbles, well graded, loose, maximum particle size = 100 mm, flat, some equidimensional, subangular, reddish brown, organic odour, moist, matrix supported, no cementation, trace woody debris. Below 4.5 m - Zones of fine SAND (SP), some silt, loose, maximum particle size = 5 mm, poorly graded, grey, organic odour, moist, homogeneous, trace woody debris.
5					
6					END OF PIT AT 5.5 m (MAX REACH) Notes: -Excavated on pad of BH-BGC12-085. -Walls remained approximately vertical throughout excavation, minimal sloughing. -No seepage observed.
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/13/2012

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 11/13/12

APPENDIX D
TEST PIT PHOTOS

	
TP-BGC12-146 – Detail of side wall at 1.8 m.	TP-BGC12-146 – Detail of side wall at 1.8 m.
	
TP-BGC12-146 – Side wall of final test pit; pit completed at 6.0 m.	



TP-BGC12-147 – Using ripper tooth to begin test pit.



TP-BGC12-147 – Detail of visible ice from 1.2 m depth.



TP-BGC12-147 – Detail of spoil pile at 3.0 m; frozen soil.



TP-BGC12-147 – Back wall of test pit; pit completed at 4.0 m.



TP-BGC12-148 – Site photo; before excavation.



TP-BGC12-148 – Detail of pit wall at 1.4 m.



TP-BGC12-148 – Back wall of test pit; pit completed at 3.3 m.



TP-BGC12-148 – Detail of metasediments at base of pit.



TP-BGC12-149 – Site photo; before excavation.



TP-BGC12-149 – Test pit at 1.4 m.



TP-BGC12-149 – Detail of pit wall at 1.4 m.



TP-BGC12-149 – Back wall of test pit; pit completed at 4.0 m.



TP-BGC12-150 – Site photo; before excavation.



TP-BGC12-150– Detail of frozen ground.



TP-BGC12-150 – Test pit completed at 3.0 m.



TP-BGC12-150 – Thawed ground sloughing into pit.



TP-BGC12-151 – Site photo; before excavation.



TP-BGC12-151 – Detail of spoil pile at 1.2 m.



TP-BGC12-151 – Detail of pit wall at 1.2 m.



TP-BGC12-151 – Back wall of test pit; pit completed at 4.2 m.



TP-BGC12-152 – Site photo; before excavation.



TP-BGC12-152 – Detail of pit wall at 2.3 m.



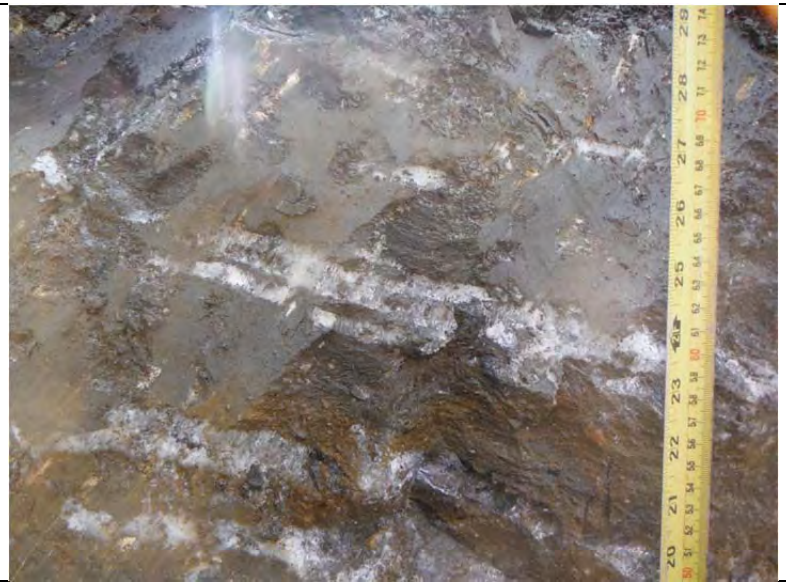
TP-BGC12-152 – Detail of spoil pile at 2.3 m.



TP-BGC12-152 – Back wall of test pit; pit completed at 3.6 m.



TP-BGC12-153 – Site photo; before excavation



TP-BGC12-153 – Detail of pit wall at 1.3 m.



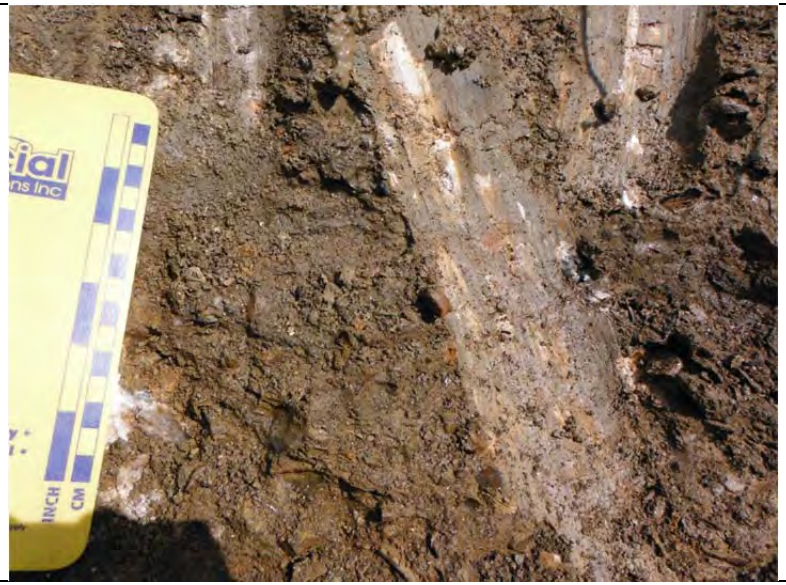
TP-BGC12-153 – Detail of ice lens in sand, taken from spoil pile.



TP-BGC12-153 – Back wall of test pit; pit completed at 4.0 m.



TP-BGC12-154 – Site photo; before excavation.



TP-BGC12-154 – Detail of pit wall at 1.4 m.



TP-BGC12-154 – Detail of spoil pile at 3.3 m.



TP-BGC12-154 – Back wall of test pit at 3.8 m.



TP-BGC12-155 – Site photo; before excavation.



TP-BGC12-155 – Detail of frozen soil in spoil pile at 2.4 m.



TP-BGC12-155 – Back wall of test pit; pit completed at 4.0 m.



TP-BGC12-155 – Detail of spoil pile at 4.0 m.



TP-BGC12-156 – Site photo; before excavation.



TP-BGC12-156 – Detail of pit wall at 1.0 m.



TP-BGC12-156 – Detail of rock, excavated from 2.7 m.



TP-BGC12-156 – Back wall of test pit; pit completed at 3.2 m.



TP-BGC12-157 – Site photo; before excavation.



TP-BGC12-157 – Pit wall at 1.2 m.



TP-BGC12-157 – Detail of rock, excavated from 3.0 m.



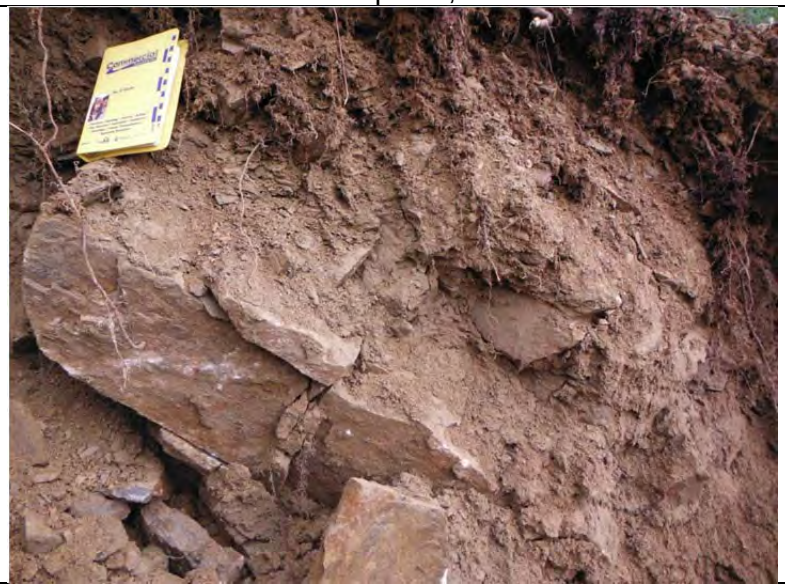
TP-BGC12-157 – Back wall of test pit; pit completed at 4.2 m.



TP-BGC12-158 – Site photo; before excavation.



TP-BGC12-158 – Detail of pit wall at 1.0 m.



TP-BGC12-158 – Detail of pit wall at 1.0 m.



TP-BGC12-158 07 – Back wall of test pit; pit completed at 3.0 m.



TP-BGC12-159 – Site photo; before excavation.



TP-BGC12-159 – Detail of pit wall at 1.0 m.



TP-BGC12-159 – Detail of disturbed rock at 1.0 m.



TP-BGC12-159 – Back wall of test pit; pit completed at 2.1 m.



TP-BGC12-160 – Site photo; before excavation.



TP-BGC12-160 – Detail of pit wall at 1.0 m.



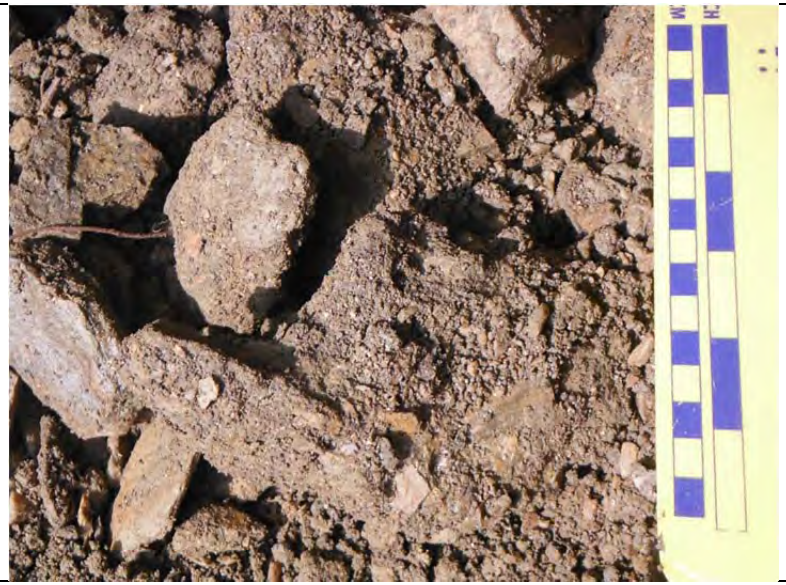
TP-BGC12-160 – Detail of spoil pile at 2.7 m.



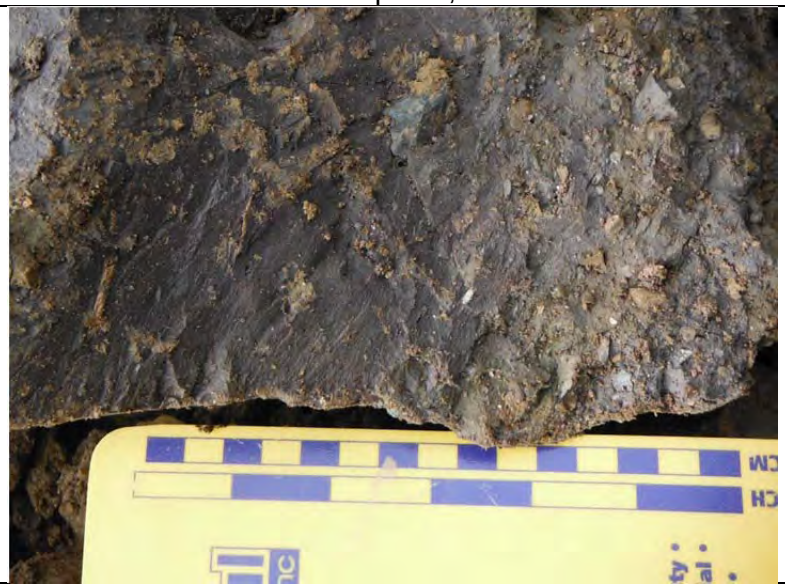
TP-BGC12-160 – Back wall of test pit; pit completed at 5.7 m.



TP-BGC12-161 – Site photo; before excavation.



TP-BGC12-161 – Detail of spoil pile at 2.0 m.



TP-BGC12-161 – Detail of spoil pile at 2.0 m.



TP-BGC12-161 – Back wall of test pit; pit completed at 3.7 m.



TP-BGC12-162 – Site photo; before excavation.



TP-BGC12-162 – Detail of pit wall at 1.2 m.



TP-BGC12-162 – Detail of spoil pile at 2.5 m.



TP-BGC12-162 – Back wall of test pit; pit completed at 3.5 m.



TP-BGC12-163 – Site photo; before excavation.



TP-BGC12-163 – Detail of spoil pile at 0.5 m.



TP-BGC12-163 – Back wall of test pit; pit completed at 3.0 m.



TP-BGC12-163 – Detail of spoil pile at 3.0 m.



TP-BGC12-164 – Site photo; before excavation.



TP-BGC12-164 – Detail of spoil pile at 2.7 m.



TP-BGC12-164 – Detail of pit wall at 1.2 m.



TP-BGC12-164 – Back wall of test pit; pit completed at 3.8 m.



TP-BGC12-165 – Site photo; before excavation.



TP-BGC12-165 – Back wall of pit at 0.8 m.



TP-BGC12-165 – Detail of pit wall at 0.8 m.



TP-BGC12-165 – Detail of spoil pile at 3.5 m.



TP-BGC12-166 – Site photo; before excavation.



TP-BGC12-166 – Detail of pit wall at 1.0 m.



TP-BGC12-166 – Detail of spoil pile at 2.5 m.



TP-BGC12-166 – Back wall of test pit; pit completed at 3.5 m.



TP-BGC12-167 – Site photo; before excavation.



TP-BGC12-167 – Detail of pit wall at 1.5 m.



TP-BGC12-167 – Detail of spoil pile at 2.8 m.



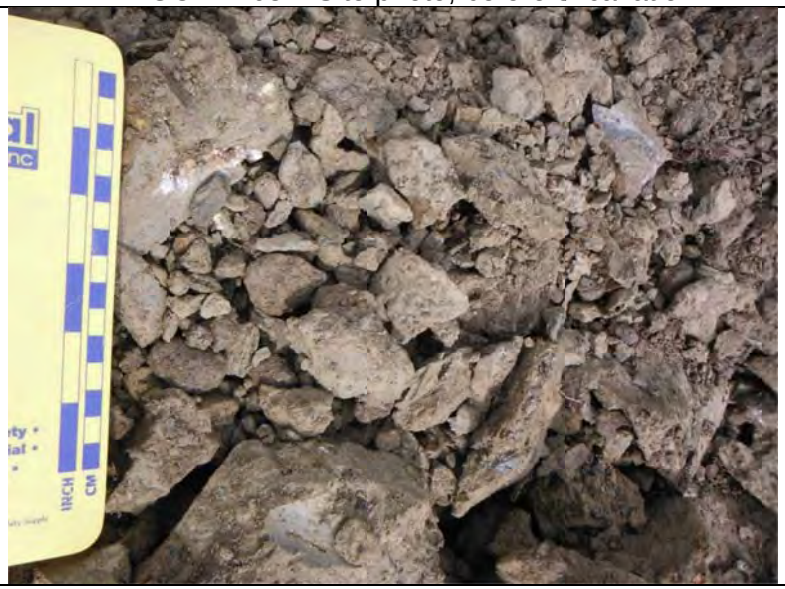
TP-BGC12-167 – Back wall of test pit; pit completed at 3.9 m.



TP-BGC12-168 – Site photo; before excavation.



TP-BGC12-168 – Detail of pit wall at 1.2 m.



TP-BGC12-168 – Detail of spoil pile at 2.5 m.



TP-BGC12-168 – Back wall of test pit; pit completed at 3.5 m.



TP-BGC12-169 – Site photo; before excavation.



TP-BGC12-169 – Detail of pit wall at 1.2 m.



TP-BGC12-169 – Detail of spoil pile at 2.8 m.



TP-BGC12-169 – Back wall of test pit; pit completed at 3.1 m.



TP-BGC12-170 – Site photo; before excavation.



TP-BGC12-170 – Back wall of test pit at 2.5 m.



TP-BGC12-170 – Back wall of test pit; pit completed at 6.0 m.



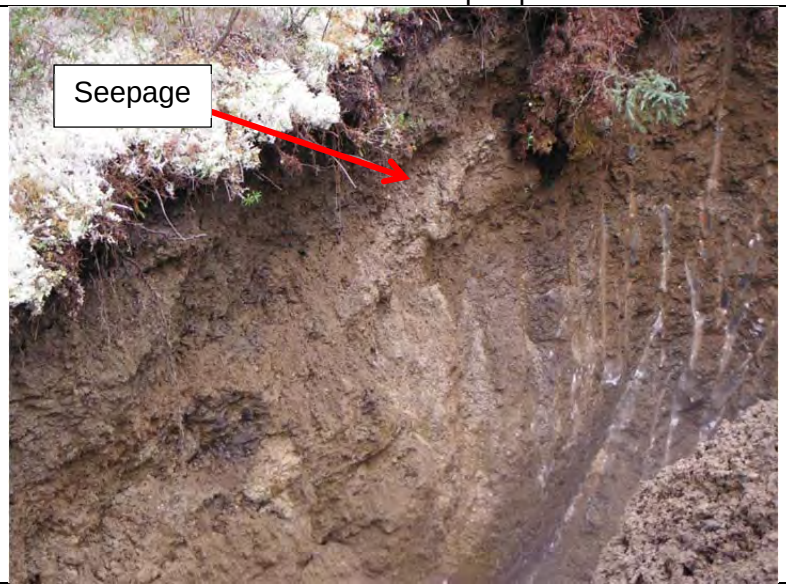
TP-BGC12-171 – Site photo; before excavation.



TP-BGC12-171 – Detail of spoil pile at 1.8 m.



TP-BGC12-171 – Back wall of test pit; pit completed at 3.2 m.



TP-BGC12-171 – Detail of seepage on pit wall.



TP-BGC12-172 – Site photo; before excavation.



TP-BGC12-172 – Detail of pit wall at 0.3 m.



TP-BGC12-172 – Detail of pit wall at 0.6 m.



TP-BGC12-172 – Back wall of test pit; pit completed at 3.5 m.



TP-BGC12-173 – Site photo; before excavation.



TP-BGC12-173 – Detail of spoil pile at 3.5 m.



TP-BGC12-173 – Detail of spoil pile at 4.6 m.



TP-BGC12-173 – Back wall of test pit; pit completed at 4.6 m.



TP-BGC12-174 – Site photo; before excavation.



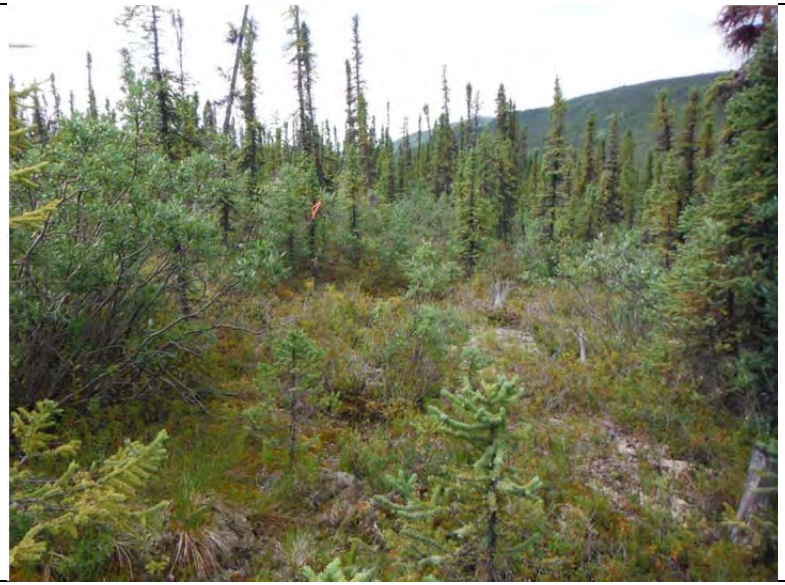
TP-BGC12-174 – Detail of visible ice at 1.1 m.



TP-BGC12-174 – Detail of spoil pile at 3.8 m.



TP-BGC12-174 – Back wall of test pit; pit completed at 4.0 m.



TP-BGC12-175 – Site photo; before excavation.



TP-BGC12-175 – Detail of visible ice at 1.1 m.



TP-BGC12-175 – Detail of spoil pile at 2.7 m.



TP-BGC12-175 – Back wall of test pit; pit completed at 3.3 m.



TP-BGC12-176 – Site photo; before excavation.



TP-BGC12-176 – Detail of pit wall at 1.3 m.



TP-BGC12-176 – Detail of spoil pile at 2.8 m.



TP-BGC12-176 – Back wall of test pit, pit completed at 5.5 m.



TP-BGC12-177 – Site photo; before excavation.



TP-BGC12-177 – Back wall of test pit at 1.1 m.



TP-BGC12-177 – Back wall of test pit; pit completed at 1.8 m.



TP-BGC12-177 – Detail of spoil pile at 1.8 m.



TP-BGC12-178 – Detail of pit wall at 1.1 m.



TP-BGC12-178 – Back wall of test pit; pit completed at 1.7 m.



TP-BGC12-178 – Detail of pit wall at base of pit at 1.7 m.



TP-BGC12-178 – Site photo; after excavation.



TP-BGC12-179A – Back wall of test pit; pit completed at 1.2 m.



TP-BGC12-179A – Detail of test pit wall.



TP-BGC12-179B – Back wall of test pit; pit completed at 1.15 m.



TP-BGC12-179B – Detail of test pit wall.

	
TP-BGC12-179C – Back wall of test pit; pit completed at 1.2 m.	TP-BGC12-179C – Detail of test pit wall.



TP-BGC12-180A – Back wall of test pit; pit completed at 1.3 m.



TP-BGC12-180A – Detail of test pit wall.



TP-BGC12-180B – Back wall of test pit; pit completed at 1.0 m.



TP-BGC12-180B – Detail of test pit wall.

	
TP-BGC12-180C – Back wall of test pit; pit completed at 1.15 m.	TP-BGC12-180C – Detail of test pit wall.

	
TP-BGC12-181 – Detail of side wall at 3.2 m.	TP-BGC12-181 – Spoil at 3.5 m.
	
TP-BGC12-181 – Spoil at 4.5 m.	TP-BGC12-181 – Spoil at 4.5 m.

APPENDIX E
BOREHOLE LOGS

BOREHOLE LOGS

Table E- 1. Summary of Boreholes

Hole ID	Easting[3] (m)	Northing[3] (m)	Elevation (masl)	Drilling Method	Hole Depth (m)	Installation	Comments
BH-BGC12-75[1]	459755	7100169	1034	Diamond	49.1	Standpipe piezometer	
BH-BGC12-76[1]	459785	7100235	1032	Diamond	42.0	Standpipe piezometer	
BH-BGC12-77[1]	458865	7100004	873	Diamond	20.5	Standpipe piezometer	
BH-BGC12-78[1]	458928	7100150	883	Diamond	22.0	Standpipe piezometer	
BH-BGC12-79[1]	459769	7100025	1051	Diamond	50.0	Standpipe piezometer	Standpipe damaged Jul, 2012[4]
BH-BGC12-80[2]	459429	7100691	922	Solid Stem Auger, CRREL	25.3	Standpipe piezometer, Thermistor	
BH-BGC12-81[2]	459527	7100838	911	Solid Stem Auger, CRREL	11.5	Standpipe piezometer, Thermistor	
BH-BGC12-82[2]	459630	7100961	918	Solid Stem Auger	19.2	None	
BH-BGC12-83[2]	459860	7101184	928	Solid Stem Auger	25	Thermistor	
BH-BGC12-84[2]	459769	7101030	919	Solid Stem Auger	9.2	Standpipe Piezometer	
BH-BGC12-85[2]	459167	7100774	865	Solid Stem and Hollow Stem Auger	26.2	Standpipe Piezometer	2nd hole drilled with hollow stem for install

Notes:
1. Borehole locations surveyed by Underhill Geomatics Ltd. using differential GPS.
2. Borehole locations surveyed by BGC staff using a handheld GPS.
3. Coordinates in UTM NAD 83, Zone 8N.
4. BH-BGC12-79 standpipe filled with grout during installation.

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-75

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,755.3E, 7,100,169.3N
GROUND ELEVATION (m) : 1,034.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Polymer
CASED TO (m) : 4.20

START DATE : 14 Jul 12
FINISH DATE : 15 Jul 12
FINAL DEPTH (m) : 49.1
DEPTH TO TOP OF ROCK (m) : 4.5
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				NO RECOVERY - Casing		
4				GRAVEL (GP) Coarse gravel, poorly/gap graded, maximum particle size = 50 mm, flat, subangular, grey, white, some iron staining, poor recovery (finer material likely washed away). [FILL/COLLUVIUM?]		
4.45				Rock encountered at 4.45 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

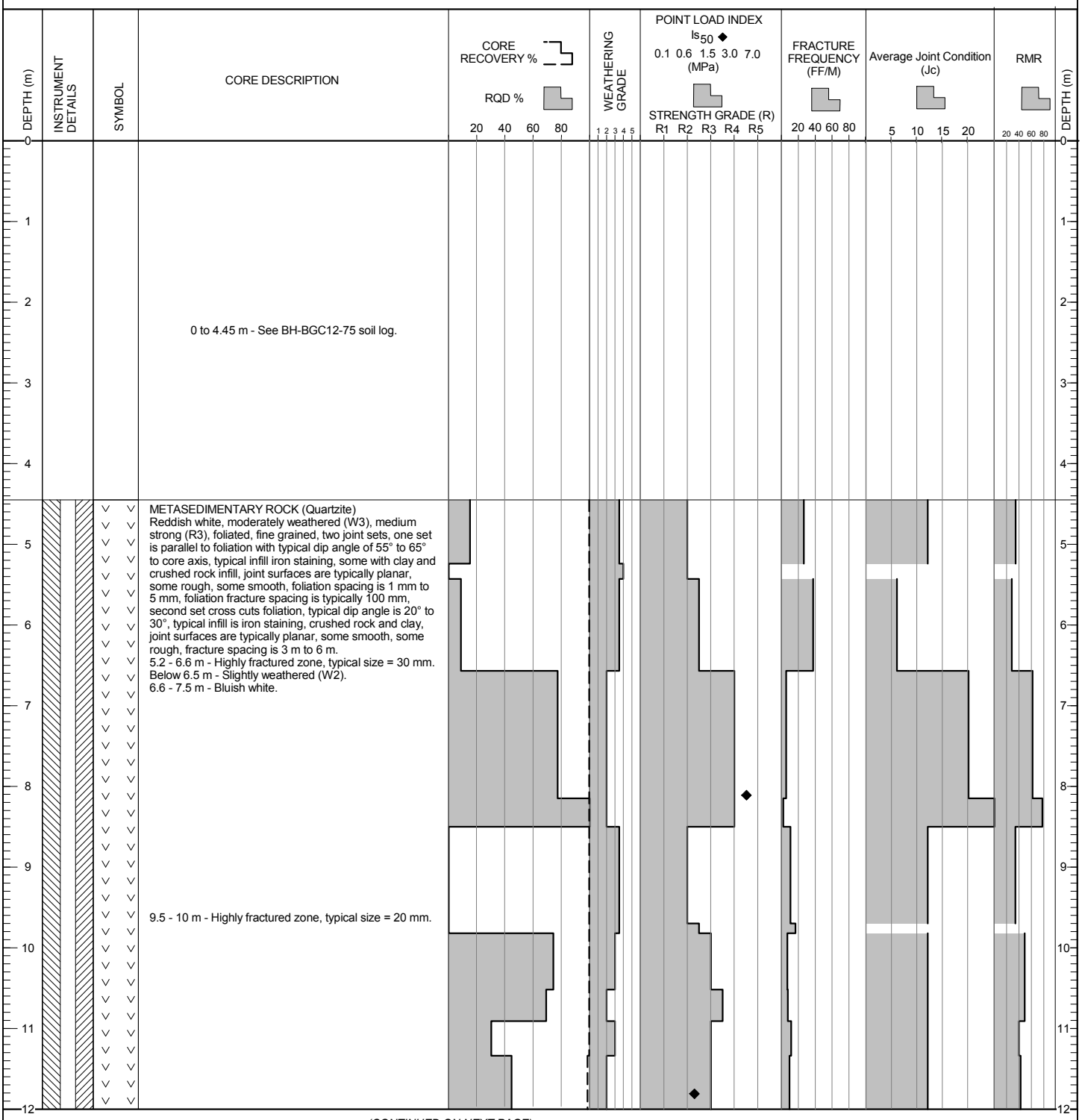
DRILL HOLE # BH-BGC12-75

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,755.3E, 7,100,169.3N
GROUND ELEVATION (m) : 1,034.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 4.2

START DATE : 14 Jul 12
FINISH DATE : 15 Jul 12
FINAL DEPTH (m) : 49.1
DEPTH TO TOP OF ROCK (m) : 4.5
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

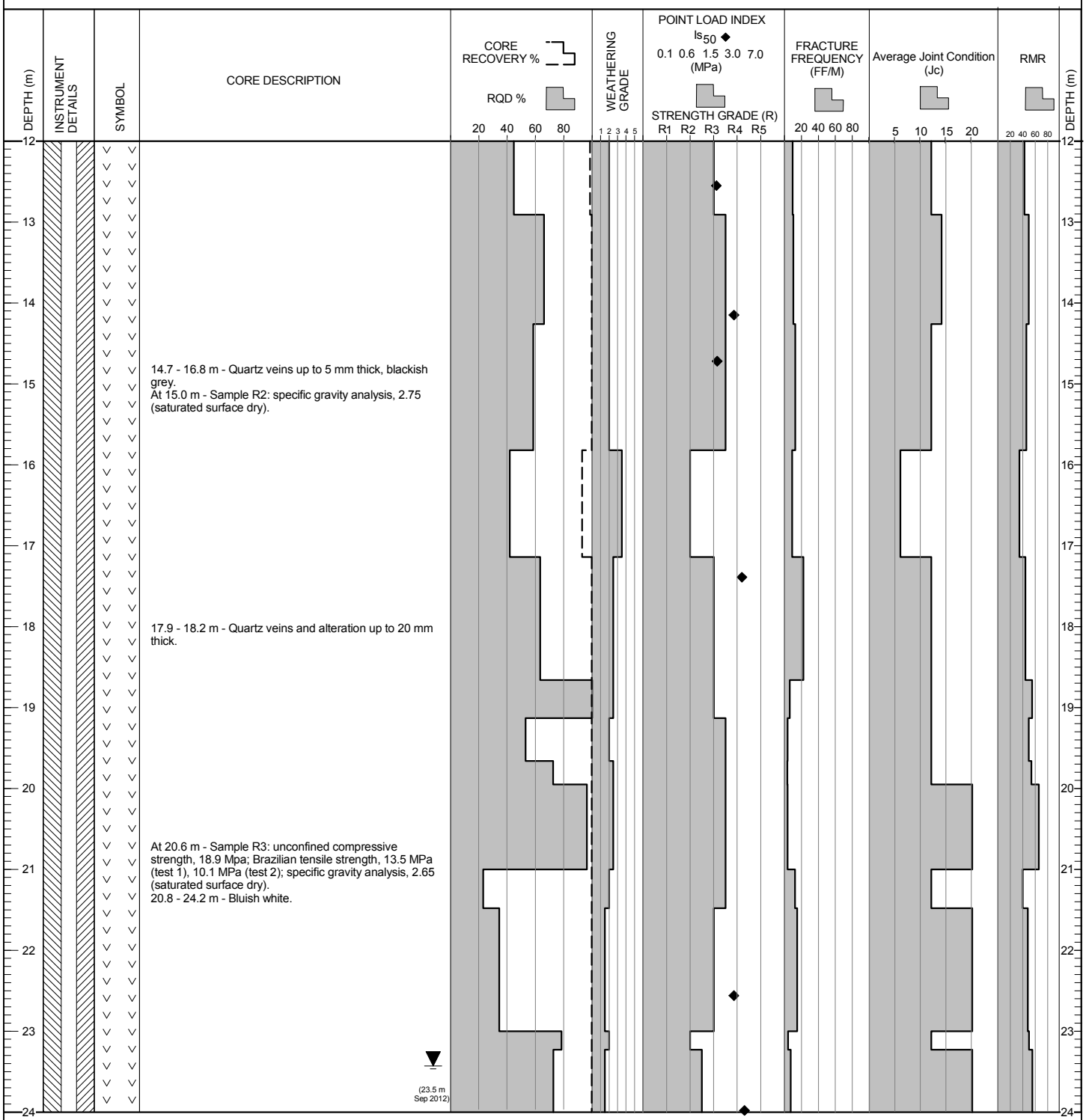
DRILL HOLE # BH-BGC12-75

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,755.3E, 7,100,169.3N
GROUND ELEVATION (m) : 1,034.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 4.2

START DATE : 14 Jul 12
FINISH DATE : 15 Jul 12
FINAL DEPTH (m) : 49.1
DEPTH TO TOP OF ROCK (m) : 4.5
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-75

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,755.3E, 7,100,169.3N
GROUND ELEVATION (m) : 1,034.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 4.2

START DATE : 14 Jul 12
FINISH DATE : 15 Jul 12
FINAL DEPTH (m) : 49.1
DEPTH TO TOP OF ROCK (m) : 4.5
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

27.0 - 27.1 m - Mostly quartz.
At 27.12 m - Fault, 170 mm thick, infill with fault gouge and breccia, low plastic silt (ML), some clay, some coarse sand, trace gravel, iron staining.
27.7 - 27.8 m - Mostly quartz.

30.0 - 30.8 m - Reddish black.

30.8 - 32.5 m - Highly fractured zone, typical size = 5 mm to 10 mm.

33.3 - 40.0 m - Typical foliation fracture spacing is 50 mm.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

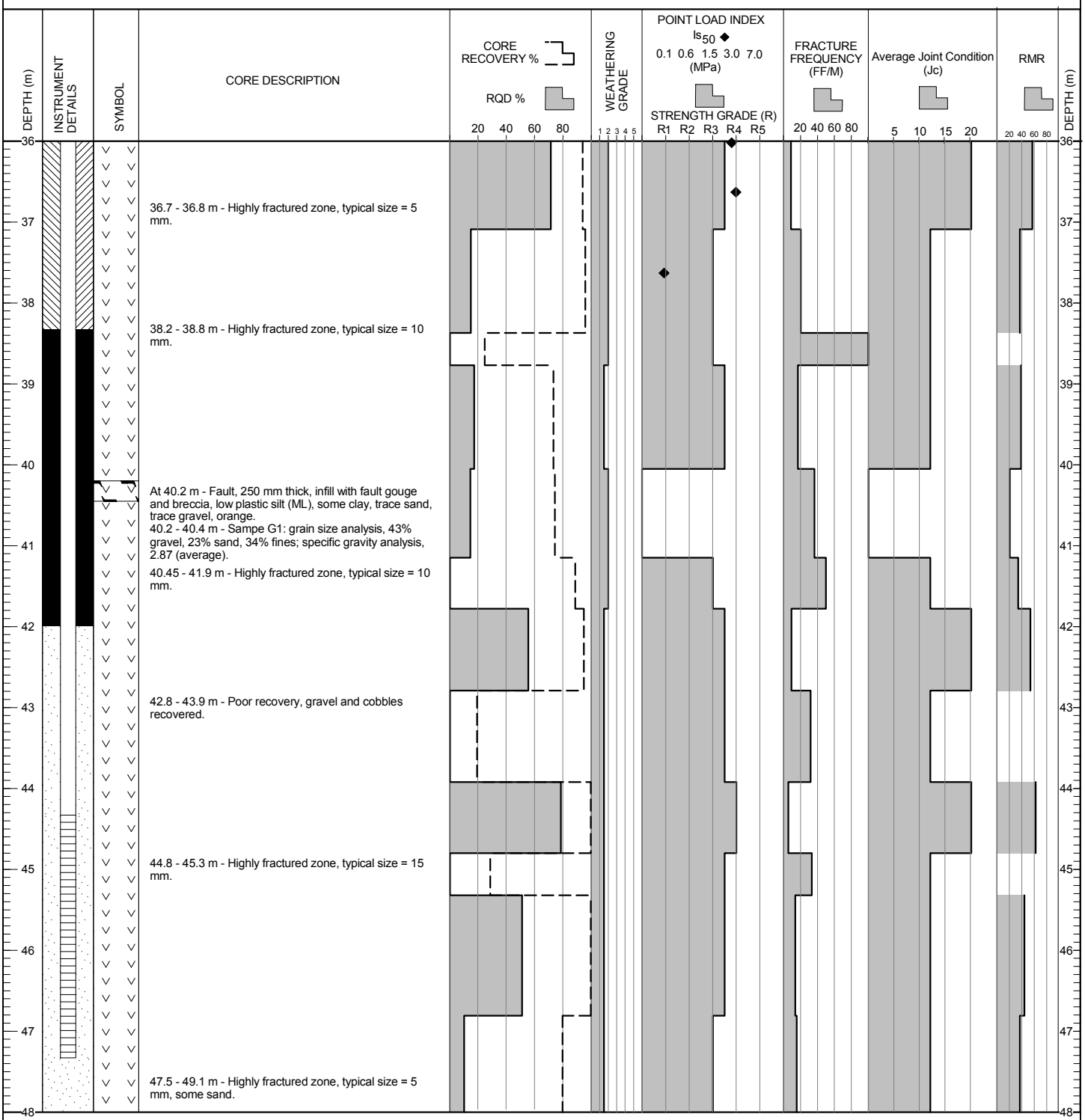
DRILL HOLE # BH-BGC12-75

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,755.3E, 7,100,169.3N
GROUND ELEVATION (m) : 1,034.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 4.2

START DATE : 14 Jul 12
FINISH DATE : 15 Jul 12
FINAL DEPTH (m) : 49.1
DEPTH TO TOP OF ROCK (m) : 4.5
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-75

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,755.3E, 7,100,169.3N
GROUND ELEVATION (m) : 1,034.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 4.2

START DATE : 14 Jul 12
FINISH DATE : 15 Jul 12
FINAL DEPTH (m) : 49.1
DEPTH TO TOP OF ROCK (m) : 4.5
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
48			
49			End of borehole at 49.1 m. Notes: 1) Target depth of 40 m was extended due to presence of approximately 5 m of fill on drill pad and poor rock quality at base of hole. 2) Plate load tests 15 - 17 were conducted on this drill pad. 3) Installation of 2" PVC standpipe piezometer; during flushing of hole prior to piezometer installation, bottom of hole was extended to 51 m.

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-76

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,784.5E, 7,100,235.0N
GROUND ELEVATION (m) : 1,032.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Polymer
CASED TO (m) : 7.45

START DATE : 15 Jul 12
FINISH DATE : 16 Jul 12
FINAL DEPTH (m) : 42.0
DEPTH TO TOP OF ROCK (m) : 4.6
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				NO RECOVERY - Casing		
				Rock encountered at 4.56 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% W% W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-76

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,784.5E, 7,100,235.0N
GROUND ELEVATION (m) : 1,032.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 7.45

START DATE : 15 Jul 12
FINISH DATE : 16 Jul 12
FINAL DEPTH (m) : 42.0
DEPTH TO TOP OF ROCK (m) : 4.6
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % / RQD % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | Average Joint Condition (Jc) (5 10 15 20) | RMR (20 40 60 80) | DEPTH (m)

0 to 4.56 m - See BH-BGC12-76 soil log.

METASEDIMENTARY ROCK
Reddish grey, moderately weathered (W3), medium strong (R3), foliated, fine grained, three joint sets, one set parallel to foliation, typical dip angle 45° to 60° to core axis, typical infill iron staining, some with clay, some with crushed rock, joint surfaces typically planar and smooth, foliation spacing 2 mm to 10 mm, foliation fracture spacing 50 mm to 100 mm, one set cross cuts foliation, typical dip angle 45° to core axis, typical infill iron staining, joint surfaces typically planar, some rough, some smooth, fracture spacing approximately 1 m, third set cross cuts foliation, typical dip angle 15° to 30° to core axis, typical infill, iron staining and clay, joint surfaces typically planar and rough, fracture spacing approximately 3 m.
5.0 - 9.0 m - Poor recovery, highly fractured zone, typical size = 10 mm.

Below 9.0 m - Fresh to slightly weathered (W1.5).

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

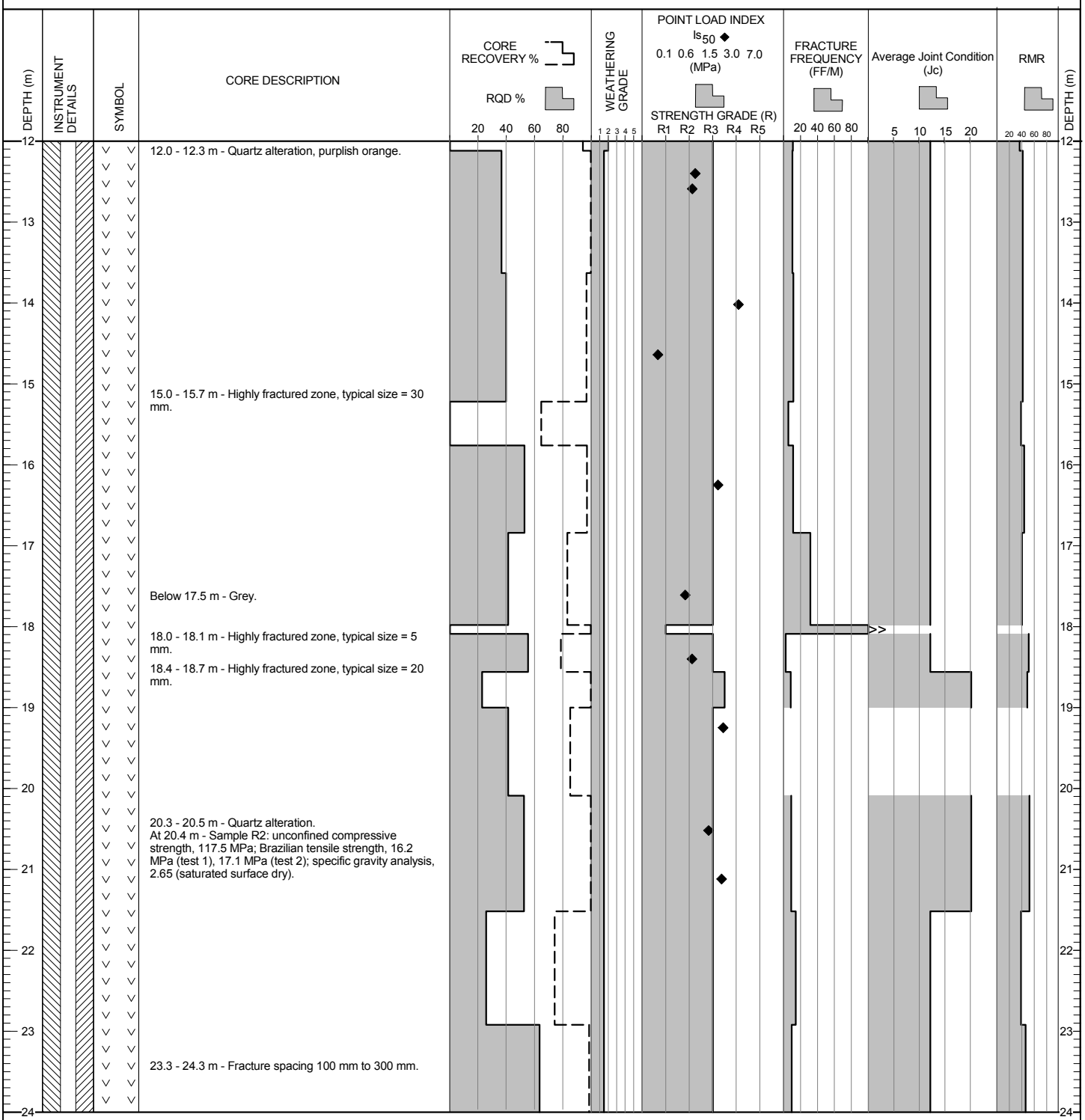
DRILL HOLE # BH-BGC12-76

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,784.5E, 7,100,235.0N
GROUND ELEVATION (m) : 1,032.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 7.45

START DATE : 15 Jul 12
FINISH DATE : 16 Jul 12
FINAL DEPTH (m) : 42.0
DEPTH TO TOP OF ROCK (m) : 4.6
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

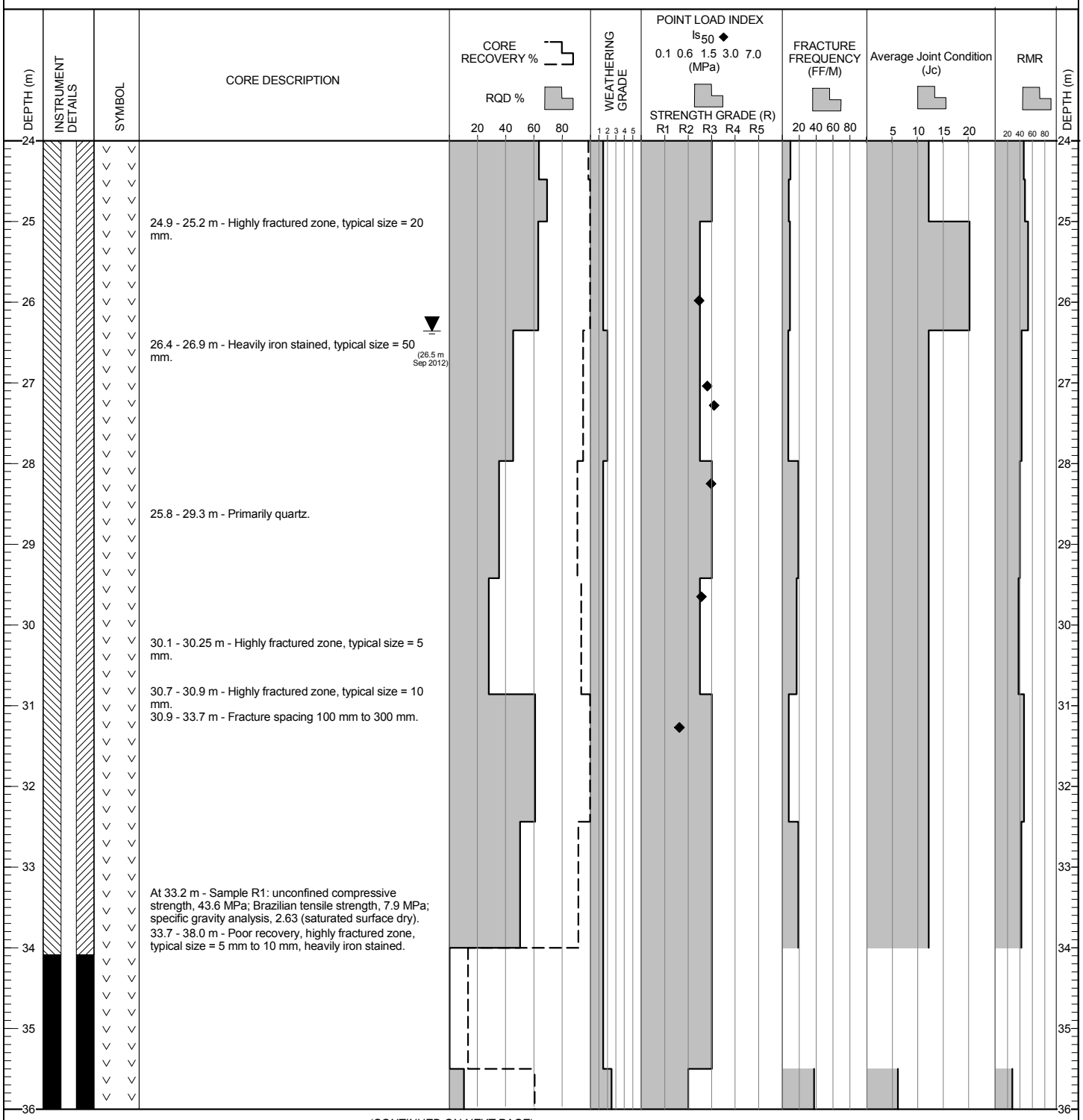
DRILL HOLE # BH-BGC12-76

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,784.5E, 7,100,235.0N
GROUND ELEVATION (m) : 1,032.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 7.45

START DATE : 15 Jul 12
FINISH DATE : 16 Jul 12
FINAL DEPTH (m) : 42.0
DEPTH TO TOP OF ROCK (m) : 4.6
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

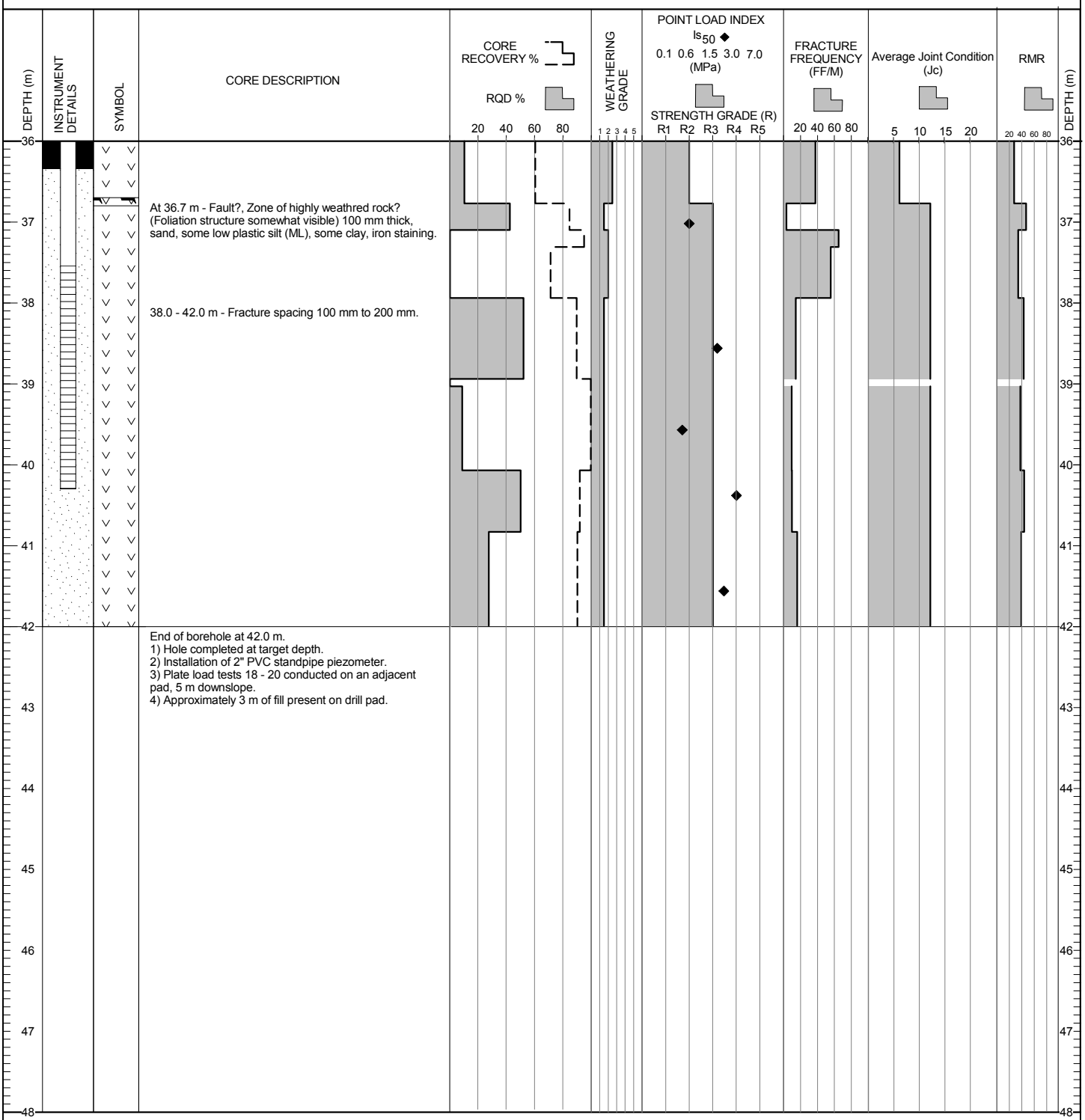
DRILL HOLE # BH-BGC12-76

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,784.5E, 7,100,235.0N
GROUND ELEVATION (m) : 1,032.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 7.45

START DATE : 15 Jul 12
FINISH DATE : 16 Jul 12
FINAL DEPTH (m) : 42.0
DEPTH TO TOP OF ROCK (m) : 4.6
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-77

LOCATION : STEINER AREA

CO-ORDINATES (m) : 458,865.0E, 7,100,004.1N
GROUND ELEVATION (m) : 872.5
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Polymer
CASED TO (m) : 7.43

START DATE : 16 Jul 12
FINISH DATE : 17 Jul 12
FINAL DEPTH (m) : 20.5
DEPTH TO TOP OF ROCK (m) : 9.5
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				SAND (SM) Fine to coarse, silty, some gravel, maximum particle size = 30 mm, equidimensional (some flat), angular to subangular, brown, matrix supported, clasts are metasedimentary, organics/rootlets in top 200 mm, poor recovery, some finer material may have been washed away. [COLLUVIUM]		
4				GRAVEL (GW) Fine to coarse, some sand, maximum particle size = 50 mm, well graded, equidimensional, subangular, grey, clasts are metasedimentary, poor recovery, finer material may have been washed away. [COLLUVIUM]		
9.5				Rock encountered at 9.50 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-77

LOCATION : STEINER AREA

CO-ORDINATES (m) : 458,865.0E, 7,100,004.1N
GROUND ELEVATION (m) : 872.5
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 7.43

START DATE : 16 Jul 12
FINISH DATE : 17 Jul 12
FINAL DEPTH (m) : 20.5
DEPTH TO TOP OF ROCK (m) : 9.5
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0			0 to 9.50 m - See BH-BGC12-77 soil log.
10			METASEDIMENTARY ROCK Bluish grey, very weak to weak (R1/R2), moderately to highly weathered (W3.5), fine grained, foliated, one set parallel to foliation, typical dip angle 60° to 75°, typical infill iron staining and clay, joint surfaces typically planar and smooth, foliation spacing is 1 mm to 5 mm, foliation fracture spacing is typically 20 mm to 50 mm. 11.5 - 13.6 m - Dark blue/black, extremely weak (R0), crumbles upon handling.
12			

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆
0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

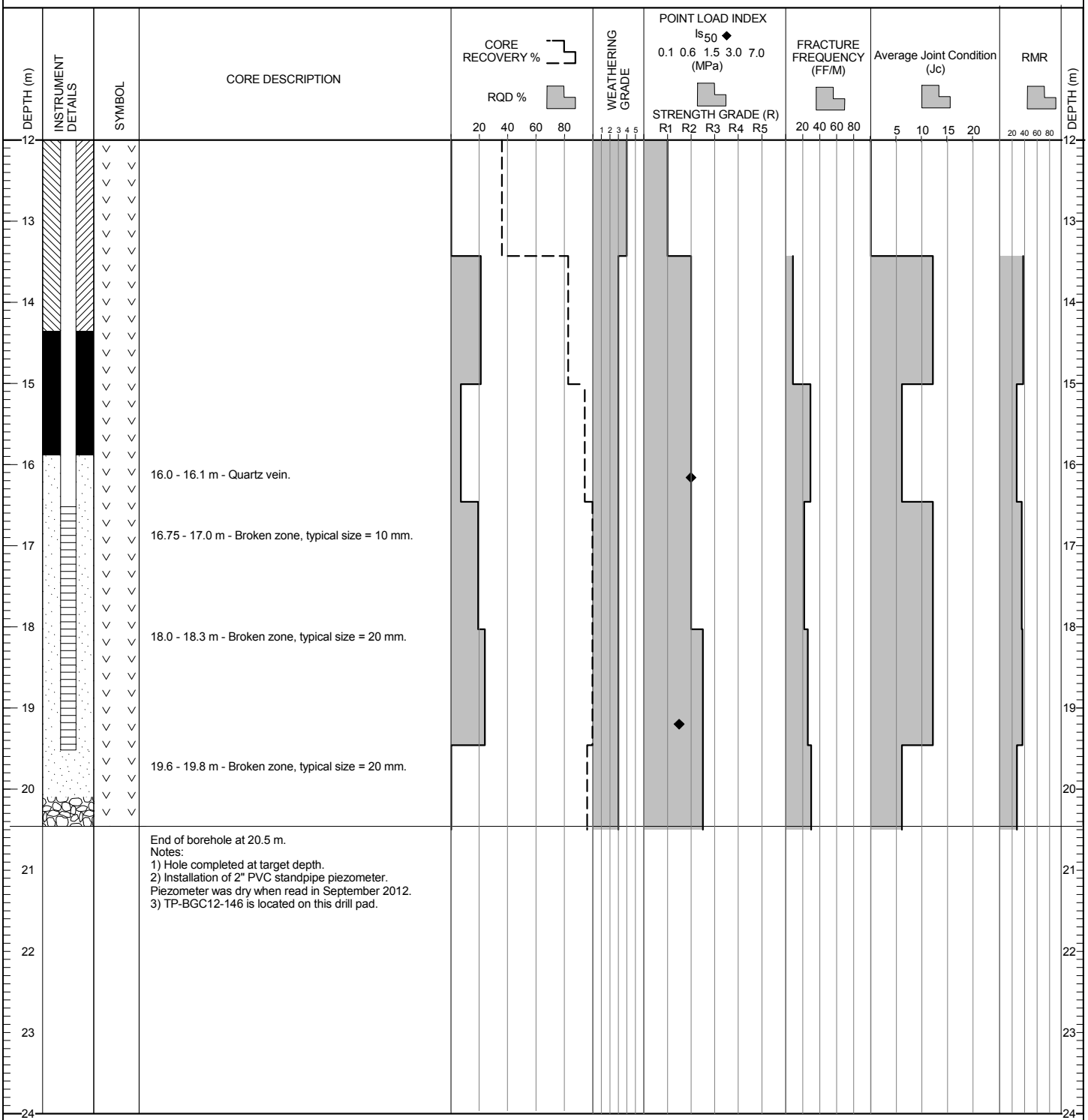
DRILL HOLE # BH-BGC12-77

LOCATION : STEINER AREA

CO-ORDINATES (m) : 458,865.0E, 7,100,004.1N
GROUND ELEVATION (m) : 872.5
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 7.43

START DATE : 16 Jul 12
FINISH DATE : 17 Jul 12
FINAL DEPTH (m) : 20.5
DEPTH TO TOP OF ROCK (m) : 9.5
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-78

LOCATION : STEINER AREA

CO-ORDINATES (m) : 458,927.9E, 7,100,149.7N
GROUND ELEVATION (m) : 883.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Polymer
CASED TO (m) : 7.50

START DATE : 17 Jul 12
FINISH DATE : 18 Jul 12
FINAL DEPTH (m) : 22.0
DEPTH TO TOP OF ROCK (m) : 11.5
LOGGED BY : EEB/KH
REVIEWED BY : DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				NO RECOVERY - Casing		
4.5				GRAVEL (GW) Fine to coarse, trace cobbles, well graded, maximum particle size = 100 mm, equidimensional, angular to subangular, red, white and black, clasts are metasedimentary and granodiorite, poor recovery, finer material likely washed away. [COLLUVIUM]		
10.5				SAND (SW) Fine to coarse, gravelly, well graded, maximum particle size = 30 mm, equidimensional, angular, brown, matrix supported, clasts are metasedimentary. [COLLUVIUM]		
11.5				Rock encountered at 11.50 m depth. Refer to rock log.		
12						

Su - kPa: 40, 80, 120, 160

★ % FINES

● SPT (blows/300mm)

RECOVERY: 20, 40, 60, 80

MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-78

LOCATION : STEINER AREA

CO-ORDINATES (m) : 458,927.9E, 7,100,149.7N
GROUND ELEVATION (m) : 883.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 7.5

START DATE : 17 Jul 12
FINISH DATE : 18 Jul 12
FINAL DEPTH (m) : 22.0
DEPTH TO TOP OF ROCK (m) : 11.5
LOGGED BY : EEB/KH
REVIEWED BY : DW/AA

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % / RQD % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	Average Joint Condition (Jc) (5 10 15 20)	RMR (20 40 60 80)	DEPTH (m)
0										0
1										1
2										2
3										3
4										4
5										5
6			0 to 11.50 m - See BH-BGC12-78 soil log.							6
7										7
8										8
9										9
10										10
11										11
12			METASEDIMENTARY ROCK Bluish grey, moderately weathered (W3), very weak to weak (R1/R2), fine grained, foliated, one joint set paralell							12

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-78

LOCATION : STEINER AREA

CO-ORDINATES (m) : 458,927.9E, 7,100,149.7N
GROUND ELEVATION (m) : 883.3
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 7.5

START DATE : 17 Jul 12
FINISH DATE : 18 Jul 12
FINAL DEPTH (m) : 22.0
DEPTH TO TOP OF ROCK (m) : 11.5
LOGGED BY : EEB/KH
REVIEWED BY : DW/AA

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
12			to foliation plus random cross cutting joints, set parallel to foliation has a typical dip angle of 45° to 60° to core axis, typical infill is iron staining and sericite, joint surfaces are typically planar and smooth, foliation spacing is 1 mm to 5 mm, foliation fracture spacing is typically 20 mm to 50 mm.
13			12.2 - 12.5 m - Broken zone, typical size = 10 mm to 30 mm.
14			
15			14.7 - 14.8 m - Primarily quartz 14.85 - 15.1 m - Highly weathered zone, material breaks apart upon handling to silty, well graded sand, talc present on some discontinuity surfaces, platy.
16			
17			
18			
19			18.7 - 18.8 m - Highly weathered zone, material breaks apart upon handling to silty, well graded sand, talc present on some discontinuity surfaces, platy. Below 19.2 m - Light reddish grey, slightly to moderately weathered, typical foliation dip angle 50° to 70° to core axis, typical foliation fracture spacing 50 mm.
20			(20.2 m Sep 2012)
21			
22			End of borehole at 22.0 m. Notes: 1) Hole completed at target depth. 2) Installation of 2" PVC standpipe piezometer; during flushing of hole prior to piezometer installation depth of hole increased to 22.35 m.
23			
24			

CORE RECOVERY %
RQD % 20 40 60 80

WEATHERING GRADE 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) 20 40 60 80

Average Joint Condition (Jc) 5 10 15 20

RMR 20 40 60 80

DEPTH (m)

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-79

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,769.5E, 7,100,025.3N
GROUND ELEVATION (m) : 1,051.0
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE : HQ3
FLUID : Polymer
CASED TO (m) : 2.80

START DATE : 11 Jul 12
FINISH DATE : 13 Jul 12
FINAL DEPTH (m) : 50.0
DEPTH TO TOP OF ROCK (m) : 2.8
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm	Su - kPa 40 80 120 160 / ★ % FINES / RECOVERY 20 40 60 80	● SPT (blows/300mm) / MOISTURE CONTENT & SPT N W_P% W% W_L% 20 40 60 80
0				NO RECOVERY - Casing; casing removed upon drill hole completion.				
1								
2								
3				Rock encountered at 2.80 m depth. Refer to rock log.				
4								
5								
6								
7								
8								
9								
10								
11								
12								

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

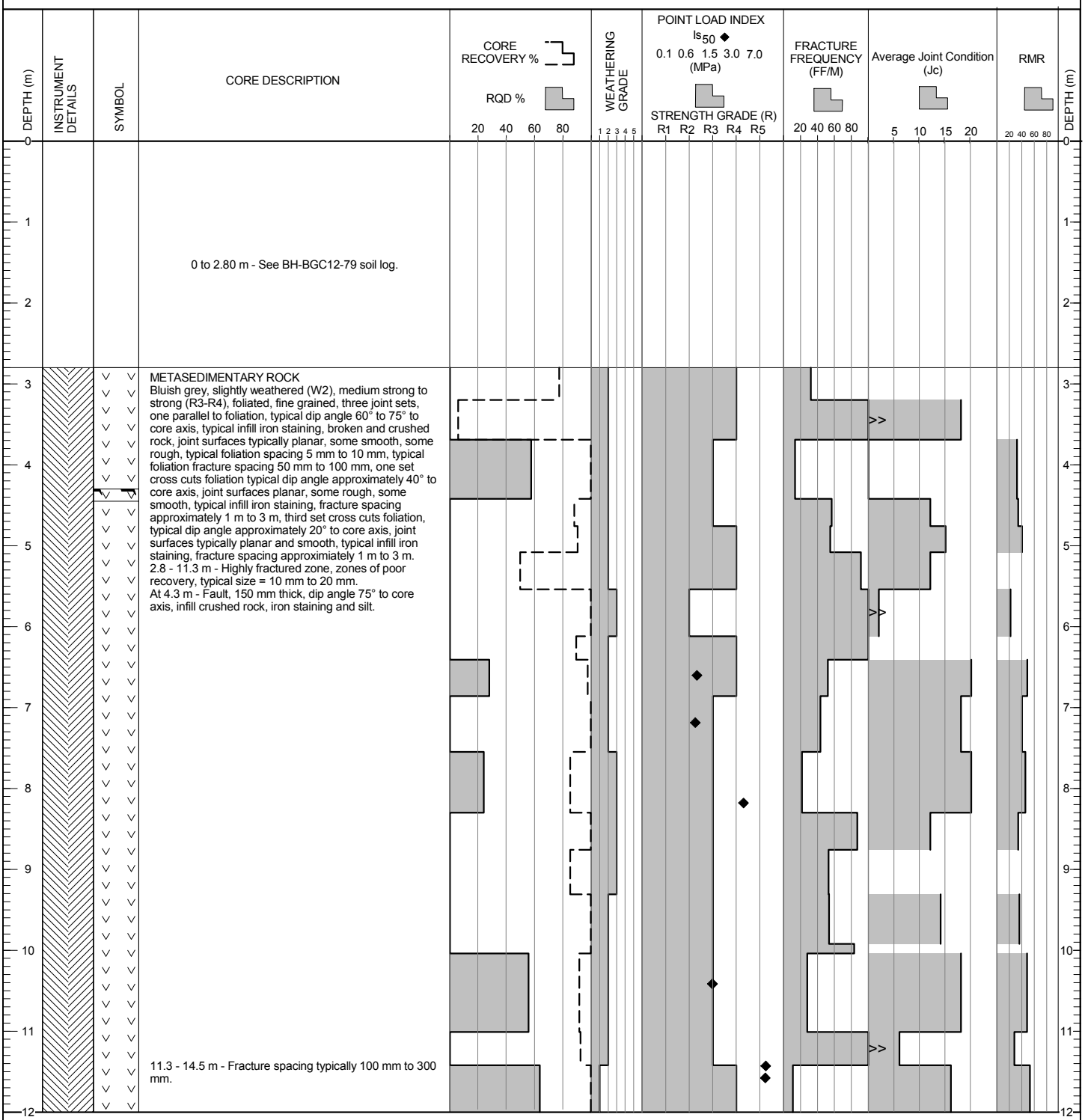
DRILL HOLE # BH-BGC12-79

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,769.5E, 7,100,025.3N
GROUND ELEVATION (m) : 1,051.0
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 2.8

START DATE : 11 Jul 12
FINISH DATE : 13 Jul 12
FINAL DEPTH (m) : 50.0
DEPTH TO TOP OF ROCK (m) : 2.8
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

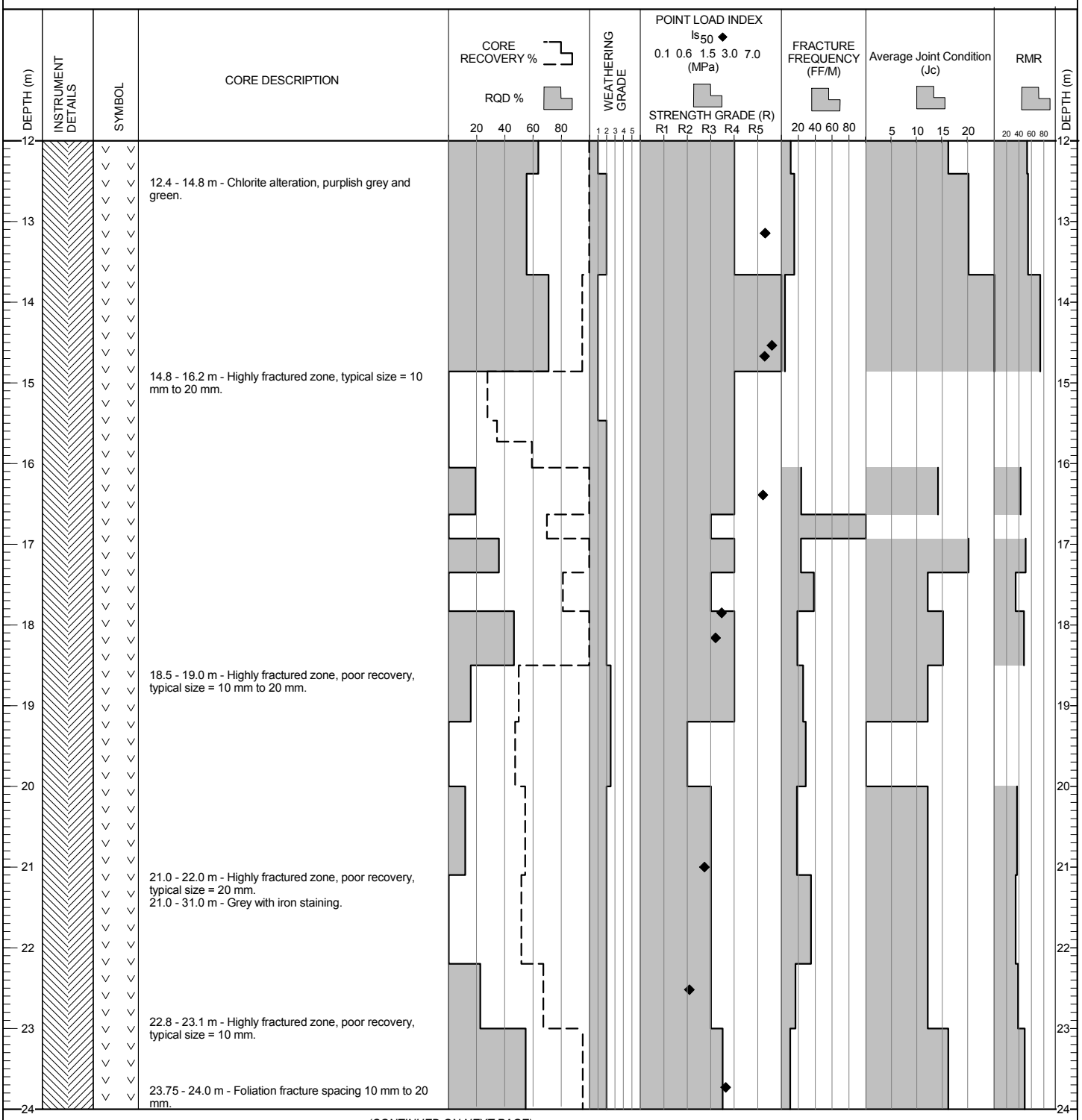
DRILL HOLE # BH-BGC12-79

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,769.5E, 7,100,025.3N
GROUND ELEVATION (m) : 1,051.0
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 2.8

START DATE : 11 Jul 12
FINISH DATE : 13 Jul 12
FINAL DEPTH (m) : 50.0
DEPTH TO TOP OF ROCK (m) : 2.8
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

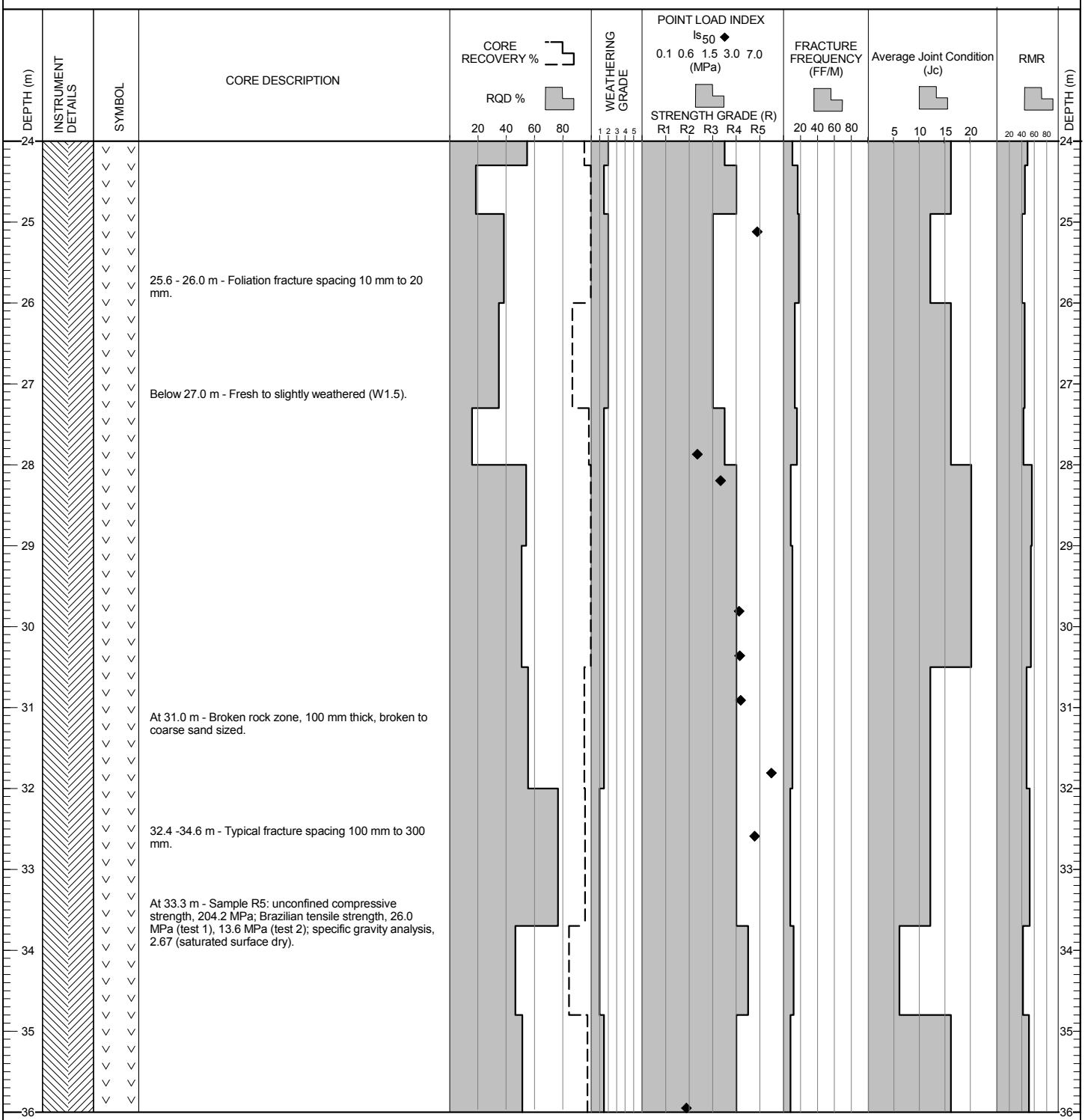
DRILL HOLE # BH-BGC12-79

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,769.5E, 7,100,025.3N
GROUND ELEVATION (m) : 1,051.0
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 2.8

START DATE : 11 Jul 12
FINISH DATE : 13 Jul 12
FINAL DEPTH (m) : 50.0
DEPTH TO TOP OF ROCK (m) : 2.8
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

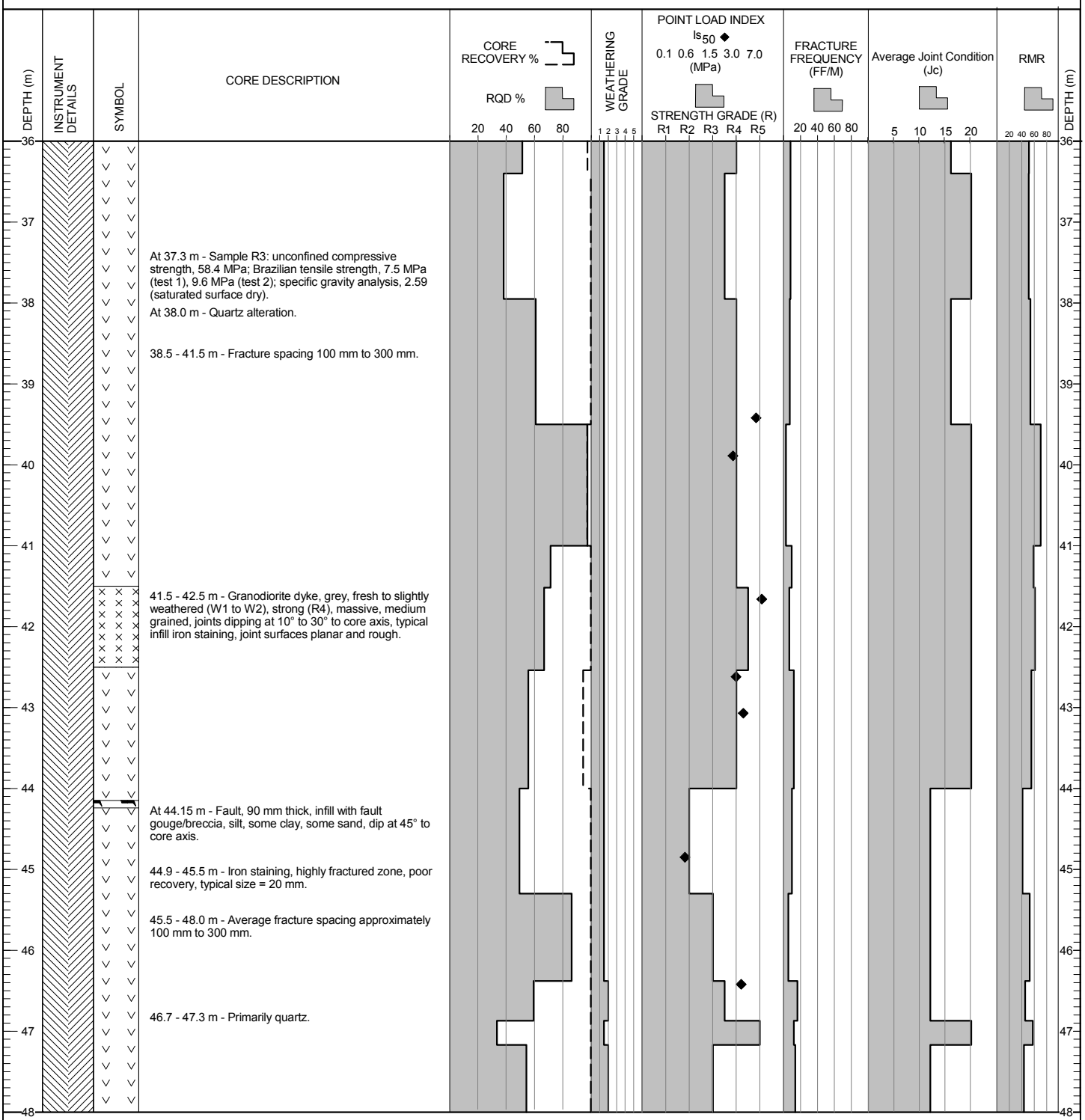
DRILL HOLE # BH-BGC12-79

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,769.5E, 7,100,025.3N
GROUND ELEVATION (m) : 1,051.0
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 2.8

START DATE : 11 Jul 12
FINISH DATE : 13 Jul 12
FINAL DEPTH (m) : 50.0
DEPTH TO TOP OF ROCK (m) : 2.8
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA



(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Infrastructure

PROJECT NO.: 0792-009

DRILL HOLE # BH-BGC12-79

LOCATION : STUTTLE GULCH

CO-ORDINATES (m) : 459,769.5E, 7,100,025.3N
GROUND ELEVATION (m) : 1,051.0
SURVEY METHOD : DGPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : N/A
DRILLING CONTRACTOR : New Age Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HQ3
FLUID : Polymer
CASED TO (m): 2.8

START DATE : 11 Jul 12
FINISH DATE : 13 Jul 12
FINAL DEPTH (m) : 50.0
DEPTH TO TOP OF ROCK (m) : 2.8
LOGGED BY : EEB/BMM/KH
REVIEWED BY : DW/AA

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
48			48.0 - 49.0 m - Highly fractured zone, typical size = 5 mm to 20 mm.
49			
50			End of borehole at 50.0 m. Notes: 1) Hole completed at target depth. 2) Hole fully grouted, grout entered 2" PVC pipe during installation of standpipe piezometer. 3) Approximately 2 m of fill on drill pad.

CORE RECOVERY %
RQD %
20 40 60 80

WEATHERING GRADE
1 2 3 4 5

POINT LOAD INDEX
Is_{50} ◆
0.1 0.6 1.5 3.0 7.0
(MPa)
STRENGTH GRADE (R)
R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M)
20 40 60 80

Average Joint Condition (Jc)
5 10 15 20

RMR
20 40 60 80

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 11/26/12

DRILL HOLE # BH-BGC12-80

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008
LOCATION : Stuttle Gulch

CO-ORDINATES (m) : 459,429E, 7,100,691N
GROUND ELEVATION (m) : 922
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 11 Sep 12
FINISH DATE : 12 Sep 12
FINAL DEPTH (m) : 25.3
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION
0				ORGANICS/ROOTMAT
				SILT (ML) sandy (fine to coarse), trace gravel, low plastic, greyish brown, no odour, matrix supported; clasts are metasedimentary, equidimensional, some flat, angular; frozen, Vc, Vs, 20% to 40% ice, crystals typically 1 mm to 2 mm and up to 5 mm, lenses 0.5 mm to 1 mm thick. [COLLUVIUM]
1		G1		
2		G2		Below 1.8 m - some gravel, Vx, 5% to 10% ice.
3		G4		2.7 - 3.25 m - SAND (SM) fine to coarse sand, silty, gravelly, maximum particle size = 20 mm, flat, some elongated, subangular to angular, dark brown, no odour, matrix supported, frozen, Vx, Vc, ~5% ice.
		G3		At 3.0 m - Sample G4, grain size analysis, 19% gravel, 50% sand, 31% fines.
		G5		3.25 - 3.7 m - SILT, sandy (fine to coarse), trace gravel, non plastic, grey, homogeneous, coarse material is metasedimentary, flat, some equidimensional, angular, maximum particle size = 30 mm, frozen, Vx, <5% ice, 1 mm to 2 mm crystals, Nbn.
4		G6		SAND (SM) fine to coarse sand, gravelly, some silt, maximum particle size = 10 mm, equidimensional, some flat, angular, matrix supported, brown, frozen, Vx, ~10% ice, 1 mm to 2 mm and up to 5 mm crystals. [COLLUVIUM]
		G7		
		G8		Below 4.3 m - maximum particle size = 20 mm, some ice occurs as coatings on larger particles (Vc) 1 mm to 2 mm thick. At 4.7 m - Sample G8, grain size analysis, 46% gravel, 41% sand, 13% fines.
5		G9		Below 5 m - maximum particle size = 75 mm, occasional granodiorite clasts, 20% to 25% ice, Vx, 2 mm to 20 mm crystals.
6				At 5.8 m - 50 mm ice crystal. At 6.4 m - Sample G10, grain size analysis, 5% gravel, 16% sand, 80% fines.
		G10		6.4 - 6.8 m - CLAY (CL), silty, some sand, trace gravel, grey, no odour, homogeneous, maximum particle size = 10 mm, frozen, Vx, 5 mm to 50 mm crystals, approximately 50% ice.
7				SAND (SM) fine to coarse sand, some silt, trace gravel, maximum particle size = 10 mm, some flat, some equidimensional, angular, orange and white, dry, foliation structure visible in some runs completed with CRREL barrel. Rock is broken down by drilling process and logged as soil. [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK]
8				
9		G11		
10				
11				10.7 - 14.3 m; completely weathered (W5).
12				

INSTRUMENT DETAILS

SPT BLOWS PER 150mm

Su - kPa
40 80 120 160
★ % FINES
● SPT (blows/300mm)
RECOVERY
20 40 60 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20 40 60 80

(Continued on next page)

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

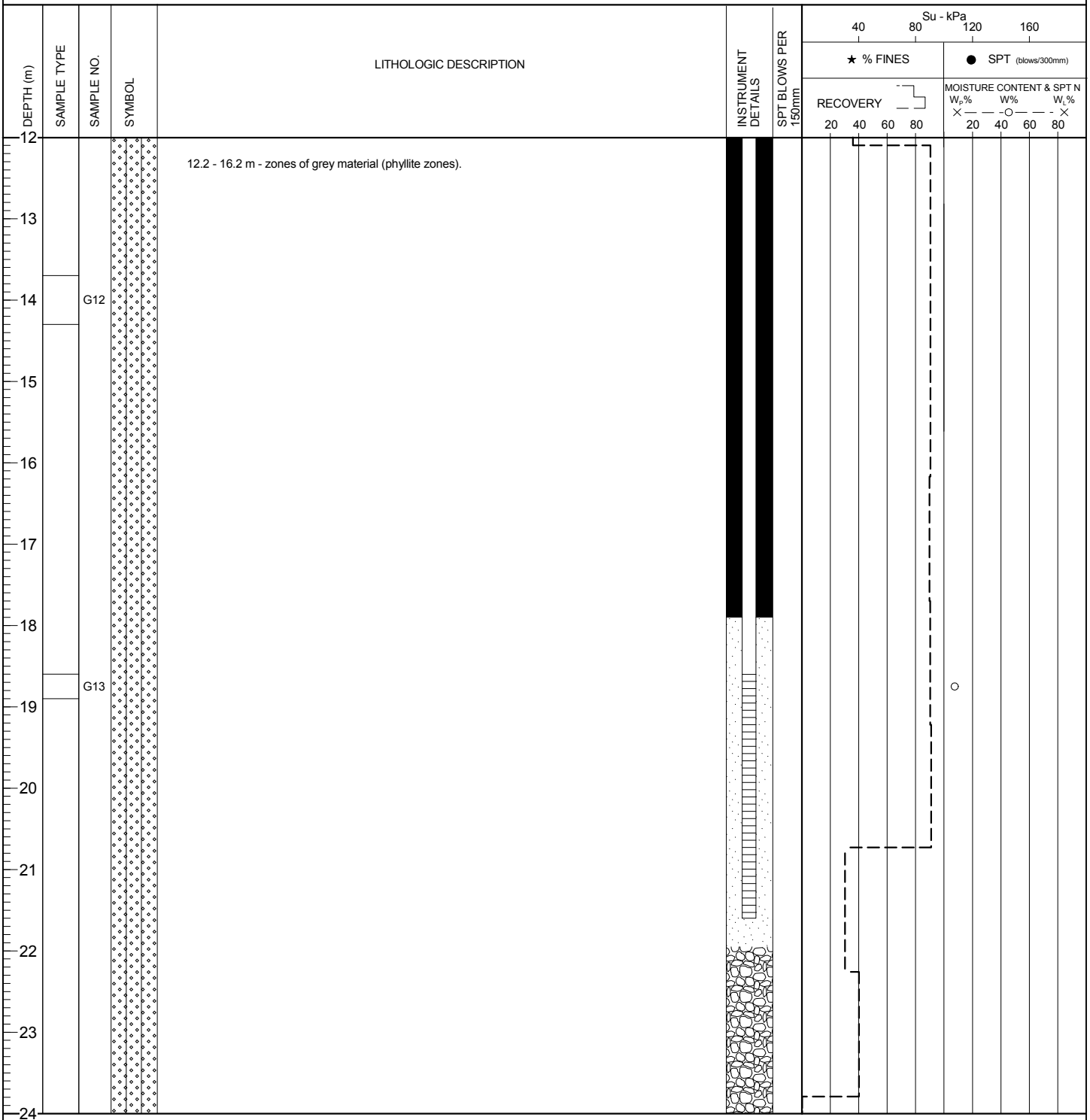
DRILL HOLE # BH-BGC12-80

LOCATION : Stuttle Gulch

CO-ORDINATES (m) : 459,429E, 7,100,691N
GROUND ELEVATION (m) : 922
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 11 Sep 12
FINISH DATE : 12 Sep 12
FINAL DEPTH (m) : 25.3
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ



(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/26/2012

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

DRILL HOLE # BH-BGC12-80

LOCATION : Stuttle Gulch

CO-ORDINATES (m) : 459,429E, 7,100,691N
GROUND ELEVATION (m) : 922
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 11 Sep 12
FINISH DATE : 12 Sep 12
FINAL DEPTH (m) : 25.3
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
24						
25						
				END OF HOLE AT 25.3 m (REFUSAL ON WEATHERED ROCK) Notes: -Standpipe piezometer installed. Piezometer was dry when read in Septmeber 2012. -Thermistor installed, M-square model YSI 44007, serial # 11.5-1.		
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

DRILL HOLE # BH-BGC12-81

LOCATION : Stuttle Gulch

CO-ORDINATES (m) : 459,527E, 7,100,838N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 12 Sep 12
FINISH DATE : 13 Sep 12
FINAL DEPTH (m) : 11.5
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				ORGANICS/ROOTMAT		
		G1		SILT (ML) sandy (fine to coarse), trace gravel, low plastic, grey, matrix supported, coarse material is flat, angular, metasedimentary, maximum particle size = 20 mm, frozen, Nbe, ~10% excess ice, wet when thawed.		
		G2				
1		G4		[COLLUVIUM]		
		G3		SAND (SM) fine to coarse sand, gravelly, silty, maximum particle size = 20 mm, equidimensional, some flat, angular, greyish brown, no odour, matrix supported, coarse material is metasedimentary, frozen, Vx, Vc, ~10% ice, crystals and coatings < 1 mm thick.		
		G5		[COLLUVIUM] 1.4 -1.5 m; Sample G3, grain size analysis, 21% gravel, 46% sand, 33% fines.		
2				Below 2.1 m - some silt, trace gravel.		
				SILT (ML) sandy, trace gravel, low plastic, grey with iron oxide mottling, no odour, matrix supported, coarse material is metasedimentary, equidimensional, some gravel is flat, angular, frozen, Vc, Vx, Vr, approximately 10% to 20% ice, lenses and coatings are 1 mm to 2 mm thick, some crystals up to 10 mm.		
3		G6		[COLLUVIUM] 2.9 -3.05 m; Sample G6, grain size analysis, 10% gravel, 31% sand, 59% fines.		
		G7				
		G8		Below 4 m - sandy, Nbe, Vx, Vs, crystals are 2 mm to 10 mm, occasional lenses up to 5 mm thick, Nbe in silt matrix, approximately 10% to 15% ice.		
4						
		G9				
5		G10				
				SILT (ML) and sand, trace gravel, low plastic, grey to black, no odour, matrix supported, coarse material is metasedimentary, equidimensional, some flat, subangular, frozen, <5% ice, Vx, 1 mm to 3 mm crystals.		
		G11		[COLLUVIUM] 5.6 - 5.8 m; Sample G11, grain size analysis, 29% gravel, 40% sand, 31% fines.		
6		G12		Below 5.8 m - Nbn.		
				Below 6.4 m - Nf, trace clay.		
		G13				
7		G14		Below 7 m - Vx, 5 mm crystals, <5% ice.		
				SAND (SM) fine to coarse sand, gravelly, some silt, maximum particle size = 20 mm, equidimensional, some flat, angular, brown, moist, matrix supported, clasts are metasedimentary.		
8		G15		[COLLUVIUM]		
9						
10		M1				R
11		G16				
				NO RECOVERY. Difficult augering, orange silt on bit and lower portion of flights. [WEATHERED METASEDIMENTARY ROCK?]		
12				END OF HOLE AT 11.5 m (REFUSAL ON WEATHERED ROCK?)		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

DRILL HOLE # BH-BGC12-81

LOCATION : Stuttle Gulch

CO-ORDINATES (m) : 459,527E, 7,100,838N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger/CRREL
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 12 Sep 12
FINISH DATE : 13 Sep 12
FINAL DEPTH (m) : 11.5
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
12				Notes: -Standpipe piezometer installed. Piezometer was dry when read in September 2012. -Thermistor installed, M-squared model YSI 44007, serial #11.5-2.		
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% W% W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/26/2012

DRILL HOLE # BH-BGC12-82

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

LOCATION : Eagle Pup

CO-ORDINATES (m) : 459,630E, 7,100,961N
GROUND ELEVATION (m) : 918
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 14 Sep 12
FINISH DATE : 14 Sep 12
FINAL DEPTH (m) : 19.2
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				SAND (SM) fine to coarse sand, gravelly to and gravel, some silt, maximum particle size = 30 mm, equidimensional (some flat, especially gravel), angular (some sand subangular), brown, no odour, moist, matrix supported, no cementation, clasts are metasedimentary with occasional granodiorite. [COLLUVIUM]		
2		G1		2.2 -2.4 m; Sample G1, grain size analysis, 42% gravel, 40% sand, 18% fines. 2.4 - 4 m - wet, possible perched water table above frozen ground.		
4		G2		4 to 8.5 m - frozen, Nf.		
5		G3		5.5 - 6.7 m - SAND (SM), fine sand, trace coarse sand, some silt, trace gravel, poorly graded, maximum particle size = 10 mm, equidimensional, angular, brown, matrix supported.		
6		G4				
7		G5		Below 7 m - some gravel.		
8		G6				
		G7				
9		G8		SILT (ML) and sand (fine to coarse), trace gravel, low plastic, grey, no odour, dry to moist, homogeneous, no cementation, coarse material is metasedimentary, equidimensional, angular to subangular. [COLLUVIUM] 9.3 -9.4 m; Sample G8, grain size analysis, 17% gravel, 45% sand, 38% fines.		
10				SAND (SM) fine to coarse sand, some silt, some gravel, maximum particle size = 20 mm, equidimensional, some flat, subangular, light brown, no odour, moist, matrix supported, no cementation, coarse material is metasedimentary with occasional granodiorite. [COLLUVIUM]		
11		G9				
12						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/26/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

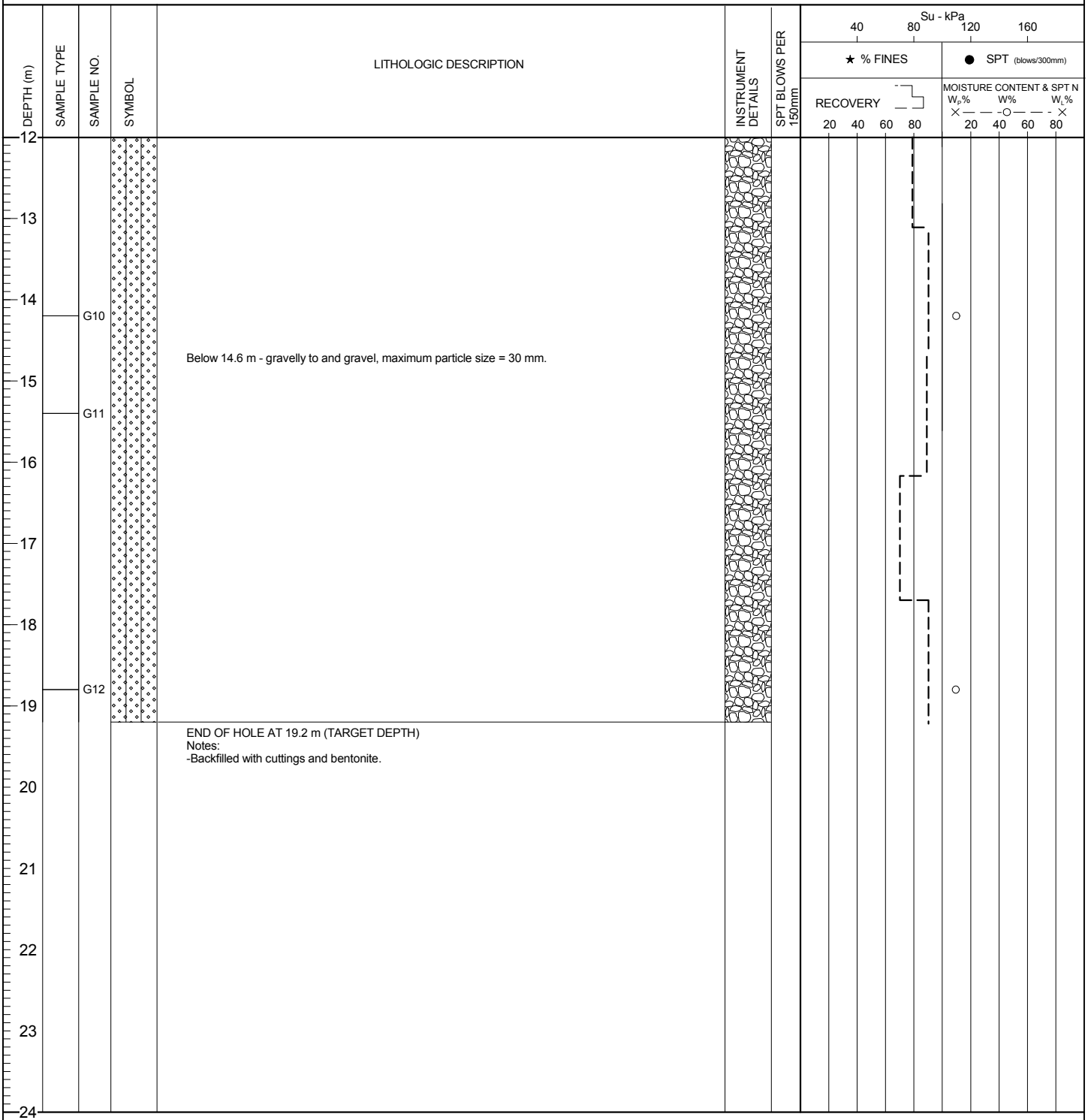
DRILL HOLE # BH-BGC12-82

LOCATION : Eagle Pup

CO-ORDINATES (m) : 459,630E, 7,100,961N
GROUND ELEVATION (m) : 918
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 14 Sep 12
FINISH DATE : 14 Sep 12
FINAL DEPTH (m) : 19.2
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 11/26/12

DRILL HOLE # BH-BGC12-83

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

LOCATION : Eagle Pup

CO-ORDINATES (m) : 459,860E, 7,101,184N
GROUND ELEVATION (m) : 928
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 15 Sep 12
FINISH DATE : 16 Sep 12
FINAL DEPTH (m) : 25.0
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	LITHOLOGIC DESCRIPTION	SPT BLOWS PER 150mm
0			ORGANICS/ROOTMAT	
		G1	SILT (ML) sandy (fine to coarse), some gravel, low plastic, dark brown, moist, matrix supported, no cementation, coarse material is metasedimentary. [FILL]	
1		M1		
			SAND (SM) fine to coarse sand, and silt, and gravel, loose, maximum particle size = 30 mm, flat (some equidimensional), angular (some subangular, especially coarse sand, grey with red iron oxide mottling, no odour, moist, homogeneous, no cementation. [COLLUVIUM]	
2		G2	1.9 -2.1 m; Sample G2, grain size analysis, 32% gravel, 29% sand, 39% fines.	
		M2		10 8 7
3		G3		
		M3		6 4 5
4			SAND (SM) fine to coarse sand, some gravel, some silt, maximum particle size = 30 mm, dense to very dense/extremely weak rock, equidimensional, some flat, angular, whitish orange, dry, homogeneous, foliation structure visible in some SPT samples - foliation spacing <1 mm and approximately horizontal, no cementation, metasedimentary clasts (quartzite), talc on some clast surfaces. Rock broken down by drilling process and described as a soil. [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK]	
5		G4		
		M4		6 14 30
6				
7		M5		10 R
8			Below 8.2 m - alternating grey (phyllite) zones with iron oxide staining and quartzite zones.	
		M6		12 36 29
9				
10		M7		30 R
11				
		M8	Below 11.3 m; some gravel to gravelly	22 R
12				

INSTRUMENT DETAILS

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%: 20, 40, 60, 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 11/26/12

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

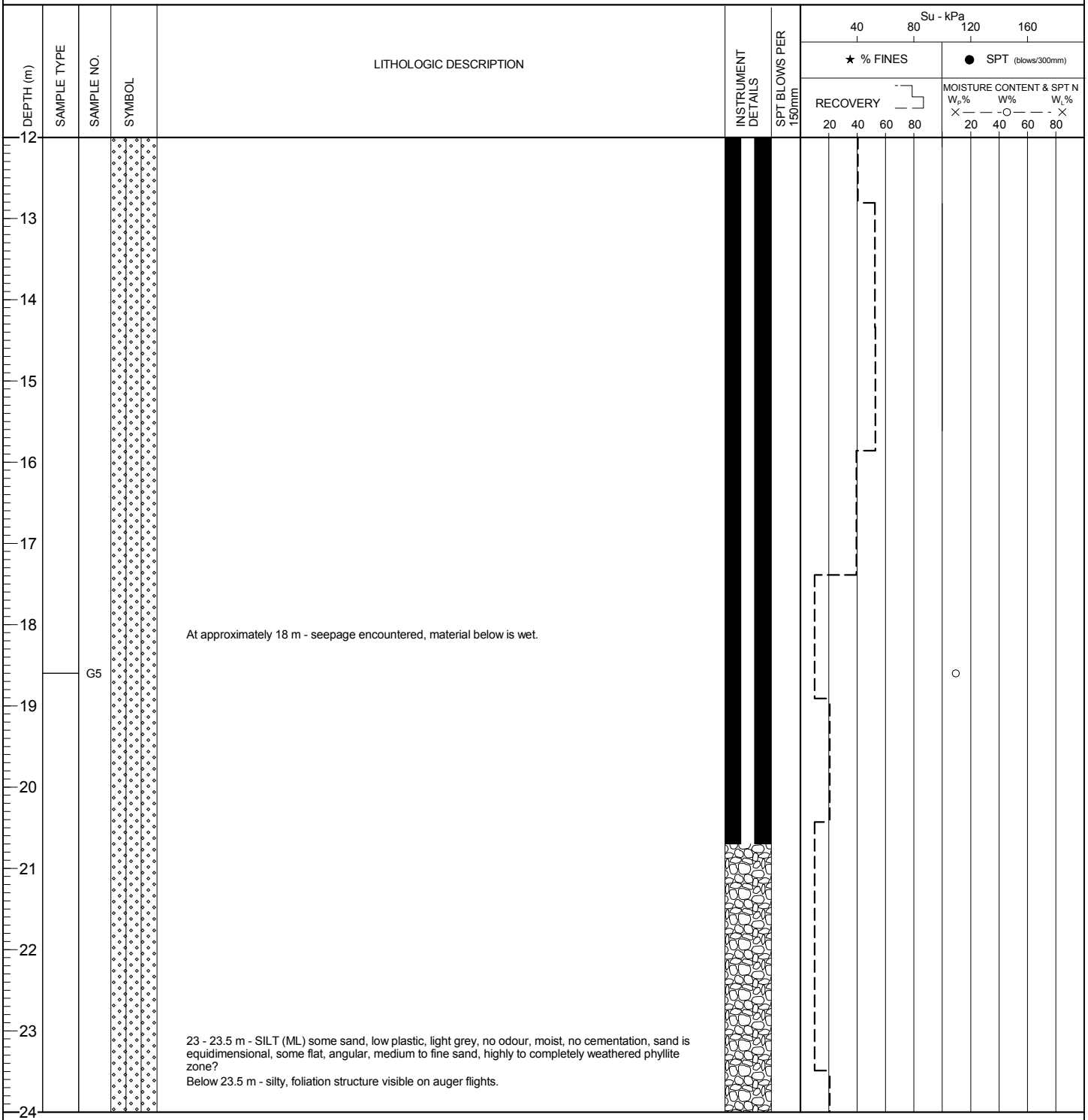
DRILL HOLE # BH-BGC12-83

LOCATION : Eagle Pup

CO-ORDINATES (m) : 459,860E, 7,101,184N
GROUND ELEVATION (m) : 928
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 15 Sep 12
FINISH DATE : 16 Sep 12
FINAL DEPTH (m) : 25.0
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ



(Continued on next page)

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

DRILL HOLE # BH-BGC12-83

LOCATION : Eagle Pup

CO-ORDINATES (m) : 459,860E, 7,101,184N
GROUND ELEVATION (m) : 928
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 15 Sep 12
FINISH DATE : 16 Sep 12
FINAL DEPTH (m) : 25.0
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
24						
25				END OF HOLE AT 25 m (TARGET DEPTH) Notes: -Thermistor installed, M-squared model YSI 44007, serial #11.5-3.		
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/26/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 11/26/12

DRILL HOLE # BH-BGC12-84

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

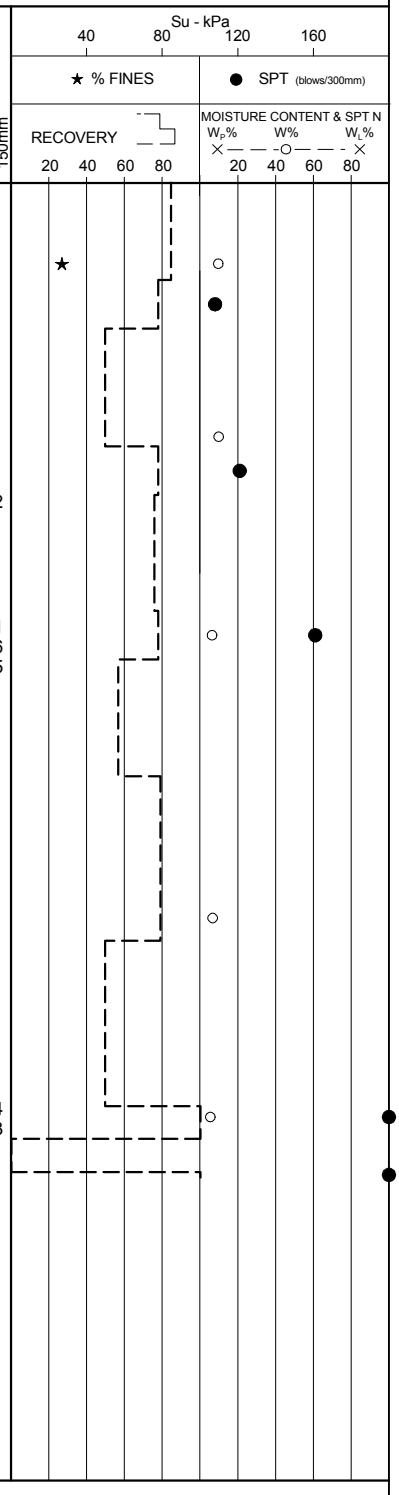
LOCATION : Eagle Pup

CO-ORDINATES (m) : 459,769E, 7,101,030N
GROUND ELEVATION (m) : 919
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Solid Stem Auger
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 16 Sep 12
FINISH DATE : 16 Sep 12
FINAL DEPTH (m) : 9.2
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				ORGANICS/ROOTMAT		
				SAND (SM) fine to coarse sand and gravel, silty, loose to compact, maximum particle size = 10 mm, equidimensional, some flat, subangular, brown, matrix supported, moist, no cementation, metasedimentary clasts with occasional granodiorite. [COLLUVIUM]		
		G1				
1		M1		0.6 -0.9 m; Sample G1, grain size analysis, 40% gravel, 33% sand, 27% fines.		7 4 4
2						
		G2				
		M2				9 9 12
3						
4		M3		Below 4 m - very dense.		21 26 35
		G3				
5				Below 5.5 m - trace cobbles, maximum particle size = 100 mm.		
6						
		G4				
7				SAND (SM) fine to coarse sand, some silt, trace gravel, very dense/extremely weak rock, maximum particle size = 10 mm, equidimensional, some flat, subangular to angular, dry, orange, foliation structure visible in SPT samples, foliation spacing < 1 mm, approximately horizontal, talc on some foliation surfaces. Rock broken down by drilling process and described as a soil. [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK]		
8		G5				
		M4				14 63 R
9		M5		Below 8.9 m - very poor recovery. Orange silt on bit and lower flights.		R
				END OF HOLE AT 9.2 m (REFUSAL ON WEATHERED ROCK) Notes: -Piezometer installed. Piezometer was dry when read in September 2012.		
10						
11						
12						



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 11/26/2012

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 11/26/12

DRILL HOLE # BH-BGC12-85

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

LOCATION : Stuttle Gulch

CO-ORDINATES (m) : 459,167E, 7,100,774N
GROUND ELEVATION (m) : 865
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Hollow and Solid Stem Auger
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 16 Sep 12
FINISH DATE : 18 Sep 12
FINAL DEPTH (m) : 26.2
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0		G1		SILT (ML) sandy (fine to coarse), trace gravel, low plastic, soft, dark brown, organic odour, moist, matrix supported, no cementation, coarse material is metasedimentary, equidimensional, some flat, angular to subangular, maximum particle size = 10 mm. [FILL]		
1		M1		SAND (SM) fine sand, trace medium to coarse sand, some silt, some gravel, loose to compact, maximum particle size = 30 mm, equidimensional, some flat, angular to subangular, dark grey with iron staining and zones of light brown, organic odour, moist, no cementation, buried organics and woody debris throughout. [FILL]		5 5 6
2		G2				
		M2		Below 2.4 m - fine to coarse sand, silty.		3 4 5
3		G3				
4		M3		Below 4 m - fine sand, trace medium to coarse sand, silty, maximum particle size = 50 mm.		7 5 5
5		G4				
6		M4		Below 5.5 m - gravelly, some silt.		5 4 3
7		G5				
		M5				8 9 10
8	G	G6		SAND (SM) fine to coarse sand, some silt, some gravel, maximum particle size = 10 mm, flat, some equidimensional, angular, brown with grey clasts, no odour, moist, homogeneous, no cementation, metasedimentary clasts, talc on some clast surfaces. [COLLUVIUM/COMPLETELY WEATHERED METASEDIMENTARY ROCK?]		
9		M6		SAND (SM) fine to coarse sand, some silt, some gravel, compact to very dense/extremely weak to very weak rock, maximum particle size = 10 mm, flat, some equidimensional, angular, brown with grey clasts, no odour, moist, homogeneous, no cementation, metasedimentary clasts, talc on some clast surfaces, rock structure visible in SPT samples, foliation oriented approximate 30° from horizontal, spacing <1 mm up to 2 mm, folation surfaces planar and smooth. Rock broken down by drilling process and described as a soil. [HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK]		10 14 13
10		G7				
		M7		Below 10 m - seepage encountered, material recovered as SAND (SM) primarily medium to coarse sand, trace fine sand, gravelly, some silt, flat, equidimensional, angular, red (iron oxide), wet, some zones with less gravel that are grey (phyllite).		50 R
11						
12						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% — W% — W_L%: 20, 40, 60, 80

(Continued on next page)

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

DRILL HOLE # BH-BGC12-85

LOCATION : Stuttle Gulch

CO-ORDINATES (m) : 459,167E, 7,100,774N	DRILL DESIGNATION : MARL 4CT	START DATE : 16 Sep 12
GROUND ELEVATION (m) : 865	DRILLING CONTRACTOR : Midnight Sun Drilling	FINISH DATE : 18 Sep 12
SURVEY METHOD : Handheld GPS	DRILL METHOD : Hollow and Solid Stem Auger	FINAL DEPTH (m) : 26.2
DATUM : UTM NAD 83	CORE : N/A	DEPTH TO TOP OF ROCK (m) : N/A
PLUNGE (°) : -90	FLUID : N/A	LOGGED BY : KH
TREND (°) : N/A	CASED TO (m) : N/A	REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm	Su - kPa (40, 80, 120, 160) / ★ % FINES / RECOVERY (20, 40, 60, 80)	● SPT (blows/300mm) / MOISTURE CONTENT & SPT N W_P% W% W_L% (20, 40, 60, 80)
12								
13				Below 13 m - phyllite zones present, break down with handling to SILT (ML) sandy (fine to medium), low plastic, grey, no odour, wet, some foliation structure visible on flights, no cementation.				
14								
15								
16								
17								
18				Below 17.7 m - exclusively phyllite zones, some zones are SILT as described above, some are SAND as described above.				
19								
20								
21								
22								
23		G8						○
24								

(Continued on next page)

PROJECT: Eagle Gold Project
PROJECT NO.: 0792-008

DRILL HOLE # BH-BGC12-85

LOCATION : Stuttle Gulch

CO-ORDINATES (m) : 459,167E, 7,100,774N
GROUND ELEVATION (m) : 865
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : MARL 4CT
DRILLING CONTRACTOR : Midnight Sun Drilling
DRILL METHOD : Hollow and Solid Stem Auger
CORE : N/A
FLUID : N/A
CASED TO (m) : N/A

START DATE : 16 Sep 12
FINISH DATE : 18 Sep 12
FINAL DEPTH (m) : 26.2
DEPTH TO TOP OF ROCK (m) : N/A
LOGGED BY : KH
REVIEWED BY : DW/PQ

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
25		G9				
26				END OF HOLE AT 26.2 m (REFUSAL ON WEATHERED ROCK) Notes: -Due to sloughing during drilling below the water table, a second hole was drilled approximately 0.6 m to the North with hollow stem auger to 15 m below ground surface and a 2" piezometer was installed in this hole. No log was completed for this hole as it was drilled for the piezometer installation only and no sample was recovered using the hollow stem auger. -Original hole backfilled with cuttings. -Test pit TP-BGC12-181 was excavated on this drill pad.		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 11/26/2012

APPENDIX F
BOREHOLE PHOTOS



BH-BGC12-75 Box 1 – 0.0 m to 6.6 m



BH-BGC12-75 Box 2 – 6.6 m to 9.5 m



BH-BGC12-75 Box 3 – 9.5 m to 12.4 m



BH-BGC12-75 Box 4 – 12.4 m to 15.2 m



BH-BGC12-75 Box 5 – 15.2 m to 17.9 m



BH-BGC12-75 Box 6 – 17.9 m to 21.0 m



BH-BGC12-75 Box 7 – 21.0 m to 24.1 m



BH-BGC12-75 Box 8 – 24.1 m to 26.8 m



BH-BGC12-75 Box 9 – 26.8 m to 29.8 m



BH-BGC12-75 Box 10 – 29.8 m to 33.2 m



BH-BGC12-75 Box 11 – 33.2 m to 36.5 m



BH-BGC12-75 Box 12 – 36.5 m to 40.1 m



BH-BGC12-75 Box 13 – 40.1 m to 44.2 m



BH-BGC12-75 Box 14 – 44.2 m to 47.6 m



BH-BGC12-75 Box 15 – 47.6 m to 49.1 m



BH-BGC12-76 Box 1 – 4.0 m to 9.9 m



BH-BGC12-76 Box 2 – 9.9 m to 12.7 m



BH-BGC12-76 Box 3 – 12.7 m to 15.8 m



BH-BGC12-76 Box 4 – 15.8 m to 18.7 m



BH-BGC12-76 Box 5 – 18.7 m to 21.3 m



BH-BGC12-76 Box 6 – 21.3 m to 24.9 m



BH-BGC12-76 Box 7 – 24.9 m to 27.5 m



BH-BGC12-76 Box 8 – 27.5 m to 30.6 m



BH-BGC12-76 Box 9 – 30.6 m to 33.7 m



BH-BGC12-76 Box 10 – 33.7 m to 38.2 m



BH-BGC12-76 Box 11 – 38.2 m to 41.0 m



BH-BGC12-76 Box 12 – 41.0 m to 42.0 m



BH-BGC12-77 Box 1 – 0.0 m to 9.7 m



BH-BGC12-77 Box 2 –9.7 m to 13.4 m



BH-BGC12-77 Box 3 – 13.4 m to 16.5 m



BH-BGC12-77 Box 4 – 16.5 m to 19.5 m



BH-BGC12-77 Box 5 – 19.5 m to 20.5 m



BH-BGC12-78 Box 1 – 4.5 m to 11.7 m



BH-BGC12-78 Box 2 –11.7 m to 16.0 m



BH-BGC12-78 Box 3 – 16.0 m to 20.0 m



BH-BGC12-78 Box 4 – 20.0 m to 22.0 m



BH-BGC12-79 Box 1 – 0.0 m to 6.4 m



BH-BGC12-79 Box 2 –6.4 m to 9.5 m



BH-BGC12-79 Box 3 –9.5 m to 12.4 m



BH-BGC12-79 Box 4 – 12.4 m to 16.1 m



BH-BGC12-79 Box 5 – 16.1 m to 19.0 m



BH-BGC12-79 Box 6 – 19.0 m to 23.4 m



BH-BGC12-79 Box 7 – 23.4 m to 26.3 m



BH-BGC12-79 Box 8 – 26.3 m to 29.3 m



BH-BGC12-79 Box 9 – 29.3 m to 32.4 m



BH-BGC12-79 Box 10 – 32.4 m to 35.7 m



BH-BGC12-79 Box 11 – 35.7 m to 38.9 m



BH-BGC12-79 Box 12 – 38.9 m to 42.0 m



BH-BGC12-79 Box 13 – 42.0 m to 45.1 m



BH-BGC12-789 Box 14 – 45.1 m to 47.9 m



BH-BGC12-79 Box 15 – 47.9 m to 50.0 m

BH-BGC12-80 – COLLUVIUM (0 m to 6.8 m)



BH-BGC12-80 Run 1 – 0.00 m to 0.90 m
Organics, sandy silt (ML).



BH-BGC12-80 Run 2 – 0.9 m to 2.0 m
Sandy silt (ML), some gravel, frozen, Vx, Vc,Vs, 20-40% ice.



BH-BGC12-80 Run 4 – 2.74 m to 3.35 m
Silty, gravelly sand (SM), frozen, Vx, Vc, 5% ice.



BH-BGC12-80 Run 5 – 3.35 m to 4.25 m
Sandy silt, non plastic, trace gravel, frozen, Vx, 5% ice.

BH-BGC12-80 – COLLUVIUM (0 m to 6.8 m) Continued



BH-BGC12-80 Run 6 – 4.25 m to 5.00 m
Sand (SM), gravelly, some silt, frozen Vx, Vc, 10% ice.



BH-BGC12-80 Run 7 – 5.00 m to 5.95 m
Sand (SM), gravelly, some silt, frozen Vx, 20-25% ice.



BH-BGC12-80 Run 8 – 5.95 m to 7.00 m
Silty clay (CL), some sand, trace gravel, frozen, Vx, 50% ice.

<table>
<tr><td colspan="2">BH-BGC12-80 – WEATHERED ROCK (6.8 m to 25.3 m)</td></tr>
<tr><td> 
</td><td>  </td></tr>
<tr><td>BH-BGC12-80 Run 8 – 5.95 m to 7.00 m
Contact with highly to completely weathered metasedimentary rock.</td><td>BH-BGC12-80 Run 11 – 9.75 m to 10.67 m
Highly to completely weathered metasedimentary rock, foliation visible.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC12-80 Run 11 – 9.75 m to 10.67 m
Highly to completely weathered metasedimentary rock.</td><td>BH-BGC12-80 Run 16 – 17.67 m to 19.21 m
Highly to completely weathered metasedimentary rock, recovered as sand (SM).</td></tr>
</table>

BH-BGC12-80 – WEATHERED ROCK (6.8 m to 25.3 m) Continued	
	
BH-BGC12-80 Run 19 – 22.26 m to 23.78 m Highly to completely weathered metasedimentary rock, recovered as sand (SM).	

BH-BGC12-81 – COLLUVIUM (0 m to 11.4 m)



BH-BGC12-81 Run 1 – 0.00 m to 0.90 m
Organics, sandy silt (ML), trace gravel, frozen, Nbe, 10% excess ice.



BH-BGC12-81 Run 3 – 1.5 m to 2.1 m
Gravelly, silty sand (SM), frozen, Vx, Vc, 10% ice.



BH-BGC12-81 Run 7 – 3.96 m to 4.57 m
Sandy silt (ML), trace gravel, frozen, Vc, Vx, Vr, 10-20% ice.



BH-BGC12-81 Run 12 – 7.0 m to 7.3 m
Silt (ML) and sand, trace gravel, frozen, Vx, <5% ice.

BH-BGC12-81 – COLLUVIUM (0 m to 11.4 m) Continued	
	
BH-BGC12-81 Run 14 – 8.4 m to 9.9 m Sand (SM), gravelly, some silt, non-frozen.	

BH-BGC12-81 – WEATHERED ROCK? (11.4 m to 11.5 m)	
	
BH-BGC12-81 Run 16 – 11.4 m to 11.5 m Moderately weathered metasedimentary rock? No recovery.	

<table>
<tr><td colspan="2">BH-BGC12-82 – COLLUVIUM (0 m to 19.2 m)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC12-82 Run 2 – 0.9 m to 2.44 m
Sand (SM), gravelly, some silt, trace gravel, non frozen.</td><td>BH-BGC12-82 Run 3 – 2.44 m to 3.96 m
Sand (SM) gravelly, some silt, seepage, frozen Nf.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC12-82 Run 5 – 5.5 m to 7.0 m
Fine sand (SM), some silt, trace gravel, frozen Nf.</td><td>BH-BGC12-82 Run 6 – 7.0 m to 8.54 m
Sand (SM), some silt, some gravel, frozen, Nf.</td></tr>
</table>

<table>
<tr><td colspan="2">BH-BGC12-82 – COLLUVIUM (0 m to 19.2 m) Continued</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC12-82 Run 7 – 8.54 m to 10.06 m
Silt (ML) and sand, trace gravel, non-frozen.</td><td>BH-BGC12-82 Run 10 – 13.11 m to 14.63 m
Sand (SM), some silt, some gravel, non-frozen.</td></tr>
<tr><td>  </td><td></td></tr>
<tr><td>BH-BGC12-82 Run 11 – 14.63 m to 16.17 m
Sand (SM), gravelly, some silt, non-frozen.</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">BH-BGC12-83 – FILL & COLLUVIUM (0 m to 4 m)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC12-83 Run 1 – 0.00 m to 0.60 m
Sandy silt (ML), some gravel, non-frozen. FILL.</td><td>BH-BGC12-83 SPT 1 – 0.6 m to 1.05 m
Sand (SM), some silt, trace gravel, non-frozen. COLLUVIUM</td></tr>
<tr><td>  </td><td></td></tr>
<tr><td>BH-BGC12-83 Run 3 – 2.13 m to 3.66 m
Sand (SM), and silt, and gravel, non-frozen. COLLUVIUM</td><td></td></tr>
</table>

<table>
<tr><td colspan="2">BH-BGC12-83 – WEATHERED ROCK (4 m to 25 m)</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>BH-BGC12-83 Run 4 – 3.66 m to 5.18 m
Highly to completely weathered metasedimentary rock, recovered as sand (SM).</td><td>BH-BGC12-83 SPT 4 – 5.18 m to 5.63 m
Highly to completely weathered metasedimentary rock, foliation visible.</td></tr>
<tr><td> 
</td><td>  </td></tr>
<tr><td>BH-BGC12-83 SPT 6 – 8.23 m to 8.68 m
Highly to completely weathered metasedimentary rock, foliation visible.</td><td>BH-BGC12-83 Run 7 – 8.23 m to 9.76 m
Highly to completely weathered metasedimentary rock, recovered as sand (SM).</td></tr>
</table>

<table>
<tr><td colspan="2">BH-BGC12-83 – WEATHERED ROCK (4 m to 25 m) Continued</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC12-83 Run 9 – 11.27 m to 12.81 m
Highly to completely weathered metasedimentary rock, recovered as sand (SM).</td><td>BH-BGC12-83 Run 11 – 14.34 m to 15.86 m
Highly to completely weathered metasedimentary rock, recovered as sand (SM).</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC12-83 Run 13 – 17.39 m to 18.91 m
Highly to completely weathered metasedimentary rock, seepage.</td><td>BH-BGC12-83 Run 17 – 23.49 m to 25.01 m
Highly completely weathered metasedimentary rock, recovered as silt (ML).</td></tr>
</table>

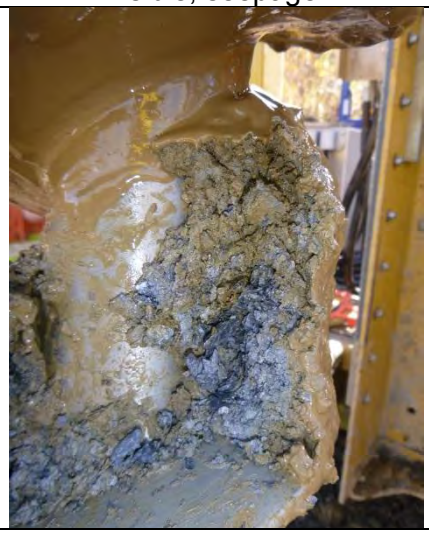
<table>
<tr><td colspan="2">BH-BGC12-84 – COLLUVIUM (0 m to 7 m)</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>BH-BGC12-84 Run 1 – 0.0 m to 0.9 m
Sand (SM) and gravel, silty, non-frozen.</td><td>BH-BGC12-84 SPT 2 – 2.44 m to 3.09 m
Sand (SM), some silt, some gravel, non-frozen.</td></tr>
<tr><td>  </td><td></td></tr>
<tr><td>BH-BGC12-84 Run 4 – 3.96 m to 5.49 m
Sand (SM) and gravel, silty, non-frozen.</td><td></td></tr>
</table>

BH-BGC12-84 – WEATHERED ROCK (7 m to 9.2 m)	
	
BH-BGC12-84 Run 6 – 7.01 m to 8.54 m Highly to completely weathered metasedimentary rock, recovered as sand (SM).	BH-BGC12-84 SPT 4 – 8.54 m to 8.84 m Highly to completely weathered metasedimentary rock, foliation visible.

<table>
<tr><td colspan="2">BH-BGC12-85 – FILL (0 m to 7.5 m)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC12-85 Run 1 – 0.0 m to 0.9 m
Sandy silt (ML), trace gravel, non-frozen.</td><td>BH-BGC12-85 Run 2 – 0.9 m to 2.44 m
Sand (SM), some silt, some gravel, buried organics, non-frozen.</td></tr>
<tr><td> 
</td><td>  </td></tr>
<tr><td>BH-BGC12-85 SPT 2 – 2.44 m to 2.89 m
Sand (SM), some silt, some gravel, buried organics, non-frozen.</td><td>BH-BGC12-85 Run 3 – 2.44 m to 3.96 m
Sand (SM), silty, some gravel, buried organics, non-frozen.</td></tr>
</table>

BH-BGC12-85 – FILL (0 m to 7.5 m) Continued	
	
BH-BGC12-85 SPT 4 – 5.49 m to 5.94 m Sand (SM), silty, some gravel, buried organics, non-frozen.	BH-BGC12-85 Run 5 – 5.49 m to 7.01 m Sand (SM), gravelly, some silt, buried organics, non-frozen.

BH-BGC12-85 – COLLUVIUM/COMPLETELY WEATHERED ROCK? (7.5 m to 8.5 m)	
	
BH-BGC12-85 Run 6 – 7.01 m to 8.54 m Sand (SM), some gravel, some silt, non-frozen.	

<table>
<tr><td colspan="2">BH-BGC12-85 – WEATHERED ROCK (8.5 m to 26.2 m)</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>BH-BGC12-85 SPT 6 – 8.54 m to 8.99 m
Highly to completely weathered metasedimentary rock, foliation visible.</td><td>BH-BGC12-85 SPT 7 – 10.06 m to 10.36 m
Highly to completely weathered metasedimentary rock, foliation visible, seepage.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>BH-BGC12-85 Run 10 – 13.11 m to 14.63 m
Highly to completely weathered metasedimentary rock, recovered as sand (SM).</td><td>BH-BGC12-85 Run 12 – 16.17 m to 17.7 m
Highly to completely weathered metasedimentary rock, recovered as sand (SM).</td></tr>
</table>

BH-BGC12-085 – WEATHERED ROCK (8.5 m to 26.2 m) Continued	
	
BH-BGC12-085 Run 14 – 19.22 m to 20.73 m Highly to completely weathered metasedimentary rock, recovered as sand (SM).	BH-BGC12-085 Run 16 – 22.26 m to 23.79 m Highly to completely weathered metasedimentary rock, recovered as silt (ML).

APPENDIX G
STANDARD PENETRATION TESTING

STANDARD PENETRATION TESTING

1.0 INTRODUCTION

This Appendix describes the methods and observations of Standard Penetration Testing (SPT, ASTM D4633-05) completed as part of geotechnical investigations for mine site infrastructure during 2012.

2.0 SPT TESTING

Standard Penetration Test (SPT) sampling involves an open sample tube driven into the formation at the base of a borehole using repeated blows of a steel weight that impacts a jar assembly or anvil at the top of the drill rods to cause the sampler to penetrate a standard distance, usually 45 cm, into the formation. The number of blows needed to achieve this penetration is taken as an indicator of the relative density or consistency of the formation material. The standard procedure for penetration testing, i.e. the Standard Penetration Test (SPT), utilizes a sampler with an internal diameter of 34.9 mm (1 3/8") and divides the blowcount into three segments (150 mm each) and considers only the two last segments (final 300 mm) for calculation of the blowcount, or N value. The first 150 mm segment is ignored, as it often represents penetration of the sampler through sloughed or disturbed material at the bottom of the hole rather than intact in-situ materials. The test is considered to end in refusal when 10 successive blows with no advancement have been applied, or a total of 50 blows in any one increment have been applied or a total of 100 blows have been applied.

In 2011, energy measurements were made to determine hammer efficiency (BGC 2012a), with an average observation of 77 % of the theoretical standard energy. The same drill rig and SPT equipment were used in 2012, so the 2011 energy measurements are applicable to SPT testing completed during this program. The N value was corrected to 60% hammer efficiency to yield $(N)_{60}$, which is calculated as:

$$(N)_{60} = N^*(\text{measured hammer energy}/60\ \%)$$

The blow count details for SPT tests can are presented in Table G.1. Of the 21 tests, three had less than 150 mm of recovery. Tests with less than 150 mm of recovery are not considered valid since insufficient material was recovered to determine validity of test and N_{60} values for these tests are not calculated. Raw N values are shown on the borehole logs (Appendix E).

Table G.1. SPT Testing Results

Borehole	Sample Number	Depth From (m)	Depth To (m)	Recovery (m)	N	$(N)_{60}$	Comments
BH-BGC12-81	M1	9.9	9.95	0.05	R	-	<6" recovery, no N_{60} Value Calculated

Borehole	Sample Number	Depth From (m)	Depth To (m)	Recovery (m)	N	$(N)_{60}$	Comments
BH-BGC12-83	M1	0.6	1.05	0.45	10	13	
BH-BGC12-83	M2	2.15	2.60	0.4	15	19	
BH-BGC12-83	M3	3.65	4.1	0.22	9	12	
BH-BGC12-83	M4	5.2	5.65	0.35	44	56	
BH-BGC12-83	M5	6.7	6.95	0.15	R	R	Refusal, no N_{60} Value Calculated
BH-BGC12-83	M6	8.25	8.7	0.45	65	83	
BH-BGC12-83	M7	9.75	9.9	0.15	R	R	Refusal, no N_{60} Value Calculated
BH-BGC12-83	M8	11.25	11.5	0.2	R	R	Refusal, no N_{60} Value Calculated
BH-BGC12-84	M1	0.9	1.35	0.35	8	10	
BH-BGC12-84	M2	2.45	2.9	0.35	21	27	
BH-BGC12-84	M3	3.95	4.4	0.35	61	78	
BH-BGC12-84	M4	8.55	8.85	0.3	R	R	Refusal, no N_{60} Value Calculated
BH-BGC12-84	M5	9.15	9.2	0.05	R	-	<6" recovery, no N_{60} Value Calculated
BH-BGC12-85	M1	0.9	1.35	0.15	11	14	
BH-BGC12-85	M2	2.45	2.9	0.25	9	12	
BH-BGC12-85	M3	3.95	4.4	0.4	10	13	
BH-BGC12-85	M4	5.5	5.95	0.45	7	9	
BH-BGC12-85	M5	7.0	7.45	0.1	19	-	<6" recovery, no N_{60} Value Calculated
BH-BGC12-85	M6	8.5	9.0	0.4	27	35	
BH-BGC12-85	M7	10.05	10.35	0.35	R	R	Refusal, no N_{60} Value Calculated

3.0 REFERENCES

American Society for Testing and Materials. Standard D4633-05. Standard Test Method for Energy Measurement for Dynamic Penetrometers. West Conshohocken, PA.

BGC Engineering Inc. 2012a. 2011 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation.

APPENDIX H
PLATE LOAD TESTS

1.0 INTRODUCTION

This Appendix documents the method and results of plate load testing undertaken during the 2012 geotechnical investigations for mine site infrastructure.

Plate load tests were carried out by BGC personnel in July 2012 to assess the stiffness of subgrade materials at or near selected proposed building pads. The aim of this testing program was to evaluate the relationship between bearing pressure and displacement of shallow bedrock subgrade materials.

2.0 PLATE LOAD TEST PROCESS DESCRIPTION

2.1. Test Locations

The tests were conducted in two excavations in the proximity of the proposed crushers. The test areas were chosen in locations where bedrock was expected to be relatively shallow. The excavations were completed into shallow bedrock under the supervision of BGC personnel.

Table H-1 summarizes the locations and characteristics of the tests performed and Drawing 6 illustrates the locations of the plate load tests.

2.2. Installation

Following excavation of the test areas test pads were constructed in representative subgrade materials. For each test pad, the surface was cleaned of loose material and then a concrete pad approximately 1 m to 1.5 m in diameter and up to 50 mm thick was constructed. A thin transition layer of clean, coarse silica sand up to 5 mm thick was then placed on the concrete pad to create a continuous and even contact between the pad and the steel plate used during the load application.

The steel plate was positioned parallel to the base of the rear differential of a Komatsu D375A bulldozer that provided approximately 50 ton of reaction force for the test. A 25 ton hydraulic jack powered by a hand pump was used to apply the load to the ground and a 10,000 psi gauge was used to set and monitor the pressure increments. A 0.76 m diameter steel plate was used as the base contact with the test pad and a 0.53 m and a 0.3 m diameter plate were used as spacers between the base plate and the hydraulic jack. All plates were 25 mm thick and made of high grade steel. The 0.76 m diameter plate was used as the base contact for all of the tests, rather than varying the size of the base plate, so that consistency could be maintained between tests. The 0.76 m plate also allowed for the largest area of subgrade to be captured by the test while still being able to apply a load of up to about 400 kPa with the equipment available (i.e. the 25 ton hydraulic jack). Refer to Photograph 1 for a general arrangement of the test set up and to Photographs 2 and 3 for the layouts of the test pads.

After testing, each plate load test location was excavated as a test pit. TP-BGC12-179A/B/C were excavated at PLT Area 4 and TP-BGC12-180A/B/C were excavated at PLT Area 5. Please refer to test pit logs in Appendix C and test pit photos in Appendix D.



Photograph 1. Details of the Instrumentation Set Up



Photograph 2. Layout of Plate Load Test Pads (PLT Area 4)



Photograph 3. Layout of Plate Load Test Pads (PLT Area 5)

2.3. Displacement monitoring and load increments

Vertical plate movements were measured to 0.01 mm resolution using three dial gauges positioned as shown in Photograph 1.

The dial gauges were mounted on two 4 m long horizontal reference beams with supporting legs resting on the ground beyond the area of influence of the test. The load pattern was selected to obtain approximately 10 to 20 increments between the start and the maximum available pressure. The maximum pressure was limited by the capacity of the jack. After an intermediate load was reached, pressure was incrementally decreased and then re-increased, inducing an unload-reload cycle. Each load increment was maintained until the movement rate on all three gauges decreased to less than 0.01 mm/15 min, or for a minimum of 30 minutes.

2.4. Instrument Calibration

The hydraulic equipment was calibrated on September 21, 2011 by an accredited laboratory (Acuren Group Inc, Richmond, BC). Loads estimated during testing and presented in this appendix have been interpreted according to the calibrated pressure-load relationship. The compression load calibration results are included at the end of this appendix.

Table H-1. Summary of Plate Load Tests

Test ID	UTM Coordinates (NAD 83)		Date of Test	Depth Below Grade[1] (m)	Plate Diameter (m)	Maximum Pressure Applied (kPa)	Maximum Displacment[2] (mm)
	Easting (m)	Northing (m)					
PLT-BGC12-15	459,771	7,100,256	July 19, 2012	4.5	0.76	383	2.56
PLT-BGC12-16	459,776	7,100,261	July 20, 2012	4	0.76	431	3.27
PLT-BGC12-17	459,782	7,100,264	July 21, 2012	3	0.76	383	1.00
PLT-BGC12-18	459,773	7,100,201	July 22, 2012	4.5	0.76	431	1.58
PLT-BGC12-19	459,768	7,100,193	July 23, 2012	4.5	0.76	431	1.42
PLT-BGC12-20	459,767	7,100,187	July 24, 2012	5	0.76	431	1.25

Notes:
1. Approximate depth that the test was conducted below the original ground surface.
2. Average value of the three gauges positioned around the test plate.

3.0 DATA RESULTS AND ANALYSIS

For each load increment the applied bearing pressure was plotted against the average recorded movement of each dial gauge allowing the vertical subgrade reaction moduli for the virgin curve, k_v, and for the rebound curve, $k_{v(u-r)}$, to be estimated for each test. Given that the relationship between displacement and bearing pressure is typically non-linear, especially at low pressures, the k_v and $k_{v(u-r)}$ moduli were estimated from idealized linear functions as follows:

1. k_v was estimated as the slope of line originating from the origin that best fit the entire set of data comprising the virgin curve.
2. $k_{v(u-r)}$ was estimated as the slope of the line that best fit the entire set of data comprising the unload-reload curve.

Given this simplification, caution is warranted when using these values as the data may need to be re-evaluated depending on the stress range being considered. Figures H-1 to H-6 illustrate the bearing pressure-displacement curves for each individual test. As can be seen from the figures, the linear fit to the virgin curve for the tests conducted generally underestimates the expected displacement below bearing pressures of approximately

300 kPa. Therefore, it may be necessary to re-evaluate the vertical subgrade reaction modulus when considering stress ranges other than approximately 300 kPa.

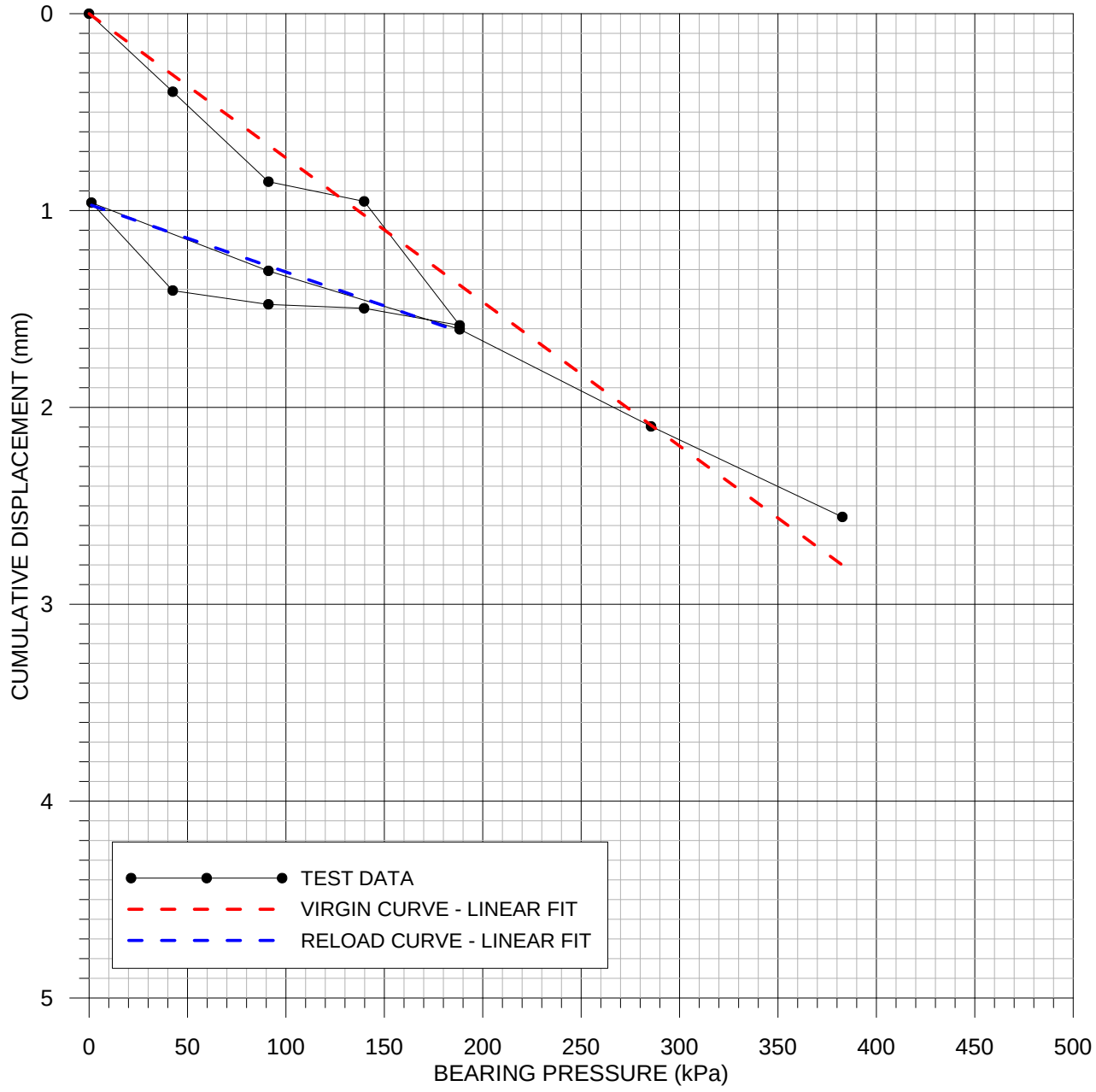
The estimated vertical subgrade reaction moduli results from the linear fits are summarized in Table H-2.

Table H-2. Summary of Subgrade Reaction Modulus from Plate Load Tests

Test ID	Depth Below Grade[1] (m)	Plate Diameter (m)	Vertical Subgrade Reaction Modulus[2]	
			k_v (kPa/mm)	$kv_{(u-r)}$ (kPa/mm)
PLT-BGC12-15	4.5	0.76	135	290
PLT-BGC12-16	4	0.76	120	270
PLT-BGC12-17	3	0.76	335	600
PLT-BGC12-18	4.5	0.76	250	385
PLT-BGC12-19	4.5	0.76	270	430
PLT-BGC12-20	5	0.76	275	500

Notes:
1. Approximate depth that the test was conducted below the original ground surface.
2. Values were estimated from the slopes of linear functions fit to the data sets.

FIGURES



NOTES:
1. TESTING WAS PERFORMED WITH A STEEL PLATE APPROXIMATELY 0.76 m IN DIAMETER.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	AS SHOWN	DESIGNED:	BMM
DATE:	NOV 2012	CHECKED:	AA
DRAWN:	BMM	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

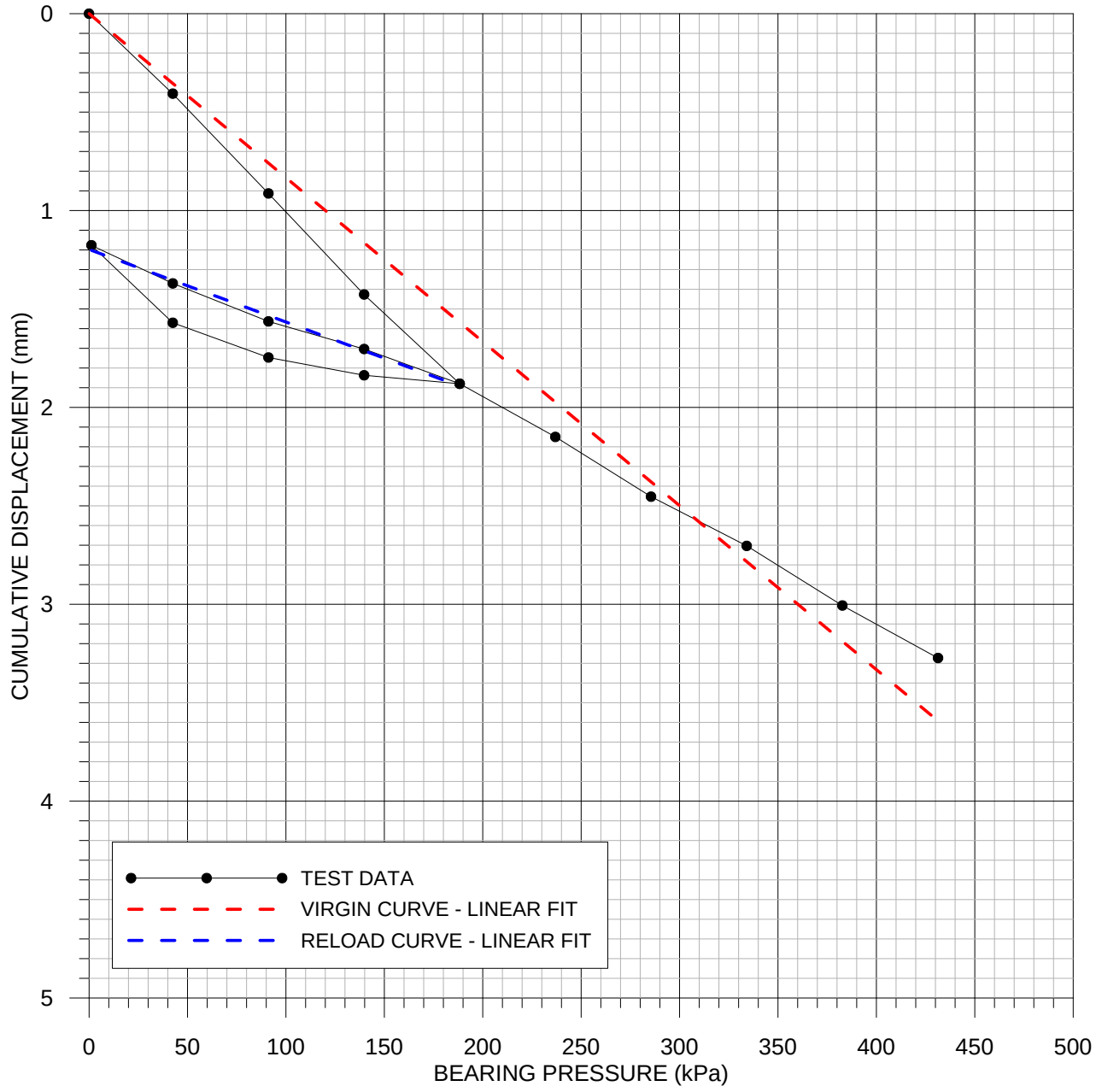
PROJECT:
EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATIONS
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
PLATE LOAD TEST RESULTS
PLT-BGC12-15

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD CORP.	0792-009	H-1	0

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Plate Load Testing\Data Reduction\PLT-BGC12-15.grf

DWG. TO BE READ WITH BGC REPORT TITLED "2012 GEOTECHNICAL INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT " DATED NOVEMBER 2012.



NOTES:
1. TESTING WAS PERFORMED WITH A STEEL PLATE APPROXIMATELY 0.76 m IN DIAMETER.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	AS SHOWN	DESIGNED:	BMM
DATE:	NOV 2012	CHECKED:	AA
DRAWN:	BMM	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

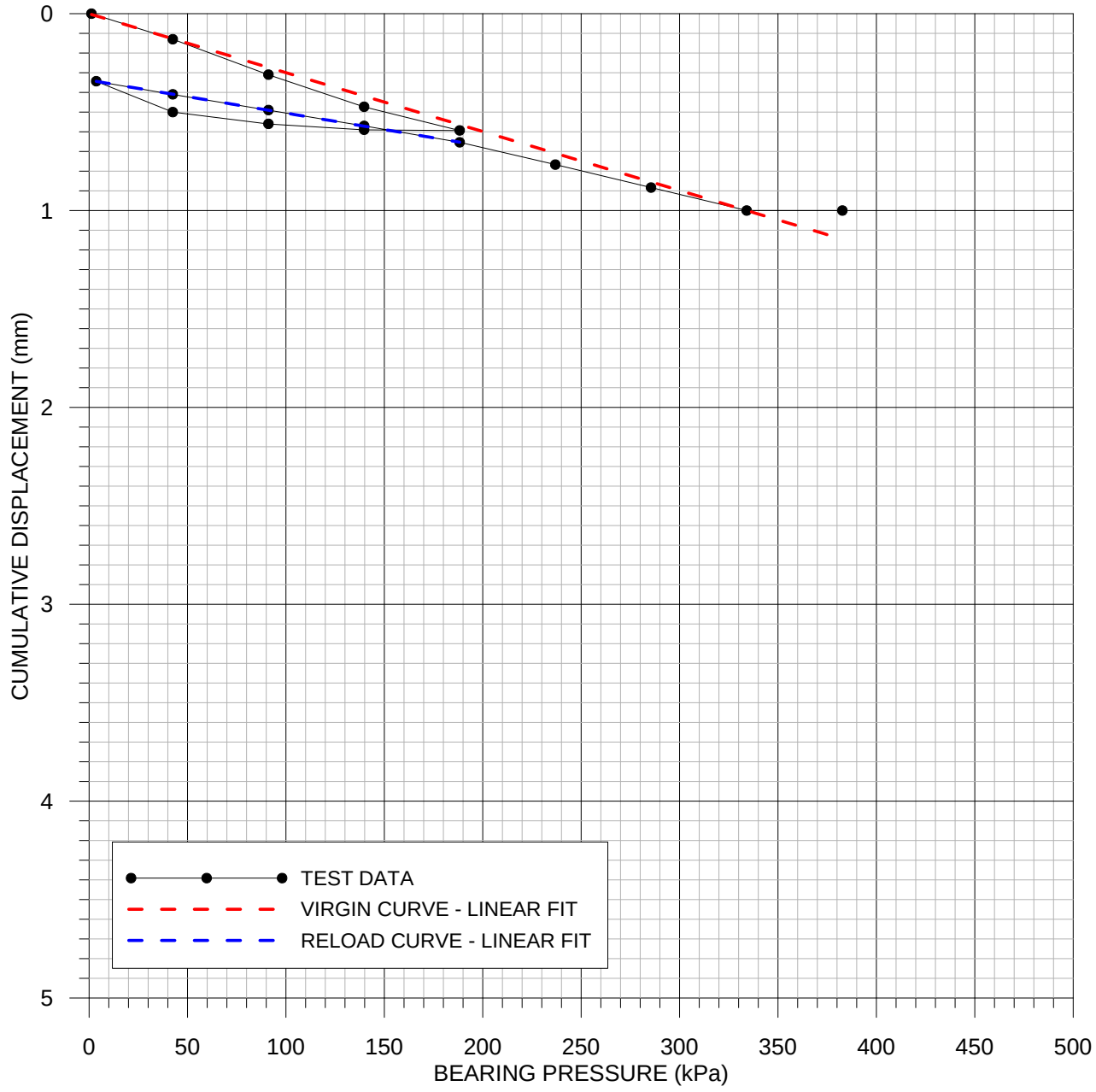
PROJECT:
EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATIONS
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
PLATE LOAD TEST RESULTS
PLT-BGC12-16

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD CORP.	0792-009	H-2	0

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Plate Load Testing\Data Reduction\PLT-BGC12-15.grf

DWG. TO BE READ WITH BGC REPORT TITLED "2012 GEOTECHNICAL INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT " DATED NOVEMBER 2012.



NOTES:
1. TESTING WAS PERFORMED WITH A STEEL PLATE APPROXIMATELY 0.76 m IN DIAMETER.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	AS SHOWN	DESIGNED:	BMM
DATE:	NOV 2012	CHECKED:	AA
DRAWN:	BMM	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

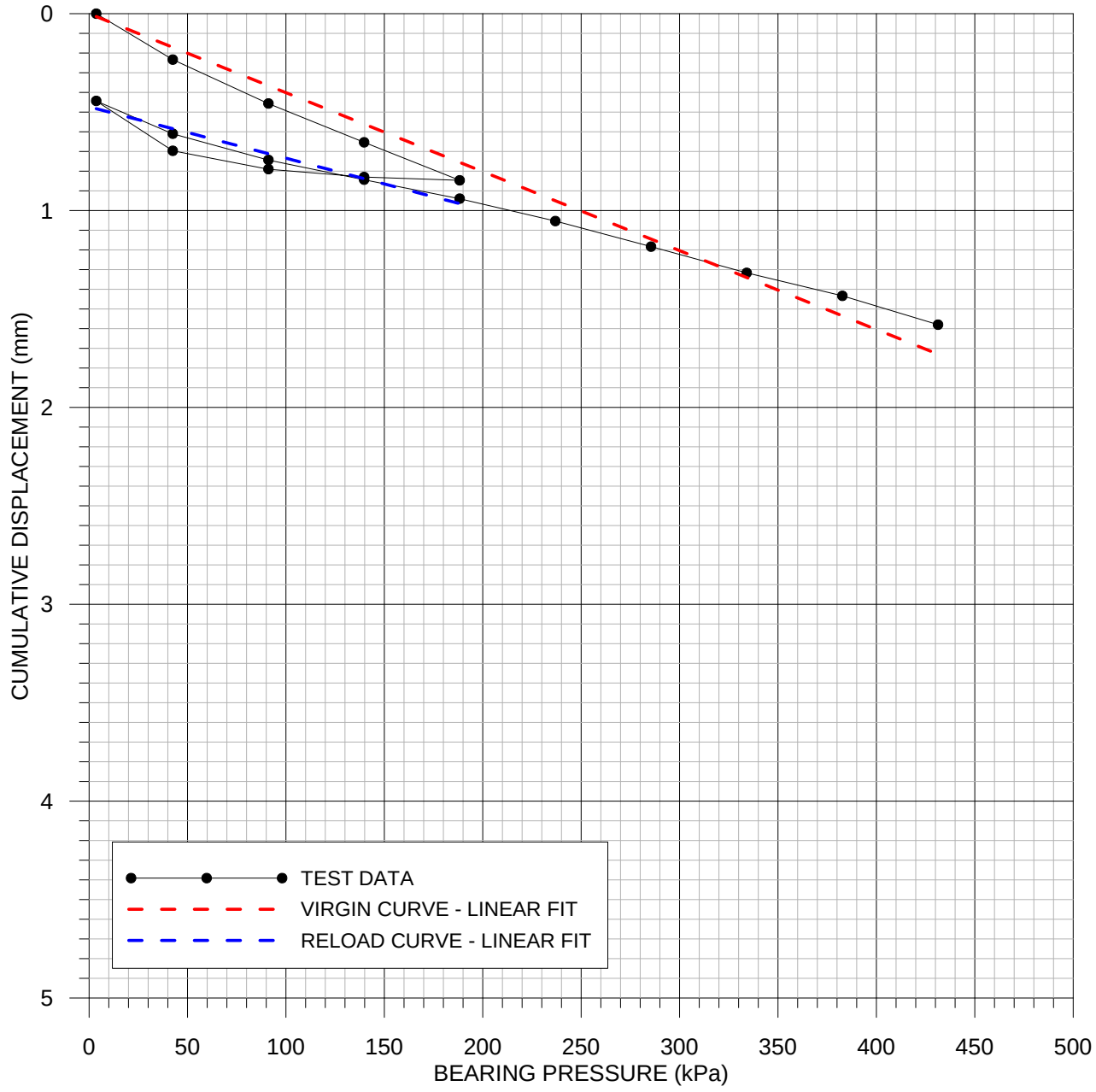
PROJECT:
EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATIONS
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
PLATE LOAD TEST RESULTS
PLT-BGC12-17

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD CORP.	0792-009	H-3	0

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Plate Load Testing\Data Reduction\PLT-BGC12-15.grf

DWG. TO BE READ WITH BGC REPORT TITLED "2012 GEOTECHNICAL INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT " DATED NOVEMBER 2012.



NOTES:
1. TESTING WAS PERFORMED WITH A STEEL PLATE APPROXIMATELY 0.76 m IN DIAMETER.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	AS SHOWN	DESIGNED:	BMM
DATE:	NOV 2012	CHECKED:	AA
DRAWN:	BMM	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

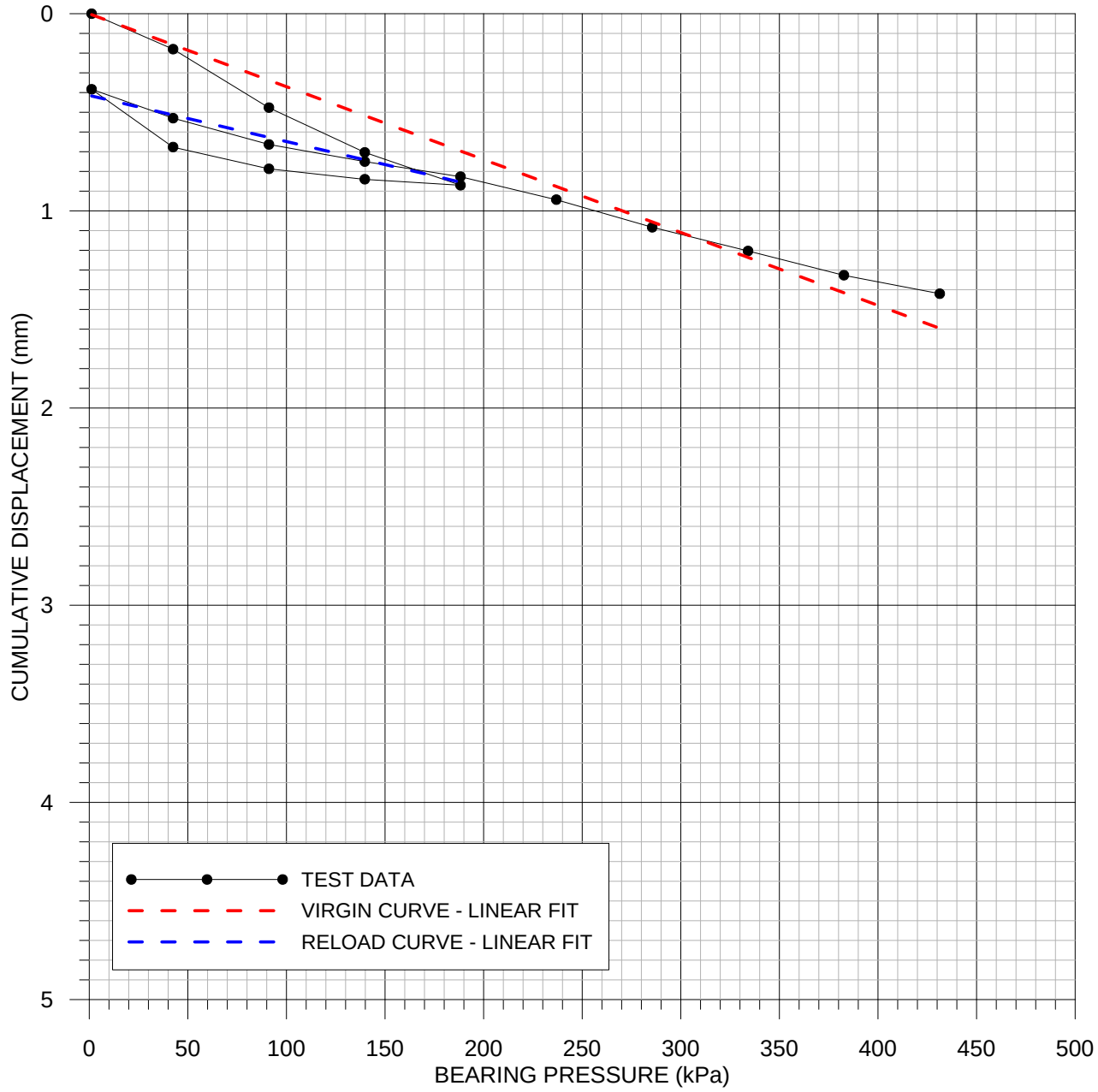
PROJECT:
EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATIONS
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
PLATE LOAD TEST RESULTS
PLT-BGC12-18

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD CORP.	0792-009	H-4	0

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Plate Load Testing\Data Reduction\PLT-BGC12-15.grf

DWG. TO BE READ WITH BGC REPORT TITLED "2012 GEOTECHNICAL INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT " DATED NOVEMBER 2012.



NOTES:
1. TESTING WAS PERFORMED WITH A STEEL PLATE APPROXIMATELY 0.76 m IN DIAMETER.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	AS SHOWN	DESIGNED:	BMM
DATE:	NOV 2012	CHECKED:	AA
DRAWN:	BMM	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

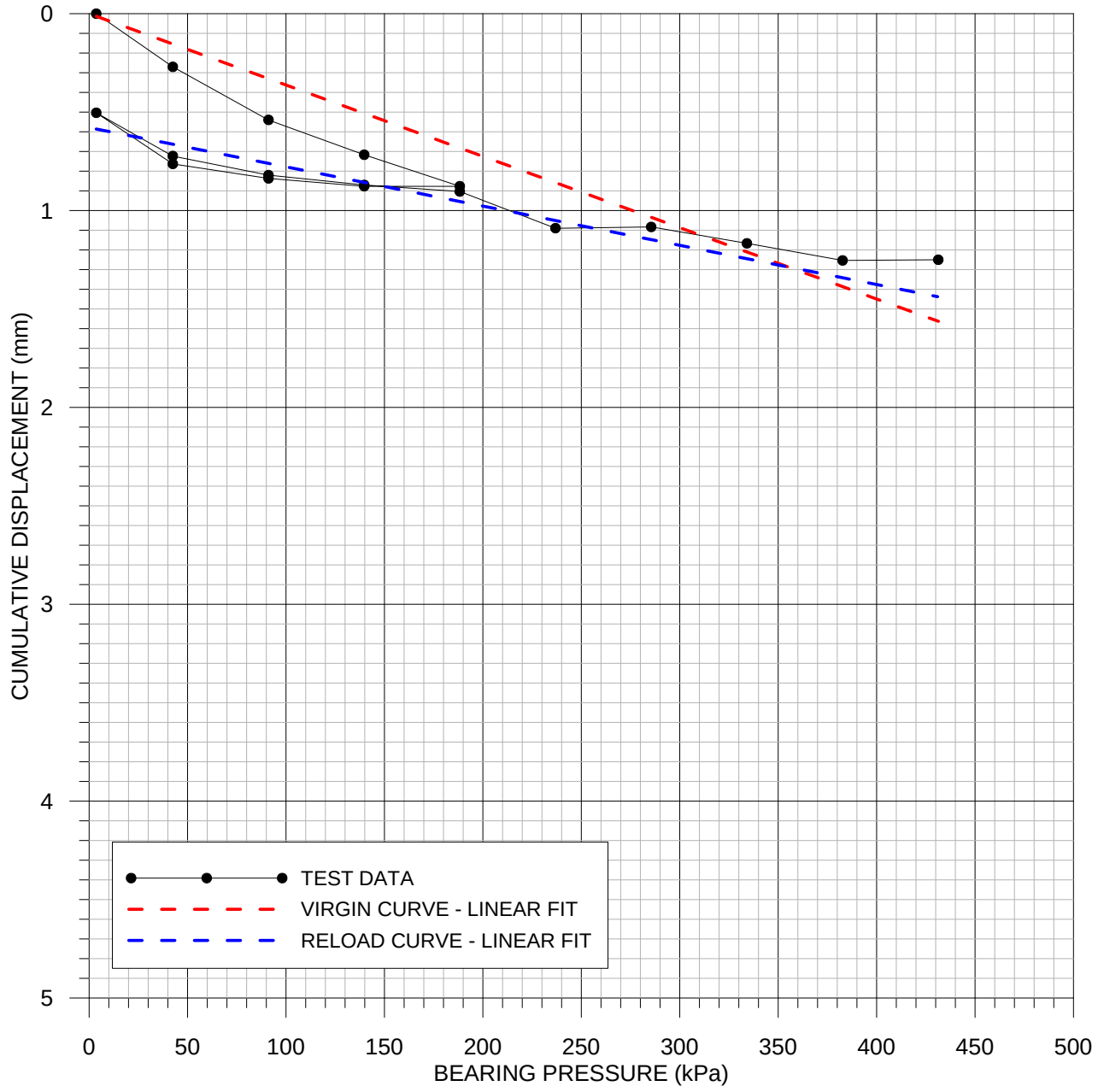
PROJECT:
EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATIONS
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
PLATE LOAD TEST RESULTS
PLT-BGC12-19

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD CORP.	0792-009	H-5	0

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Plate Load Testing\Data Reduction\PLT-BGC12-15.grf

DWG. TO BE READ WITH BGC REPORT TITLED "2012 GEOTECHNICAL INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT " DATED NOVEMBER 2012.



NOTES:
1. TESTING WAS PERFORMED WITH A STEEL PLATE APPROXIMATELY 0.76 m IN DIAMETER.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	AS SHOWN	DESIGNED:	BMM
DATE:	NOV 2012	CHECKED:	AA
DRAWN:	BMM	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PROJECT:
EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATIONS
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
PLATE LOAD TEST RESULTS
PLT-BGC12-20

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD CORP.	0792-009	H-6	0

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Plate Load Testing\Data Reduction\PLT-BGC12-15.grf

DWG. TO BE READ WITH BGC REPORT TITLED "2012 GEOTECHNICAL INVESTIGATIONS FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT " DATED NOVEMBER 2012.

CALIBRATION REPORT

Acuren Group Inc.
12271 Horseshoe Way
Richmond, BC, Canada V7A 4V4
www.acuren.com

Phone: 604.275.3800
Fax: 604.274.7235

NDT, Inspection and Materials Engineering
a Rockwood Company

CALIBRATION REPORT

BGC ENGINEERING INC.
SUITE 500 - 1045 HOWE STREET
VANCOUVER BC
V6Z 2A9

Attention: LUC TOUSSAINT

Date: September 21, 2011
File No.: 6057329
P.O. No.: VISA
Report No.: 1

Description: 25 Ton ENERPAC Ram for Compression Load Calibration
Model: RC256

Calibration Date: September 21, 2011

Testing Machine ID: SATEC Universal Testing Machine, Serial 120HVL-1164

Calibration Data

Gauge Reading (psi)	Run #1 (lbf)	Run #2 (lbf)	Test Machine Reading (Average Load) (lbf)
100	0	0	0
1000	4393	4426	4410
2000	9489	9459	9474
3000	14246	14220	14233
4000	19262	19015	19139
5000	24160	24213	24187
6000	29126	29045	29086
7000	34284	34172	34228
8000	39274	39348	39311
9000	44477	44418	44448

* Test machine calibrated to ASTM E4 and CSA A23.2-9C specifications

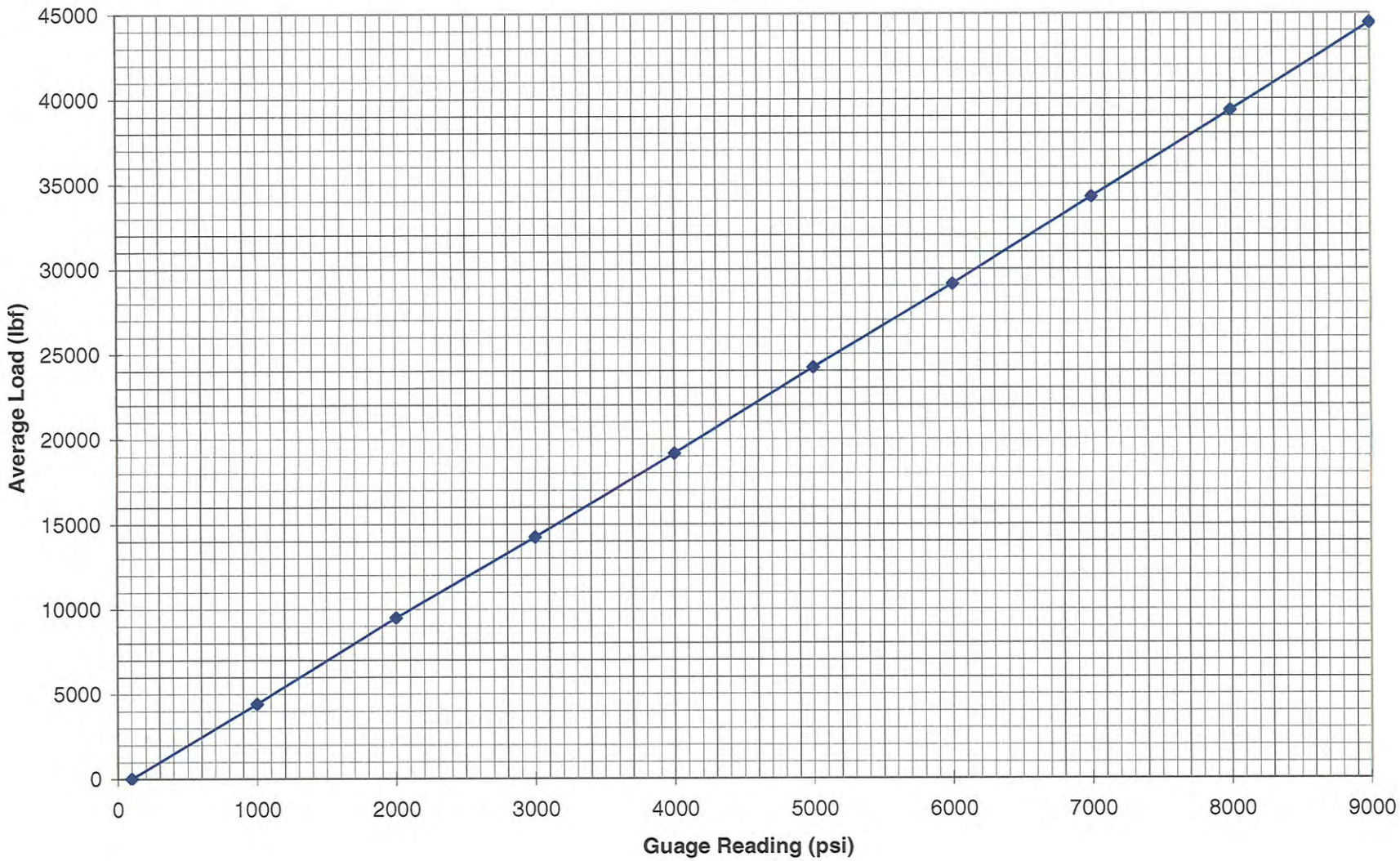
Reviewed by: _____
Alex Wong, AScT

Reviewed by: _____
Bill Johnson, AScT

SCOPE OF SERVICES: The agreement of Acuren to perform services extends only to those services specifically provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested inspection of specific equipment provided for in writing and the preparation of reports or similar documents. Any descriptions, statements, comments or expressions made reflect the opinion or observations of the Acuren examiner based solely upon data available at the time, and are not intended, nor can they be construed, as representations or warranties as to the actual circumstances. Acuren does not assume any responsibilities of the owner/operator, and the owner/operator retains complete responsibility for all engineering, repair and use decisions.
STANDARD OF CARE: In performing the services provided, Acuren shall use the degree of care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren, and all other warranties are expressly disclaimed. In the event of any breach of this warranty, Acuren's sole and exclusive obligation will be to correct or re-perform the deficient service or, at Acuren's option, to refund the amount paid for the deficient service.
LIMITATIONS OF LIABILITY: Nothing in this agreement shall be construed to mean that Acuren assumes any liability on account of injury to persons or property, including death, except and only to the extent those directly caused by the willful or negligent misconduct of Acuren in the context of performing the requested services. In no event shall Acuren's aggregate liability for any reason, in connection with any claim asserted, exceed the amount paid for the services in question. Acuren shall not be held responsible or liable for any loss, damage or delay caused by accidents, strikes, fires, floods, or other circumstances or causes beyond Acuren's control, including actions taken or not taken by the owner/operator or other third parties. In no event shall Acuren be liable for indirect, incidental, special, punitive, or consequential damages including, without limitation, damages relating to reputation, lost profits, goodwill, downtime, loss of use, business interruption or other economic loss.

ACUREN

ENERPAC RC256 COMPRESSION LOAD CALIBRATION GRAPH- 6057329
BGC ENGINEERING INC.



APPENDIX I
THERMISTORS AND GROUND TEMPERATURES

THERMISTORS

1.0 INTRODUCTION

Thermistors were installed as part of previous BGC site investigation programs in 2009, 2010 and 2011. Three new thermistors were installed as part of the 2012 site investigation work. Thermistor locations are shown on Figure I-1. A summary of thermistor installation details for previously installed thermistors is provided in Appendix J of BGC's report detailing the 2011 site investigation program (BGC 2012a). Installation details for thermistors installed in 2012 are provided below. Thermistors were installed to measure ground temperatures and determine the presence of frozen ground and thickness of the active layer. This appendix presents ground temperatures measured in 2009, 2011 and 2012 in thermistors installed by BGC.

2.0 THERMISTOR INSTALLATIONS

Thermistors installed in 2011 and 2012 were manufactured by M-Squared Instruments of Cochrane, Alberta. Thermistors installed in 2009 and 2010 were manufactured by EBA Engineering Consultants Ltd. Thermistors were installed in 2" diameter PVC pipe. The annulus between the thermistor and the PVC was not backfilled, but the top of the pipe was sealed to prevent air circulation. The annulus between the PVC pipe and the borehole wall was backfilled with grout in diamond drill holes and with bentonite chips in auger holes. Installation details for 2012 thermistors are presented in Table I-1.

Table I-1. 2012 Thermistor Installation Details

Hole	Lithology	Date Installed	Hole Depth (m)	Length of Thermistor (m)	Thermistor Cable ID#	Number and Depth of Sensors	Manufacturer	Model
BH-BGC12-80	Sandy silt; and gravelly sand to 6.8 m; highly to completely weathered rock below	2012/09/18	25.3	10.0 (plus 1.5 m lead)	11.5-1	8 (0.15 m, 0.5 m, 1 m, 1.5 m, 2.5 m, 4 m, 7 m, 10 m)	M-Squared Instruments	YSI 44007
BH-BGC12-81	Sandy silt; silty gravelly sand; and silt and sand	2012/09/18	11.4	10.0 (plus 1.5 m lead)	11.5-2	8 (0.15 m, 0.5 m, 1 m, 1.5 m, 2.5 m, 4 m, 7 m, 10 m)	M-Squared Instruments	YSI 44007
BH-BGC12-83	Sand and silt and gravel to 4 m; highly to completely weathered rock below	2012/09/19	25.0	10.0 (plus 1.5 m lead)	11.5-3	8 (0.15 m, 0.5 m, 1 m, 1.5 m, 2.5 m, 4 m, 7 m, 10 m)	M-Squared Instruments	YSI 44007

Depths are in meters below ground surface.

3.0 THERMISTOR READINGS

Thermistors were read in July 2012, September 2012 and October 2012. Thermistor readings were taken using a handheld ohmmeter and a converter box used to control which thermistor bead is being read. Readings are recorded as resistance in kilo-ohms (kΩ). Resistance readings are converted to temperatures using a polynomial function for thermistors manufactured by EBA and a table of conversions for thermistors manufactured by M-Squared instruments.

Thermistor readings are tabulated in Table I-2 and shown graphically in Figures I-2 through I-14. The figures also show thermistor readings collected in 2009 and 2011; these are tabulated in previous BGC site investigation reports (BGC 2010, BGC 2012a).

Table I-2. 2012 Thermistor Readings

			Temperature °C						
Hole (Cable ID#)	**Date Installed**	**Depth of Bead (m)**	**July 17th, 2012**	**July 18th, 2012**	**September 18th, 2012**	**September 19th, 2012**	**September 27th, 2012**	**September 28th, 2012**	**October 16th, 2012**
DH-BGC09-STU-3 (EBA #2194)	August 24th, 2009	0.5		12.0	5.1		4.6		
		1.5		8.3	5.2		4.7		
		2.5		4.5	4.2		3.5		
		4		0.9	1.7		1.5		
		7		-0.1	-0.1		-0.1		
		10		-0.2	-0.2		-0.2		
DH-BGC09-STU-4 (EBA #2193)	August 24th, 2009	0.5		10.4	3.2		4.1		
		1.5		6.0	3.7		3.3		
		2.5		2.4	2.3		1.9		
		4		0.0	0.0		0.0		
		7		-0.1	-0.1		-0.1		
		10		-0.2	-0.2		-0.2		
DH-BGC09-AG-3 (EBA #2192)	August 25th, 2009	10	0.5			0.5		0.5	
BH-BGC10-07 (EBA #2256)	August 17th, 2010	0.5	12.9			5.6			
		1.5	9.6			6.9			
		2.5	6.7			7.1			
		4	3.0			5.4			
		7	0.5			1.4			
		10	0.1			0.0			
BH-BGC11-42 (M^2 #26.5-2)	August 25th, 2011	0.3	9.3			1.6		0.8	
		0.6	8.5			1.9		1.6	
		1.2	4.9			1.8		2.1	
		2	1.3			1.1		1.1	
		5	-0.2			-0.2		-0.1	
		10	-0.3			-0.3		-0.2	

			Temperature °C						
Hole (Cable ID#)	**Date Installed**	**Depth of Bead (m)**	**July 17th, 2012**	**July 18th, 2012**	**September 18th, 2012**	**September 19th, 2012**	**September 27th, 2012**	**September 28th, 2012**	**October 16th, 2012**
BH-BGC11-44 (M^2 #11.5-3)	August 10th, 2011	0.15	11.6			4.2		2.0	
		0.5	11			4.1		4.3	
		1	8.5			5.3		5.2	
		1.5	5.7			5.4		4.9	
		2.5	2.7			4.4		4.0	
		4	0.5			2.0		2.0	
		7	0.0			0.0		0.0	
		10	-0.1			-0.1		-0.1	
BH-BGC11-51 (M^2 #26.5-1)	August 25th, 2011	0.3	13.5			12.1		-0.7	
		0.6	13.6			7.0		2.5	
		1.2	13.4			6.9		6.7	
		2	10.3			8.0		7.5	
		5	1.4			3.3		3.4	
		10	0.2			0.2		0.3	
		15	0.0			0.0		0.0	
		25	-0.1			-0.1		-0.1	
BH-BGC11-57 (M^2 #11.5-2)	August 26th, 2011	0.15		10.8	5.5		5.9		
		0.5		8.9	3.2		3.3		
		1		4.9	2.3		2.1		
		1.5		1.2	1.1		1.2		
		2.5		-0.1	-0.1		0.0		
		4		-0.2	-0.1		-0.2		
		7		-0.2	-0.2		-0.2		
		10		-0.1	-0.1		-0.1		
BH-BGC11-58 (M^2 11.5-1)	August 29th, 2011	0.15		10.7	6.2		8.5		
		0.5		6.1	2.4		3.0		
		1		0.4	0.7		0.6		
		1.5		-0.3	-0.1		-0.1		
		2.5		-0.4	-0.3		-0.3		
		4		-0.5	-0.5		-0.5		
		7		-0.5	-0.5		-0.5		
		10		-0.5	-0.5		-0.5		

			Temperature °C						
Hole (Cable ID#)	**Date Installed**	**Depth of Bead (m)**	**July 17th, 2012**	**July 18th, 2012**	**September 18th, 2012**	**September 19th, 2012**	**September 27th, 2012**	**September 28th, 2012**	**October 16th, 2012**
BH-BGC11-63 (M^2 26.5-3)	August 25th, 2011	0.3		7.7		0.3		0.1	
		0.6		4.5		0.5		0.5	
		1.2		0.2		0.0		0.1	
		2		0.0		-0.1		-0.1	
		5		0.1		0.0		0.0	
		10		0.0		-0.2		-0.1	
		15		0.0		-0.2		-0.2	
		25		0.0		0.0		0.0	
BH-BGC12-80 (M^2 11.5-1)	September 18th, 2012	0.15							-0.2
		0.5							0.0
		1							-0.1
		1.5							-0.2
		2.5							-0.3
		4							-0.4
		7							-0.5
		10							-0.6
BH-BGC12-81 (M^2 11.5-2)	September 18th, 2012	0.15							-0.4
		0.5							0
		1							0
		1.5							-0.1
		2.5							-0.2
		4							-0.4
		7							-0.4
		10							-0.4
BH-BGC12-83 (M^2 11.5-3)	September 19th, 2012	0.15							0
		0.5							0.8
		1							2.1
		1.5							3.1
		2.5							3.6
		4							3.2
		7							2
		10							1.7

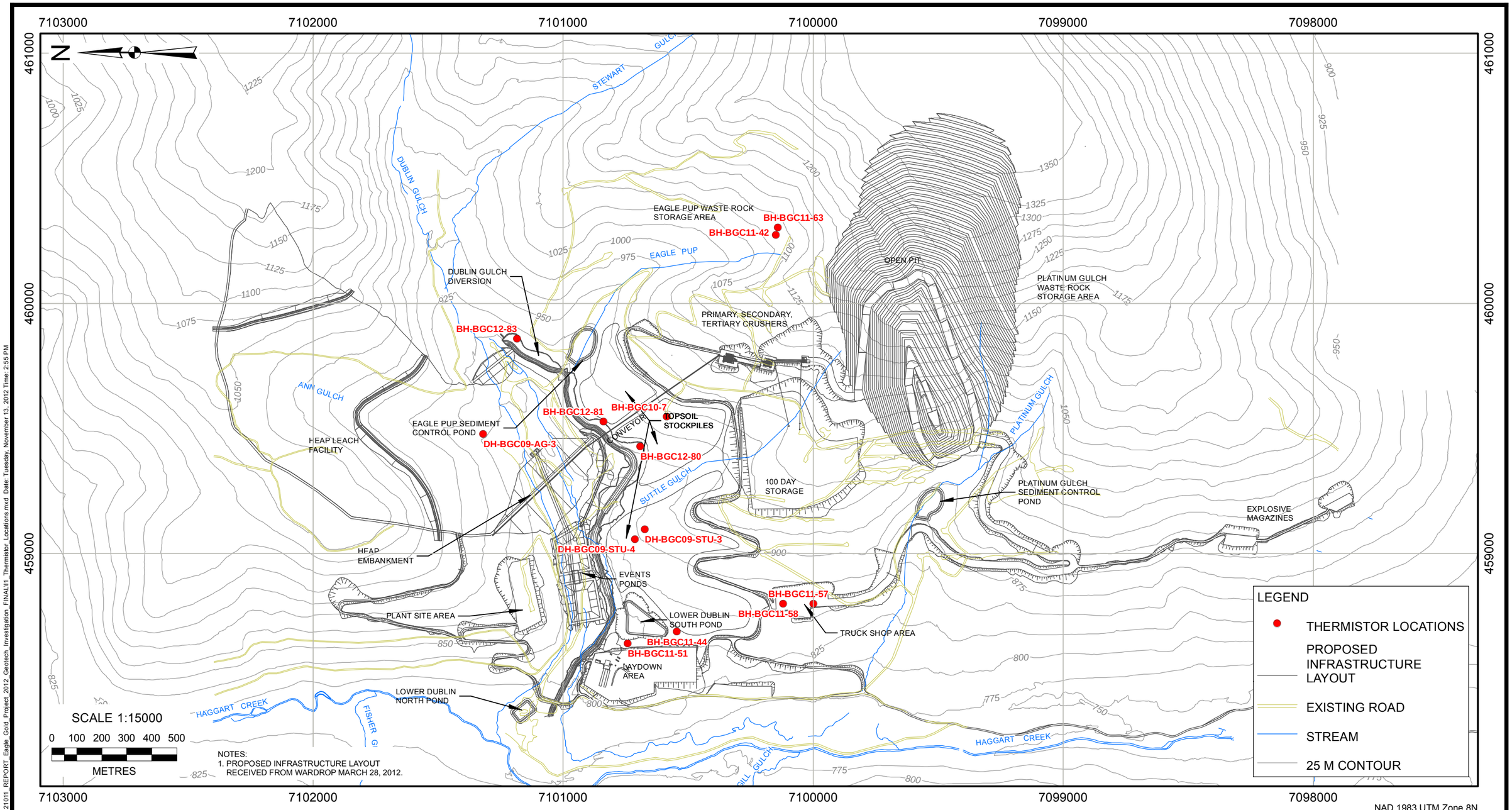
Depths are in meters below ground surface.

4.0 REFERENCES

BGC Engineering Inc. 2010. Eagle Gold Project Site Facilities Geotechnical Investigation Factual Data Report, Victoria Gold Corporation.

BGC Engineering Inc. 2012a. Eagle Gold Project 2011 Geotechnical Investigation for Mine Site Infrastructure Factual Data Report, Victoria Gold Corporation.

FIGURES



NAD 1983 UTM Zone 8N

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
B	OCT 2012	ISSUED FOR COMMENT WITH SECOND DRAFT	LL	DW	PQ
A	AUG 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE:	1:15,000
DATE:	NOV 2012
DRAWN:	LL
DESIGNED:	KH
CHECKED:	DW
APPROVED:	AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

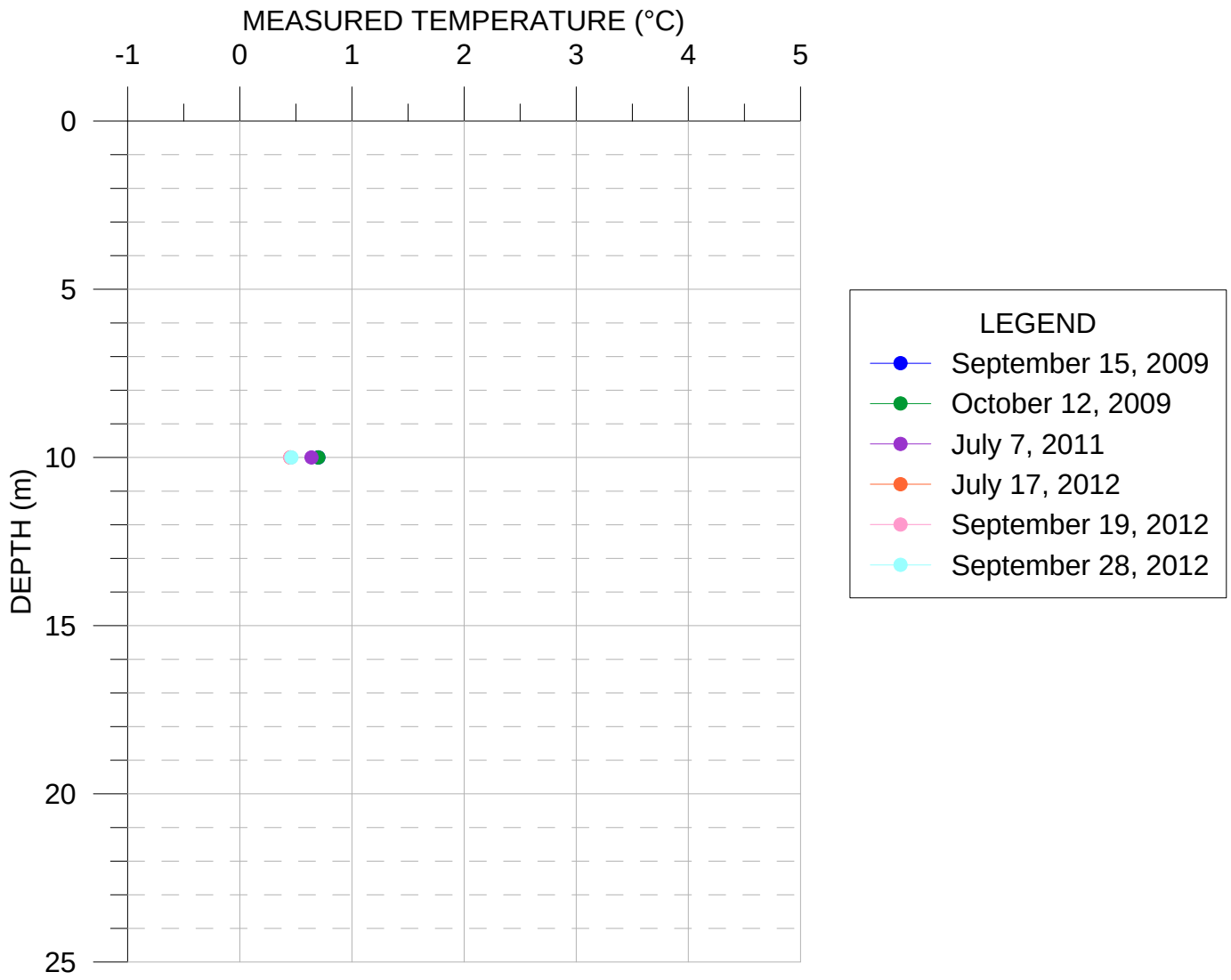
PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: THERMISTOR LOCATIONS

PROJECT No.:	DWG No.:	REV.:
0792009	I-1	0

X:\Projects\0792 Victoria Gold\009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\I1_Thermistor_Locations.mxd Date: Tuesday, November 13, 2012 Time: 2:55 PM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 23rd, 2009.
3) EBA thermistor ID#2192 installed on August 25th, 2009.
4) Thersmistor consists of single bead.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

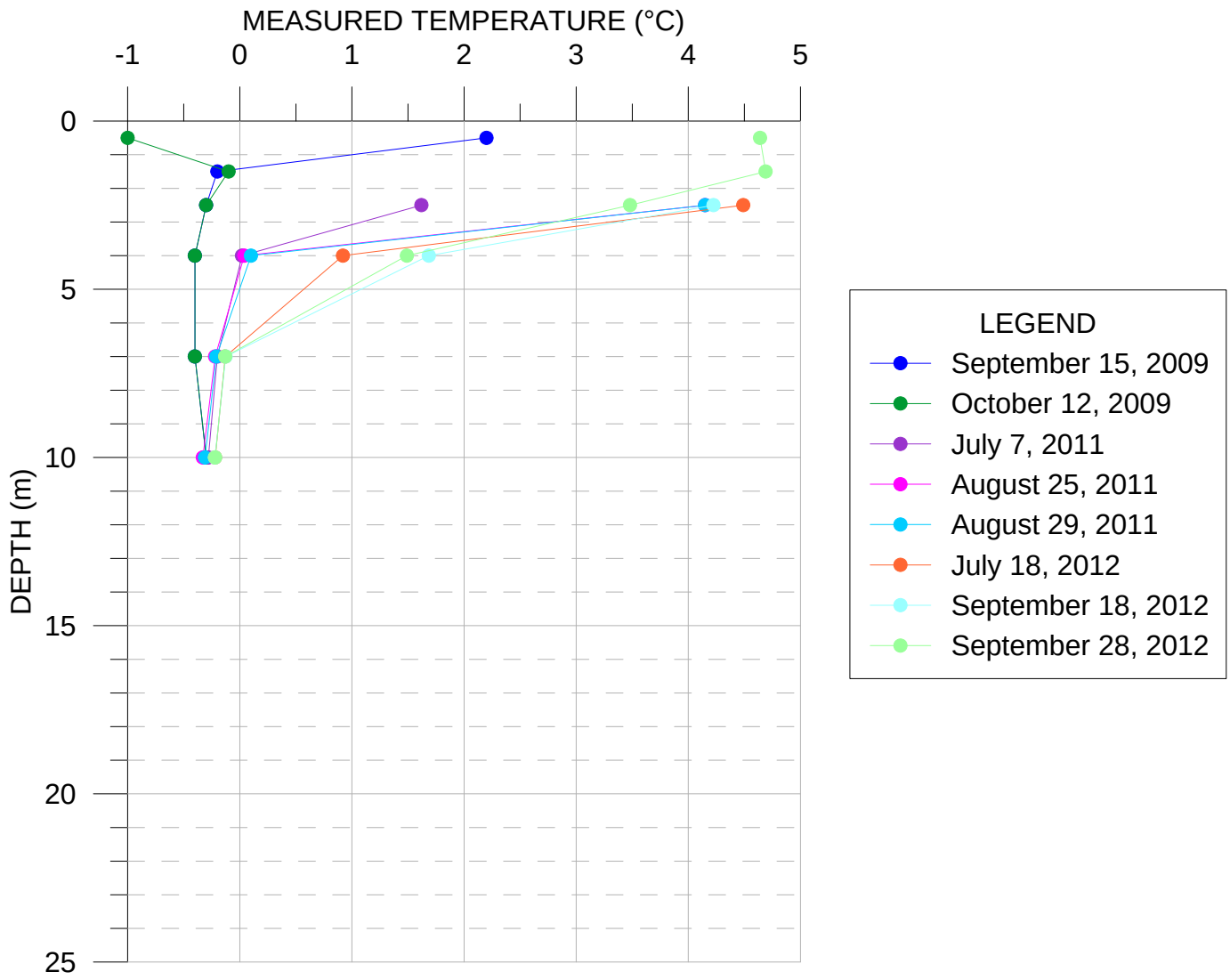
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, DH-BGC09-AG-3

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-4	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 19th, 2009.
3) EBA thermistor ID#2194 installed on August 24th, 2009.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

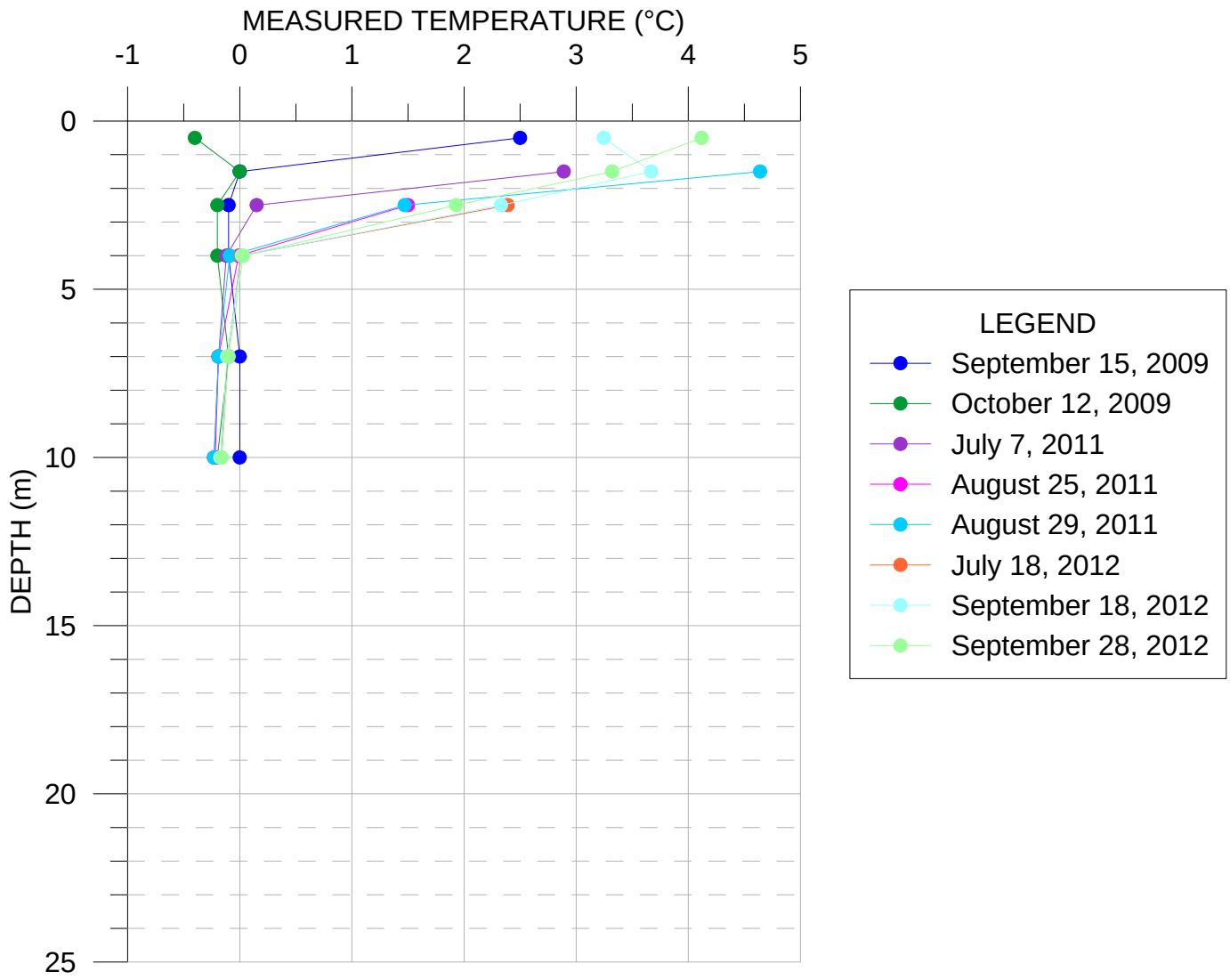
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, DH-BGC09-STU-3

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-2	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 21st, 2009.
3) EBA thermistor ID#2193 installed on August 24th, 2009.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

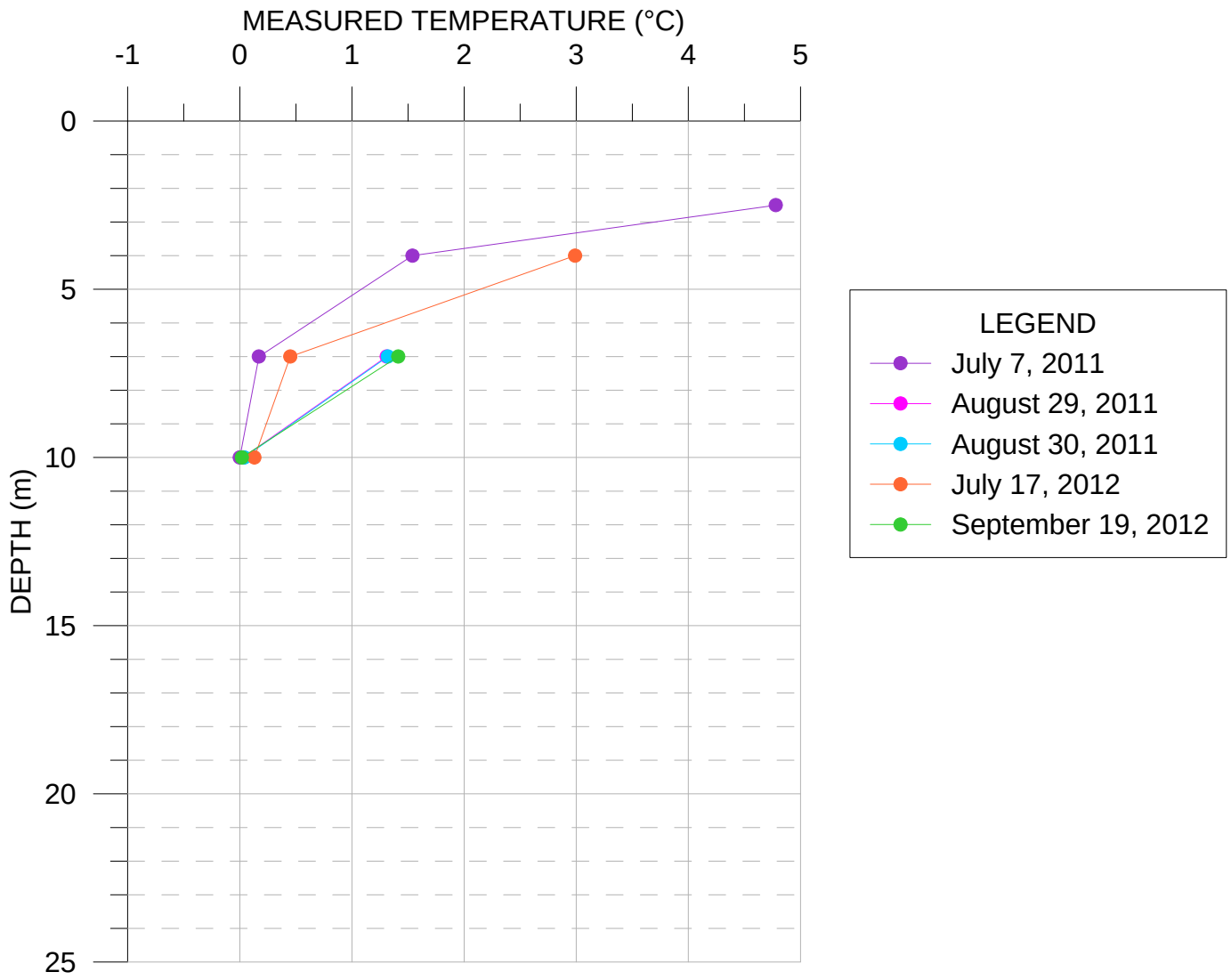
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, DH-BGC09-STU-4

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-3	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 17th, 2010.
3) EBA thermistor ID#2256 installed on August 17th, 2010.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

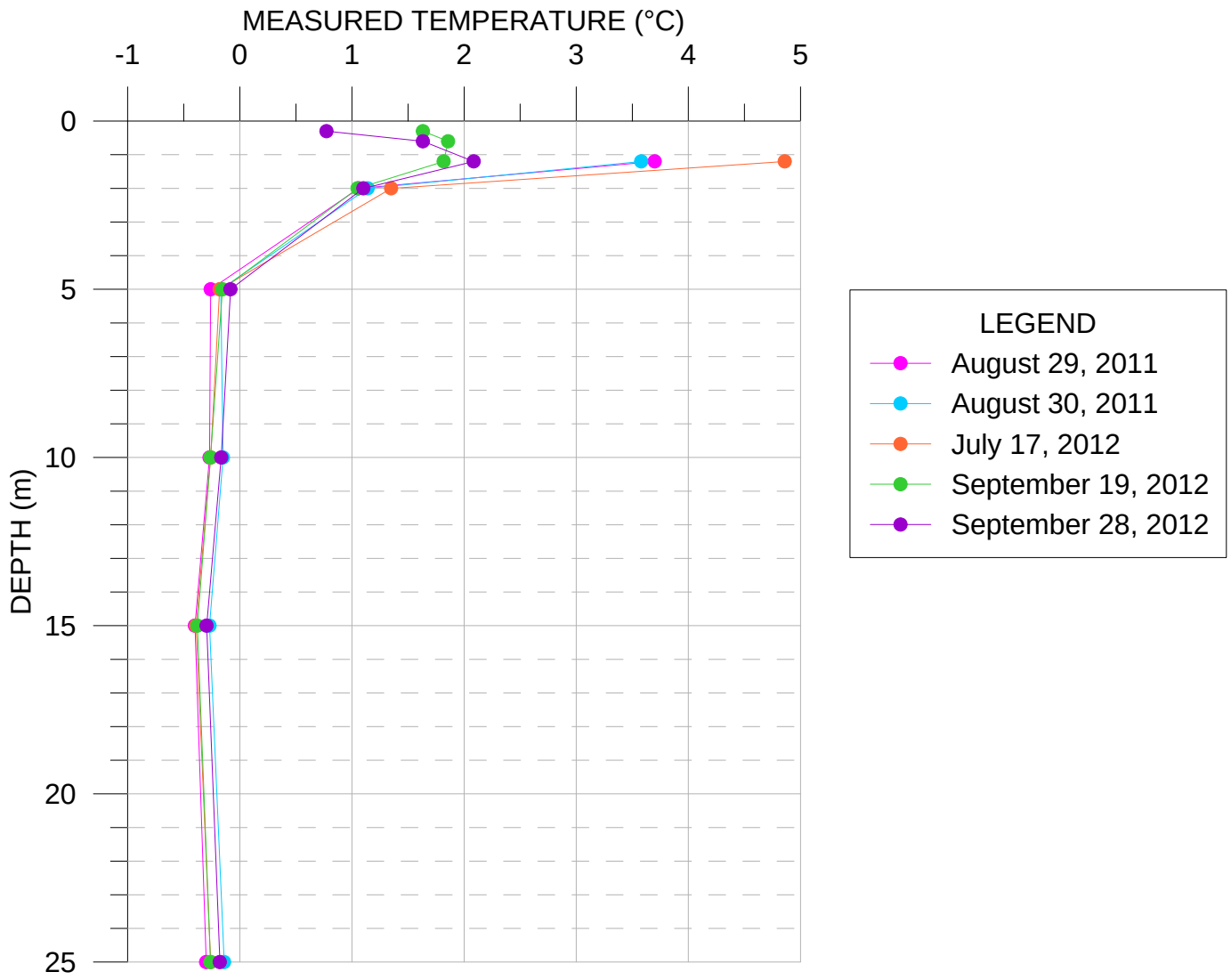
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC10-07

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-5	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 1st, 2011.
3) M-Squared thermistor #26.5-2, installed on August 25th, 2011.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

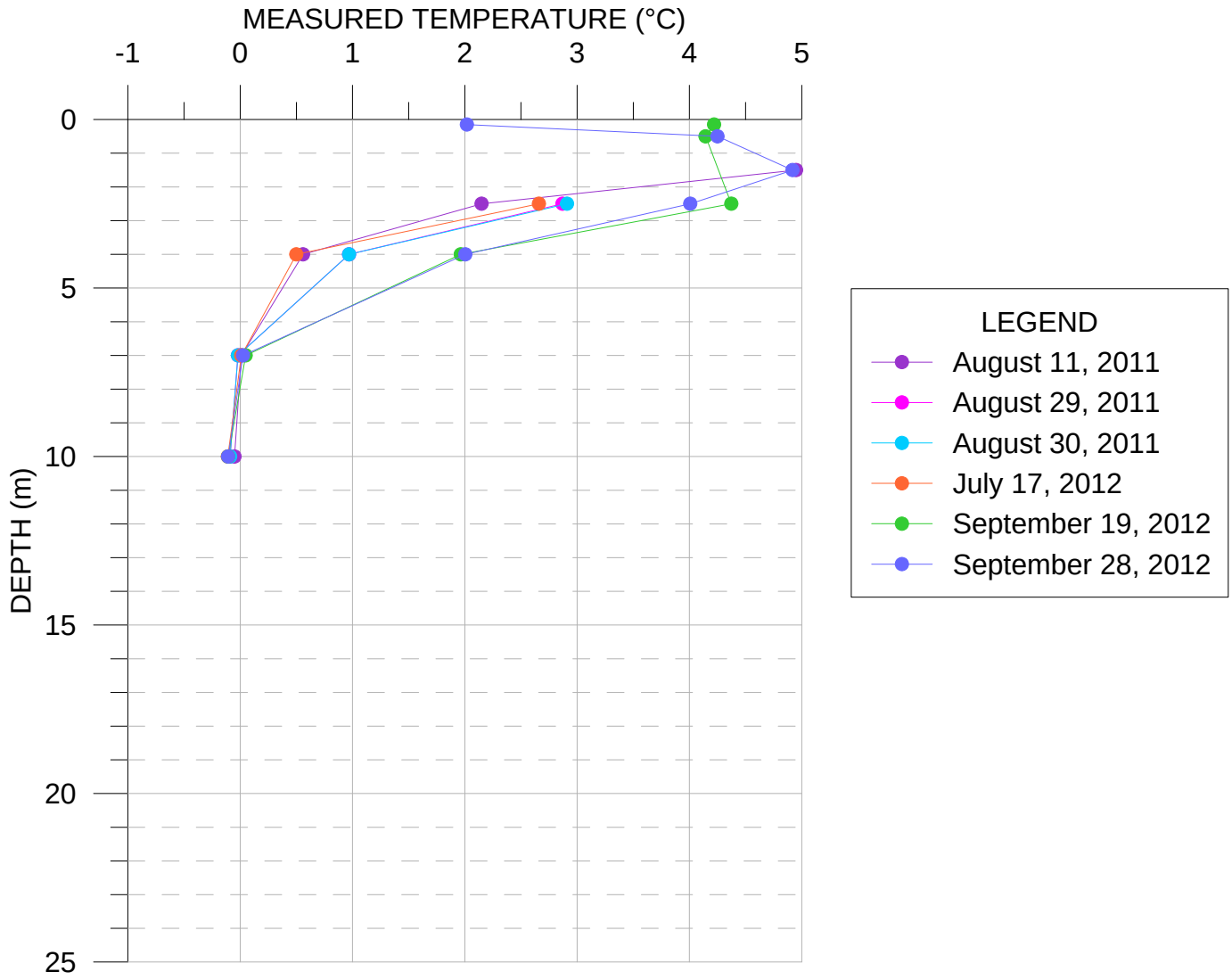
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC11-42

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-6	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 3rd, 2011.
3) M-Squared thermistor ID#11.5-3 installed on August 10th, 2011.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

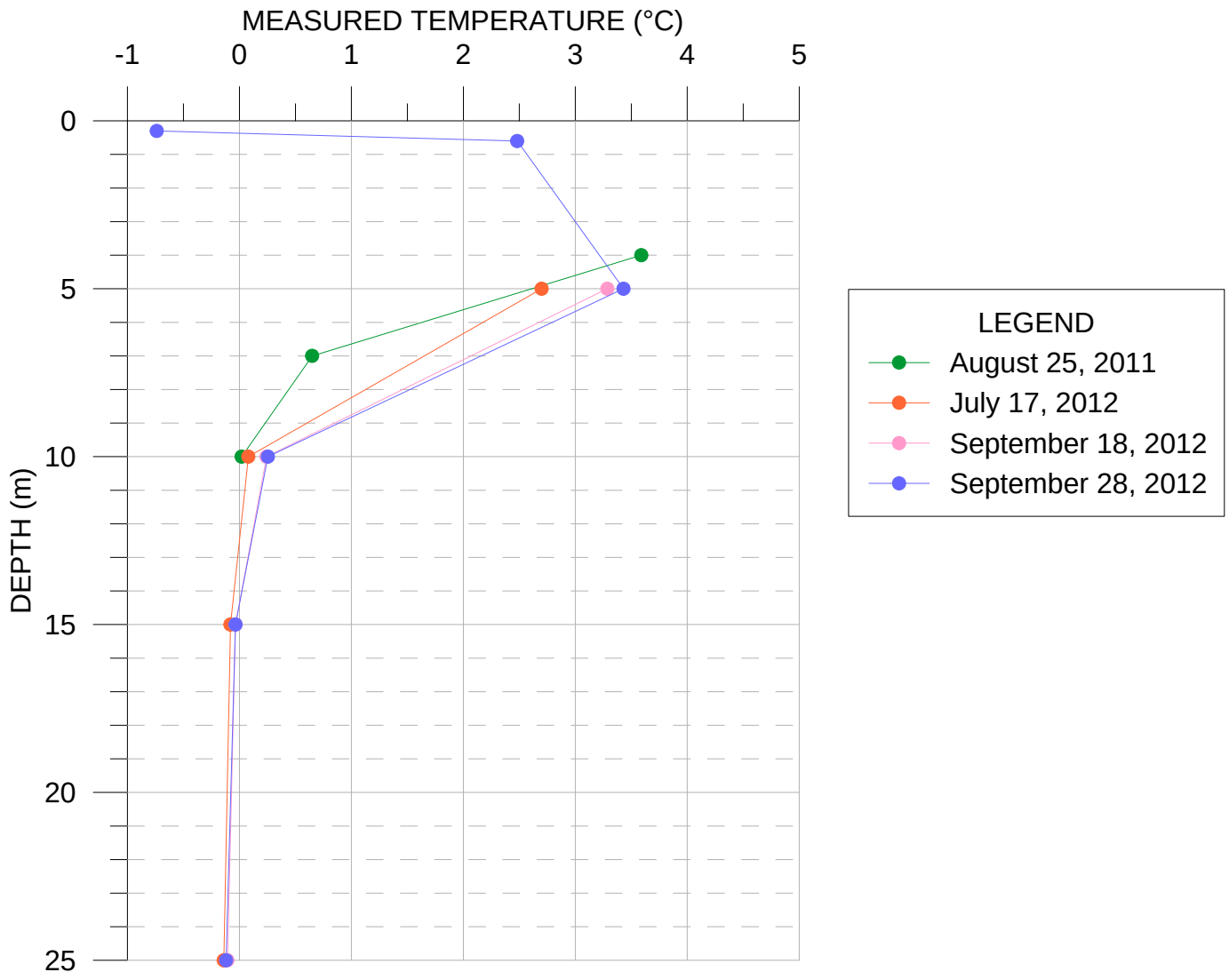
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC11-44

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-7	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:

1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 6th, 2011.
3) M-Squared thermistor ID#11.5-2 installed on August 10th, 2011 and removed on August 25th, 2011.
4) M-Squared thermistor ID#26.5-2 installed on August 25th, 2011.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

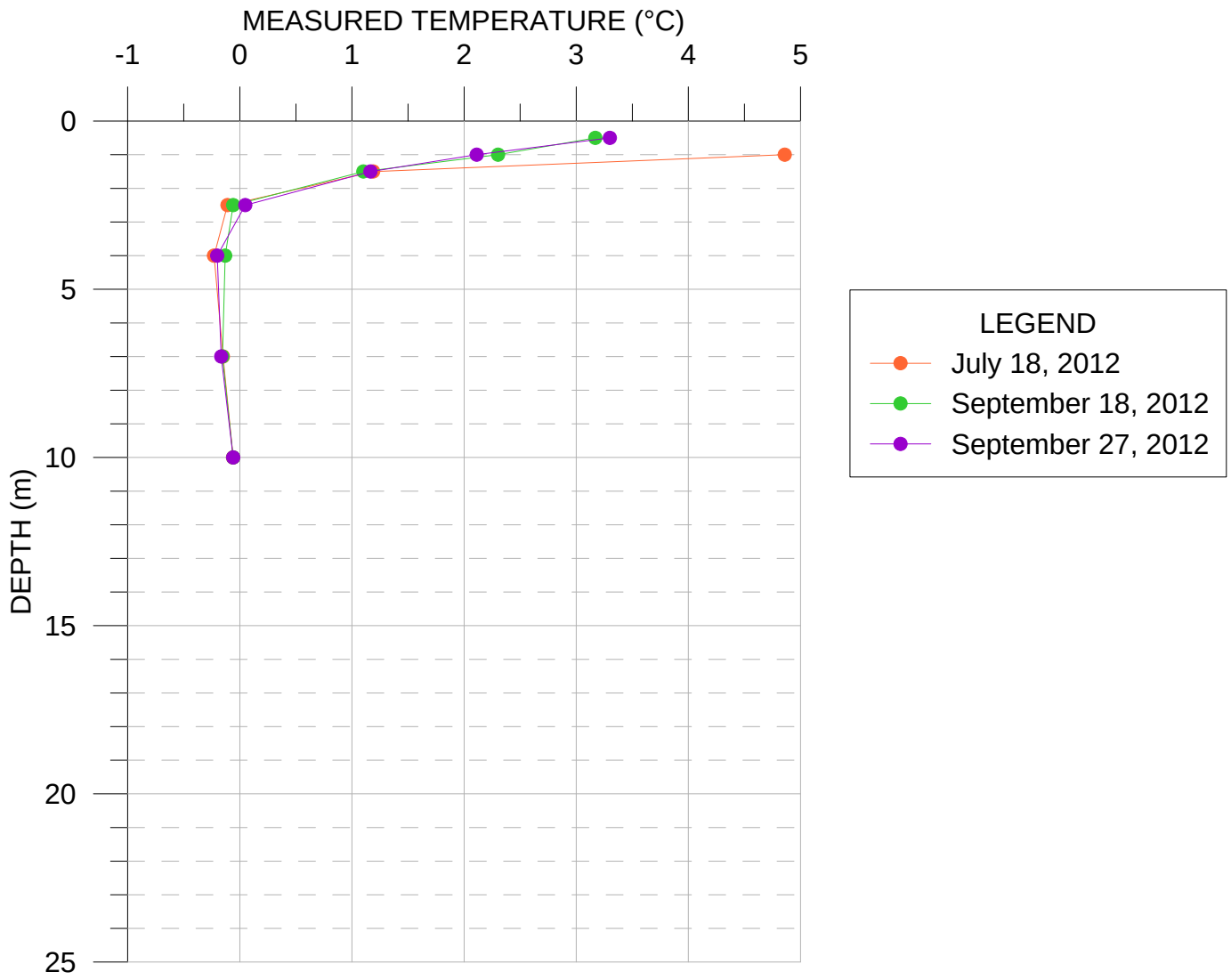
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC11-51

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-8	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 9th, 2011
3) M-Squared thermistor ID#11.5-2 installed on August 26th, 2011.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

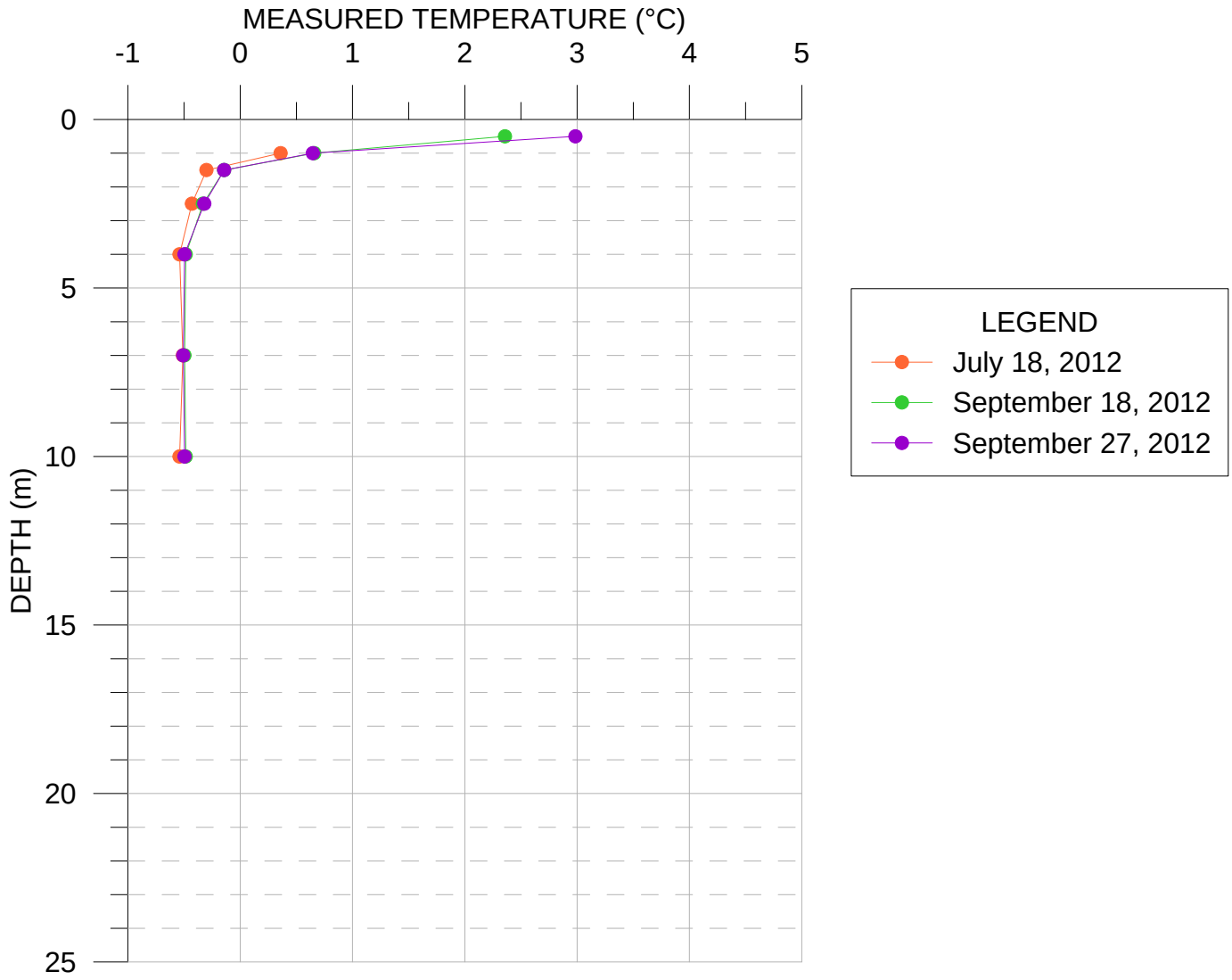
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC11-57

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-9	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 10th, 2011.
3) M-Squared thermistor ID#11.5-1 installed on August 29th, 2011.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

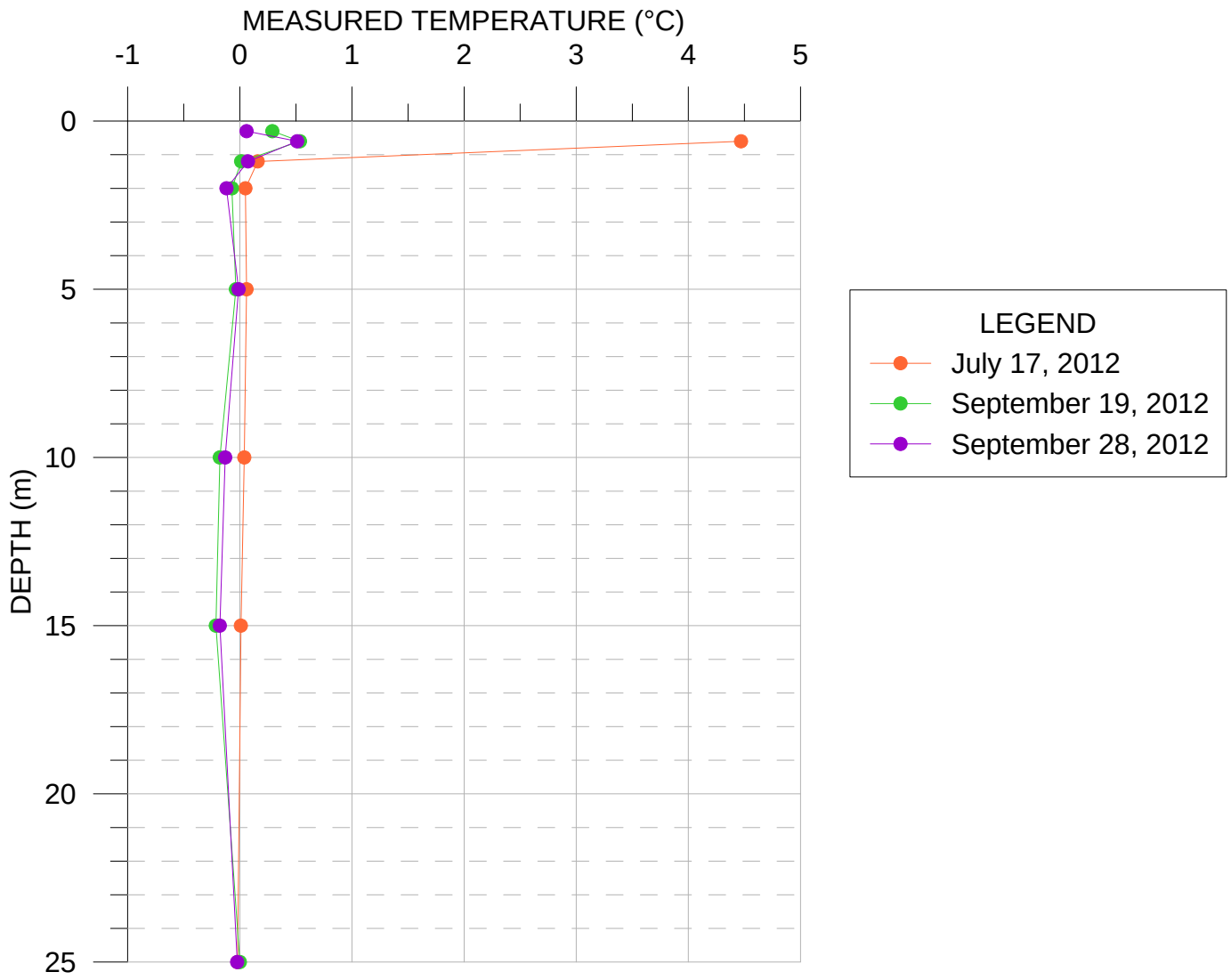
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC11-58

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-10	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on August 13th, 2011
3) M-Squared thermistor ID#26.5-3 installed on August 25th, 2011.
4) Vibrating wire piezometer also installed in this hole.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

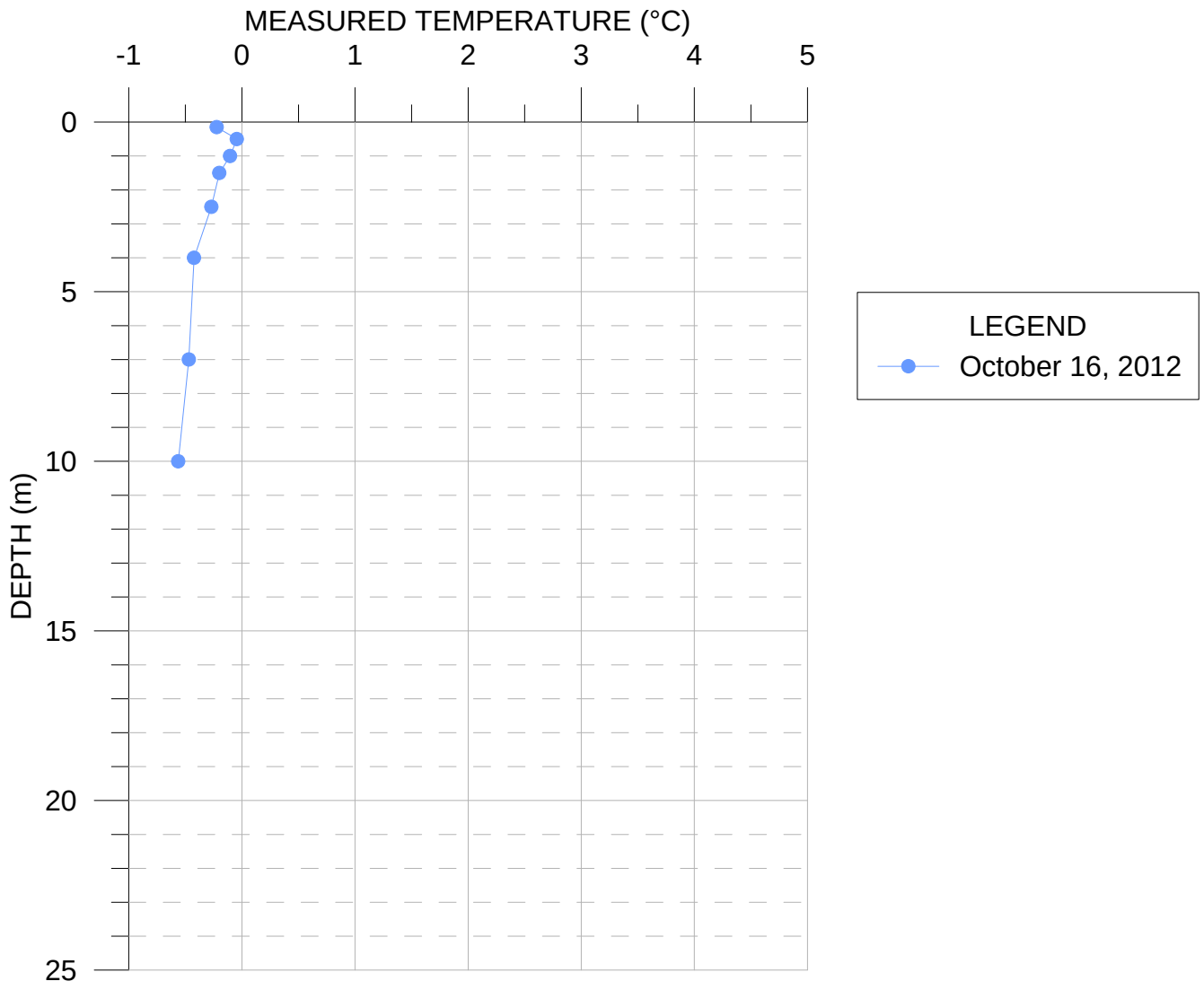
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC11-63

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-11	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on September 12th, 2012
3) M-Squared thermistor ID#11.5-1 installed on September 18th, 2012.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

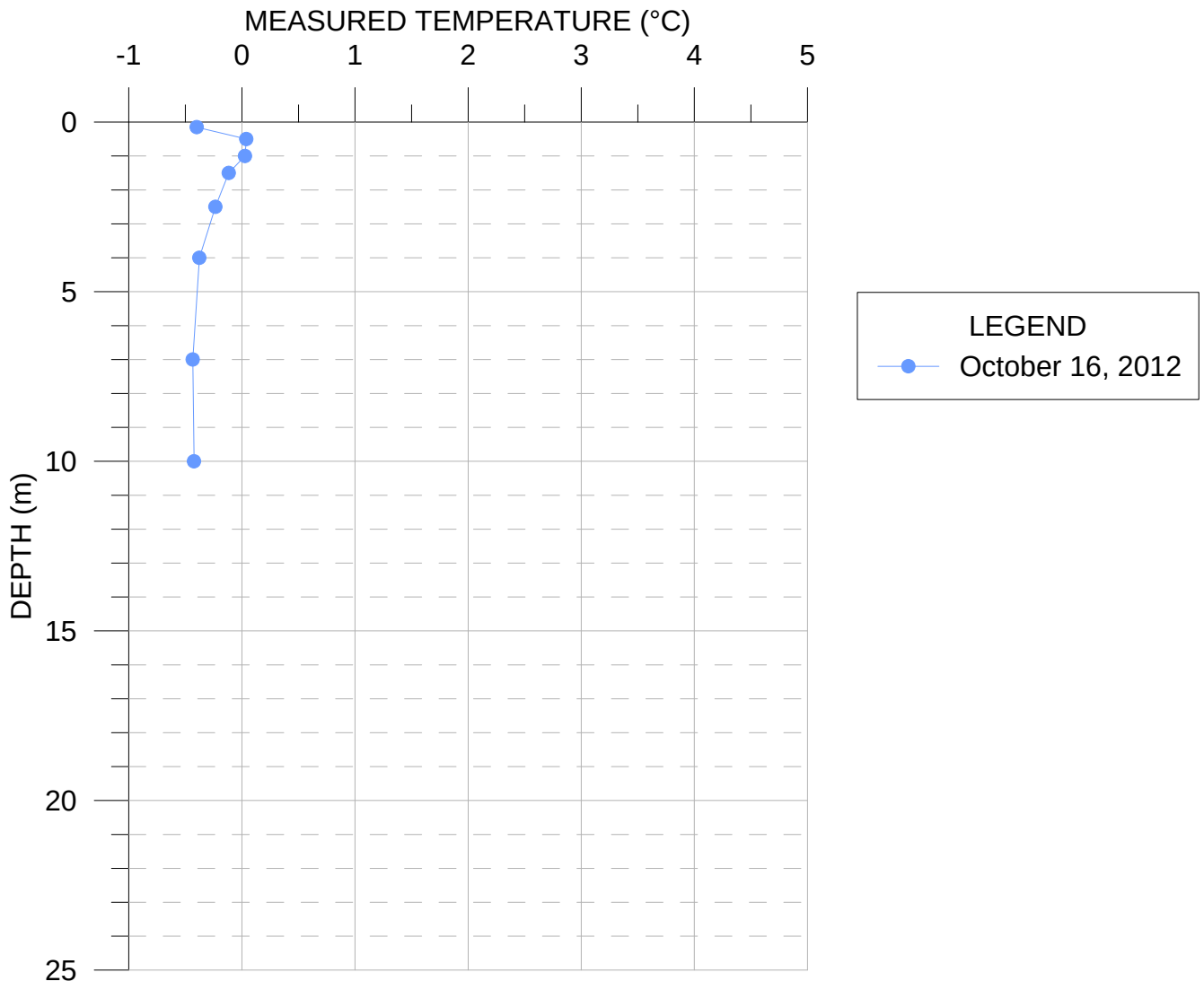
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC12-80

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-12	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on September 13th, 2012
3) M-Squared thermistor ID#11.5-2 installed on September 18th, 2012.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

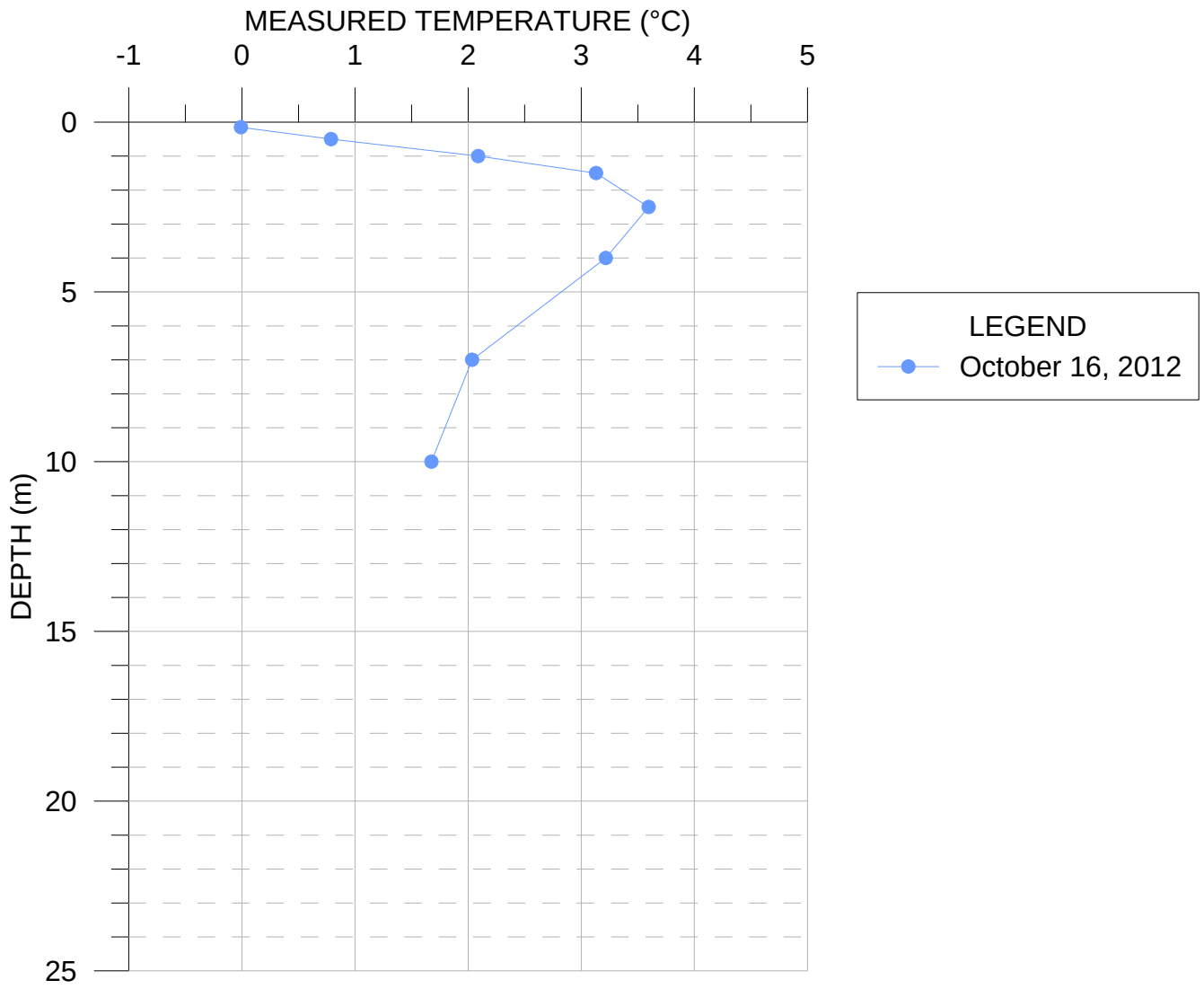
PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC12-81

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-13	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.



NOTES:
1) Measured temperatures greater than 5°C not shown for clarity.
2) Drillhole completed on September 16th, 2012
3) M-Squared thermistor ID#11.5-3 installed on September 19th, 2012.

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	KH	APPROVED:	AA

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PROJECT:
EAGLE GOLD PROJECT 2012 GEOTECHNICAL
SITE INVESTIGATION FOR MINE SITE INFRASTRUCTURE

TITLE:
MEASURED GROUND TEMPERATURE
PROFILES, BH-BGC12-83

CLIENT:	PROJECT No.:	FIG No.:	REV.:
VICTORIA GOLD	0792009	I-14	-

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Thermistors\Grapher Plots

DWG. TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOV 2012.

APPENDIX J
GROUNDWATER OBSERVATIONS

GROUNDWATER

1.0 INTRODUCTION

Groundwater investigation work consisted of measuring static water levels in standpipe piezometers and obtaining readings of piezometric head from vibrating wire piezometers. Observations of surface seepage were made at three locations in the Eagle Pup catchment; these observations were made on an opportunity basis as they were observed while reading nearby thermistors.

2.0 PIEZOMETER INSTALLATIONS

A total of eight standpipe piezometers were installed in diamond drill holes during the 2012 geotechnical site investigation for mine site infrastructure. Piezometer installation details are summarized in Table J-1 and illustrated graphically on the borehole logs in Appendix E. Piezometer locations are shown on Drawing 05 and Figure J-1.

Standpipe piezometers typically consisted of 2 inch (51 mm) diameter PVC with 10 ft (3 m) slotted screens. Piezometers were typically installed at the bottom of the hole; however in borehole BH-BGC12-77, BH-BGC12-80, BH-BGC12-81 and BH-BGC12-84 slough ranging in thickness from 0.4 m to 4.3 m was present at the bottom of the hole prior to installation, so these piezometers were placed at some height above the bottom of the completed drill holes. For BH-BGC12-85, a second hole was drilled approximately 1 m away from the original hole specifically for the installation of the piezometer, following collapse of the original auger hole.

Medium silica sand was used for the sand packs in the screened zone of the piezometers. In diamond drill holes, a bentonite seal ranging from approximately 1.5 m to 3.5 m in thickness was installed above the sand pack, and the remainder of the hole grouted to surface using a cement-bentonite grout. In auger holes, bentonite chips were used to backfill the hole from above the sand pack to the ground surface. A piezometer installation in borehole BH-BGC12-79 failed; grout entered the PVC pipe during installation, and the hole was completed as a fully grouted borehole.

Standpipe piezometers installed in BH-BGC12-75, BH-BGC12-76 and BH-BGC12-85 were developed on July 21st, July 20th and September 19th respectively. Development in BH-BGC12-75 and BH-BGC12-76 was completed by pumping water from the well and agitating the screened interval with surge blocks until pumped water was generally free of sediment. This typically took four hours. In BH-BGC12-85 water was bailed from the hole manually, while measuring water levels, until the water level remained constant even with bailing. Standpipe piezometers installed in BH-BGC12-77, BH-BGC12-78, BH-BGC12-80, BH-BGC12-81 and BH-BGC12-84 were not developed as they had only 0.5 m to 1 m of water or were dry following installation.

Table J-1. Standpipe Piezometer Installation Details

Hole	Northing (m)	Easting (m)	Elevation (masl)	PVC Diameter (mm)	Bottom of Hole (mbgs)	Bottom of Sand Pack (mbgs)	Bottom of Screen (mbgs)	Top of Screen (mbgs)	Top of Sand Pack (mbgs)	Height of Stickup (m)
BH-BGC12-75	7100169	459755	1034	51	51	51.0	47.3	44.3	42.0	0.84
BH-BGC12-76	7100235	459784	1032	51	42	42.0	40.3	37.5	36.3	1.13
BH-BGC12-77	7100004	458865	873	51	20.5	20.1	19.5	16.5	15.9	0.99
BH-BGC12-78	7100150	458928	883	51	22.4	22.4	20.7	17.7	17. 5	0.96
BH-BGC12-80	7100691	459429	922	51	25.3	22	21.6	18.6	17.9	0.81
BH-BGC12-81	7100838	459527	911	51	11.5	10.7	10.0	7.0	6.5	0.92
BH-BGC12-84	7101030	459769	919	51	9.2	8.8	7.3	4.3	3	0.92
BH-BGC12-85	7100774	459167	865	51	15.2	14.9	14.1	11.1	7.3	1.01

1. Holes completed in July 2012 were surveyed by Underhill Geomatics Ltd. in August 2012 using a differential GPS. Holes completed in September 2012 were surveyed by BGC staff using a handheld GPS.
2. Coordinates are in UTM NAD 83, Zone 8N.
3. Depths are recorded in meters below ground surface (mbgs).
4. Stickups are recorded in meters above ground surface.
5. Bottom of hole for BH-BGC12-85 is the bottom of the second hole drilled for installation purposes; original hole drilled to 26.2 m.

3.0 WATER LEVEL OBSERVATIONS

Water level measurements in standpipe piezometers and vibrating wire piezometers were made in four separate campaigns. Water levels in select standpipes installed by BGC in 2011 were read in late June 2012. Water levels in select standpipes and vibrating wire piezometers installed by BGC in 2011 and 2012 were read in mid to late July 2012, twice in September 2012 and in October 2012. Table J-2 summarizes the observed ground water depths; water level readings from 2011 are included for comparison. Figure J-1 illustrates measured groundwater levels.

Table J-2. Groundwater Level Observations

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Bottom of Screen/Depth of Vibrating Wire Tip (mbgs)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC11-26	7102088	460206	1139.6	18.3	27-Aug-11	16.4	Standpipe
					28-Jun-12	16.6	
					19-Jul-12	15.1	
					24-Jul-12	15.3	
					29-Sep-12	18.5	
BH-BGC11-29	7101802	459978	1045.3	20	27-Aug-11	7.8	Standpipe
					26-Jun-12	8.2	
					19-Jul-12	8.4	
					29-Sep-12	10.4	
BH-BGC11-30	7101568	460122	952	30.7	27-Aug-11	16.3	Standpipe
					26-Jun-12	15.3	
					19-Jul-12	15.8	
					28-Sep-12	17.1	
BH-BGC11-32	7100934	458745	818.7	23.1	24-Aug-11	10.8	Standpipe
					28-Jun-12	10.6	
					19-Jul-12	10.8	
					27-Sep-12	10.8	
					15-Oct-12	10.8	
					28-Oct-12	11.1	

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Bottom of Screen/Depth of Vibrating Wire Tip (mbgs)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC11-33	7100984	459116	833	40.0	26-Aug-11	4.2	Standpipe
					26-Jun-12	4.0	
					19-Jul-12	4.0	
					27-Sep-12	3.3	
					15-Oct-12	4.0	
					28-Oct-12	4.2	
BH-BGC11-34	7101054	459308	848.3	33.7	24-Aug-11	8.3	Standpipe
					26-Jun-12	8.3	
					19-Jul-12	8.4	
					27-Sep-12	8.4	
BH-BGC11-35	7100440	459696	986.3	48.3	27-Aug-11	24.6	Standpipe
					19-Jul-12	22.4	
					24-Jul-12	22.3	
					19-Sep-12	21.9	
					28-Sep-12	20.9	
BH-BGC11-36	7100275	459700	1002.5	18.8	27-Aug-11	19.9	Standpipe
					19-Jul-12	21.0	
					24-Jul-12	21.3	
					19-Sep-12	22.7	
					28-Sep-12	22.7	
BH-BGC11-38	7100416	459820	1013	48.6	25-Aug-11	26.3	Standpipe
					19-Jul-12	25.7	
					19-Sep-12	25.8	
					28-Sep-12	25.8	
BH-BGC11-39	7101062	458462	796.6	18.6	24-Aug-11	9.8	Standpipe
					28-Jun-12	9.0	
					19-Jul-12	9.3	
					27-Sep-12	10.5	
BH-BGC11-40B	7100039	459767	1049.8	44.0	25-Aug-11	8.5	Standpipe
					27-Jun-12	8.8	
					19-Jul-12	8.8	
					19-Sep-12	10.9	
					27-Sep-12	10.8	

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Bottom of Screen/Depth of Vibrating Wire Tip (mbgs)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC11-45	7099110	460556	1354.4	19.9	27-Aug-11	8.4	Standpipe
					19-Jul-12	11.4	
					24-Jul-12	11.9	
					28-Sep-12	17.2	
BH-BGC11-46	7099004	460263	1246.1	17.5	27-Aug-11	15.3	Standpipe
					19-Jul-12	16.3	
					24-Jul-12	16.3	
					27-Sep-12	17.5	
BH-BGC11-48	7099118	459936	1140.0	32.3	27-Aug-11	31.3	Standpipe
					27-Sep-12	31.1	
BH-BGC11-52	7101316	459891	909	21.8	25-Aug-11	4.1	Standpipe
					26-Jun-12	4.1	
					19-Jul-12	4.1	
					19-Sep-12	4.2	
					28-Sep-12	4.4	
BH-BGC11-54	7101246	458886	883.8	38.4	29-Aug-11	11.8	Vibrating Wire
					17-Jul-12	11.0	
					26-Jul-12	10.9	
					19-Sep-12	10.8	
					29-Sep-12	10.7	
					16-Oct-12	10.8	
					25-Oct-12	10.7	
BH-BGC11-55	7100918	459441	881	12.7	27-Aug-11	DRY	Standpipe
					26-Jun-12	DRY	
					19-Jul-12	DRY	
					19-Sep-12	DRY	
					27-Sep-12	DRY	
BH-BGC11-57	7099978	458799	859.2	9.9	27-Aug-11	DRY	Standpipe
					28-Jun-12	DRY	
					19-Jul-12	DRY	
					18-Sep-12	DRY	

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Bottom of Screen/Depth of Vibrating Wire Tip (mbgs)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC11-59	7101239	459113	883.7	29.1	27-Aug-11	29.4	Standpipe
					26-Jun-12	29.4	
					19-Jul-12	29.3	
					19-Sep-12	29.3	
					28-Sep-12	29.5	
BH-BGC11-60	7100042	458796	859.2	8.6	27-Aug-11	DRY	Standpipe
					26-Jun-12	DRY	
					19-Jul-12	DRY	
					19-Sep-12	DRY	
					27-Sep-12	DRY	
BH-BGC11-62	7100334	459786	1017.9	34.2	27-Aug-11	20.2	Standpipe
					19-Jul-12	22.8	
					24-Jul-12	23.2	
					19-Sep-12	24.7	
					28-Sep-12	24.7	
BH-BGC11-63	7100114	460303	1100.7	26.3	29-Aug-11	18.1	Vibrating Wire
					17-Jul-12	19.9	
					26-Jul-12	20.0	
					19-Sep-12	25.3	
					28-Sep-12	DRY	
BH-BGC11-64	7100263	460182	1044.1	46.7	28-Jun-12	11.1	Standpipe
					21-Jul-12	10.6	
BH-BGC11-72	7101087	458242	782	17.5	19-Sep-11	2.2	Standpipe
					25-Sep-11	2.2	
					19-Jul-12	1.7	
					15-Oct-12	1.5	
					28-Oct-12	2.5	
BH-BGC11-74	7101161	458278	789.1	29	19-Sep-11	7.8	Standpipe
					25-Sep-11	7.8	
					19-Jul-12	7.6	
					15-Oct-12	8.5	
					28-Oct-12	9.1	

Hole ID	Northing (m)	Easting (m)	Elevation (masl)	Bottom of Screen/Depth of Vibrating Wire Tip (mbgs)	Date Collected	Depth (mbgs)	Piezometer Type
BH-BGC12-75	7100169	459755	1034	47.3	21-Jul-12	20.5	Standpipe
					19-Sep-12	23.4	
					27-Sep-12	23.5	
BH-BGC12-76	7100235	459785	1032	40.3	20-Jul-12	24.2	Standpipe
					19-Sep-12	26.4	
					27-Sep-12	26.5	
BH-BGC12-77	7100004	458865	873	19.5	19-Jul-12	18.4	Standpipe
					18-Sep-12	DRY	
					27-Sep-12	DRY	
BH-BGC12-78	7100150	458928	883	20.7	19-Jul-12	20.1	Standpipe
					18-Sep-12	20.0	
					27-Sep-12	21.2	
BH-BGC12-80	7100691	459429	922	21.6	16-Sep-12	DRY	Standpipe
					18-Sep-12	DRY	
BH-BGC12-81	7100838	459527	911	10.3	16-Sep-12	DRY	Standpipe
					18-Sep-12	DRY	
BH-BGC12-84	7101030	459769	919	7.3	19-Sep-12	DRY	Standpipe
PW-BGC11-01	7100916	458396	800	93.6	25-Sep-11	13.2	Pumping Well
					19-Jul-12	13.7	
PW-BGC11-02	7099382	460433	1326	140.2	13-Oct-11	7.4	Pumping Well
					19-Jul-12	6.6	
					28-Sep-12	7.8	
PW-BGC11-03	7101156	458300	789	32.3	19-Sep-11	7.0	Pumping Well
					19-Jul-12	6.5	
					27-Sep-12	6.7	

1. Holes completed in 2011 were surveyed by Underhill Geomatics Ltd. in August and September 2011 using a differential GPS, with the exception of BH-BGC11-39, which was surveyed in 2012. Holes completed in July 2012 were surveyed in August 2012 using a differential GPS by Underhill Geomatics Ltd. Holes completed in September 2012 were surveyed by BGC staff using a handheld GPS.
2. Coordinates in UTM NAD 83, Zone 8N.
3. Depths are recorded in meters below ground surface (mbgs).
4. Linear calibration used for vibrating wire piezometers.
5. PW-BGC11-01 is used as a water source for drilling throughout the winter and summer. The July 2012 water level was taken while the pump was running.

4.0 SURFACE SEEPAGE OBSERVATIONS

When observed, locations of surface seepage were recorded and approximate seepage rate was estimated. Table J-3 lists the surface seepage locations noted on an opportunity basis during this site investigation program. Photos of surface seepage observations are included below.

Table J-3. Surface Seepage Observations

Seep Number	Northing (m)	Easting (m)	Elevation (masl)	Date	Approximate flow rate (L/min)	Comments
1	7100084	460274	1104	23-Jul-12	1-2	Seepage noted in two locations from bank along access road to BH-BGC11-63
2				23-Jul-12	1-2	
3	7100119	460305	1099	23-Jul-12	20-25	Seepage adjacent to BH-BGC11-63

1. Locations from handheld GPS measurements.
2. Coordinates in UTM NAD 83, Zone 8N.



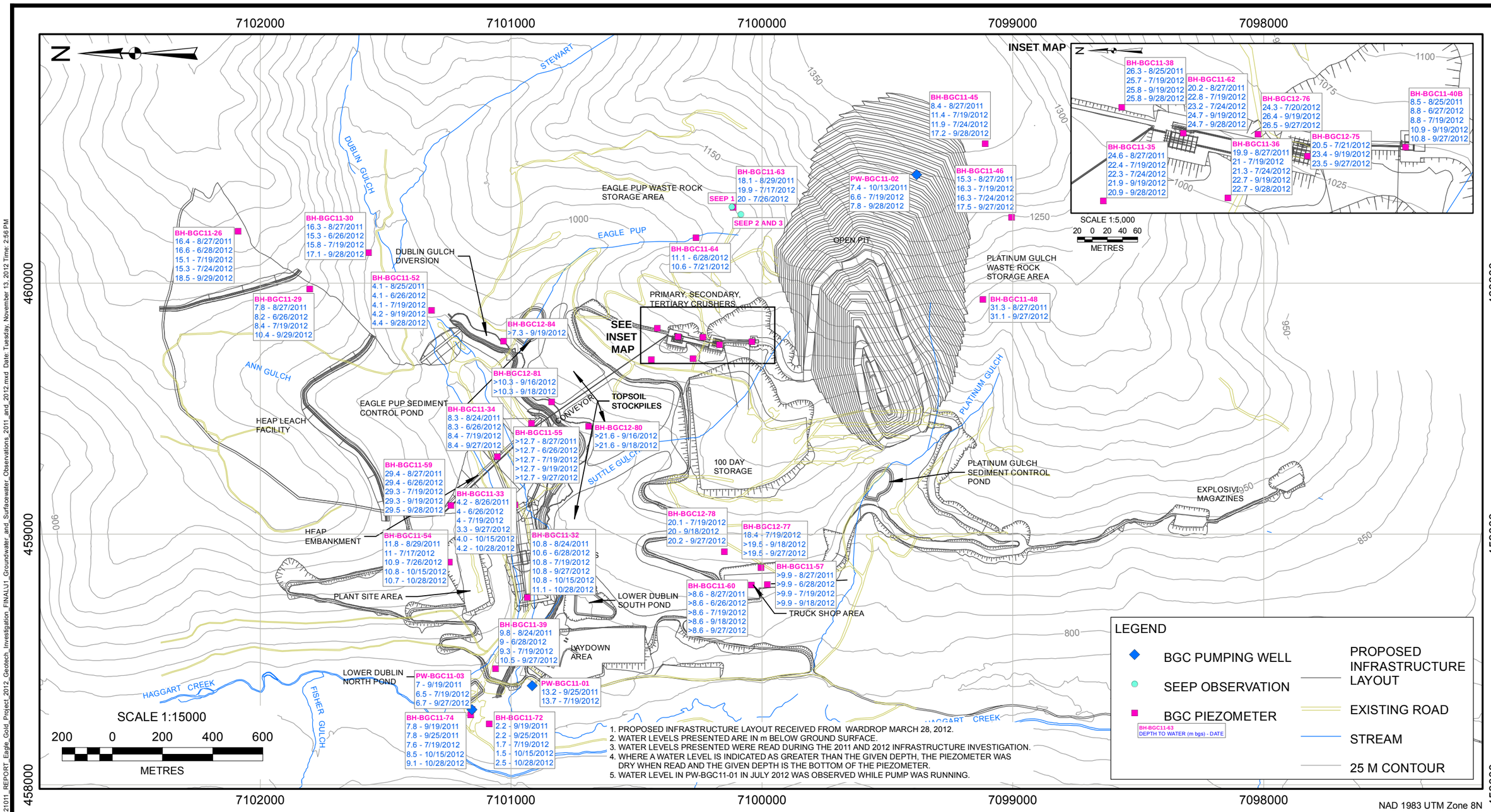
Seep 1



Seep 2



Seep 3



AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
B	OCT 2012	ISSUED FOR COMMENT WITH SECOND DRAFT	LL	DW	PQ
A	AUG 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE:	AS SHOWN
DATE:	NOV 2012
DRAWN:	LL
DESIGNED:	KH
CHECKED:	DW
APPROVED:	AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: GROUNDWATER AND SURFACE WATER OBSERVATIONS
2011 AND 2012

PROJECT No.:	DWG No.:	REV.:
0792-009	J1	0

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012

X:\Projects\0792 Victoria Gold\009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\J1_Groundwater_and_Surfacewater_Observations_2011_and_2012.mxd Date: Tuesday, November 13, 2012 Time: 2:56 PM

APPENDIX K
LABORATORY REPORTS

Laboratory Determination of Water Content of Soil and Rock

ASTM D 2216-10

Project #:	12-1415-0029
Short Title:	Eagle Gold
Client	BGC Eng Inc
Location	Yukon
Lab ID	138

Borehole	TP-BGC12-75	TP-BGC12-146	TP-BGC12-146	TP-BGC-12-146	TP-BGC12-147	TP-BGC12-147
Sample Number	G1	N/A	N/A	N/A	SA.1	SA.2
Depth (m)	40.2-40.2	1.5	3.0	2.0	0.5	1.2
Mass of Dry Soil (g)	518.9	509.0	428.6	429.2	427.1	179.0
Water Content W (%)	**13.2**	**17.9**	**1.9**	**21.5**	**9.0**	**3.7**

Borehole	TP-BGC12-147	TP-BGC12-148	TP-BGC12-150	TP-BGC12-151	TP-BGC12-152	TP-BGC12-153
Sample Number	SA.3	G1	G1	G1	G1	G1
Depth (m)	3.0	1.35-1.4	0.8-0.8	1.1-1.2	1.0-1.0	1.3-1.3
Mass of Dry Soil (g)	471.7	3718.5	1126.2	661.2	1078.5	245.1
Water Content W (%)	**7.9**	**6.3**	**13.0**	**4.9**	**14.8**	**29.3**

Borehole	TP-BGC12-153	TP-BGC12-154	TP-BGC12-155	TP-BGC12-155	TP-BGC12-156	TP-BGC12-157
Sample Number	G2	G1	G1	G2	G1	G1
Depth (m)	2.4-2.4	3.8-3.8	1.0-1.0	1.0-1.0	1.0-1.0	1.2-1.2
Mass of Dry Soil (g)	789.7	517.7	838.4	719.0	931.4	721.8
Water Content W (%)	**9.3**	**22.0**	**19.9**	**11.9**	**5.7**	**10.3**

Borehole	TP-BGC12-160	TP-BGC12-161	TP-BGC12-161	TP-BGC12-162	TP-BGC12-163	TP-BGC12-164
Sample Number	G1	G1	G2	G1	G1	G1
Depth (m)	1.0-1.0	2.0-2.0	3.7-3.7	2.5-2.5	2.0-2.0	2.7-2.7
Mass of Dry Soil (g)	507.3	1075.5	125.2	1332.9	772.2	610.8
Water Content W (%)	**6.3**	**8.3**	**37.1**	**12.2**	**11.5**	**18.0**

Borehole	TP-BGC12-165	TP-BGC12-166	TP-BGC12-167	TP-BGC12-168	TP-BGC12-169	TP-BGC12-170
Sample Number	G1	G1	G1	G1	G1	G1
Depth (m)	3.5-3.5	2.5-2.5	2.8-2.8	2.5-2.5	2.8-2.8	3.5-3.5
Mass of Dry Soil (g)	717.6	838.8	810.0	627.1	1126.2	402.3
Water Content W (%)	**9.5**	**16.8**	**18.7**	**20.5**	**6.3**	**15.4**

EB	September 4, 2012	GP	September 21, 2012
TESTED BY	DATE TESTED	CHECKED BY	DATE CHECKED

Golder Associates Ltd.
500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
Tel: +1 (604) 296 4200 Fax: +1 (604) 298 5253 www.golder.com

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

Laboratory Determination of Water Content of Soil and Rock

ASTM D 2216-10

Project #:	12-1415-0029
Short Title:	Eagle Gold
Client	BGC Eng Inc
Location	Yukon
Lab ID	138

Borehole	TP-BGC12-171	TP-BGC12-171	TP-BGC12-172	TP-BGC12-173	TP-BGC12-173	TP-BGC12-174
Sample Number	G1	G2	G1	G1	G2	G1
Depth (m)	1.1-1.1	1.1-1.1	2.1-2.1	3.5-3.5	4.6-4.6	3.0-3.0
Mass of Dry Soil (g)	671.2	561.7	505.0	699.9	1025.0	876.1
Water Content W (%)	**10.4**	**8.5**	**15.1**	**12.0**	**6.7**	**13.3**

Borehole	TP-BGC12-175	TP-BGC12-176				
Sample Number	G1	G1				
Depth (m)	2.7-2.7	1.3-1.3				
Mass of Dry Soil (g)	913.4	1036.0				
Water Content W (%)	**11.0**	**5.9**				

Borehole						
Sample Number						
Depth (m)						
Mass of Dry Soil (g)						
Water Content W (%)						

Borehole						
Sample Number						
Depth (m)						
Mass of Dry Soil (g)						
Water Content W (%)						

Borehole						
Sample Number						
Depth (m)						
Mass of Dry Soil (g)						
Water Content W (%)						

EB	September 4, 2012	GP	September 21, 2012
TESTED BY	DATE TESTED	CHECKED BY	DATE CHECKED

Golder Associates Ltd.
500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
Tel: +1 (604) 296 4200 Fax: +1 (604) 298 5253 www.golder.com

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

Laboratory Approximation of Ice Content within Thawed Soil Specimens

Non-Standard Test

Project #:	12-1415-0029 Phase 5000
Short Title:	Eagle Gold
Client	BGC Engineering
Location	Yukon
Lab ID	138

Borehole	175	162	161	167	169	155
Sample Number	G1	G1	G1	G1	G1	G1
Depth (m)	2.7	2.5	2.0	2.8	2.8	1.0
Total Wet Mass (g)	4139	4717	3393	1450	6444	2114
Total Dry Mass (g)	3551	4072	3128	1129	5919	1743
Mass of Decant (g)	193.1	148.9	4.5	110.0	151.2	22.9
Water Content (%)	11.1	12.2	8.3	18.7	6.3	19.9
Total Water Content, (%)	16.5	15.8	8.5	28.5	8.9	21.2
Freewater Content (%)	5.4	3.7	0.1	9.7	2.6	1.3

Borehole	174	153	172	171	154	153
Sample Number	G1	G1	G1	G1	G1	G2
Depth (m)	3	1.3	2.1	1.1	3.8	2.4
Total Wet Mass (g)	4496	1349	3967	4078	2955	3293
Total Dry Mass (g)	3955	842	3276	3565	2372	2838
Mass of Decant (g)	13.2	259.6	196.3	143.4	61.2	190.3
Water Content (%)	13.3	29.3	15.1	10.4	22.0	9.3
Total Water Content, (%)	13.7	60.2	21.1	14.4	24.6	16.0
Freewater Content (%)	0.3	30.8	6.0	4.0	2.6	6.7

Borehole	164	155	163	150	152	
Sample Number	G1	G2	G1	G1	G1	
Depth (m)	2.7	2.4	2.0	0.8	1	
Total Wet Mass (g)	4641	6578	2999	3278	5175	
Total Dry Mass (g)	3840	5749	2645	2886	4394	
Mass of Decant (g)	109.6	146.27	50.3	16.0	129.2	
Water Content (%)	18.0	11.9	11.5	13.0	14.8	
Total Water Content, (%)	20.9	14.4	13.4	13.6	17.8	
Freewater Content (%)	2.9	2.5	1.9	0.6	2.9	

BM/EB	September 4, 2012	LP	October 12, 2012
TESTED BY	DATE TESTED	CHECKED BY	DATE CHECKED

Golder Associates Ltd.
500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
Tel: +1 (604) 296 4200 Fax: +1 (604) 298 5253 www.golder.com

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

WATER CONTENT DETERMINATION

Reference(s)
ASTM D 4959

Client: BGC Engineering Inc.
Lab Schedule No.: 197

Project: Dublin Gulch Diversion Channel Drilling Program

Location: Yukon

Project No.: 12-1415-0029 **Phase:** 9000

Sample Location	Sample No.	Sample Interval		Water Content (%)
		Depth (m)	Bottom (m)	
BH-BGC12-080	**G1**	1.20	1.20	**12.8**
BH-BGC12-080	**G4**	3.00	3.00	**16.6**
BH-BGC12-080	**G3**	3.30	3.30	**25.6**
BH-BGC12-080	**G5**	3.60	3.60	**25.3**
BH-BGC12-080	**G6**	4.10	4.10	**14.3**
BH-BGC12-080	**G7**	4.30	4.30	**13.5**
BH-BGC12-080	**G8**	4.70	4.70	**21.0**
BH-BGC12-080	**G9**	5.30	5.30	**12.7**
BH-BGC12-080	**G10**	6.00	6.00	**42.4**
BH-BGC12-080	**G13**	18.60	18.90	**7.5**
BH-BGC12-081	**G1**	0.50	0.60	**17.7**
BH-BGC12-081	**G2**	0.80	0.90	**13.2**
BH-BGC12-081	**G4**	1.00	1.00	**15.9**
BH-BGC12-081	**G3**	1.40	1.50	**13.6**
BH-BGC12-081	**G5**	1.80	1.80	**8.5**
BH-BGC12-081	**G6**	2.90	3.05	**23.1**
BH-BGC12-081	**G7**	3.50	3.50	**17.2**
BH-BGC12-081	**G8**	3.90	3.90	**23.7**
BH-BGC12-081	**G9**	4.50	4.50	**11.4**
BH-BGC12-081	**G10**	5.10	5.10	**17.2**
BH-BGC12-081	**G11**	5.60	5.80	**39.3**
BH-BGC12-081	**G12**	6.20	6.20	**11.7**
BH-BGC12-081	**G13**	6.80	6.80	**14.5**
BH-BGC12-081	**G14**	7.10	7.10	**16.1**
BH-BGC12-081	**G15**	8.20	8.30	**12.0**
BH-BGC12-081	**G16**	10.90	11.10	**9.9**
BH-BGC12-082	**G1**	2.20	2.40	**7.2**
BH-BGC12-082	**G2**	3.80	3.80	**11.6**
BH-BGC12-082	**G3**	5.20	5.20	**11.6**
BH-BGC12-082	**G4**	6.00	6.00	**20.1**
BH-BGC12-082	**G5**	6.80	6.80	**18.0**
BH-BGC12-082	**G6**	7.80	7.80	**6.7**
BH-BGC12-082	**G7**	8.20	8.20	**3.3**
BH-BGC12-082	**G8**	9.30	9.40	**10.9**

GP	25/10/2012
Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_WATER CONTENT (REPORT) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB GPatton 26/10/12

WATER CONTENT DETERMINATION

Reference(s)
ASTM D 4959

Client: BGC Engineering Inc.
Lab Schedule No.: 197

Project: Dublin Gulch Diversion Channel Drilling Program

Location: Yukon

Project No.: 12-1415-0029 **Phase:** 9000

Sample Location	Sample No.	Sample Interval		Water Content (%)
		Depth (m)	Bottom (m)	
BH-BGC12-082	**G10**	14.20	14.20	**9.8**
BH-BGC12-082	**G12**	18.80	18.80	**9.5**
BH-BGC12-083	**M1**	0.60	1.05	**13.9**
BH-BGC12-083	**G2**	1.90	2.10	**10.9**
BH-BGC12-083	**M2**	2.13	2.58	**12.1**
BH-BGC12-083	**G4**	4.90	5.00	**3.7**
BH-BGC12-083	**M5**	6.71	6.95	**1.3**
BH-BGC12-083	**M7**	9.76	9.91	**3.2**
BH-BGC12-083	**G5**	18.60	18.60	**9.5**
BH-BGC12-084	**G1**	0.60	0.90	**9.7**
BH-BGC12-084	**G2**	2.30	2.40	**9.9**
BH-BGC12-084	**M3**	4.00	4.10	**6.4**
BH-BGC12-084	**G4**	6.80	6.80	**6.7**
BH-BGC12-084	**M4**	8.44	8.84	**5.5**
BH-BGC12-085	**M2**	2.44	2.89	**12.7**
BH-BGC12-085	**M3**	3.96	4.41	**10.7**
BH-BGC12-085	**M4**	5.59	5.94	**25.8**
BH-BGC12-085	**G6**	8.20	8.40	**9.9**
BH-BGC12-085	**M6**	8.54	8.99	**5.6**
BH-BGC12-085	**M7**	10.06	10.36	**9.8**
BH-BGC12-085	**G8**	23.50	23.50	**12.5**
BH-BGC12-085	**G9**	25.00	25.00	**14.3**
TP-BGC12-181	**G1**	1.00	1.00	**7.8**
TP-BGC12-181	**G2**	3.50	3.50	**14.2**
TP-BGC12-181	**G3**	4.00	4.00	**7.8**

GP	25/10/2012
Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_WATER CONTENT (REPORT) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB GPatton 26/10/12

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

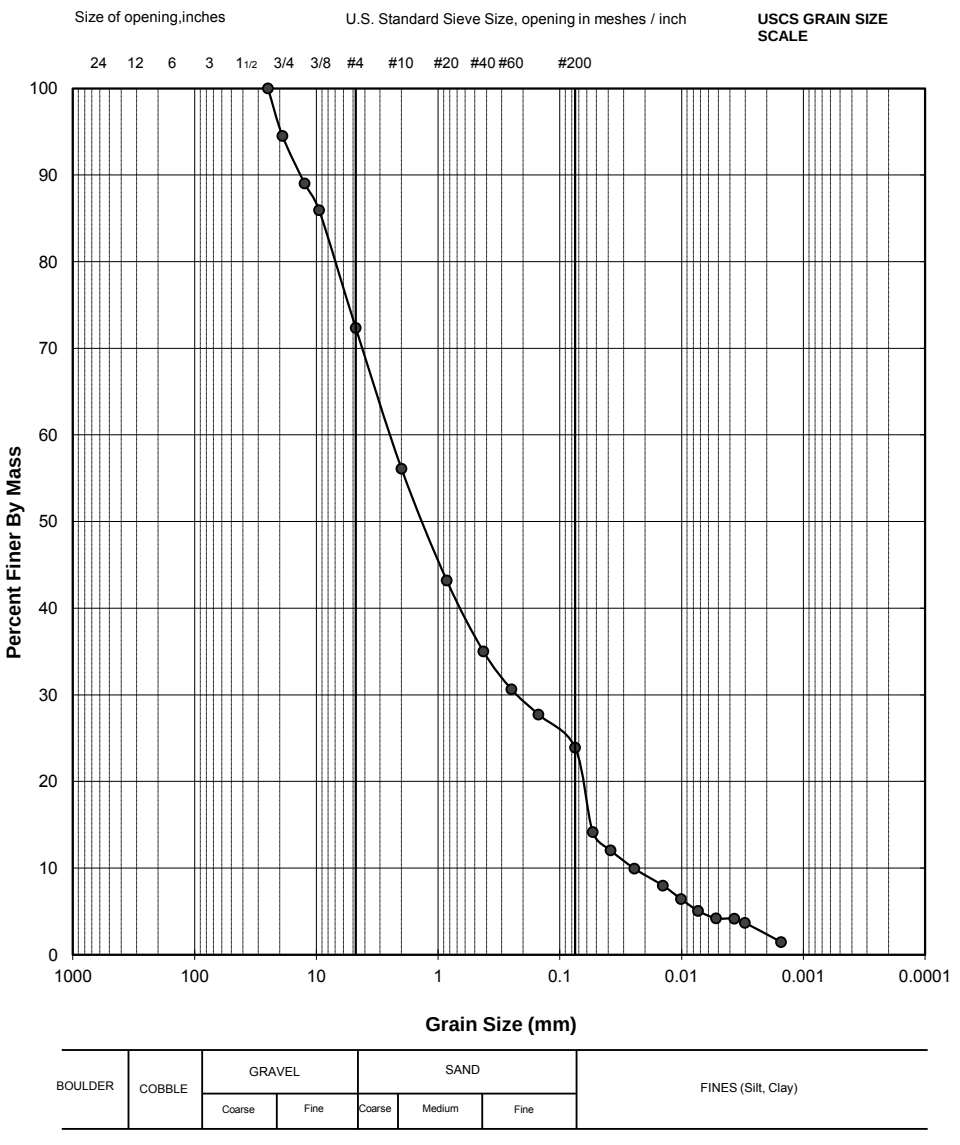
Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-146**
Client:	BGC Engineering Inc.	**Sample No.:**	Not Provided
Project:	Eagle Gold Detail Design Support	**Depth (m):**	3
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (assumed): 2.70

Other Remarks:

Dispersion Method: Stirring
Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	100.0
1"	25.00	100.0
3/4"	19.00	94.5
1/2"	12.50	89.0
3/8"	9.50	85.9
#4	4.75	72.4
#10	2.00	56.1
#20	0.850	43.2
#40	0.425	35.0
#60	0.250	30.6
#100	0.150	27.7
#200	0.075	23.9
-	0.0537	14.2
-	0.0383	12.0
-	0.0245	9.9
-	0.0143	8.0
-	0.0101	6.4
-	0.0073	5.1
-	0.0052	4.2
-	0.0037	4.2
-	0.0030	3.7
-	0.0015	1.5



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-147**
Client:	BGC Engineering Inc.	**Sample No.:**	Not Provided
Project:	Eagle Gold Detail Design Support	**Depth (m):**	3
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (measured): 2.64

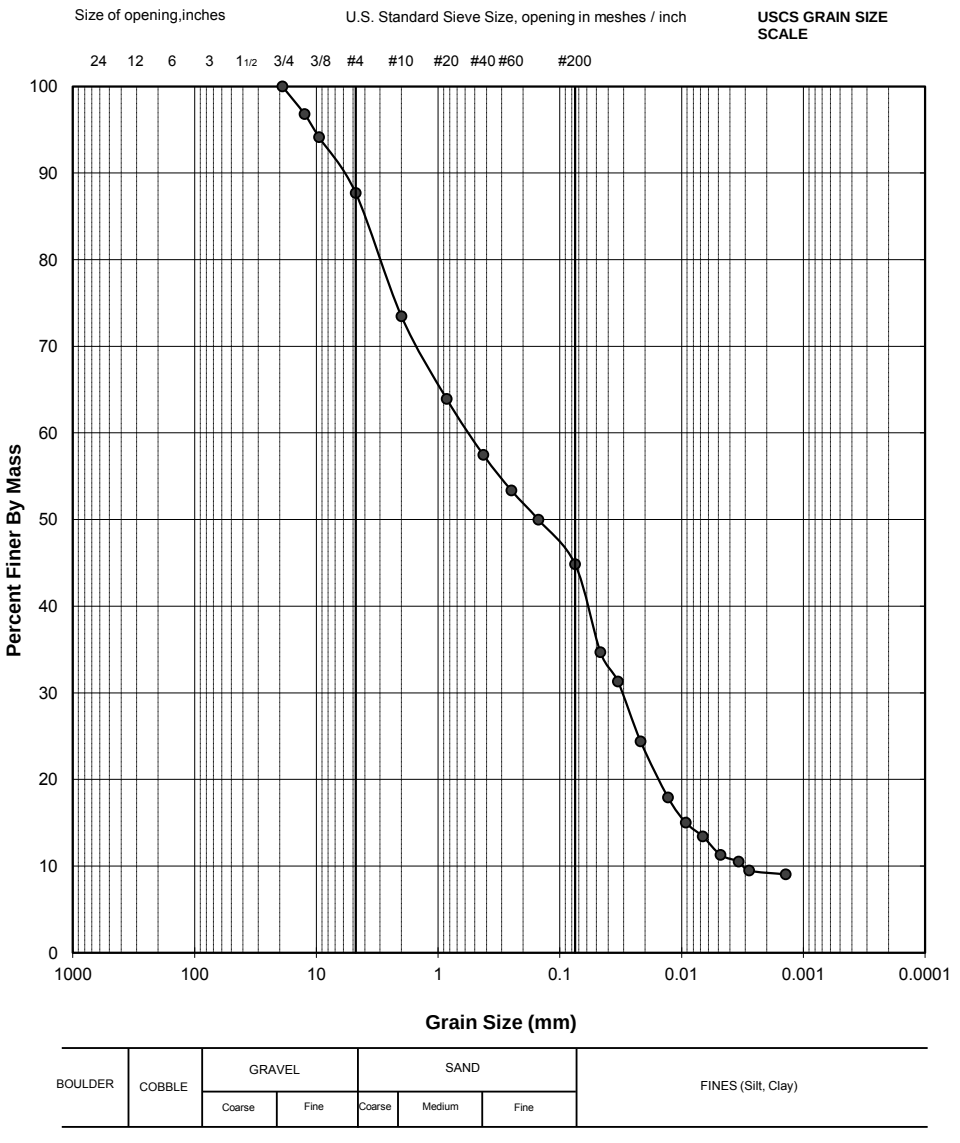
Other

Remarks:

Dispersion Method: Stirring

Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	100.0
1"	25.00	100.0
3/4"	19.00	100.0
1/2"	12.50	96.8
3/8"	9.50	94.1
#4	4.75	87.7
#10	2.00	73.5
#20	0.850	63.9
#40	0.425	57.5
#60	0.250	53.4
#100	0.150	50.0
#200	0.075	44.8
-	0.0465	34.7
-	0.0334	31.3
-	0.0217	24.4
-	0.0129	17.9
-	0.0092	15.0
-	0.0067	13.4
-	0.0048	11.3
-	0.0034	10.5
-	0.0028	9.5
-	0.0014	9.0



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

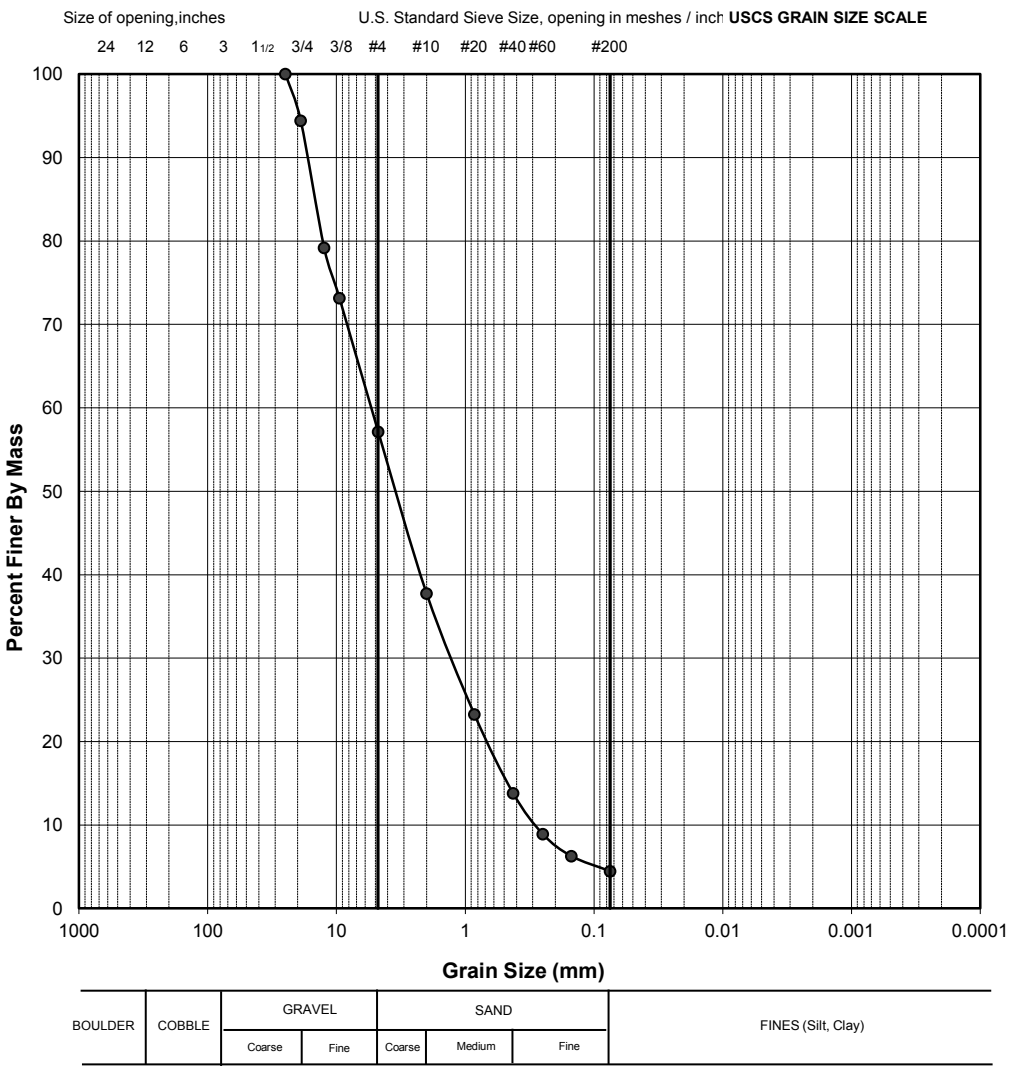
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-151**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	1.1-1.2
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	(mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	94.4
1/2"	12.5	79.2
3/8"	9.5	73.1
#4	4.75	57.1
#10	2.00	37.7
#20	0.850	23.2
#40	0.425	13.8
#60	0.250	8.9
#100	0.150	6.3
#200	0.075	4.4



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-153**
Client:	BGC Engineering Inc.	**Sample No.:**	G1
Project:	Eagle Gold Detail Design Support	**Depth (m):**	1.3-1.3
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (assumed): 2.70

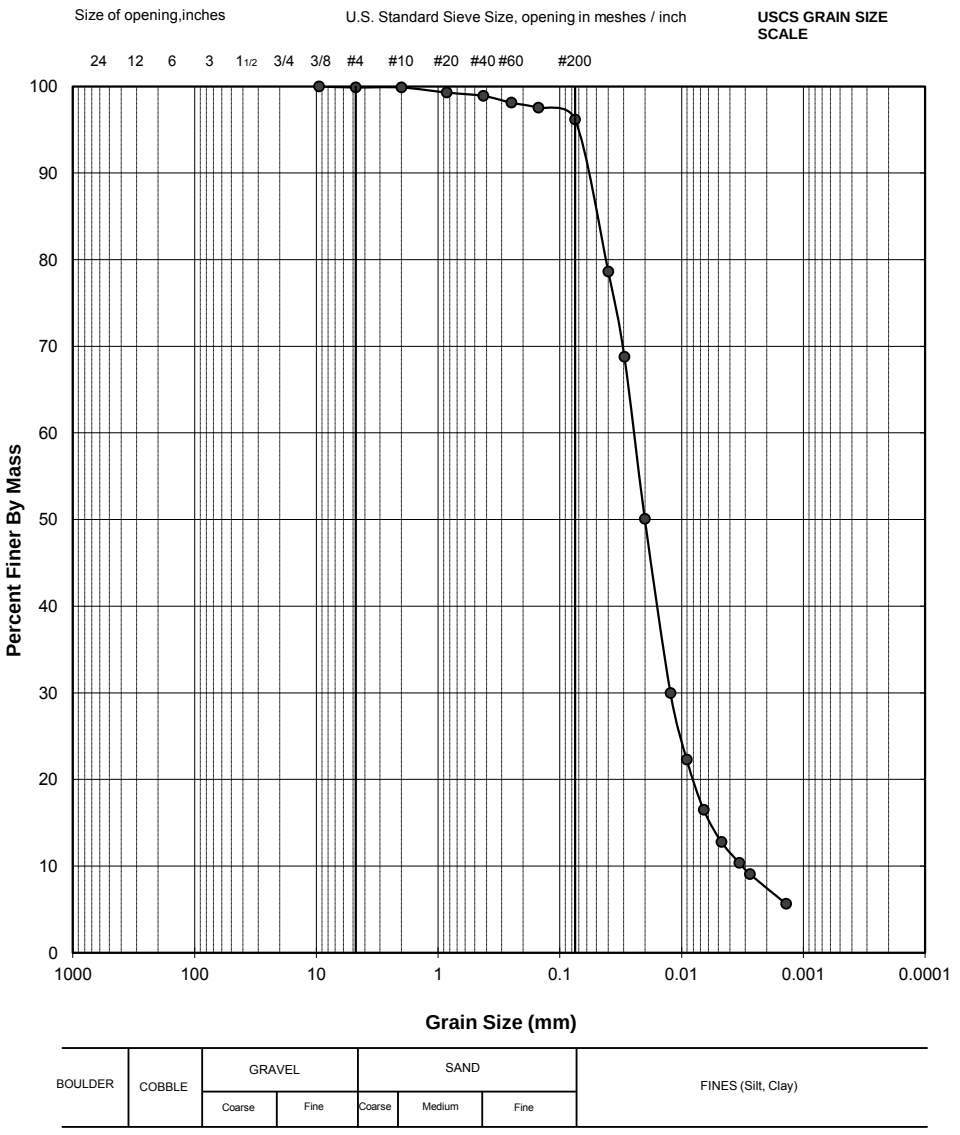
Other

Remarks:

Dispersion Method: Stirring

Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	100.0
1"	25.00	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	99.9
#10	2.00	99.9
#20	0.850	99.3
#40	0.425	98.9
#60	0.250	98.1
#100	0.150	97.6
#200	0.075	96.2
-	0.0400	78.6
-	0.0295	68.8
-	0.0200	50.1
-	0.0123	30.0
-	0.0091	22.3
-	0.0066	16.5
-	0.0047	12.8
-	0.0034	10.4
-	0.0027	9.1
-	0.0014	5.7



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-154**
Client:	BGC Engineering Inc.	**Sample No.:**	G1
Project:	Eagle Gold Detail Design Support	**Depth (m):**	3.8-3.8
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (measured): 2.73

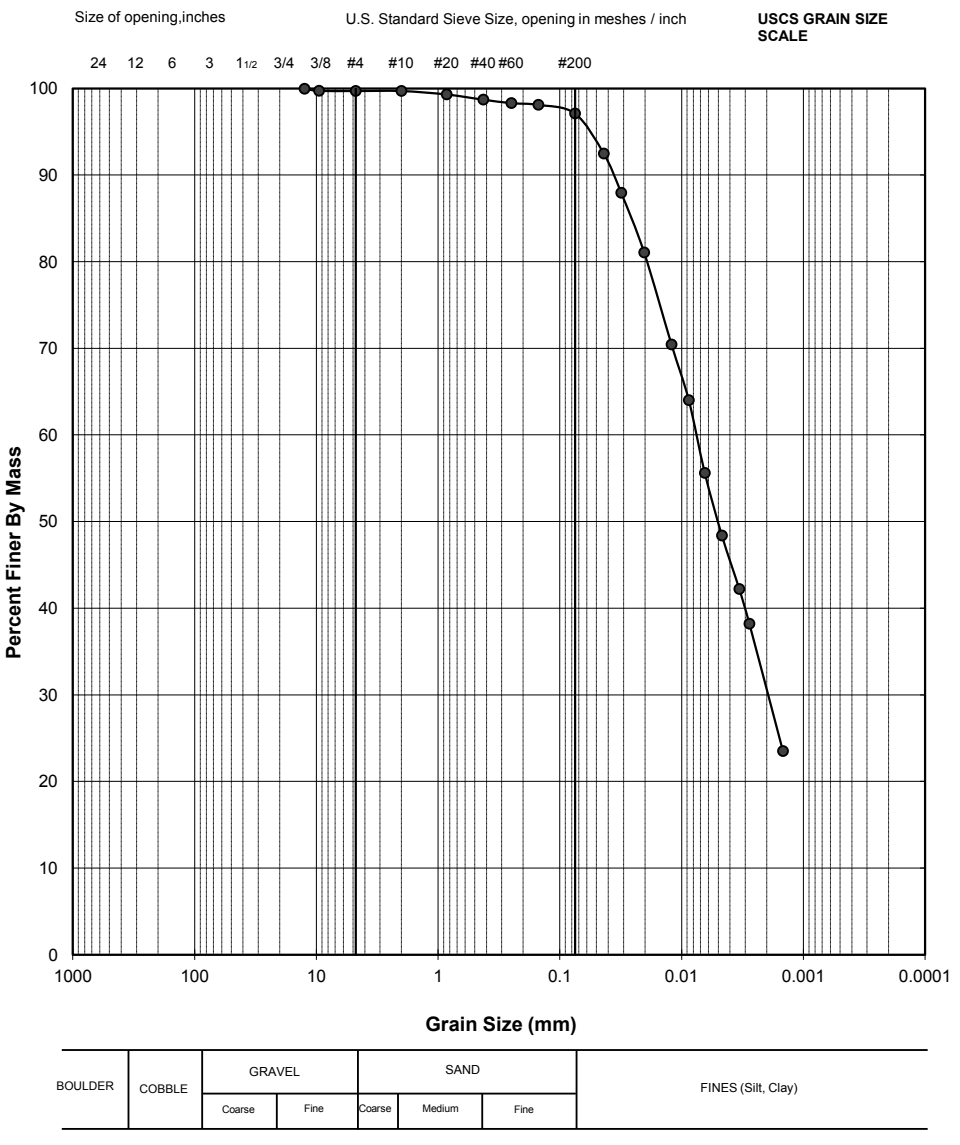
Other

Remarks:

Dispersion Method: Stirring

Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	100.0
1"	25.00	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	99.7
#4	4.75	99.7
#10	2.00	99.7
#20	0.850	99.3
#40	0.425	98.7
#60	0.250	98.3
#100	0.150	98.1
#200	0.075	97.1
-	0.0435	92.5
-	0.0313	88.0
-	0.0203	81.1
-	0.0121	70.4
-	0.0087	64.0
-	0.0064	55.6
-	0.0047	48.4
-	0.0034	42.2
-	0.0028	38.2
-	0.0015	23.5



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

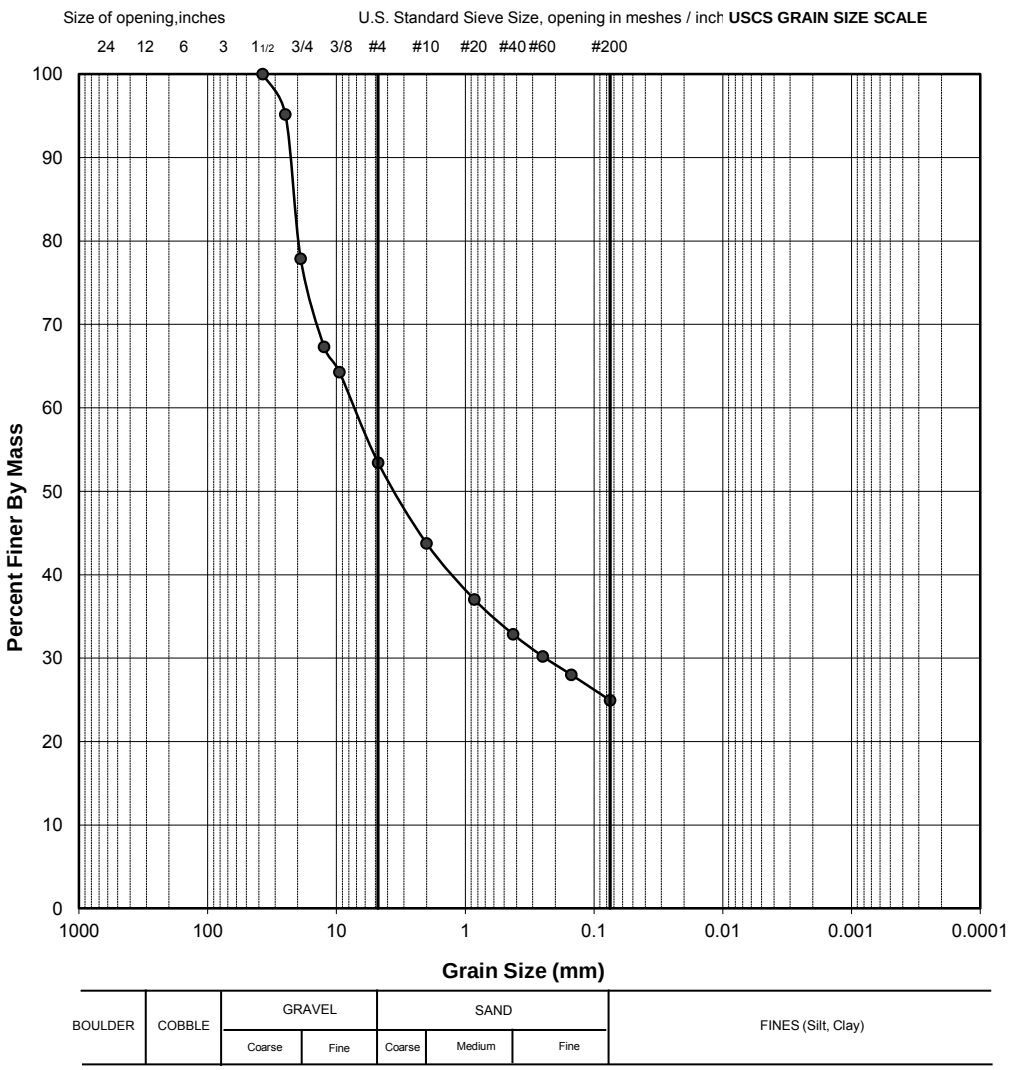
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-155**
Client:	BGC Engineering	**Sample No.:**	2
Project:	Eagle Gold	**Depth (m):**	2.4
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	(mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	95.2
3/4"	19.0	77.9
1/2"	12.5	67.3
3/8"	9.5	64.3
#4	4.75	53.4
#10	2.00	43.8
#20	0.850	37.0
#40	0.425	32.9
#60	0.250	30.2
#100	0.150	28.0
#200	0.075	24.9



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

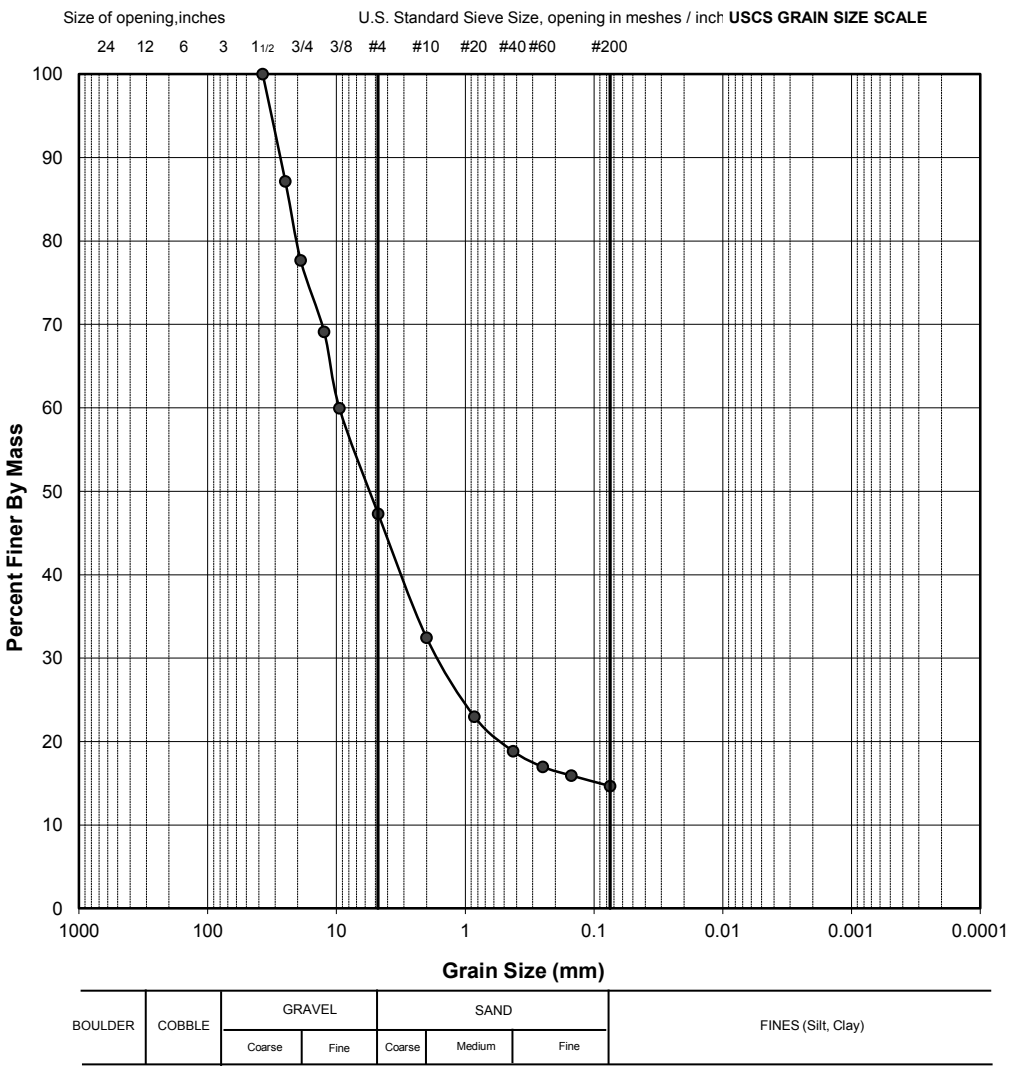
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-157**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	1.2
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	87.1
3/4"	19.0	77.7
1/2"	12.5	69.1
3/8"	9.5	59.9
#4	4.75	47.3
#10	2.00	32.4
#20	0.850	23.0
#40	0.425	18.8
#60	0.250	17.0
#100	0.150	15.9
#200	0.075	14.7



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

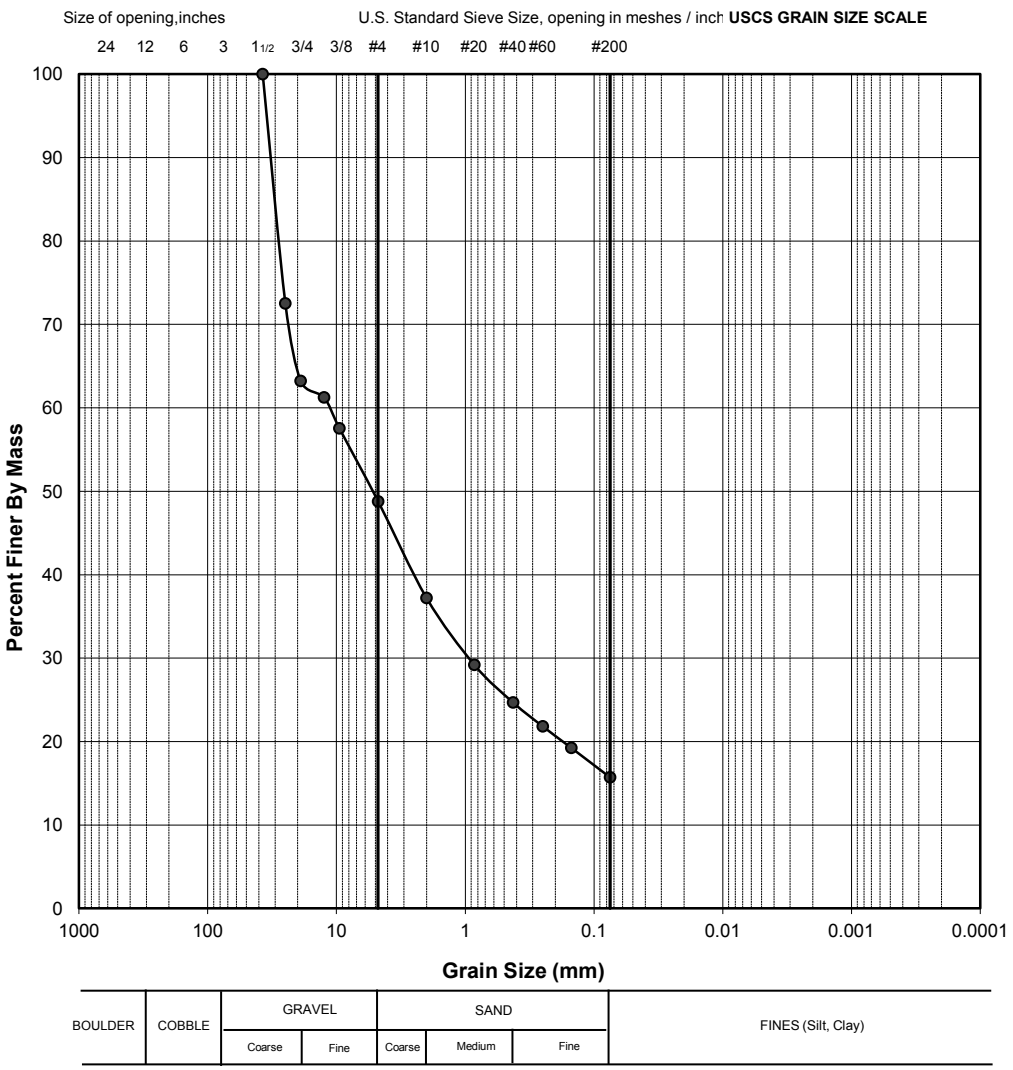
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-160**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	1.0
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	72.5
3/4"	19.0	63.2
1/2"	12.5	61.3
3/8"	9.5	57.5
#4	4.75	48.8
#10	2.00	37.2
#20	0.850	29.2
#40	0.425	24.7
#60	0.250	21.8
#100	0.150	19.3
#200	0.075	15.7



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

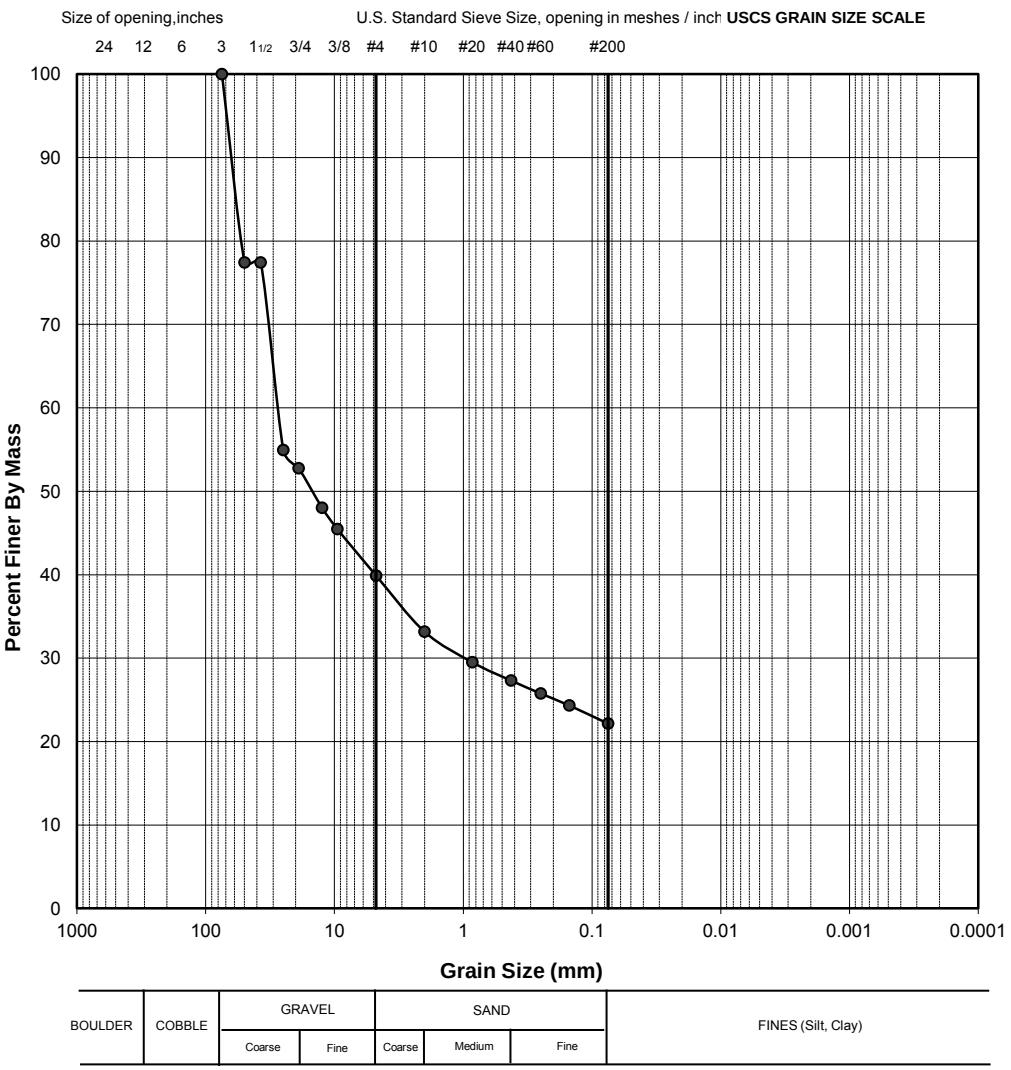
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-161**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	2
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	(mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	77.4
1.5"	37.5	77.4
1"	25.0	54.9
3/4"	19.0	52.8
1/2"	12.5	48.0
3/8"	9.5	45.5
#4	4.75	39.9
#10	2.00	33.2
#20	0.850	29.5
#40	0.425	27.3
#60	0.250	25.8
#100	0.150	24.3
#200	0.075	22.2



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2102
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

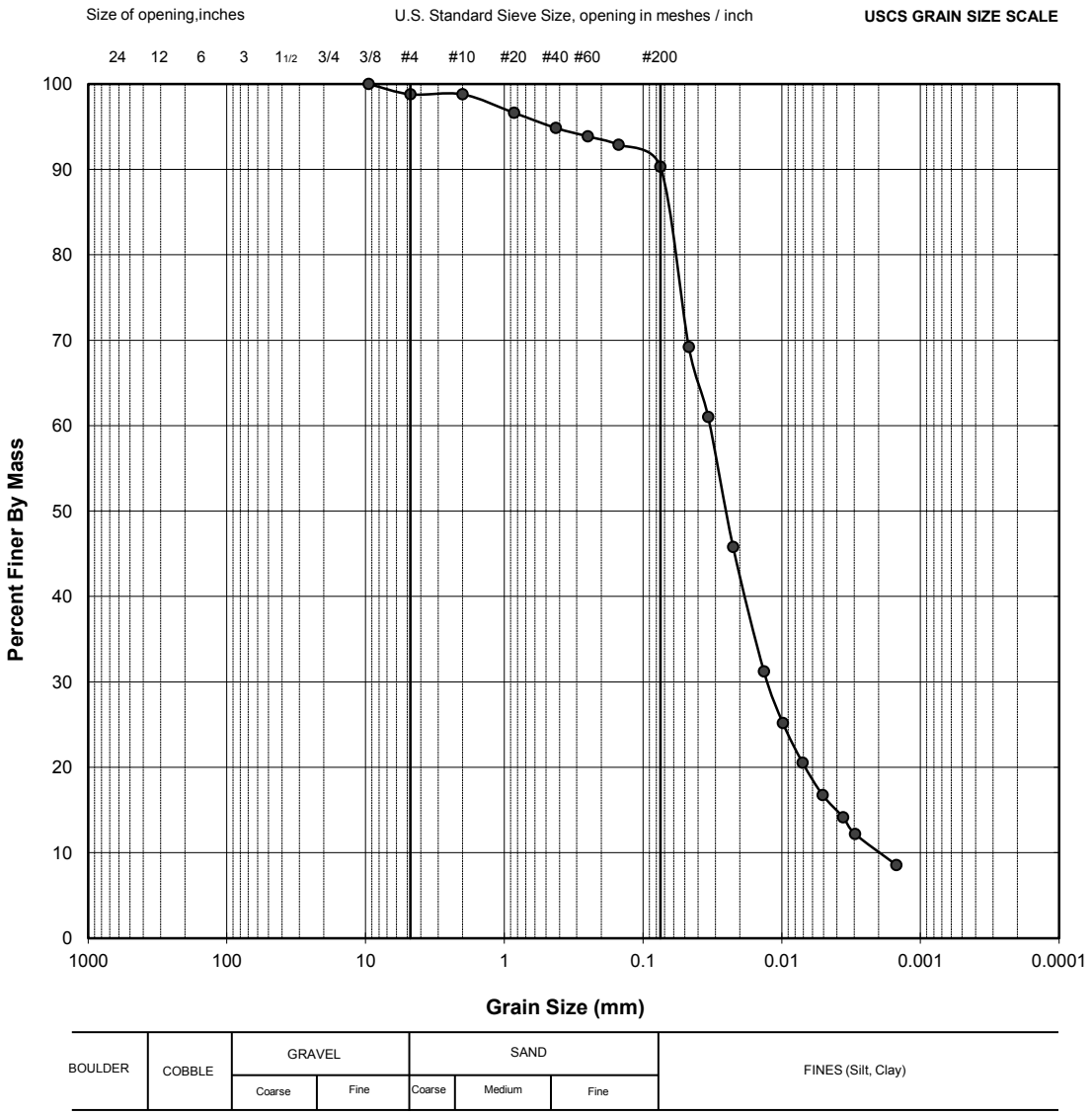
Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-161**
Client:	BGC Engineering Inc.	**Sample No.:**	G2
Project:	Eagle Gold Detail Design Support	**Depth (m):**	3.7-3.7
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (assumed): 2.70

Other Remarks:

Dispersion Method: Stirring
Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	100.0
1"	25.00	100.0
3/4"	19.00	100.0
1/2"	12.50	100.0
3/8"	9.50	100.0
#4	4.75	98.8
#10	2.00	98.8
#20	0.850	96.6
#40	0.425	94.9
#60	0.250	93.9
#100	0.150	92.9
#200	0.075	90.3
-	0.0467	69.2
-	0.0339	61.0
-	0.0224	45.8
-	0.0134	31.2
-	0.0098	25.2
-	0.0071	20.5
-	0.0051	16.8
-	0.0036	14.2
-	0.0030	12.2
-	0.0015	8.6



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

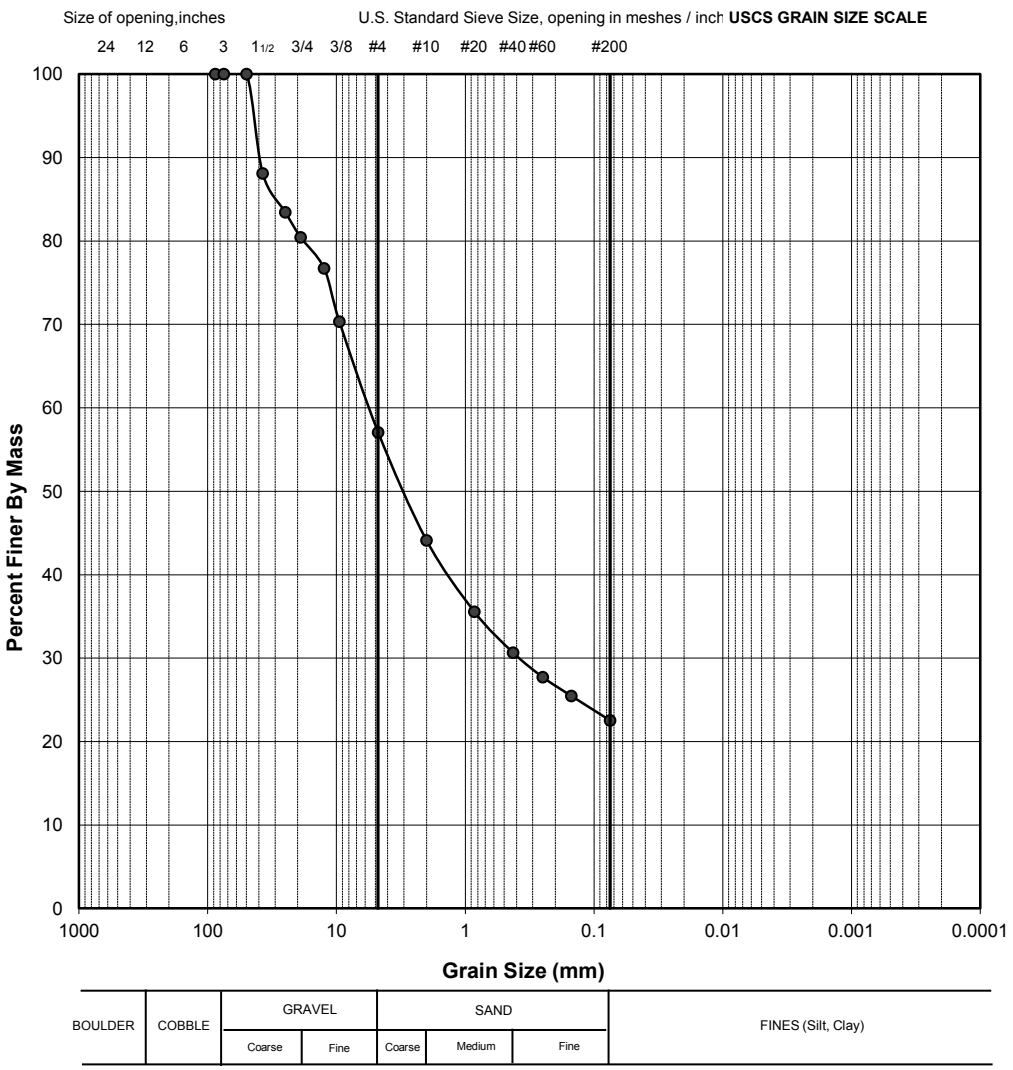
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-163**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	2
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	(mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	88.1
1"	25.0	83.4
3/4"	19.0	80.4
1/2"	12.5	76.7
3/8"	9.5	70.3
#4	4.75	57.1
#10	2.00	44.1
#20	0.850	35.6
#40	0.425	30.7
#60	0.250	27.7
#100	0.150	25.5
#200	0.075	22.5



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2102
TESTED BY	DATE	CHECKED BY	DATE

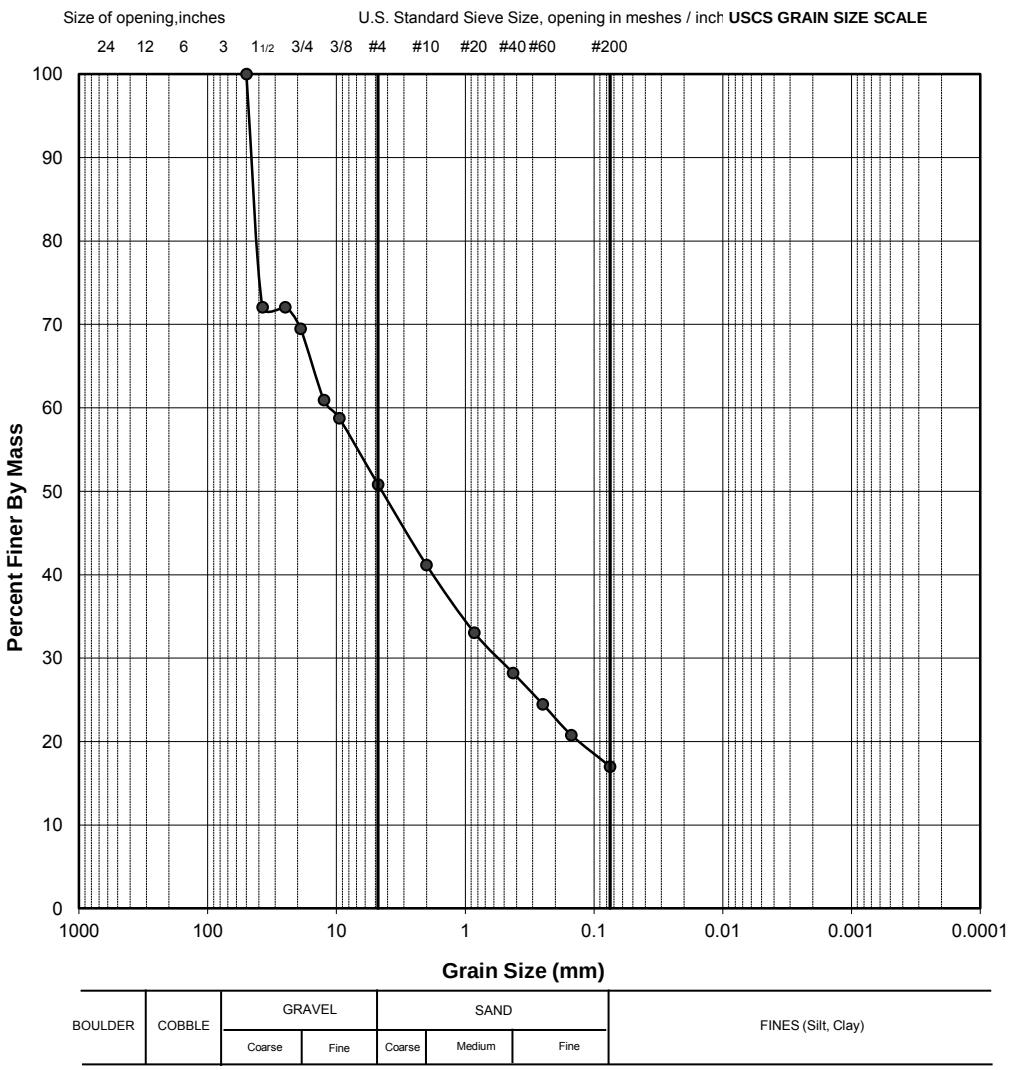
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-165**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	3.5
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	(mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	72.1
1"	25.0	72.1
3/4"	19.0	69.5
1/2"	12.5	60.9
3/8"	9.5	58.8
#4	4.75	50.8
#10	2.00	41.2
#20	0.850	33.0
#40	0.425	28.2
#60	0.250	24.5
#100	0.150	20.8
#200	0.075	17.0



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-167**
Client:	BGC Engineering Inc.	**Sample No.:**	G1
Project:	Eagle Gold Detail Design Support	**Depth (m):**	2.8-2.8
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (assumed): 2.70

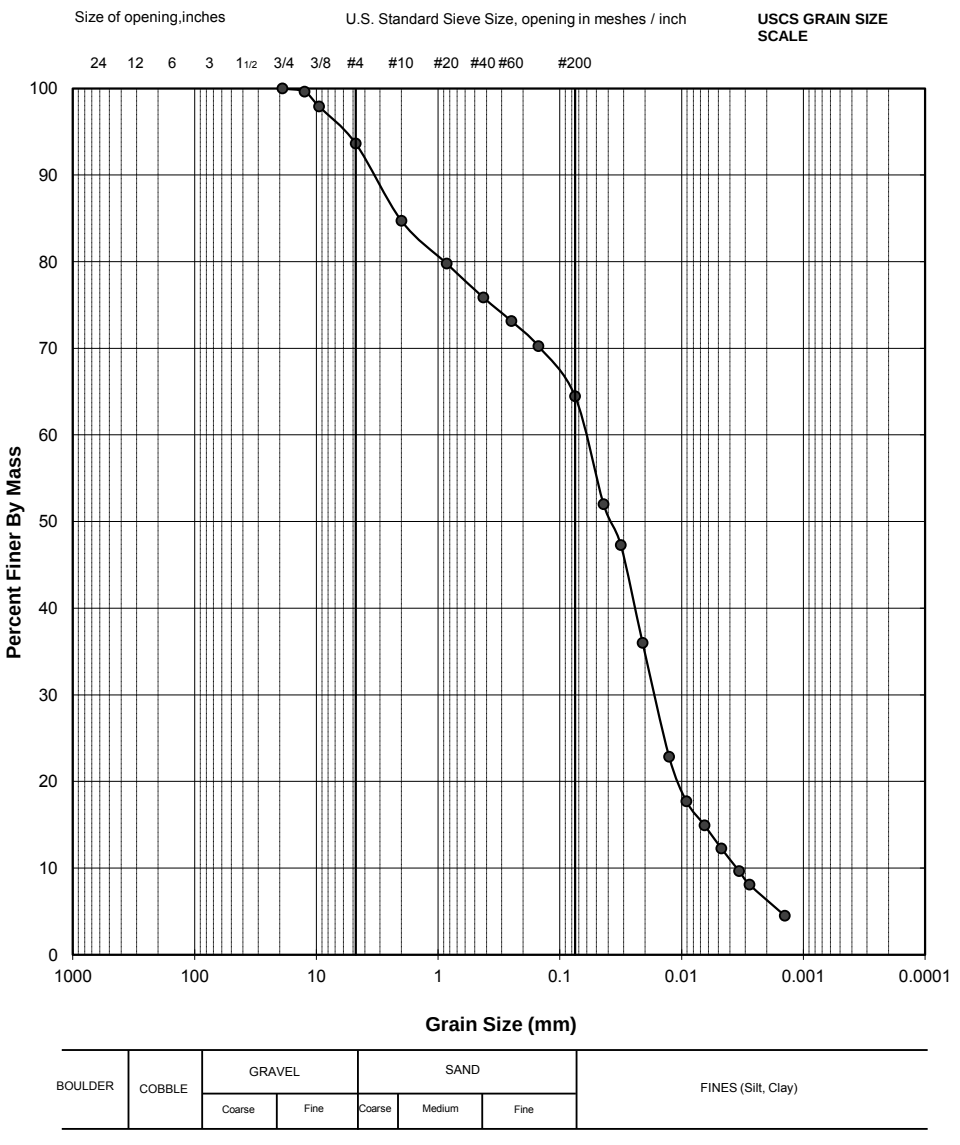
Other

Remarks:

Dispersion Method: Stirring

Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	100.0
1"	25.00	100.0
3/4"	19.00	100.0
1/2"	12.50	99.6
3/8"	9.50	97.9
#4	4.75	93.6
#10	2.00	84.7
#20	0.850	79.8
#40	0.425	75.9
#60	0.250	73.1
#100	0.150	70.3
#200	0.075	64.5
-	0.0438	52.0
-	0.0316	47.3
-	0.0209	36.0
-	0.0127	22.9
-	0.0091	17.7
-	0.0065	14.9
-	0.0047	12.3
-	0.0034	9.7
-	0.0028	8.1
-	0.0014	4.5



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

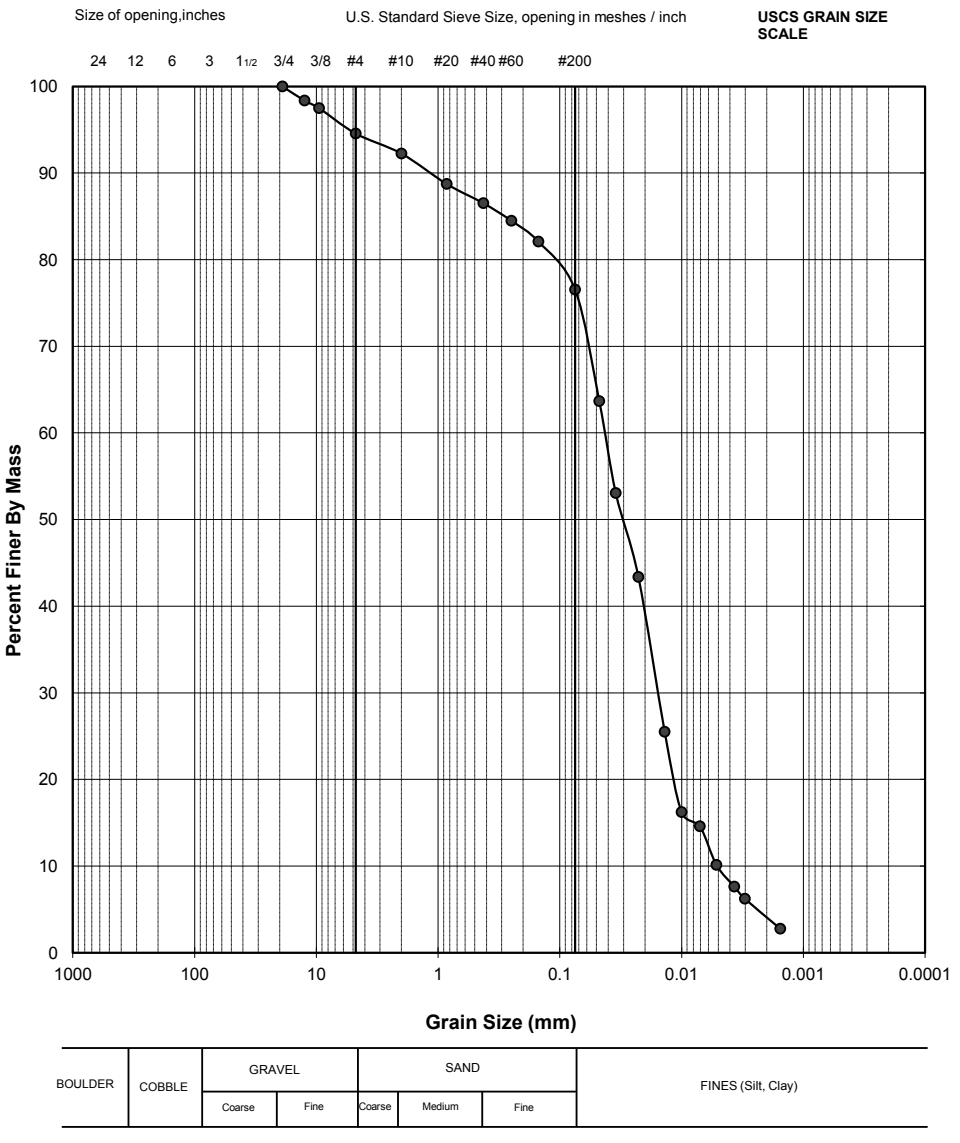
Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-168**
Client:	BGC Engineering Inc.	**Sample No.:**	G1
Project:	Eagle Gold Detail Design Support	**Depth (m):**	2.5-2.5
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (assumed): 2.70

Other Remarks:

Dispersion Method: Stirring
Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	100.0
1"	25.00	100.0
3/4"	19.00	100.0
1/2"	12.50	98.4
3/8"	9.50	97.5
#4	4.75	94.6
#10	2.00	92.3
#20	0.850	88.7
#40	0.425	86.5
#60	0.250	84.5
#100	0.150	82.1
#200	0.075	76.6
-	0.0475	63.7
-	0.0348	53.1
-	0.0227	43.4
-	0.0138	25.5
-	0.0100	16.2
-	0.0071	14.6
-	0.0052	10.1
-	0.0037	7.6
-	0.0030	6.2
-	0.0015	2.8



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

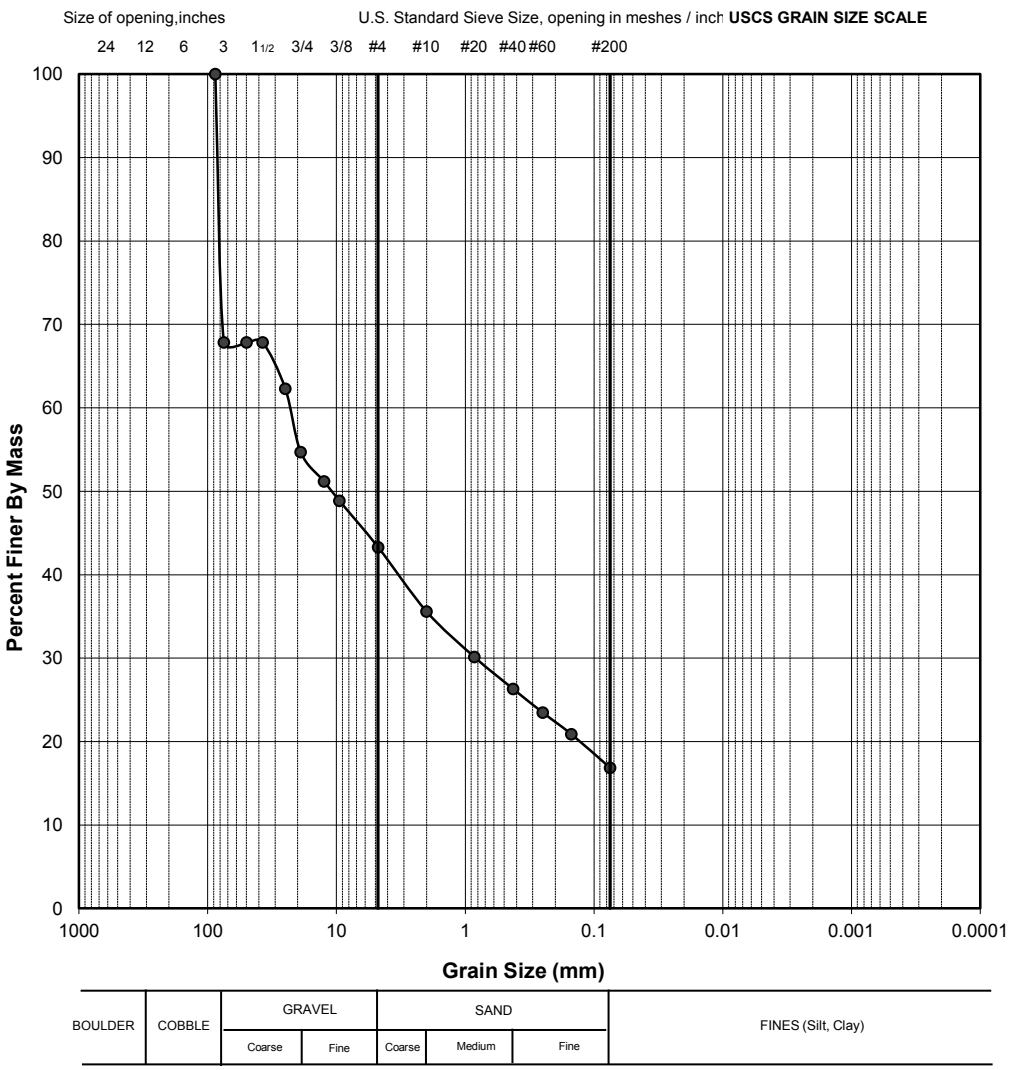
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-169**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	2.8
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	Sieve Size (mm)	Passing %
3.5"	87.5	100.0
3"	75.0	67.8
2"	50.0	67.8
1.5"	37.5	67.8
1"	25.0	62.3
3/4"	19.0	54.7
1/2"	12.5	51.2
3/8"	9.5	48.9
#4	4.75	43.3
#10	2.00	35.6
#20	0.850	30.1
#40	0.425	26.3
#60	0.250	23.5
#100	0.150	20.9
#200	0.075	16.9



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

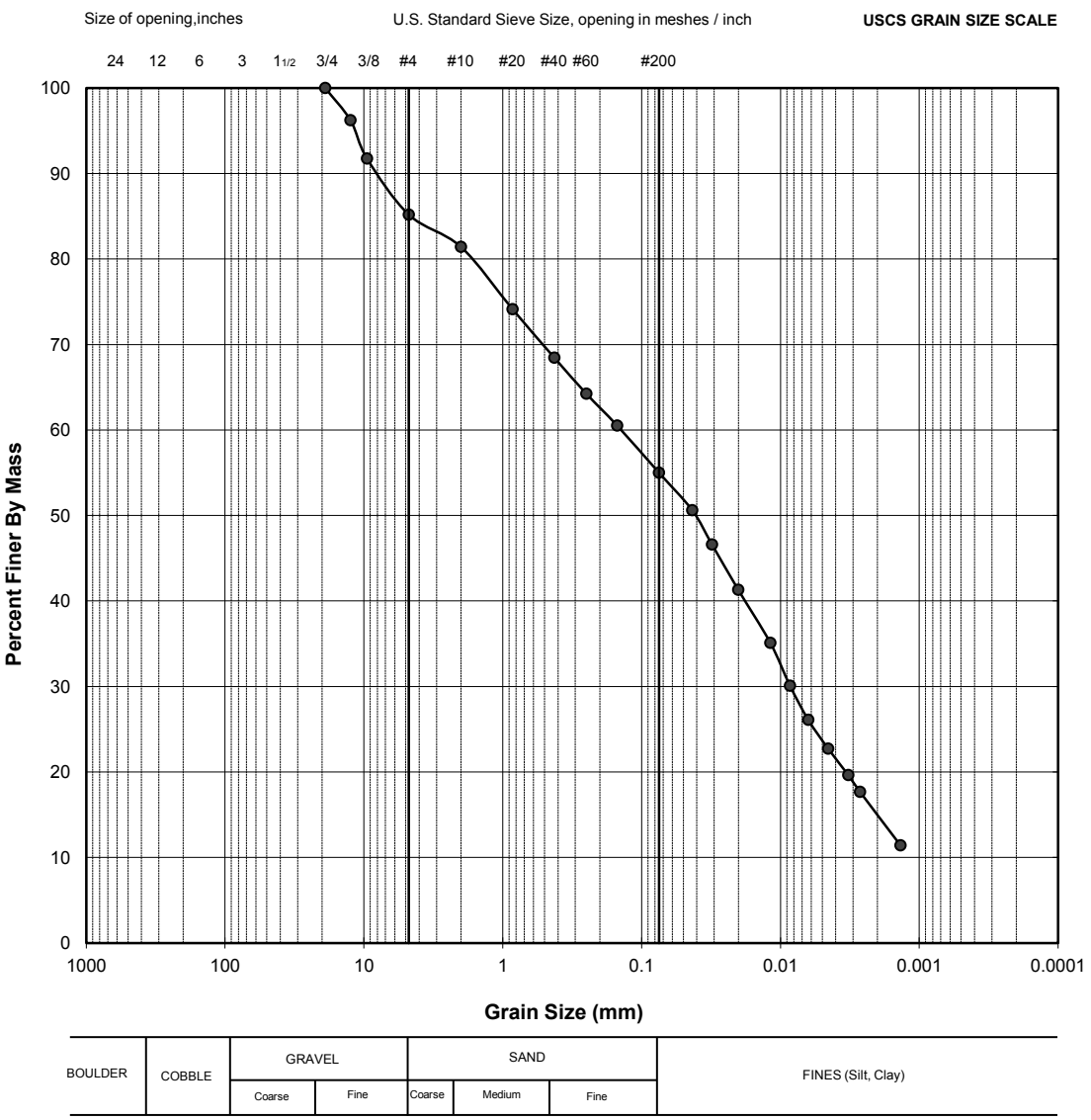
Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-170**
Client:	BGC Engineering Inc.	**Sample No.:**	G1
Project:	Eagle Gold Detail Design Support	**Depth (m):**	6.0-6.0
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (assumed): 2.70

Other Remarks:

Dispersion Method: Stirring
Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	100.0
1"	25.00	100.0
3/4"	19.00	100.0
1/2"	12.50	96.2
3/8"	9.50	91.8
#4	4.75	85.2
#10	2.00	81.4
#20	0.850	74.1
#40	0.425	68.5
#60	0.250	64.2
#100	0.150	60.5
#200	0.075	55.0
-	0.0432	50.6
-	0.0311	46.6
-	0.0201	41.3
-	0.0118	35.1
-	0.0085	30.1
-	0.0063	26.1
-	0.0045	22.7
-	0.0032	19.7
-	0.0027	17.7
-	0.0014	11.4



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

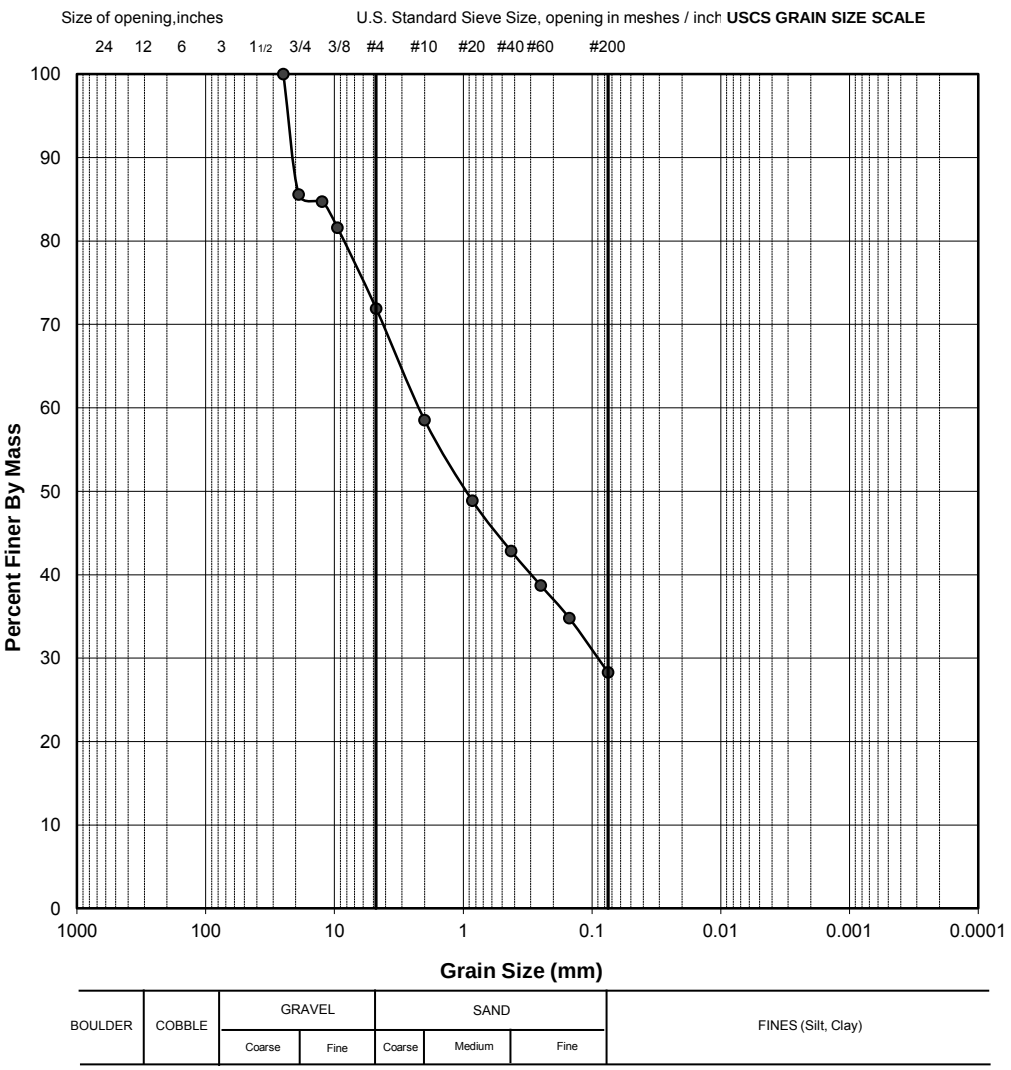
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-171**
Client:	BGC Engineering	**Sample No.:**	G2
Project:	Eagle Gold	**Depth (m):**	1.1
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	(mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	100.0
1.5"	37.5	100.0
1"	25.0	100.0
3/4"	19.0	85.6
1/2"	12.5	84.7
3/8"	9.5	81.6
#4	4.75	71.9
#10	2.00	58.5
#20	0.850	48.9
#40	0.425	42.8
#60	0.250	38.7
#100	0.150	34.8
#200	0.075	28.3



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

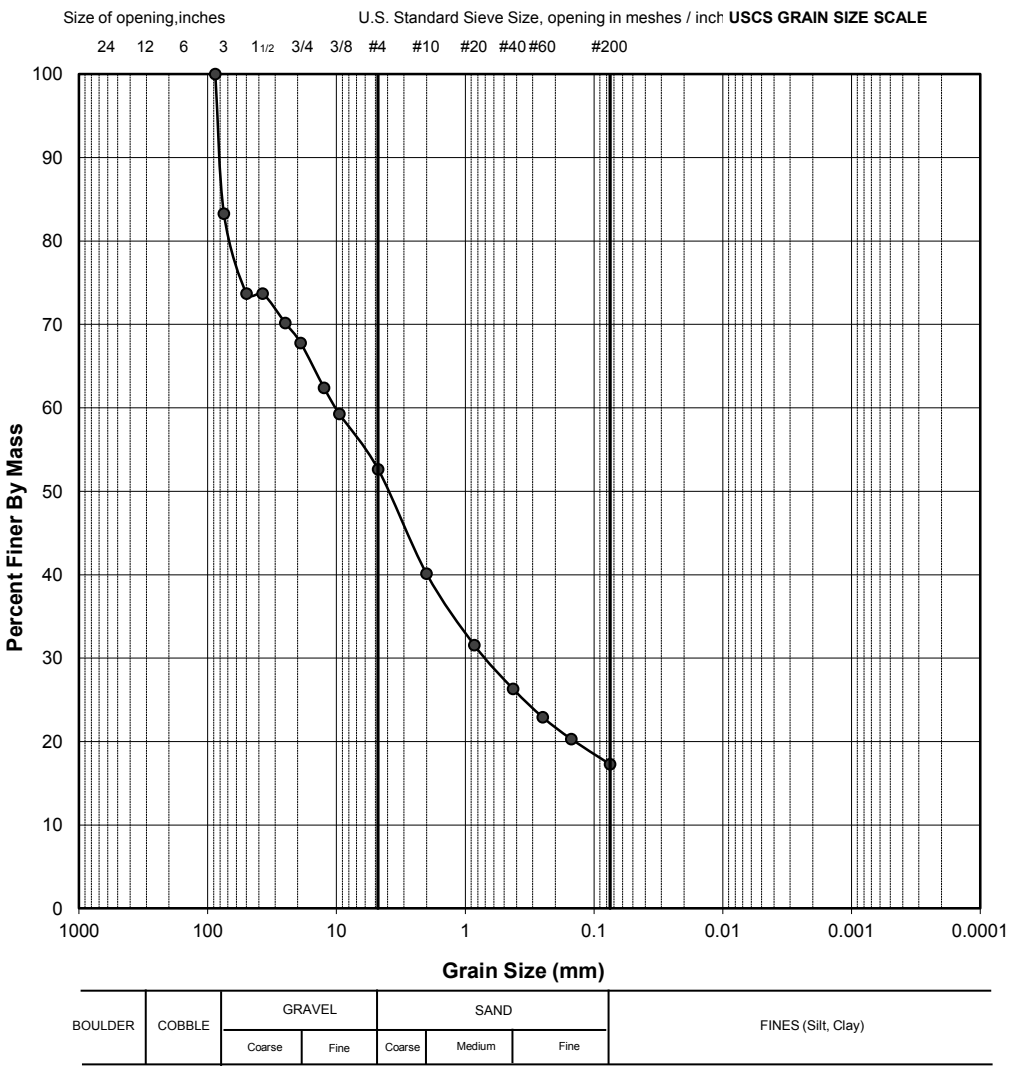
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029	**Borehole:**	**TP-BGC12-173**
Client:	BGC Engineering	**Sample No.:**	G2
Project:	Eagle Gold	**Depth (m):**	3.5
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	9/19/12

Sieve Size (USS)	(mm)	Passing %
3.5"	87.5	100.0
3"	75.0	83.3
2"	50.0	73.7
1.5"	37.5	73.7
1"	25.0	70.2
3/4"	19.0	67.8
1/2"	12.5	62.4
3/8"	9.5	59.3
#4	4.75	52.6
#10	2.00	40.1
#20	0.850	31.6
#40	0.425	26.3
#60	0.250	22.9
#100	0.150	20.3
#200	0.075	17.3



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

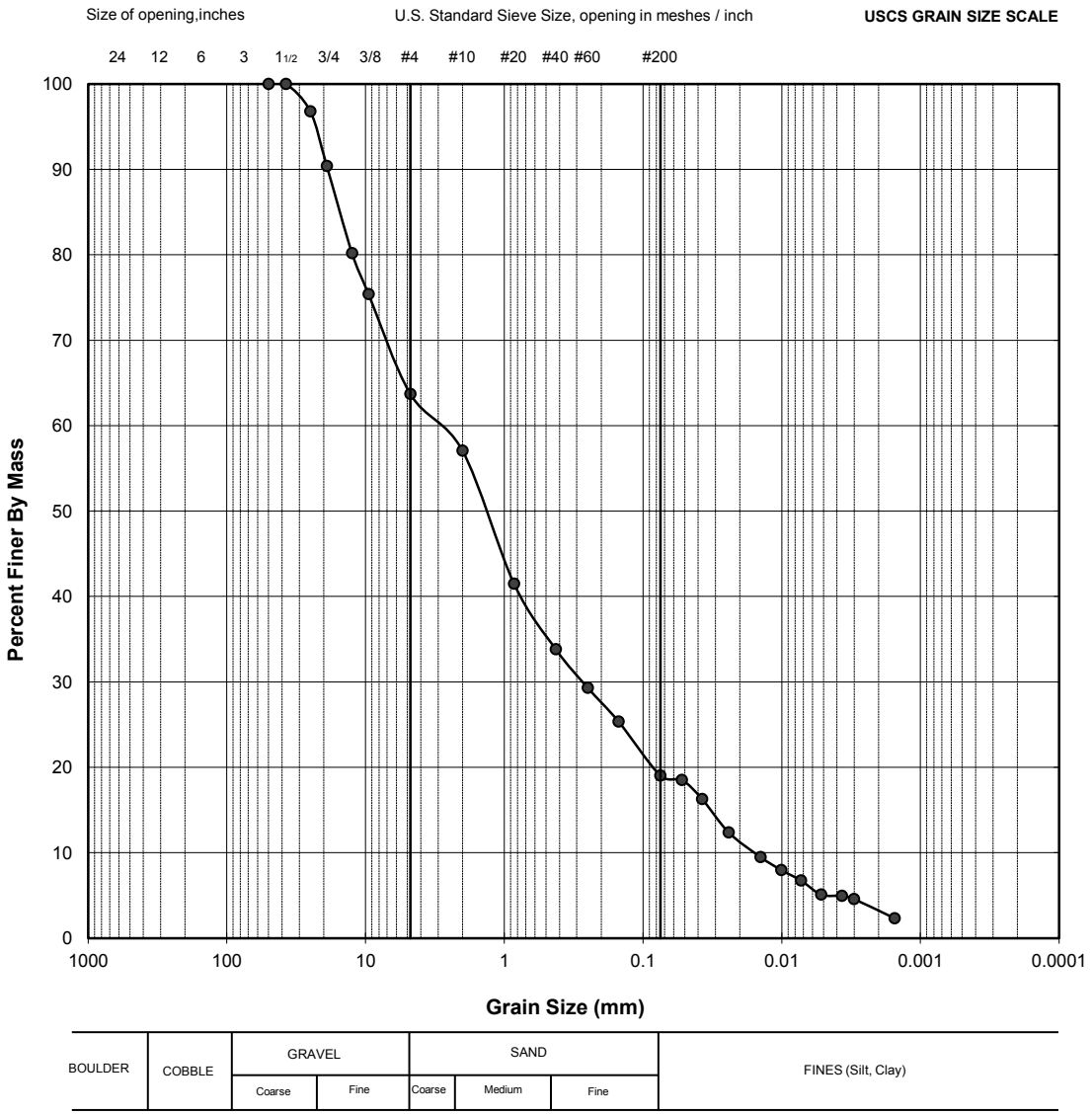
Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-175**
Client:	BGC Engineering Inc.	**Sample No.:**	G1
Project:	Eagle Gold Detail Design Support	**Depth (m):**	2.7-2.7
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (assumed): 2.70

Other Remarks:

Dispersion Method: Stirring
Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	100.0
1"	25.00	96.8
3/4"	19.00	90.4
1/2"	12.50	80.2
3/8"	9.50	75.4
#4	4.75	63.7
#10	2.00	57.1
#20	0.850	41.5
#40	0.425	33.8
#60	0.250	29.3
#100	0.150	25.4
#200	0.075	19.0
-	0.0525	18.5
-	0.0375	16.3
-	0.0241	12.4
-	0.0142	9.5
-	0.0101	8.0
-	0.0073	6.8
-	0.0052	5.1
-	0.0037	5.0
-	0.0030	4.6
-	0.0015	2.3



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

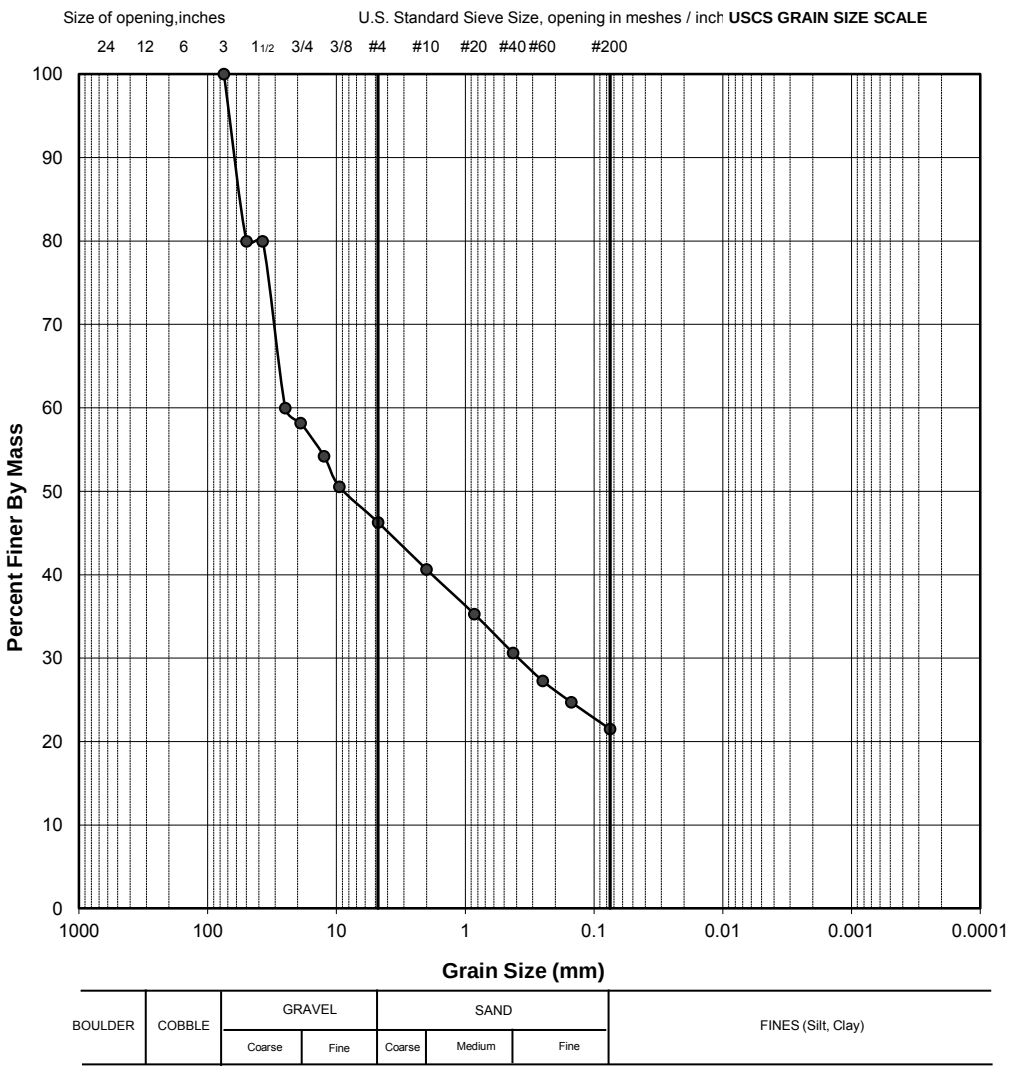
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM C136-06 & C117-04

Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-176**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	1.3
Location:	Yukon	**Lab ID No:**	138
Remarks:		**Other:**	-
		Material Specification:	NONE
		Method:	SPLIT, WASHED
		Date Tested:	SEPT. 12, 2012

Sieve Size (USS)	(mm)	Passing %
3.5"	87.5	100.0
3"	75.0	100.0
2"	50.0	80.0
1.5"	37.5	80.0
1"	25.0	60.0
3/4"	19.0	58.2
1/2"	12.5	54.2
3/8"	9.5	50.5
#4	4.75	46.3
#10	2.00	40.6
#20	0.850	35.3
#40	0.425	30.6
#60	0.250	27.3
#100	0.150	24.7
#200	0.075	21.5



** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

B MATHOT	September 12, 2012	G. Patton	September 26, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

PARTICLE SIZE ANALYSIS OF SOILS

Reference
ASTM D 422-63 (2007)

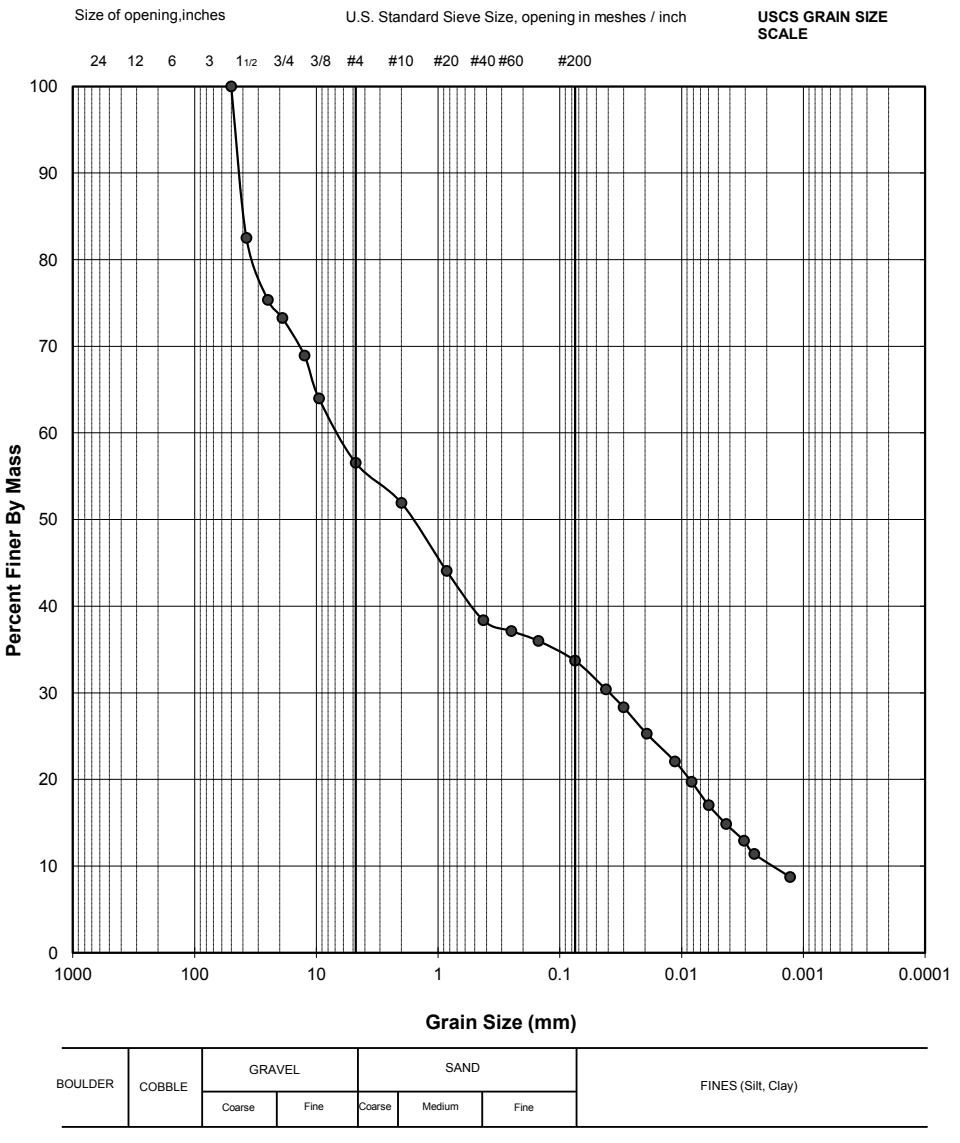
Project No.:	12-1415-0029/9000	**Borehole:**	**BGC12-75**
Client:	BGC Engineering Inc.	**Sample No.:**	G1
Project:	Eagle Gold Detail Design Support	**Depth (m):**	40.2
Location:	Yukon	**Lab ID No:**	138

Specific Gravity (measured): 2.87

Other
Remarks:

Dispersion Method: Stirring
Dispersion Period (min): 1.0

Sieve Size (USS)	Sieve Size (mm)	% Passing
3.5"	87.50	100.0
3"	75.00	100.0
2"	50.00	100.0
1.5"	37.50	82.5
1"	25.00	75.4
3/4"	19.00	73.3
1/2"	12.50	68.9
3/8"	9.50	64.0
#4	4.75	56.6
#10	2.00	51.9
#20	0.850	44.1
#40	0.425	38.4
#60	0.250	37.1
#100	0.150	36.0
#200	0.075	33.7
-	0.0418	30.4
-	0.0300	28.3
-	0.0193	25.3
-	0.0113	22.1
-	0.0083	19.7
-	0.0060	17.0
-	0.0043	14.9
-	0.0031	12.9
-	0.0025	11.4
-	0.0013	8.7



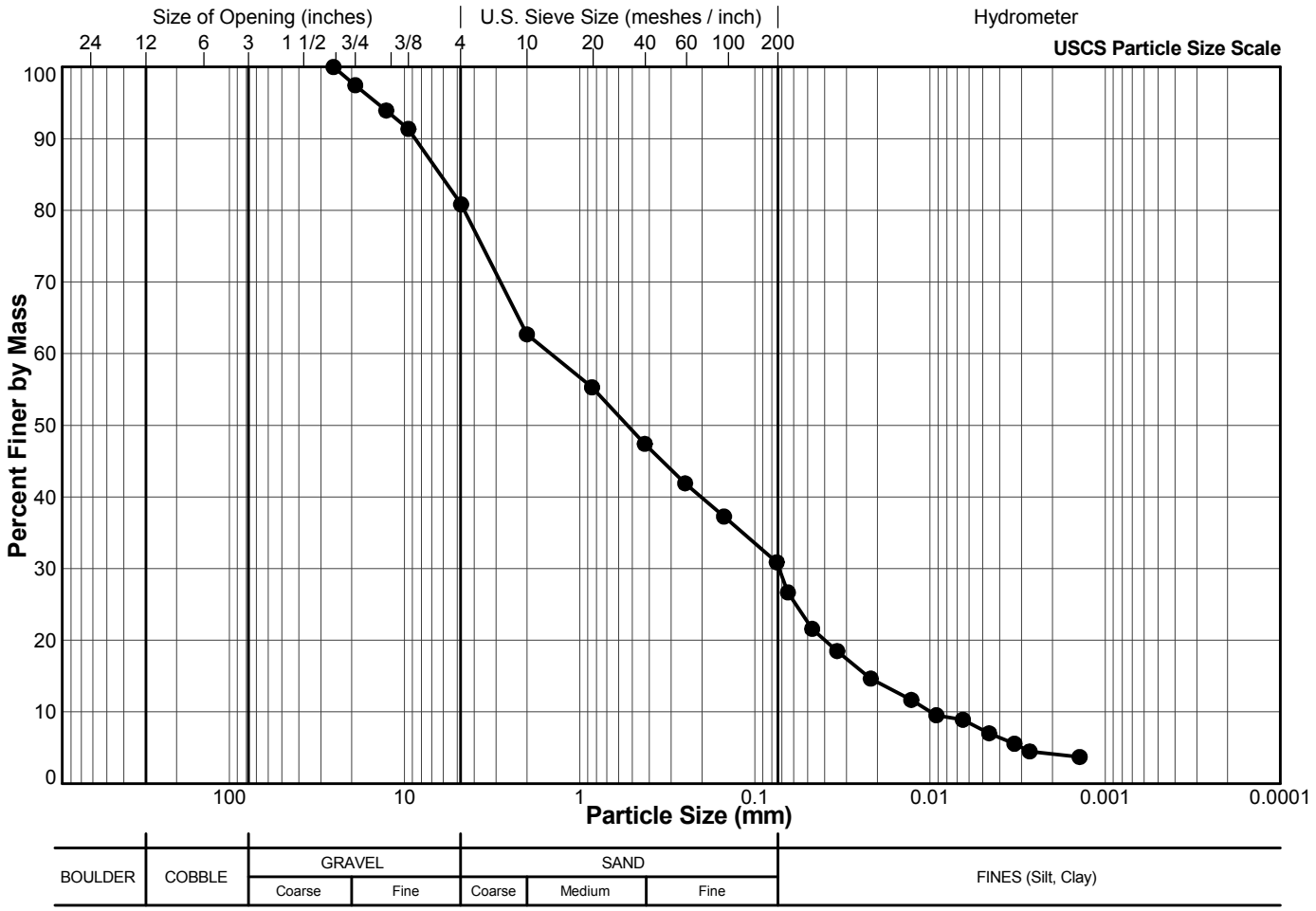
** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

TESTED BY	DATE	CHECKED BY	DATE
EB	September 19, 2012	GP	September 24, 2012

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-080
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G4
Location:	Yukon	**Depth (m):**	3.00
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		100.0
3/4"	19.1		97.4
1/2"	12.7		93.9
3/8"	9.5		91.4
#4 US MESH	4.75		80.8
#10 US MESH	2		62.7
#20 US MESH	0.85		55.3
#40 US MESH	0.425		47.4
#60 US MESH	0.25		41.9
#100 US MESH	0.15		37.3
#200 US MESH	0.075		30.9
		0.0648	26.7
		0.0471	21.6
		0.0339	18.5
		0.0218	14.6
		0.0128	11.7
		0.0092	9.5
		0.0065	8.9
		0.0046	7.0
		0.0033	5.6
		0.0027	4.5
		0.0014	3.7

MM	10/22/2012	GP	10/25/2012
Tech	Date	Checked	Date

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_PARTICLE SIZE (W/ GRADATIONS) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB ebarnes 11/08/12

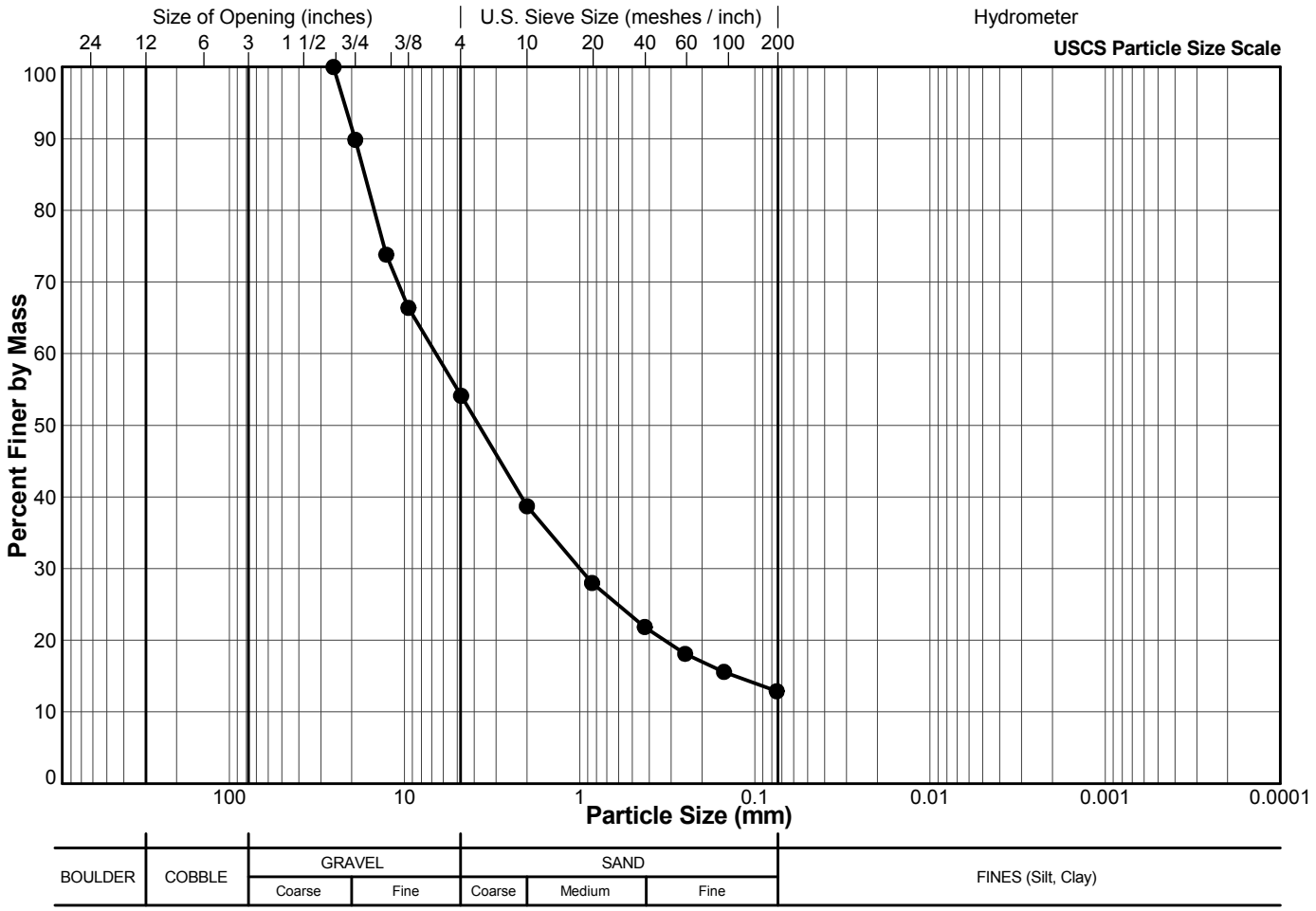
Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-080
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G8
Location:	Yukon	**Depth (m):**	4.70
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		100.0
3/4"	19.1		89.8
1/2"	12.7		73.8
3/8"	9.5		66.4
#4 US MESH	4.75		54.1
#10 US MESH	2		38.7
#20 US MESH	0.85		28.0
#40 US MESH	0.425		21.8
#60 US MESH	0.25		18.1
#100 US MESH	0.15		15.6
#200 US MESH	0.075		12.9

	MM/BM	**10/16/2012**	**GP**	**10/25/2012**
	Tech	Date	Checked	Date

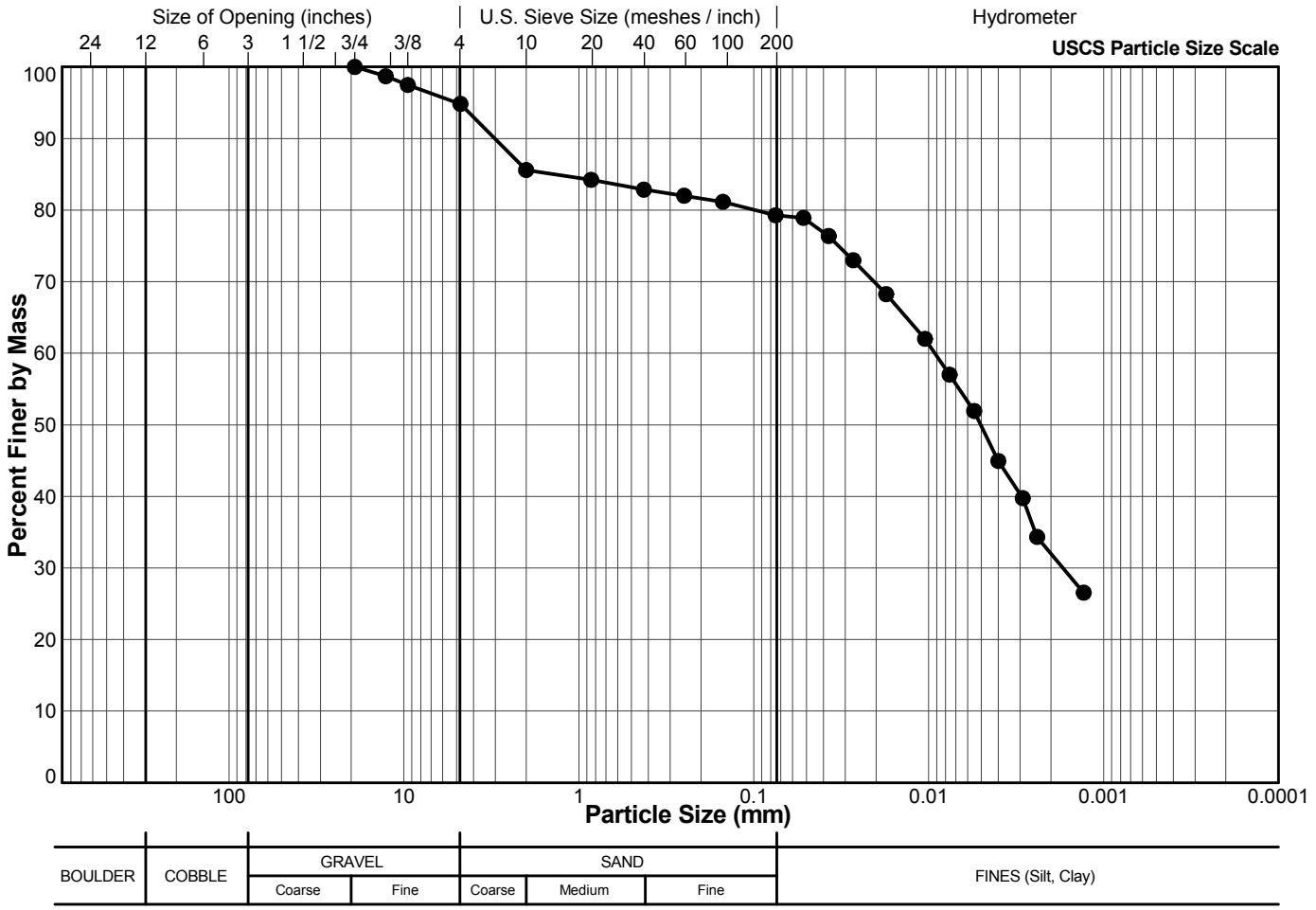
Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-080
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G10
Location:	Yukon	**Depth (m):**	6.00
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		100.0
3/4"	19.1		100.0
1/2"	12.7		98.7
3/8"	9.5		97.5
#4 US MESH	4.75		94.8
#10 US MESH	2		85.6
#20 US MESH	0.85		84.2
#40 US MESH	0.425		82.9
#60 US MESH	0.25		82.0
#100 US MESH	0.15		81.1
#200 US MESH	0.075		79.3
		0.0520	78.9
		0.0373	76.4
		0.0270	73.0
		0.0175	68.2
		0.0105	62.0
		0.0076	57.0
		0.0055	51.9
		0.0040	44.9
		0.0029	39.7
		0.0024	34.3
		0.0013	26.5

	MM	**10/22/2012**	**GP**	**10/25/2012**
	Tech	Date	Checked	Date

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_PARTICLE SIZE (W/ GRADATIONS) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB ebarnes 11/08/12

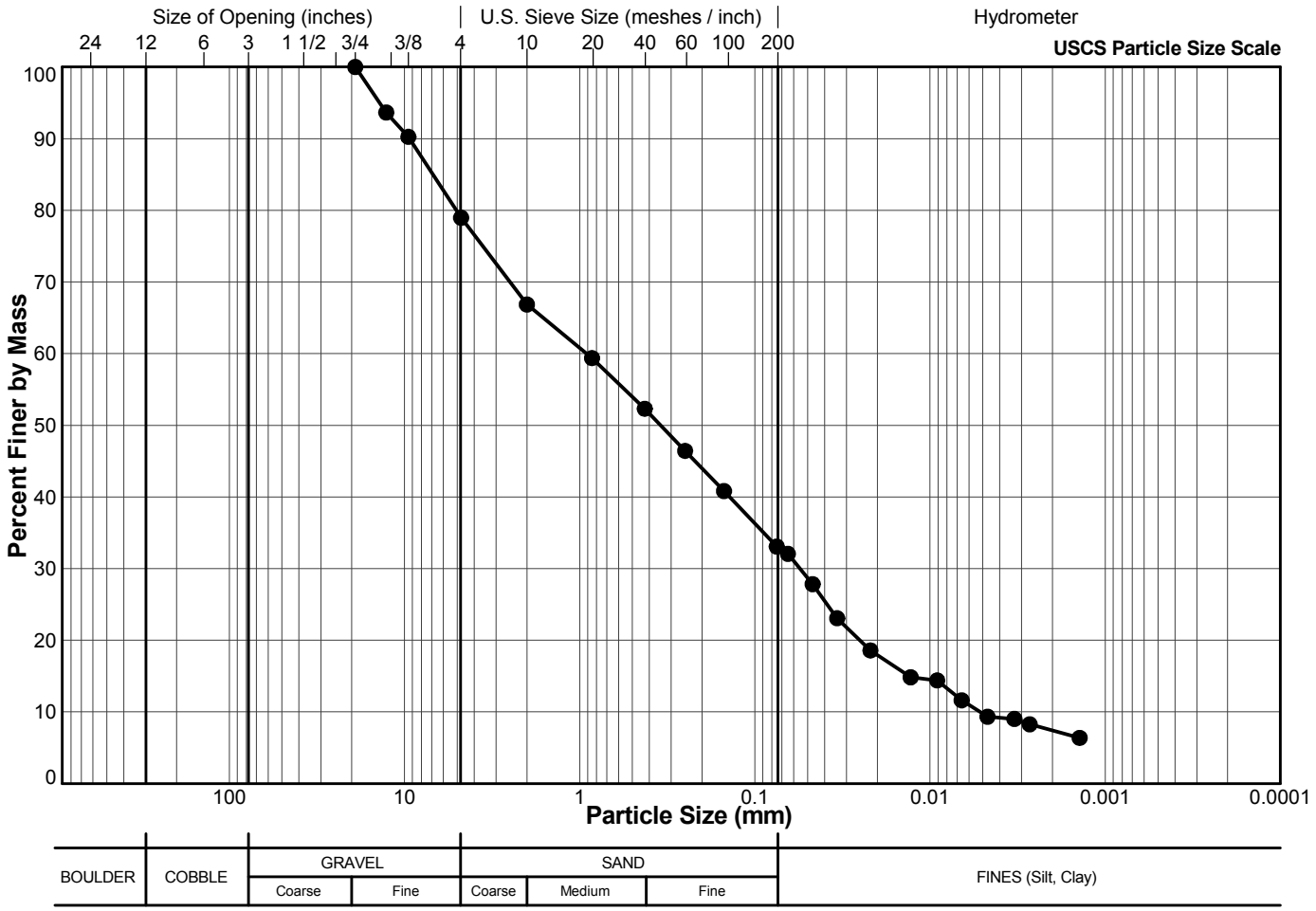
Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-081
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G3
Location:	Yukon	**Depth Interval (m):**	1.40 to 1.50
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		100.0
3/4"	19.1		100.0
1/2"	12.7		93.6
3/8"	9.5		90.3
#4 US MESH	4.75		79.0
#10 US MESH	2		66.9
#20 US MESH	0.85		59.4
#40 US MESH	0.425		52.3
#60 US MESH	0.25		46.4
#100 US MESH	0.15		40.8
#200 US MESH	0.075		33.1
		0.0648	32.1
		0.0468	27.8
		0.0339	23.1
		0.0219	18.6
		0.0129	14.8
		0.0091	14.4
		0.0066	11.6
		0.0047	9.3
		0.0033	9.0
		0.0027	8.3
		0.0014	6.4

	EB/BM	**10/29/2012**	**GP**	**10/31/2012**
	Tech	Date	Checked	Date

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_PARTICLE SIZE (W/ GRADATIONS) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB ebarnes 11/08/12

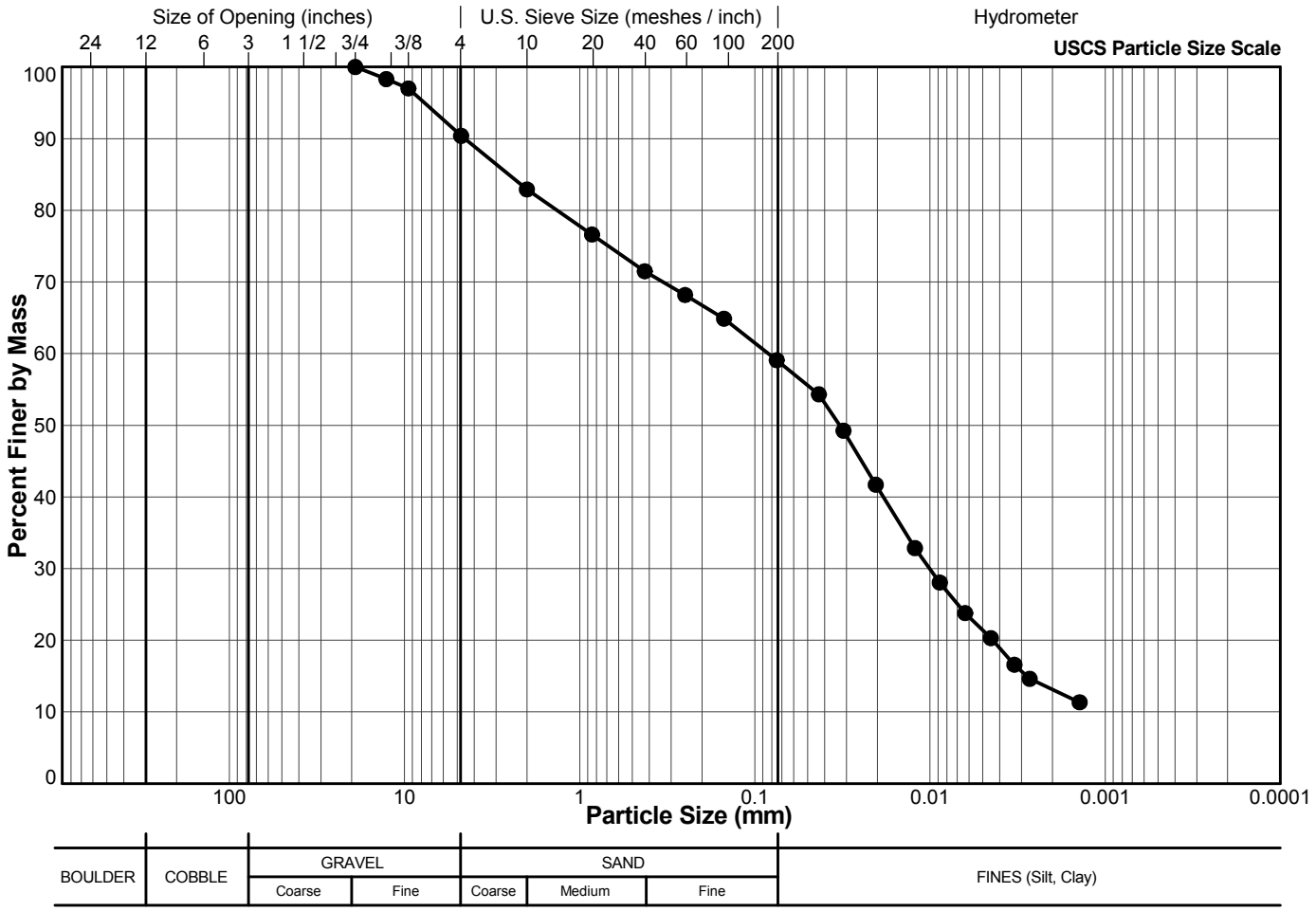
Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-081
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G6
Location:	Yukon	**Depth Interval (m):**	2.90 to 3.05
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		100.0
3/4"	19.1		100.0
1/2"	12.7		98.3
3/8"	9.5		97.0
#4 US MESH	4.75		90.4
#10 US MESH	2		82.9
#20 US MESH	0.85		76.6
#40 US MESH	0.425		71.5
#60 US MESH	0.25		68.2
#100 US MESH	0.15		64.9
#200 US MESH	0.075		59.1
		0.0431	54.3
		0.0312	49.2
		0.0204	41.7
		0.0122	32.9
		0.0088	28.0
		0.0063	23.8
		0.0045	20.3
		0.0033	16.6
		0.0027	14.6
		0.0014	11.3

	MM	**10/22/2012**	**GP**	**10/25/2012**
	Tech	Date	Checked	Date

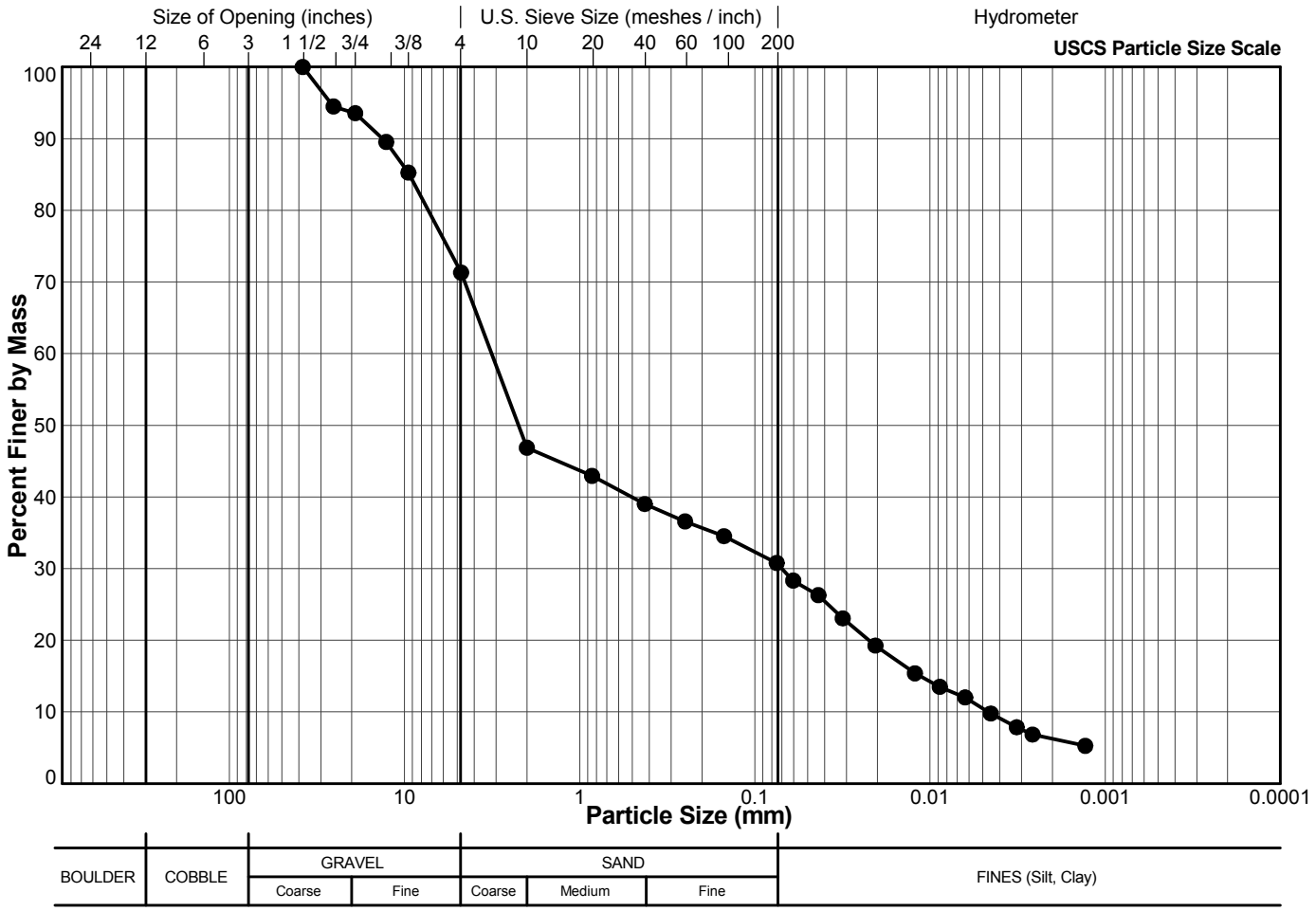
Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-081
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G11
Location:	Yukon	**Depth Interval (m):**	5.60 to 5.80
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		94.5
3/4"	19.1		93.6
1/2"	12.7		89.5
3/8"	9.5		85.3
#4 US MESH	4.75		71.3
#10 US MESH	2		46.9
#20 US MESH	0.85		42.9
#40 US MESH	0.425		39.0
#60 US MESH	0.25		36.6
#100 US MESH	0.15		34.5
#200 US MESH	0.075		30.8
		0.0604	28.3
		0.0434	26.3
		0.0315	23.0
		0.0205	19.3
		0.0122	15.4
		0.0088	13.5
		0.0063	12.0
		0.0045	9.8
		0.0032	7.9
		0.0026	6.8
		0.0013	5.3

	MM	**10/22/2012**	**GP**	**10/25/2012**
	Tech	Date	Checked	Date

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_PARTICLE SIZE (W/ GRADATIONS) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB ebarnes 11/08/12

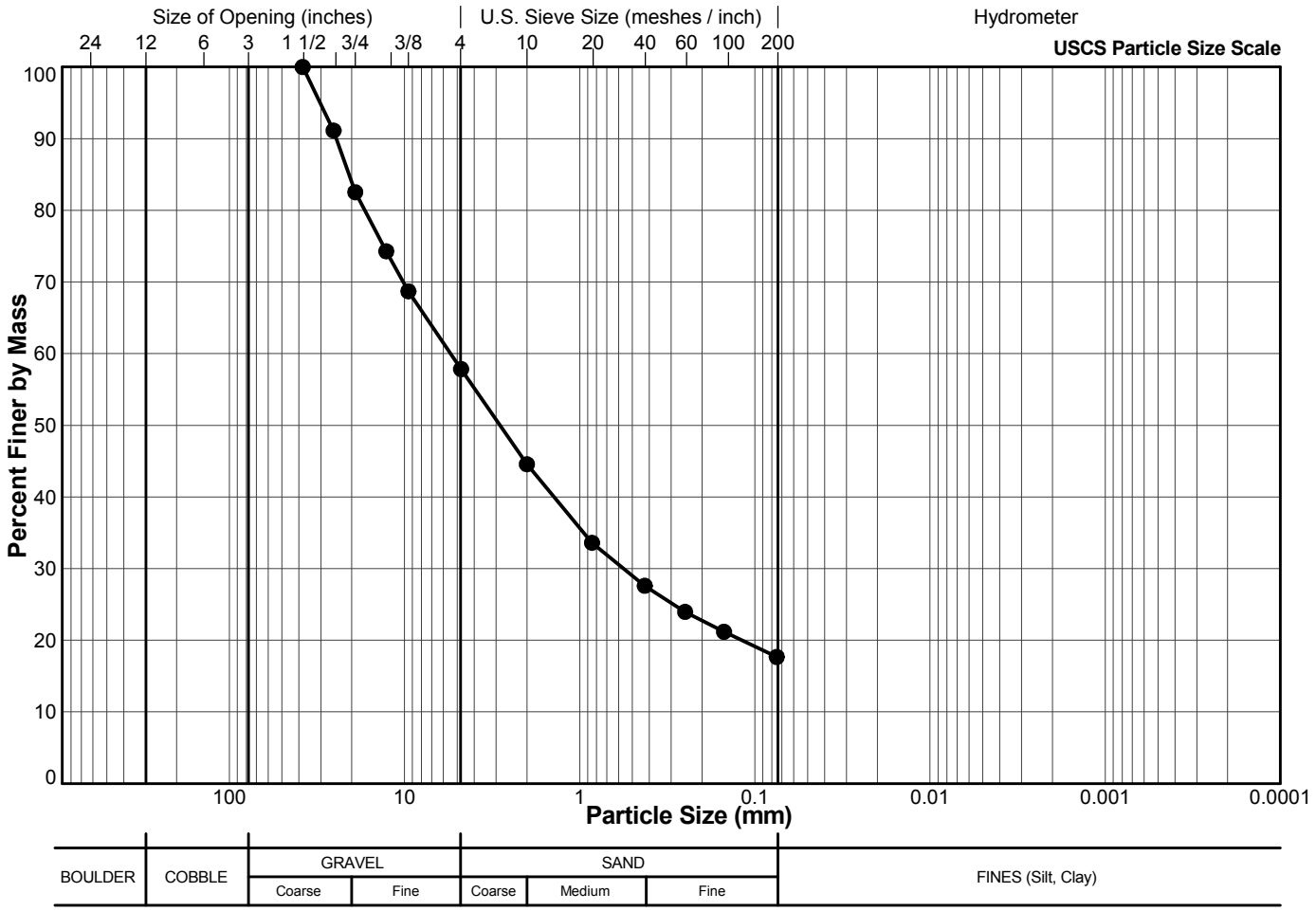
Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-082
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G1
Location:	Yukon	**Depth Interval (m):**	2.20 to 2.40
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		91.1
3/4"	19.1		82.5
1/2"	12.7		74.3
3/8"	9.5		68.7
#4 US MESH	4.75		57.8
#10 US MESH	2		44.6
#20 US MESH	0.85		33.6
#40 US MESH	0.425		27.6
#60 US MESH	0.25		24.0
#100 US MESH	0.15		21.2
#200 US MESH	0.075		17.7

	MM/BM	**10/16/2012**	**GP**	**10/25/2012**
	Tech	Date	Checked	Date

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_PARTICLE SIZE (W/ GRADATIONS) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB ebarnes 11/08/12

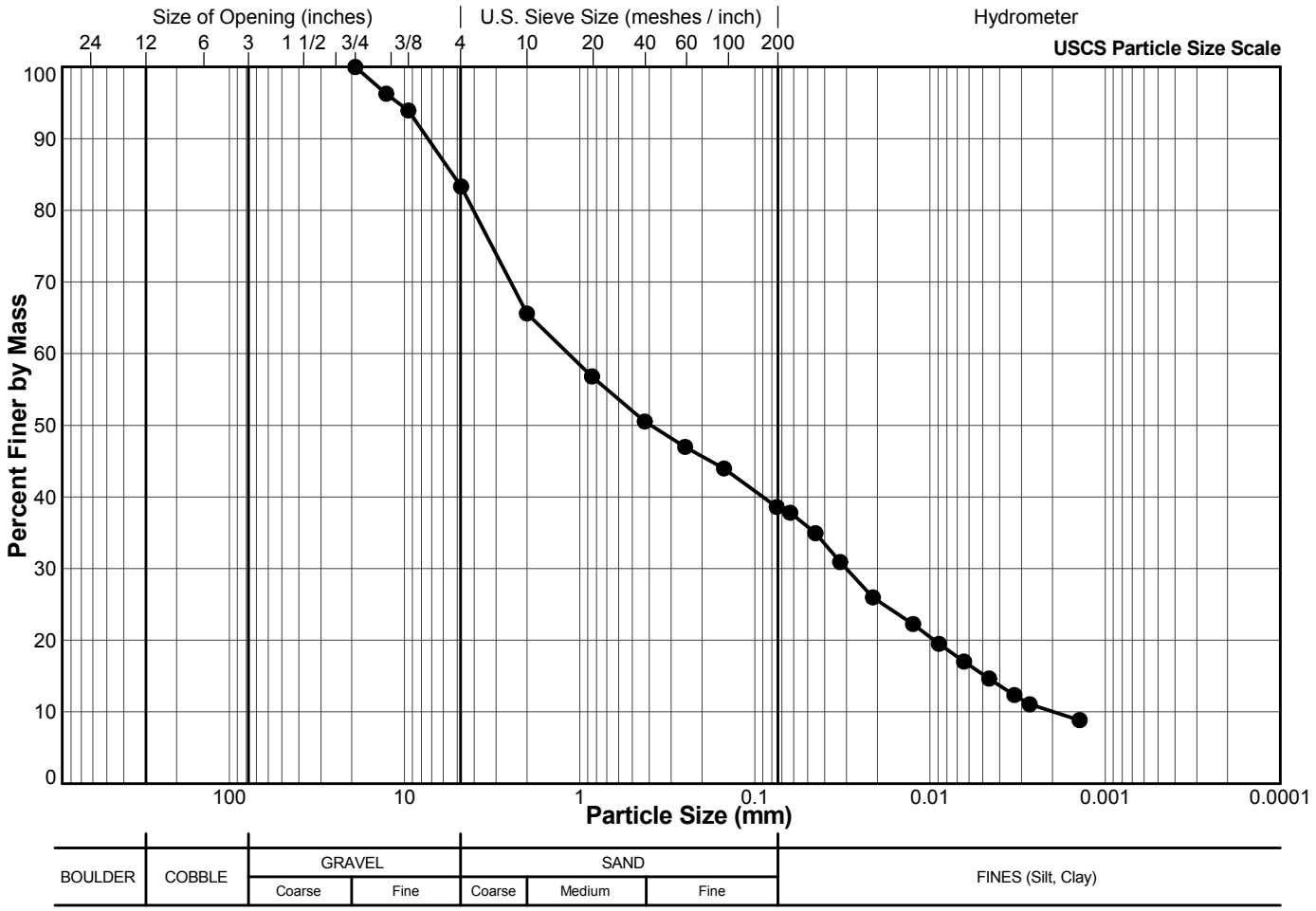
Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-082
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G8
Location:	Yukon	**Depth Interval (m):**	9.30 to 9.40
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		100.0
3/4"	19.1		100.0
1/2"	12.7		96.3
3/8"	9.5		93.9
#4 US MESH	4.75		83.3
#10 US MESH	2		65.6
#20 US MESH	0.85		56.8
#40 US MESH	0.425		50.5
#60 US MESH	0.25		47.0
#100 US MESH	0.15		44.0
#200 US MESH	0.075		38.6
		0.0628	37.8
		0.0451	34.9
		0.0326	30.9
		0.0212	26.0
		0.0125	22.3
		0.0089	19.5
		0.0064	17.0
		0.0046	14.6
		0.0033	12.4
		0.0027	11.1
		0.0014	8.9

	MM	**10/22/2012**	**GP**	**10/25/2012**
	Tech	Date	Checked	Date

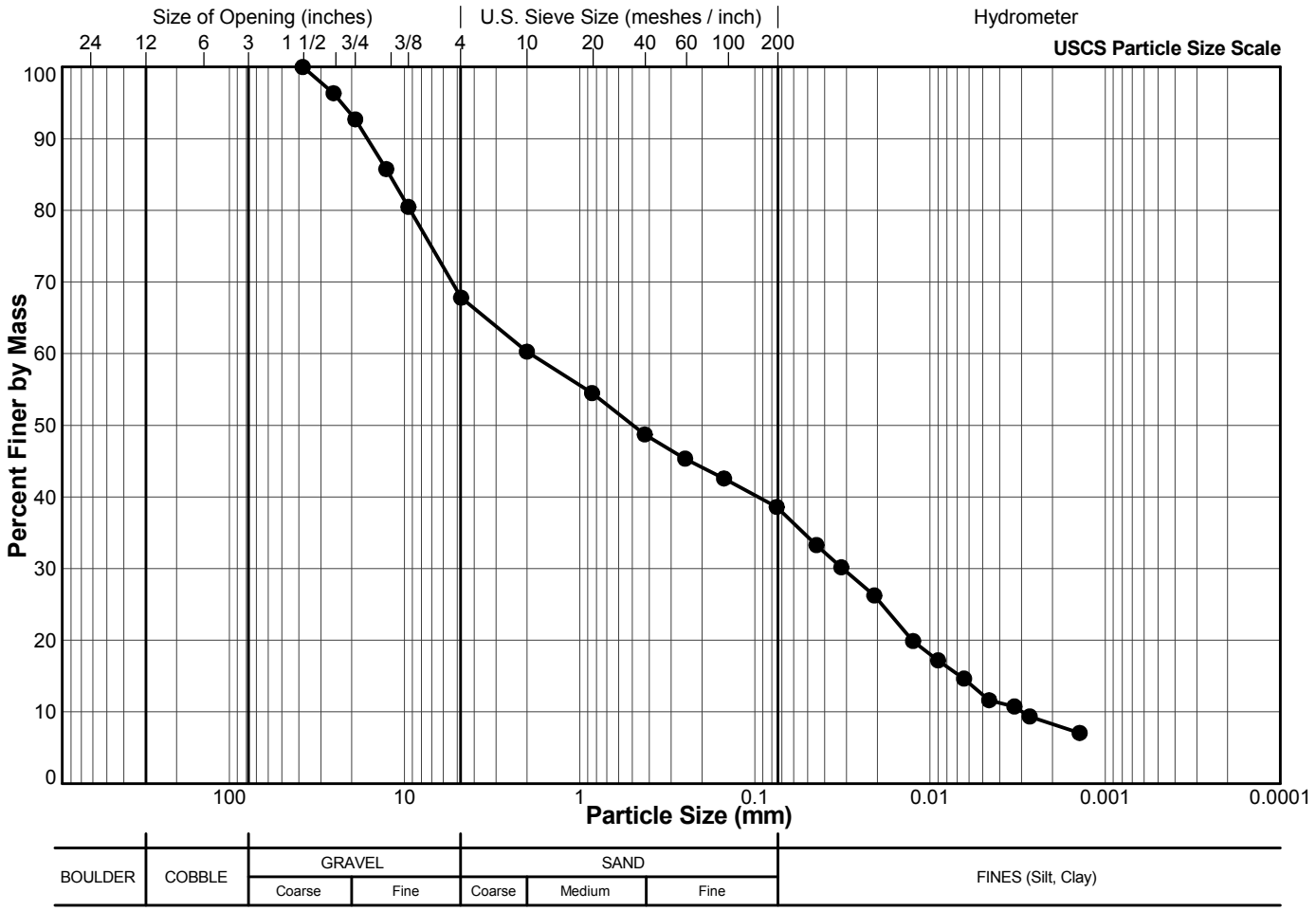
Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-083
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G2
Location:	Yukon	**Depth Interval (m):**	1.90 to 2.10
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		96.3
3/4"	19.1		92.7
1/2"	12.7		85.8
3/8"	9.5		80.5
#4 US MESH	4.75		67.8
#10 US MESH	2		60.3
#20 US MESH	0.85		54.5
#40 US MESH	0.425		48.7
#60 US MESH	0.25		45.3
#100 US MESH	0.15		42.6
#200 US MESH	0.075		38.6
		0.0445	33.3
		0.0321	30.2
		0.0208	26.2
		0.0125	19.9
		0.0090	17.2
		0.0064	14.6
		0.0046	11.6
		0.0033	10.8
		0.0027	9.4
		0.0014	7.1

EB/BM	10/29/2012	GP	10/31/2012
Tech	Date	Checked	Date

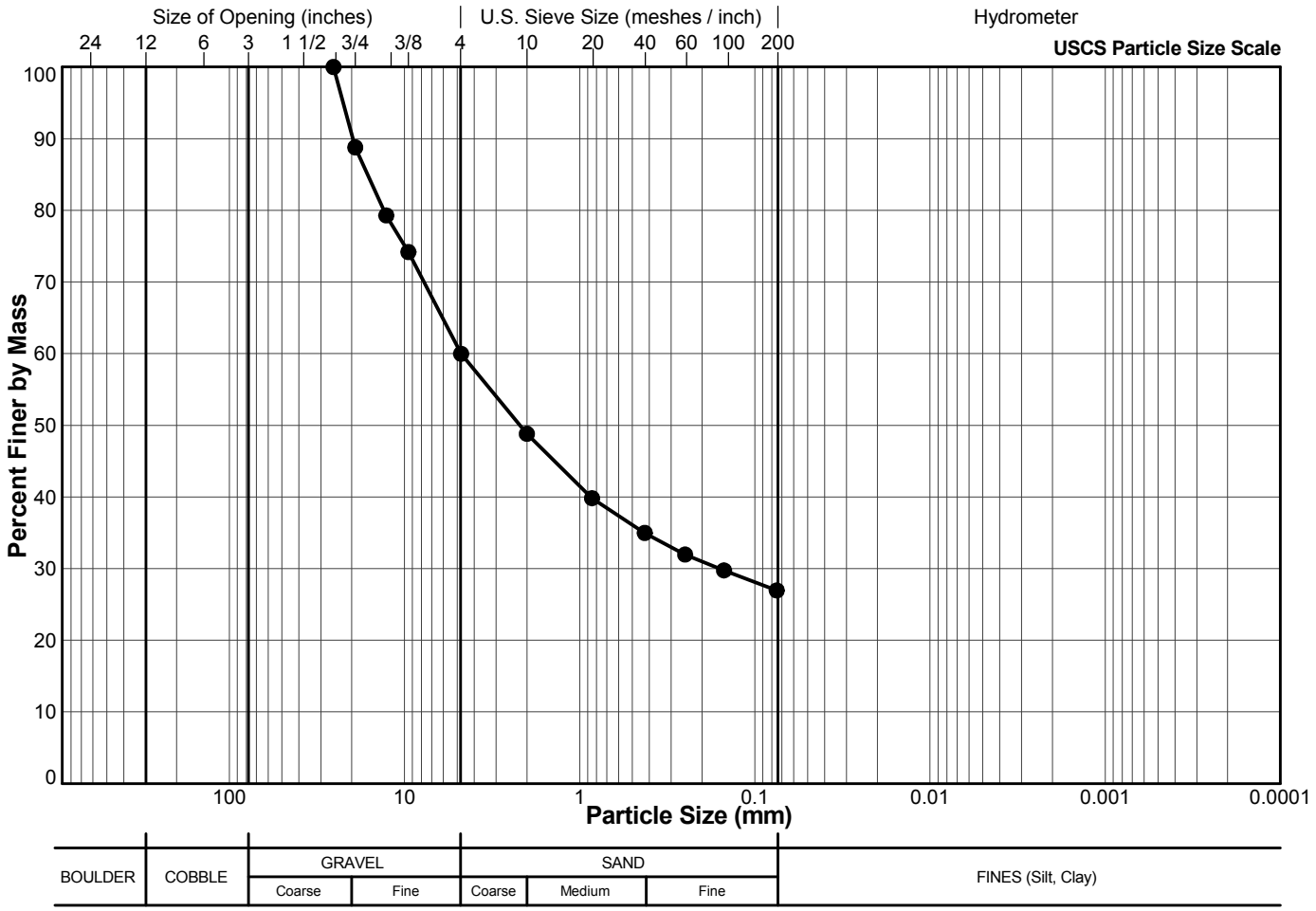
Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

FIGURE 1: SUMMARY OF PARTICLE SIZE DISTRIBUTION

Reference(s)
ASTM D 422-63 (2007)

Client:	BGC Engineering Inc.	**Sample Location:**	BH-BGC12-084
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	G1
Location:	Yukon	**Depth Interval (m):**	0.60 to 0.90
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197



Legend

Sieve Size (USS)	Sieve Size (mm)	Particle Size (mm)	Percent Passing
6"	152.4		100.0
3.5"	88.9		100.0
3"	76.2		100.0
2"	50.8		100.0
1 1/2"	38.1		100.0
1"	25.4		100.0
3/4"	19.1		88.8
1/2"	12.7		79.3
3/8"	9.5		74.2
#4 US MESH	4.75		60.0
#10 US MESH	2		48.8
#20 US MESH	0.85		39.8
#40 US MESH	0.425		35.0
#60 US MESH	0.25		32.0
#100 US MESH	0.15		29.7
#200 US MESH	0.075		26.9

	MM/BM	**10/16/2012**	**GP**	**10/25/2012**
	Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

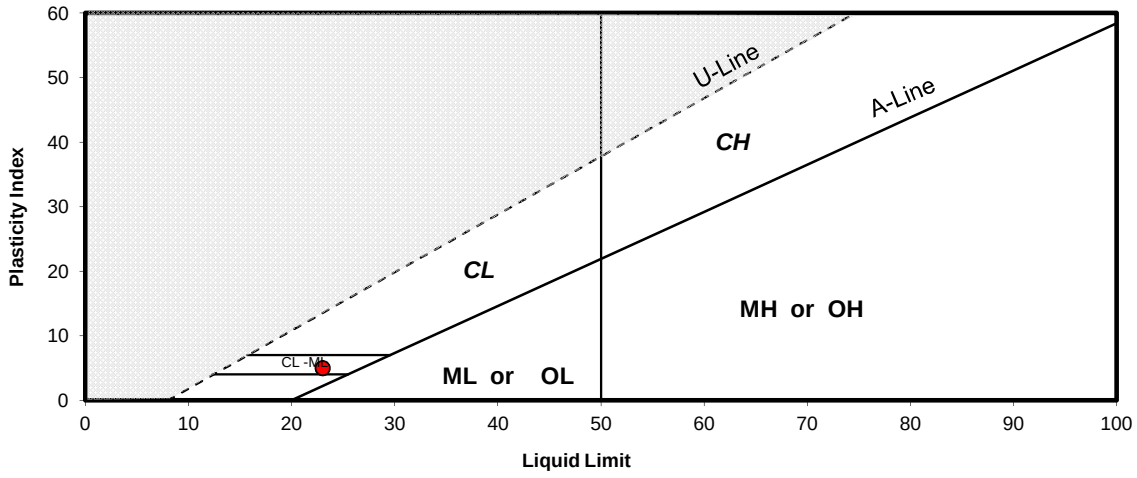
Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

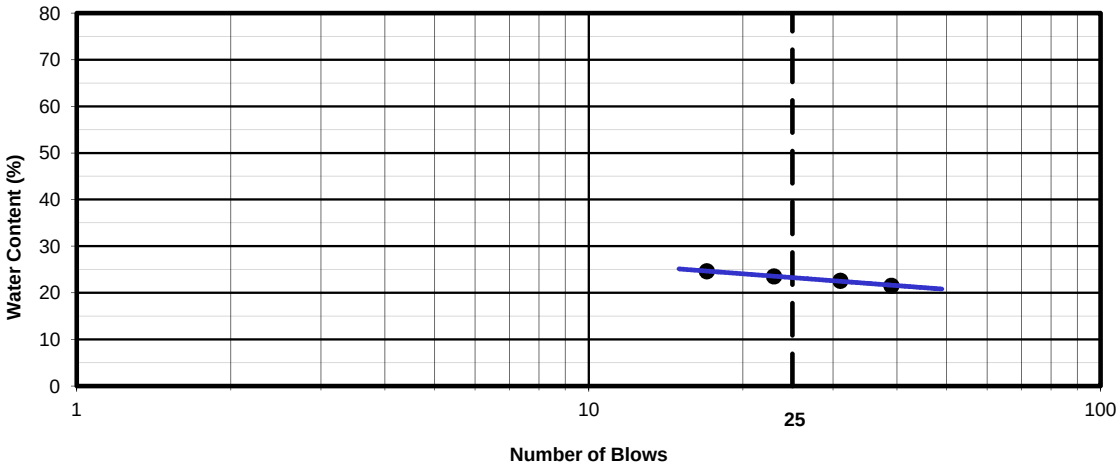
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Liquid Limit, Plastic Limit and Plasticity Index of Soils

Reference
ASTM D 4318-10

Project No.:	12-1415-0029/9000	**Borehole:**	**TP-BGC12-147**
Client:	BGC Engineering	**Sample No.:**	
Project:	Eagle Gold	**Depth (m):**	3
Location:	Yukon	**Lab ID No.:**	138
Method:	A-Multi Point	**Preparation Method:**	Air-Dried
Sample Description:	CL-ML	**Classification Definition**	*Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity*





Test Summary		Remarks
Percent passing #40 Sieve (%)		
Liquid Limit	**23**	
Plastic Limit	**18**	
Plasticity Index	**5**	
Natural water content (%)	**8**	
Liquidity Index	**-2.0**	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.*

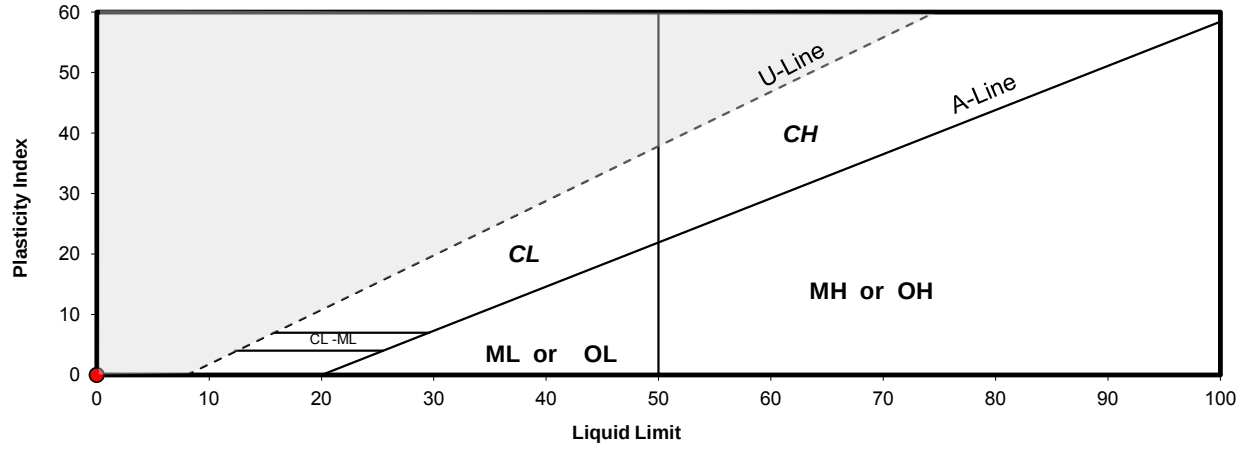
TM	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

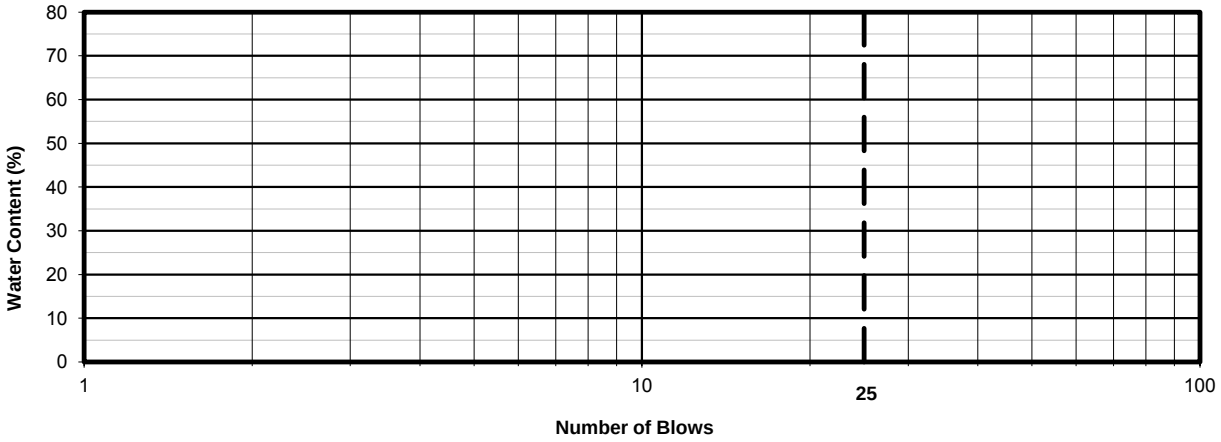
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Liquid Limit, Plastic Limit and Plasticity Index of Soils

Reference: ASTM D 4318-10

Project No.:	12-1415-0029/9000	**Borehole:**	**TP-BGC12-153**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	1.3-1.3
Location:	Yukon	**Lab ID No.:**	138
Method:	A-Multi Point	**Preparation Method:**	Air-Dried
Sample Description:		**Classification Definition**	*Non Plastic*





Test Summary		Remarks
Percent passing #40 Sieve (%)		
Liquid Limit		
Plastic Limit	**Non Plastic**	
Plasticity Index	**N/A**	
Natural water content (%)		
Liquidity Index		

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.*

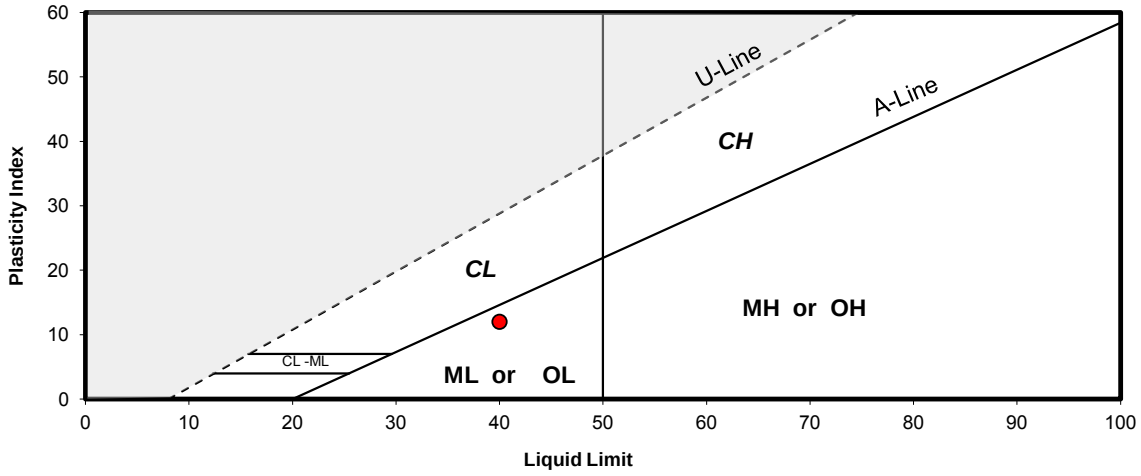
TM	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

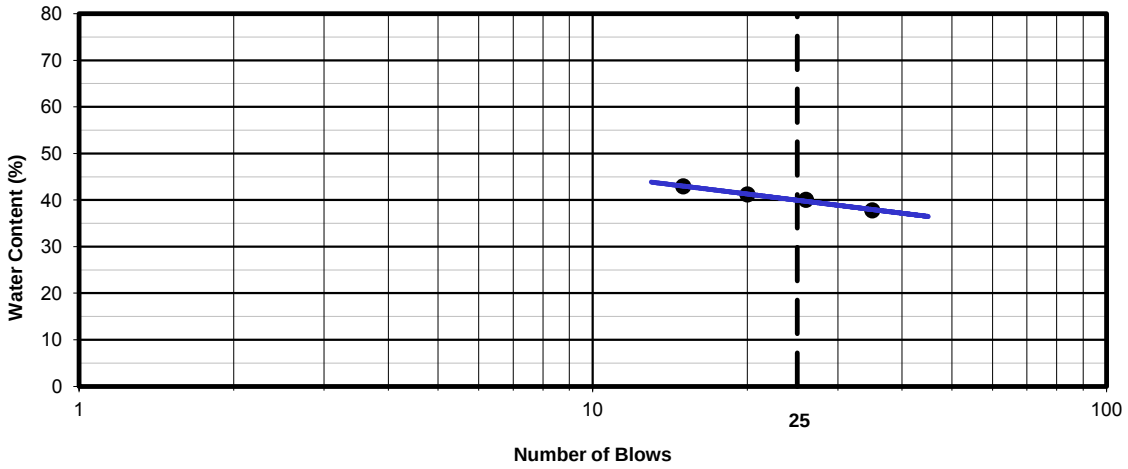
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Liquid Limit, Plastic Limit and Plasticity Index of Soils

Reference: ASTM D 4318-10

Project No.:	12-1415-0029/9000	**Borehole:**	**TP-BGC12-154**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	3.8
Location:	Yukon	**Lab ID No.:**	138
Method:	A-Multi Point	**Preparation Method:**	Air-Dried
Sample Description:	ML	**Classification Definition**	*Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity*





Test Summary		Remarks
Percent passing #40 Sieve (%)		
Liquid Limit	**40**	
Plastic Limit	**28**	
Plasticity Index	**12**	
Natural water content (%)	**22**	
Liquidity Index	**-0.5**	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.*

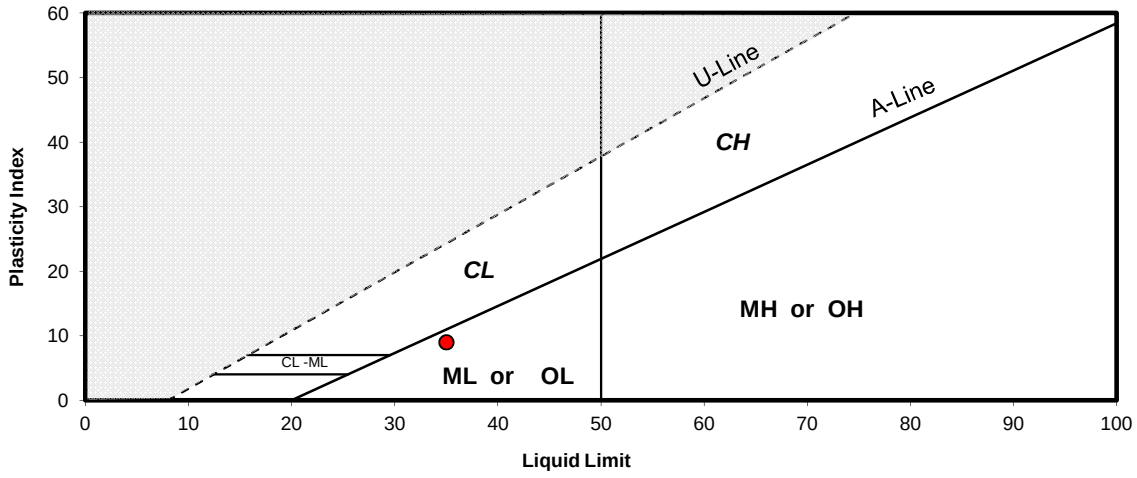
TM	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

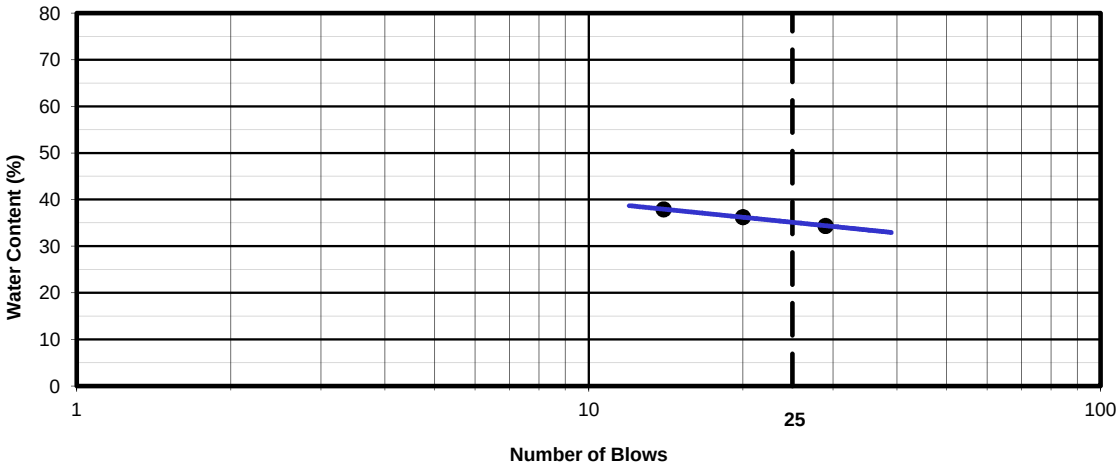
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Liquid Limit, Plastic Limit and Plasticity Index of Soils

Reference
ASTM D 4318-10

Project No.:	12-1415-0029/9000	**Borehole:**	**TP-BGC12-161**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	37
Location:	Yukon	**Lab ID No.:**	138
Method:	A-Multi Point	**Preparation Method:**	Air-Dried
Sample Description:	ML	**Classification Definition**	*Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity*





Test Summary		Remarks
Percent passing #40 Sieve (%)		
Liquid Limit	**35**	
Plastic Limit	**26**	
Plasticity Index	**9**	
Natural water content (%)	**8**	
Liquidity Index	**-2.0**	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.*

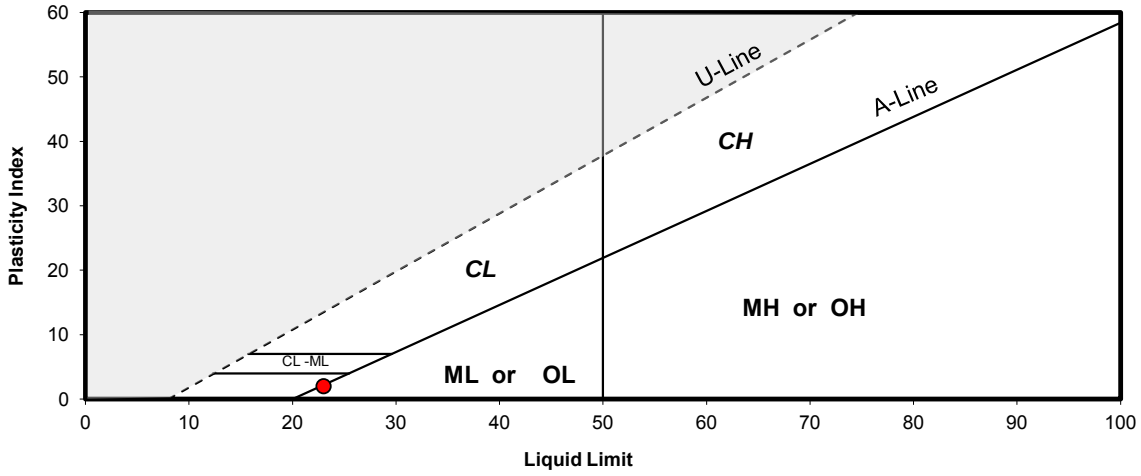
TM	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

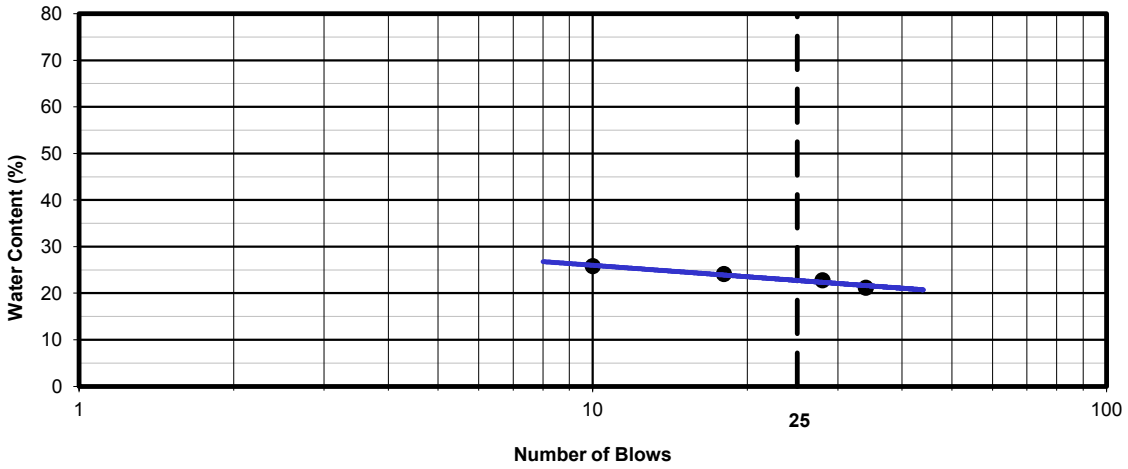
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Liquid Limit, Plastic Limit and Plasticity Index of Soils

Reference: ASTM D 4318-10

Project No.:	12-1415-0029/9000	**Borehole:**	**TP-BGC12-161**
Client:	BGC Engineering	**Sample No.:**	G2
Project:	Eagle Gold	**Depth (m):**	3.7
Location:	Yukon	**Lab ID No.:**	138
Method:	A-Multi Point	**Preparation Method:**	Air-Dried
Sample Description:	ML	**Classification Definition**	*Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity*





Test Summary		Remarks
Percent passing #40 Sieve (%)		
Liquid Limit	**23**	
Plastic Limit	**21**	
Plasticity Index	**2**	
Natural water content (%)	**37**	
Liquidity Index	**8.0**	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.*

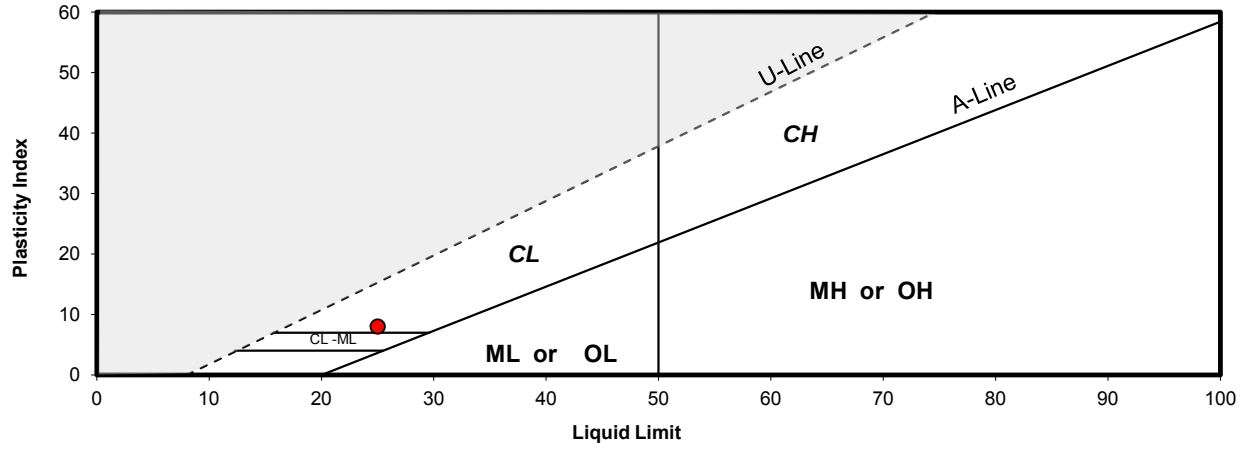
EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

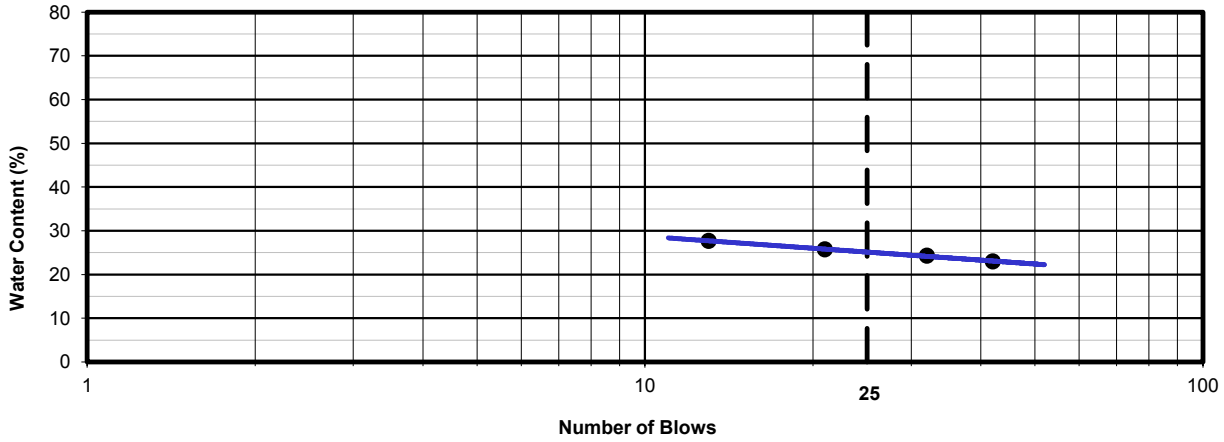
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Liquid Limit, Plastic Limit and Plasticity Index of Soils

Reference: ASTM D 4318-10

Project No.:	12-1415-0029/9000	**Borehole:**	**TP-BGC12-170**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	6
Location:	Yukon	**Lab ID No.:**	138
Method:	A-Multi Point	**Preparation Method:**	Air-Dried
Sample Description:	CL	**Classification Definition**	*Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays*





Test Summary		Remarks
Percent passing #40 Sieve (%)		
Liquid Limit	**25**	
Plastic Limit	**17**	
Plasticity Index	**8**	
Natural water content (%)	**15**	
Liquidity Index	**-0.3**	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.*

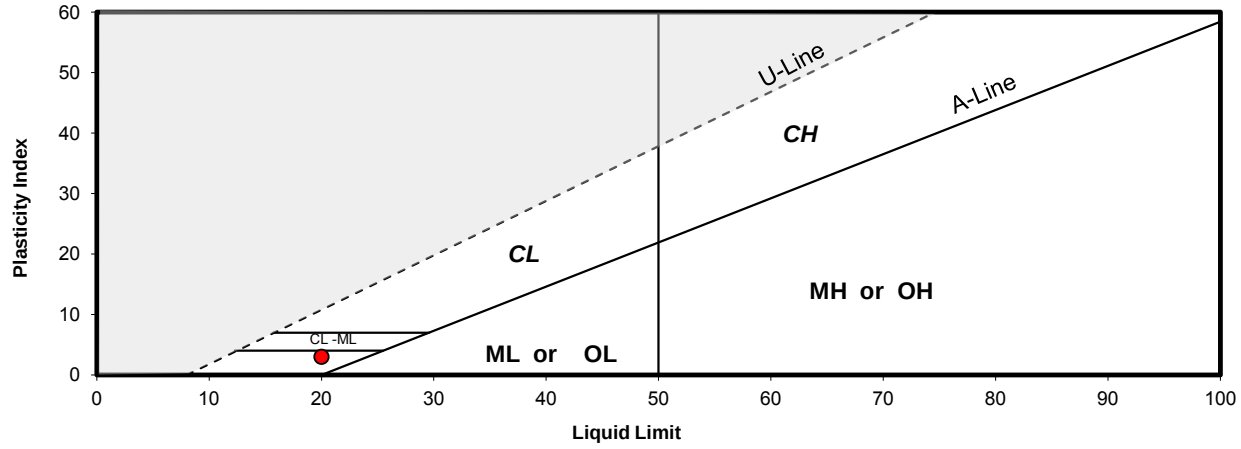
TM	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

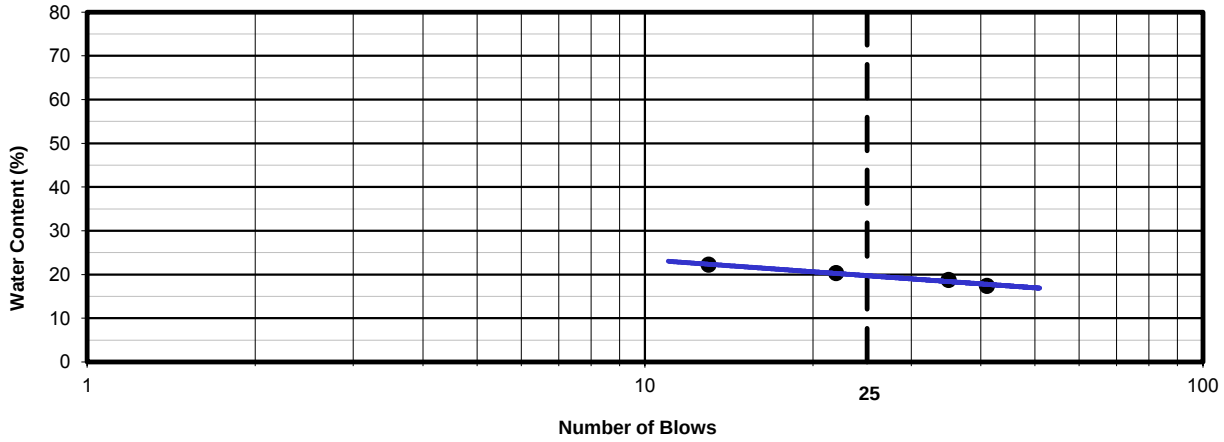
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Liquid Limit, Plastic Limit and Plasticity Index of Soils

Reference: ASTM D 4318-10

Project No.:	12-1415-0029/9000	**Borehole:**	**TP-BGC12-176**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	1.3
Location:	Yukon	**Lab ID No.:**	138
Method:	A-Multi Point	**Preparation Method:**	Air-Dried
Sample Description:	ML	**Classification Definition**	*Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity*





Test Summary		Remarks
Percent passing #40 Sieve (%)		
Liquid Limit	**20**	
Plastic Limit	**17**	
Plasticity Index	**3**	
Natural water content (%)	**6**	
Liquidity Index	**-3.7**	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.*

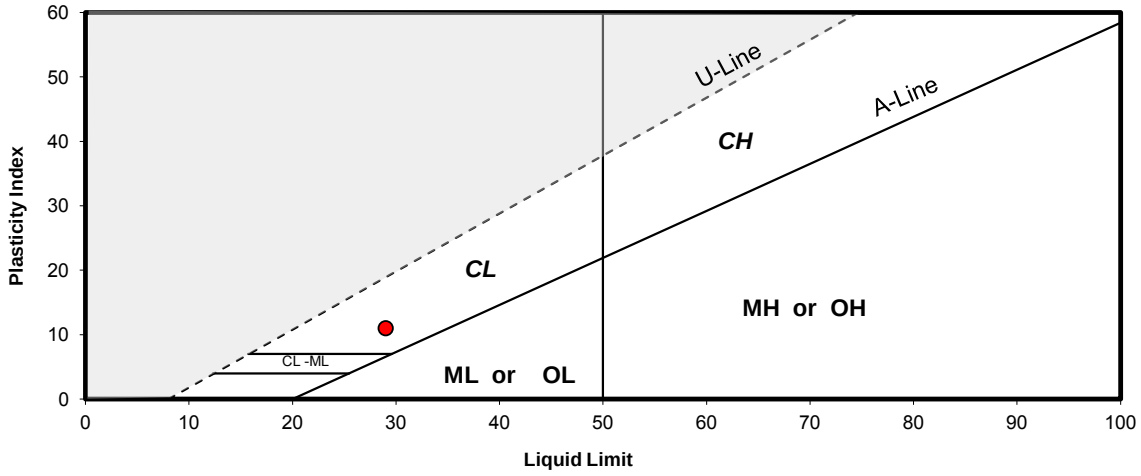
EB	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

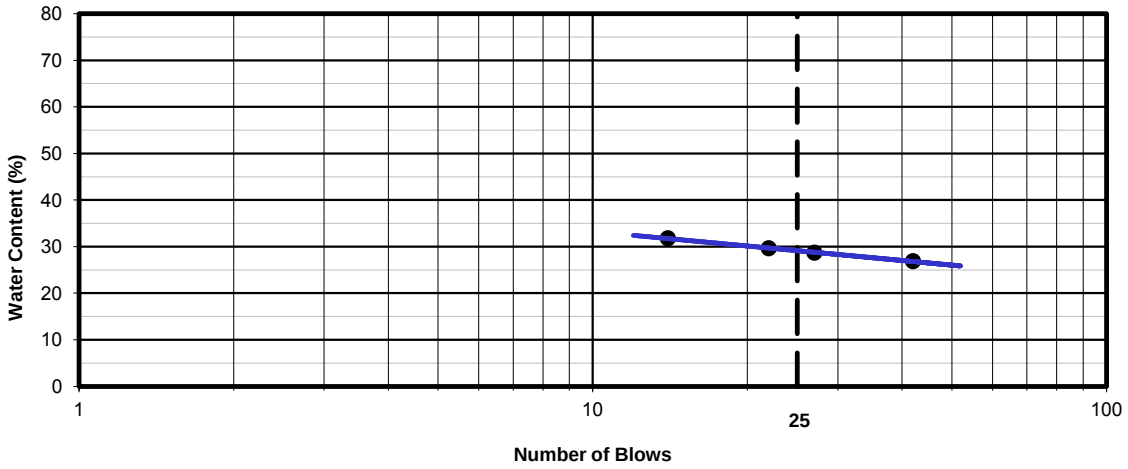
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Liquid Limit, Plastic Limit and Plasticity Index of Soils

Reference: ASTM D 4318-10

Project No.:	12-1415-0029/9000	**Borehole:**	**TP-BGC12-75**
Client:	BGC Engineering	**Sample No.:**	G1
Project:	Eagle Gold	**Depth (m):**	40
Location:	Yukon	**Lab ID No.:**	138
Method:	A-Multi Point	**Preparation Method:**	Air-Dried
Sample Description:	CL	**Classification Definition**	*Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays*





Test Summary		Remarks
Percent passing #40 Sieve (%)		
Liquid Limit	**29**	
Plastic Limit	**18**	
Plasticity Index	**11**	
Natural water content (%)	**13**	
Liquidity Index	**-0.5**	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.*

TM	September 19, 2012	GP	September 21, 2012
TESTED BY	DATE	CHECKED BY	DATE

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

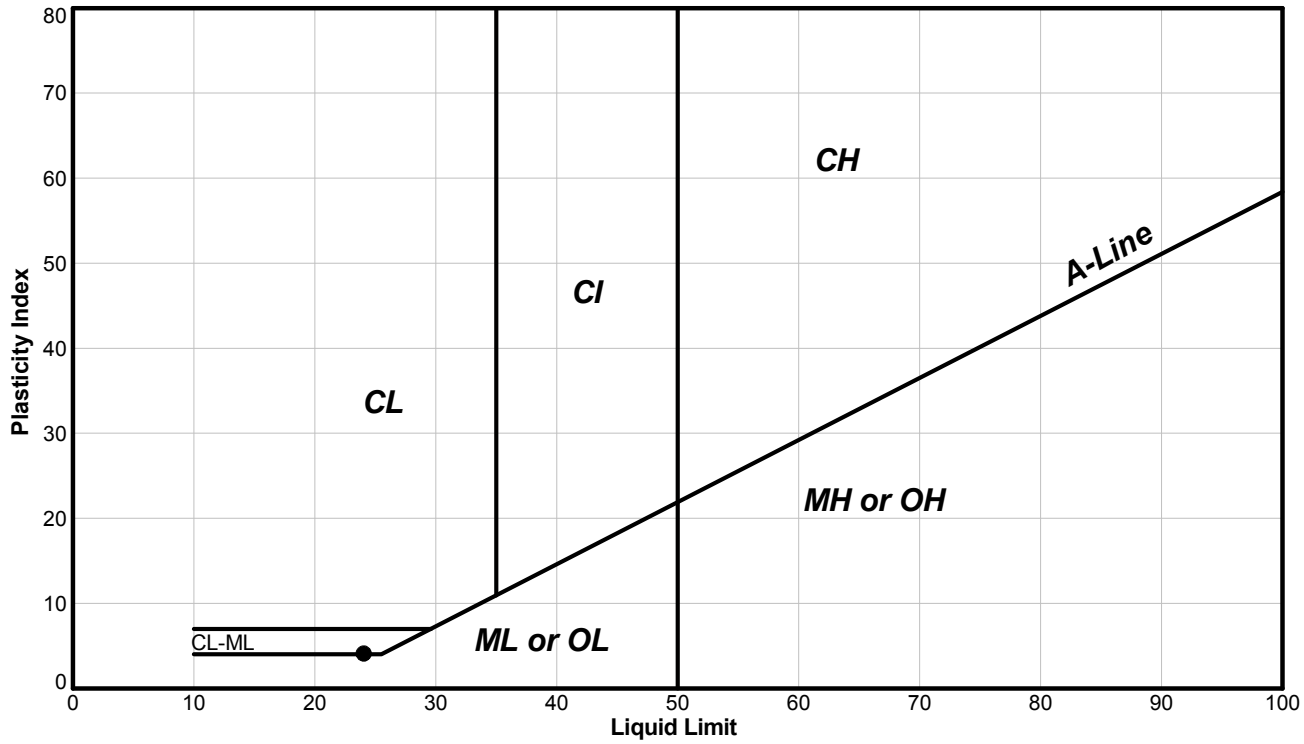
Client:	BGC Engineering Inc.	**Borehole ID:**	**BH-BGC12-080**
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	**G4**
Location:	Yukon	**Depth (m):**	3.00
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197

Classification and Definition: CL-ML - Inorganic clays of low to medium plasticity --- Inorganic silts and very fine sands, clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Air Dried**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	BH-BGC12-080	G4	3.00	3.00	47	24	20	4	16.6	-0.8

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

MM	18/10/2012	GP	25/10/2012
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB GPatton 26/10/12

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

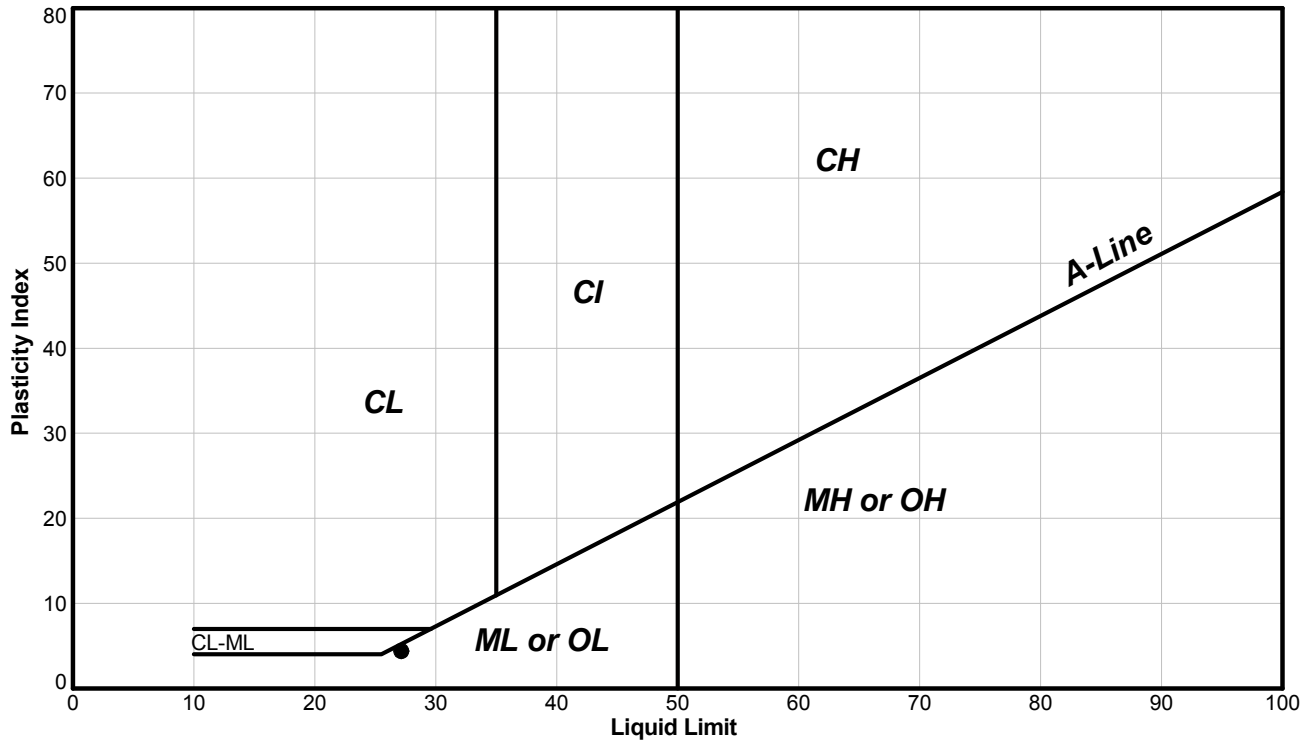
Client:	BGC Engineering Inc.	**Borehole ID:**	**BH-BGC12-080**
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	**G3**
Location:	Yukon	**Depth (m):**	3.30
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Air Dried**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	BH-BGC12-080	G3	3.30	3.30	100	27	23	4	25.6	0.7

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

MM	18/10/2012	GP	25/10/2012
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB GPatton 26/10/12

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

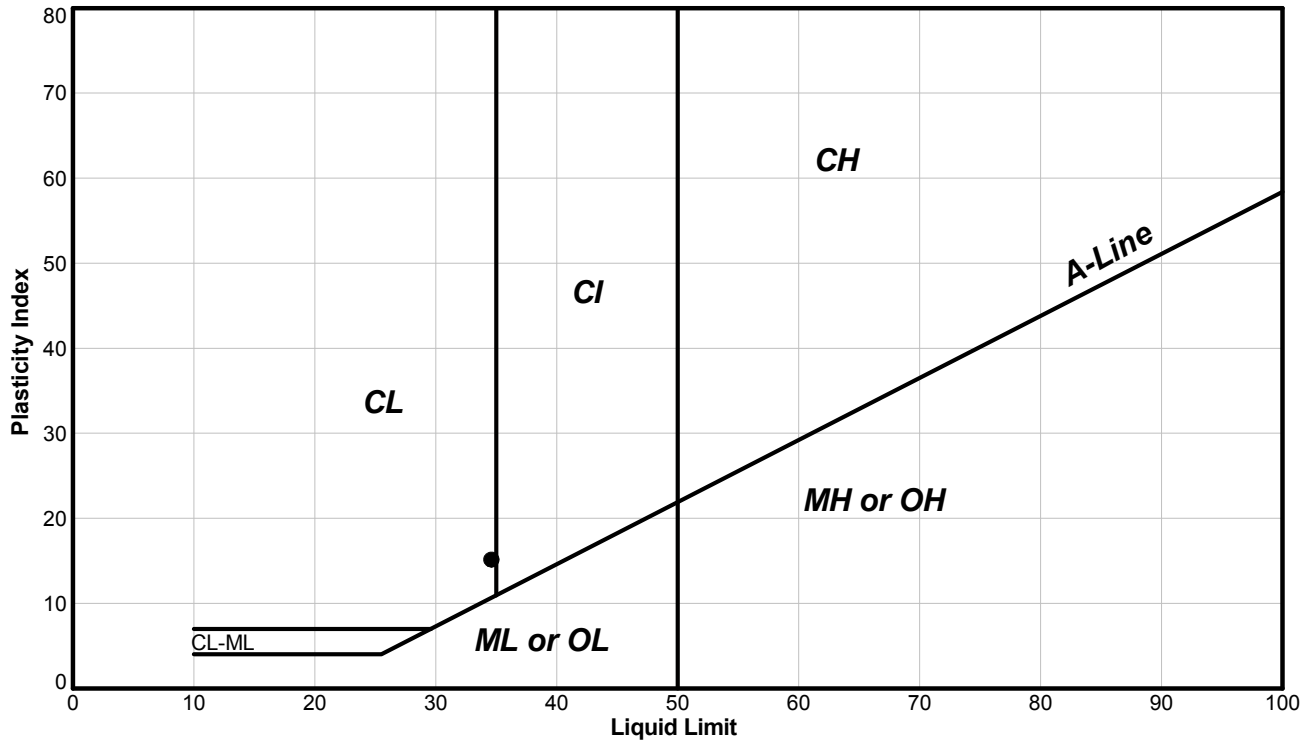
Client:	BGC Engineering Inc.	**Borehole ID:**	**BH-BGC12-080**
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.:**	**G10**
Location:	Yukon	**Depth (m):**	6.00
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:**	197

Classification and Definition: CL - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Air Dried**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	BH-BGC12-080	G10	6.00	6.00	83	35	19	16	42.4	1.5

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

MM	18/10/2012	GP	25/10/2012
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB GPatton 26/10/12

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

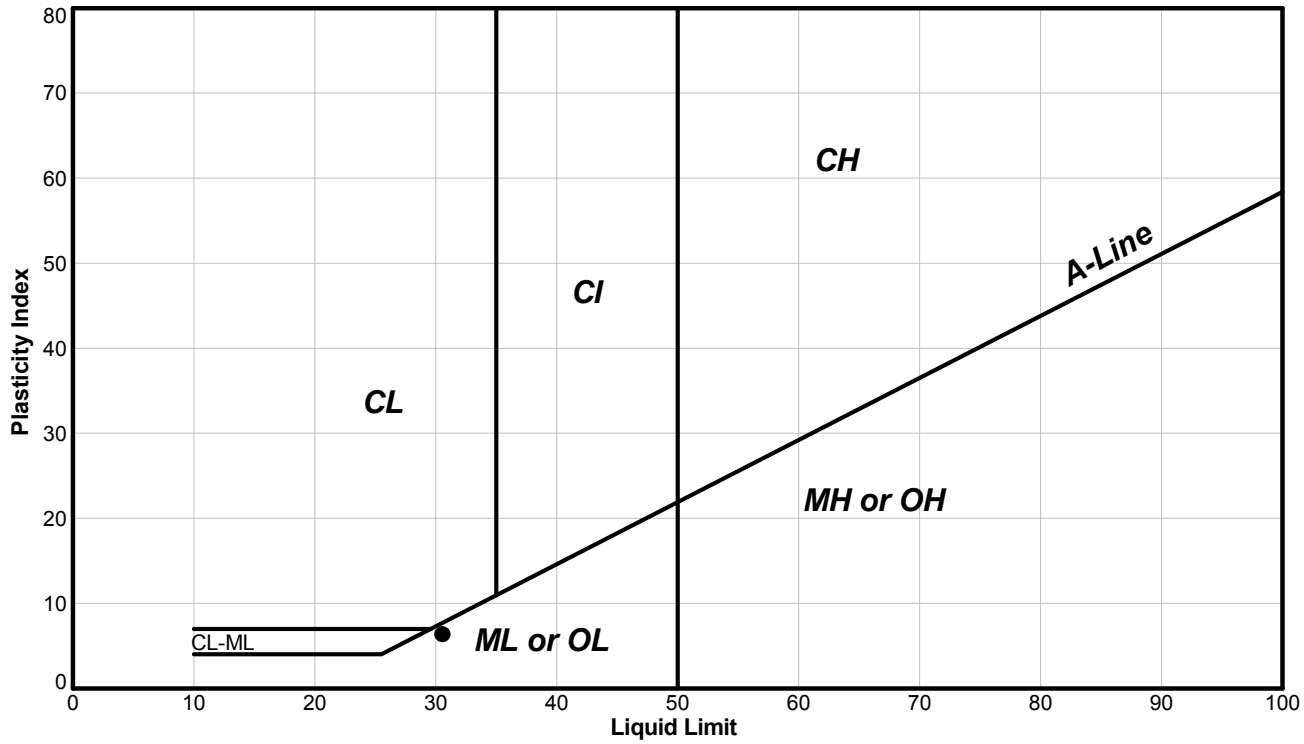
Client:	BGC Engineering Inc.	**Borehole ID: BH-BGC12-081**
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.: G6**
Location:	Yukon	**Depth Interval (m):** 2.90 to 3.05
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:** 197

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Air Dried**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	BH-BGC12-081	G6	2.90	3.05	71	31	24	7	23.1	-0.1

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

MM	18/10/2012	GP	25/10/2012
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB GPatton 26/10/12

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

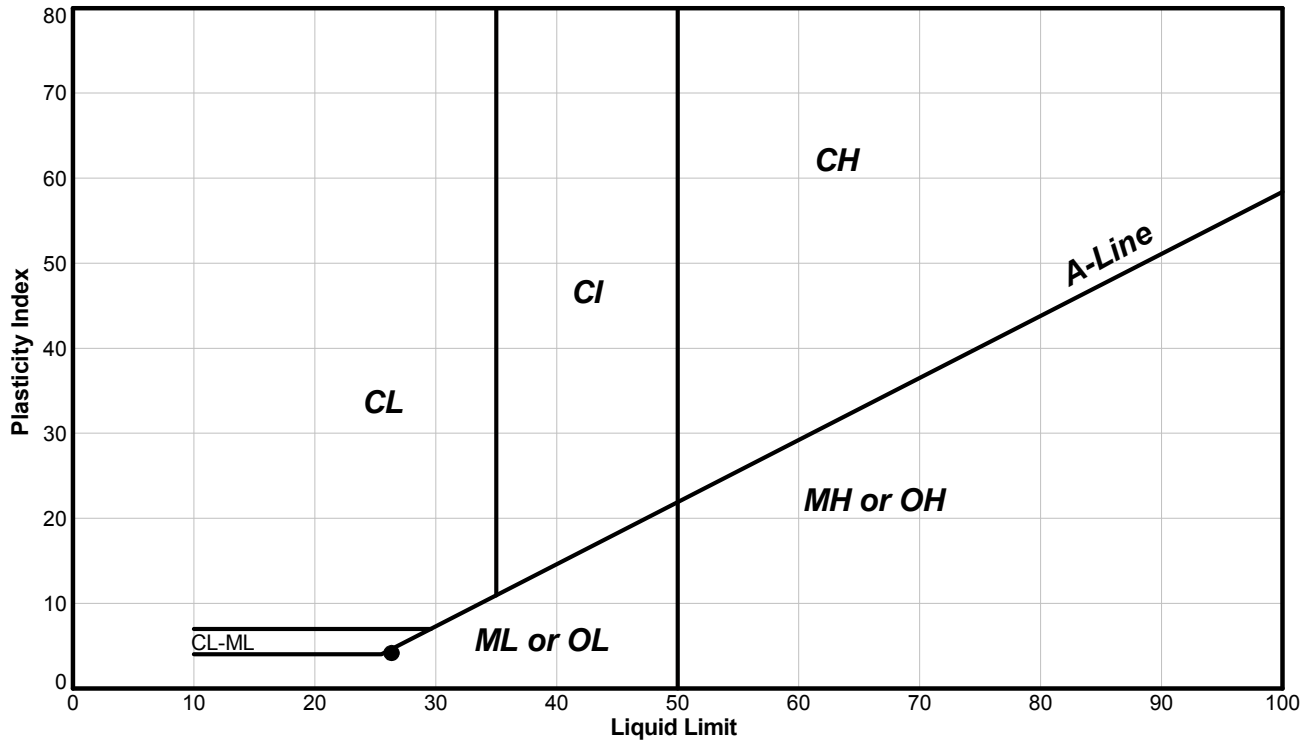
Client:	BGC Engineering Inc.	**Borehole ID: BH-BGC12-081**
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.: G11**
Location:	Yukon	**Depth Interval (m):** 5.60 to 5.80
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:** 197

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Air Dried**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	BH-BGC12-081	G11	5.60	5.80	39	26	22	4	39.3	4.3

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

MM	18/10/2012	GP	25/10/2012
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:O:\ACTIVE_2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form:_LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB GPatton 26/10/12

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

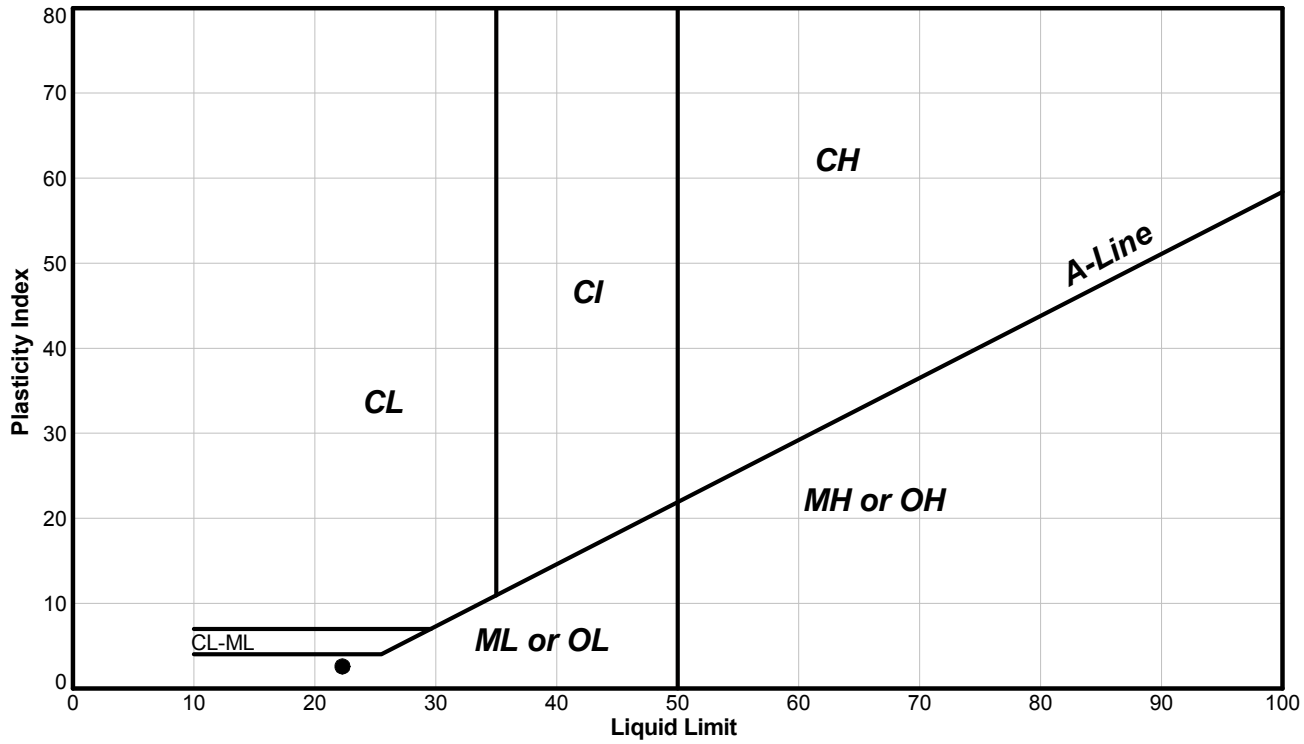
Client:	BGC Engineering Inc.	**Borehole ID: BH-BGC12-082**
Project:	Dublin Gulch Diversion Channel Drilling Program	**Sample No.: G8**
Location:	Yukon	**Depth Interval (m):** 9.30 to 9.40
Project No.:	12-1415-0029 **Phase:** 9000	**Lab Schedule No.:** 197

Classification and Definition: ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Air Dried**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	BH-BGC12-082	G8	9.30	9.40	50	22	20	2	10.9	-4.6

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

MM	18/10/2012	GP	25/10/2012
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia Canada V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:O:\ACTIVE\...2012\1415\12-1415-0029 BGC ENGINEERING INC\PHASE 9000 EAGLE GOLD 2012\4.0 LAB DATA\4.1 LAB WORKING FILES\GINT\12-1415-0029-9000 SCH 197.GPJ Output Form: LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 2.GDT Library:BC REGION LIBRARY.GLB GPatton 26/10/12

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-10 Method B

Project No.:	12-1415-0029/9000	**Borehole**	**BH12-147**
Client:	BGC Engineering Inc.	**Sample No.:**	Not Provided
Project:	Eagle Gold Detail Design Support	**Depth (m):**	3
Location:	Yukon	**Lab Sch No:**	138

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		100
Test Number		1
Flask Number		5
Air Removal Method		Vacuum
Mass of Flask (g)		174.78
Mass of Flask + Dry Soil (g)	M_P	255.78
Mass of Dry Soil (g)		81.00
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	723.10
Test Temperature (g)	T_t	23.40
Mass of Flask + Water (g)	$M_{\rho w,t}$	672.85
Mass of Dish + Dry Soil (g)		255.78
Mass of Dish (g)		174.78
Mass of Oven Dry Soil (g)	M_S	81.00
Temperature Coefficient	K	1.00
Density of Solids (g/cm3)	ρ_s	2.63
Specific Gravity at Test Temperature	G_t	2.64
Specific Gravity at 20ºC	$G_{20ºC}$	2.64
AVERAGE SPECIFIC GRAVITY		**2.64**

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	
Apparent	C/(C-A)	
Absorbtion (%)	(B-C)/C	

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	Gavg @20°C	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB/BM	September 19, 2012	GP	September 24, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-10 Method B

Project No.:	12-1415-0029/9000	**Borehole**	**BH12-154**
Client:	BGC Engineering Inc.	**Sample No.:**	G1
Project:	Eagle Gold Detail Design Support	**Depth (m):**	3.8-3.8
Location:	Yukon	**Lab Sch No:**	138

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		100
Test Number		1
Flask Number		5
Air Removal Method		Vacuum
Mass of Flask (g)		174.88
Mass of Flask + Dry Soil (g)	M_P	261.55
Mass of Dry Soil (g)		86.67
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	727.65
Test Temperature (g)	T_t	23.50
Mass of Flask + Water (g)	$M_{\rho w,t}$	672.83
Mass of Dish + Dry Soil (g)		261.55
Mass of Dish (g)		174.88
Mass of Oven Dry Soil (g)	M_S	86.67
Temperature Coefficient	K	1.00
Density of Solids (g/cm3)	ρ_s	2.72
Specific Gravity at Test Temperature	G_t	2.73
Specific Gravity at 20ºC	$G_{20ºC}$	2.73
AVERAGE SPECIFIC GRAVITY		**2.73**

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	
Apparent	C/(C-A)	
Absorbtion (%)	(B-C)/C	

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	Gavg @20ºC	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB/BM	September 19, 2012	GP	September 24, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-10 Method B

Project No.:	12-1415-0029/9000	**Borehole**	**BH12-173**
Client:	BGC Engineering Inc.	**Sample No.:**	G2
Project:	Eagle Gold Detail Design Support	**Depth (m):**	4.6-4.6
Location:	Yukon	**Lab Sch No:**	138

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		100
Test Number		1
Flask Number		4
Air Removal Method		Vacuum
Mass of Flask (g)		172.73
Mass of Flask + Dry Soil (g)	M_P	255.06
Mass of Dry Soil (g)		82.33
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	723.84
Test Temperature (g)	T_t	23.70
Mass of Flask + Water (g)	$M_{\rho w,t}$	670.78
Mass of Dish + Dry Soil (g)		255.06
Mass of Dish (g)		172.73
Mass of Oven Dry Soil (g)	M_S	82.33
Temperature Coefficient	K	1.00
Density of Solids (g/cm3)	ρ_s	2.81
Specific Gravity at Test Temperature	G_t	2.82
Specific Gravity at 20°C	$G_{20°C}$	2.82
AVERAGE SPECIFIC GRAVITY		**2.82**

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	
Apparent	C/(C-A)	
Absorbtion (%)	(B-C)/C	

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	Gavg @20°C	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB/BM	September 19, 2012	GP	September 24, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-10 Method B

Project No.:	12-1415-0029/9000	**Borehole**	**BH12-75**
Client:	BGC Engineering Inc.	**Sample No.:**	G1
Project:	Eagle Gold Detail Design Support	**Depth (m):**	40
Location:	Yukon	**Lab Sch No:**	138

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		100
Test Number		1
Flask Number		4
Air Removal Method		Vacuum
Mass of Flask (g)		172.70
Mass of Flask + Dry Soil (g)	M_P	281.76
Mass of Dry Soil (g)		109.06
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	741.79
Test Temperature (g)	T_t	23.40
Mass of Flask + Water (g)	$M_{\rho w,t}$	670.81
Mass of Dish + Dry Soil (g)		281.76
Mass of Dish (g)		172.70
Mass of Oven Dry Soil (g)	M_S	109.06
Temperature Coefficient	K	1.00
Density of Solids (g/cm3)	ρ_s	2.86
Specific Gravity at Test Temperature	G_t	2.87
Specific Gravity at 20ºC	$G_{20ºC}$	2.87
AVERAGE SPECIFIC GRAVITY		**2.87**

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	
Apparent	C/(C-A)	
Absorbtion (%)	(B-C)/C	

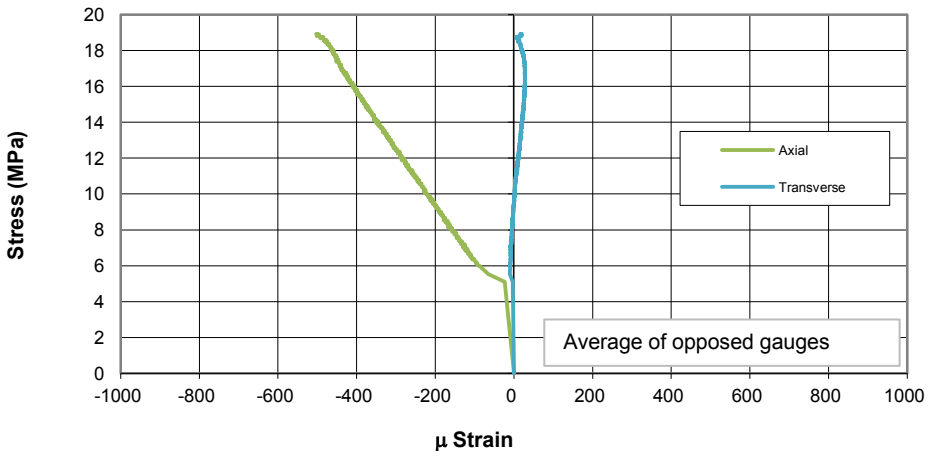
Combined Specific Gravity

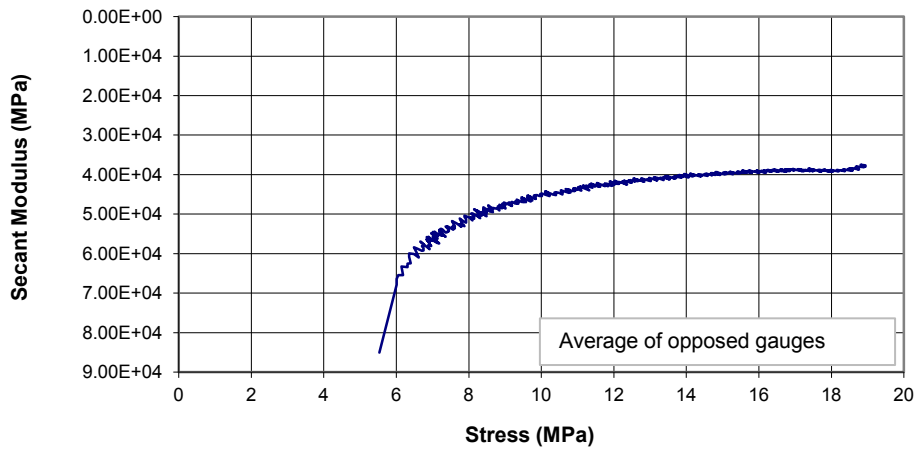
COMBINED SPECIFIC GRAVITY	Gavg @20ºC	

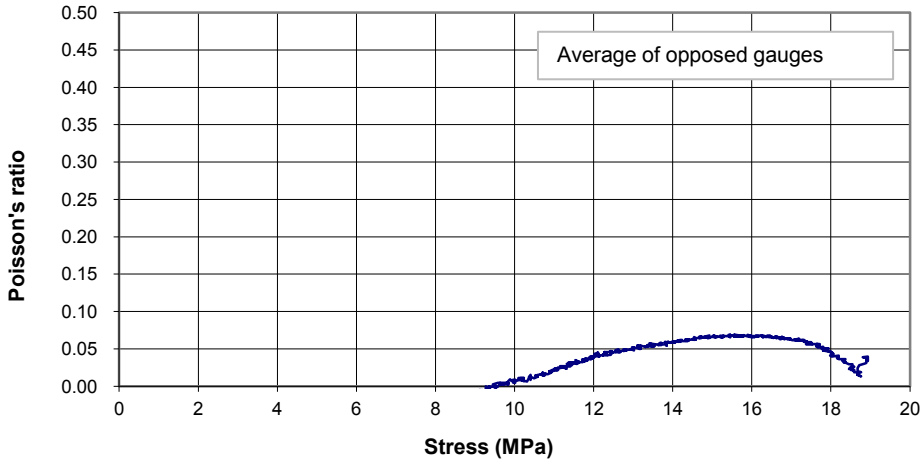
** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

EB/BM	September 19, 2012	GP	September 24, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test



After Test

Test Summary		
Peak Stress σ_{peak}	18.9	MPa
Secant Modulus, ε_{50}	56.7	GPa
Poisson's Ratio, ν_{50}	INVALID	
Height:	124.21	mm
Diameter:	60.49	mm
Failure Mode:	Along Foliation 39°	

ASTM D7012-07 Method D
Modulus in Uniaxial Compression

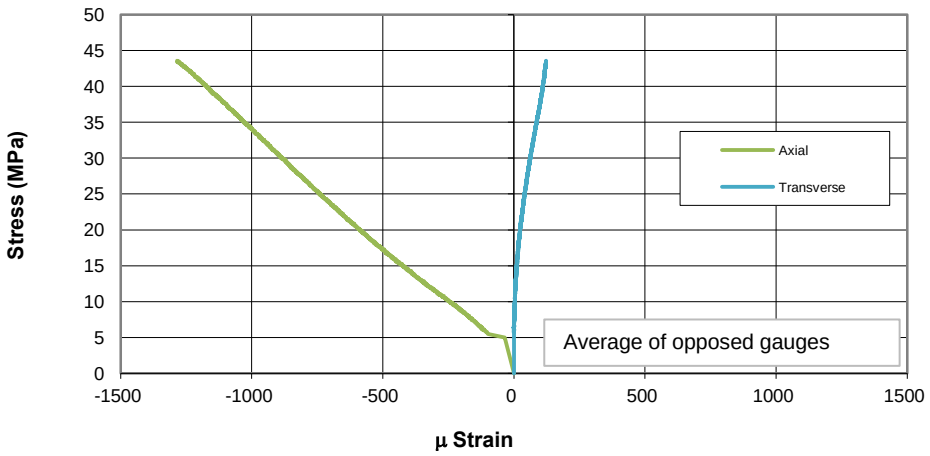
Borehole:	BH-BGC12-75
Sample:	R3
Depth (m):	20.55
Tested By:	G. Patton
Reviewed By	E. Kostyukov

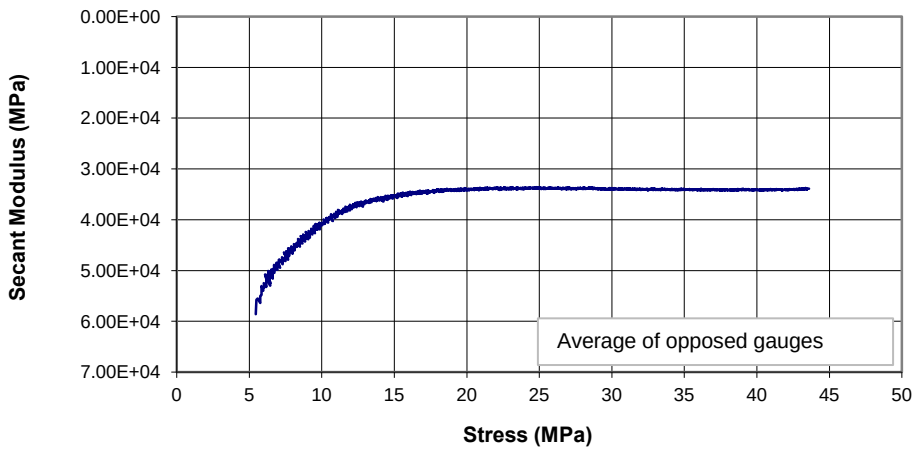
Project Details

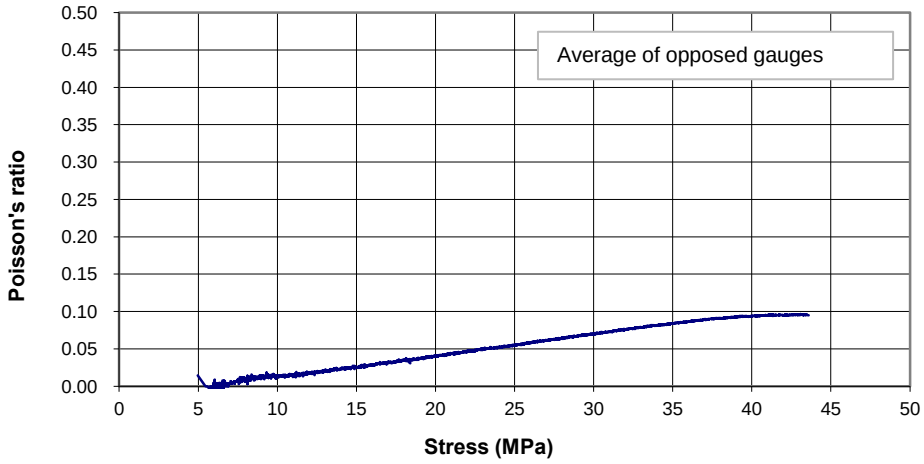
Project No.:	12-1415-0029/9000
Project:	Eagle Gold Detail Design Support
Location	Yukon
Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test

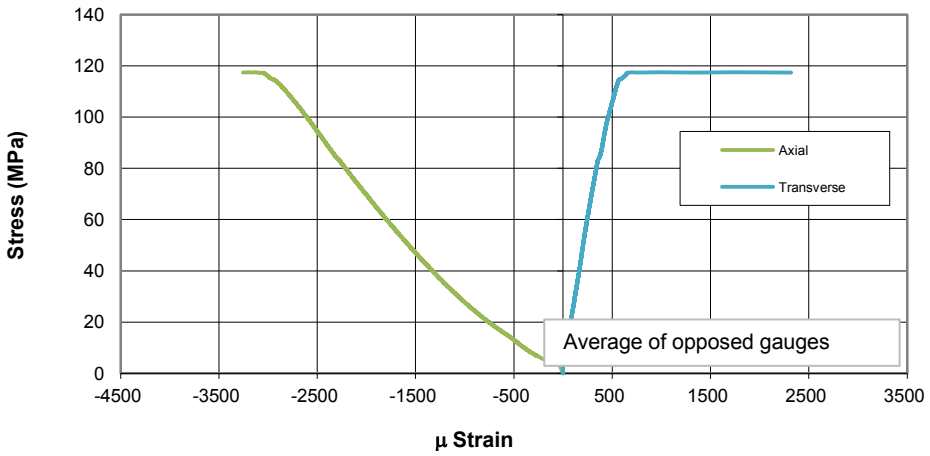


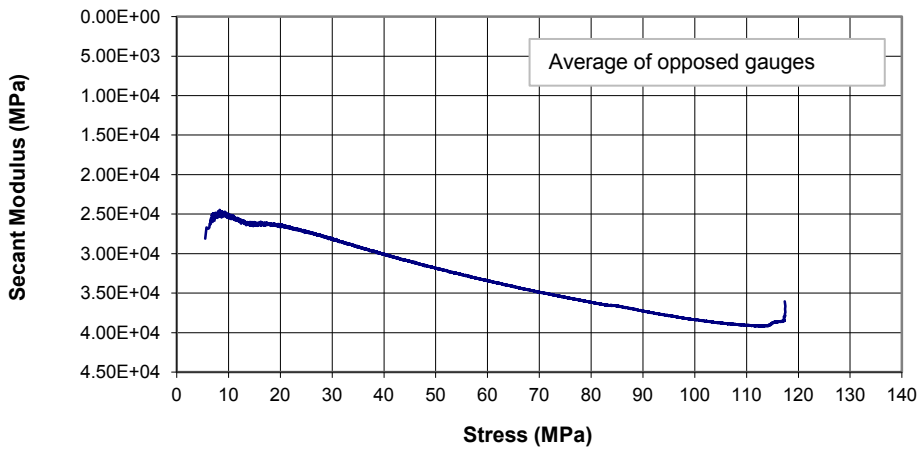
After Test

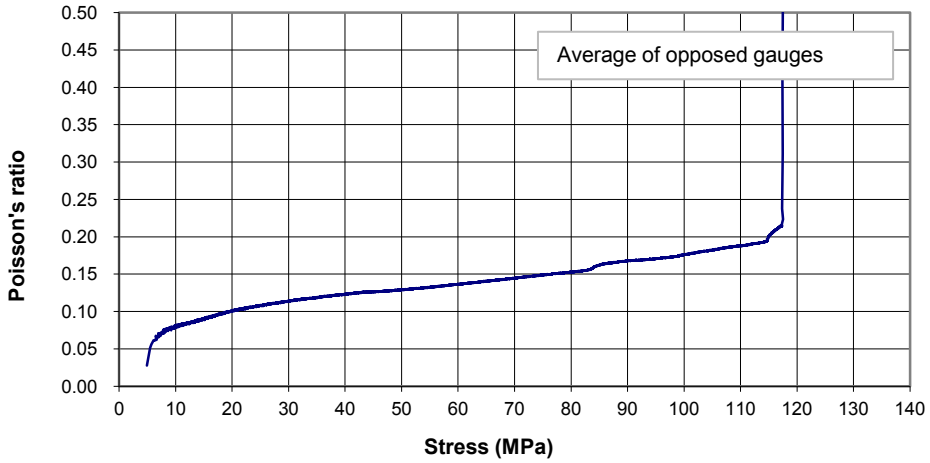
Test Summary			ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	43.6	MPa				
Secant Modulus, ε_{50}	33.7	GPa	Borehole:	BH-BGC12-76	Project No.:	12-1415-0029/9000
Poisson's Ratio, ν_{50}	0.05		Sample:	R1	Project:	Eagle Gold Detail Design Support
Height:	129.50	mm	Depth (m):	33.20		
Diameter:	60.93	mm	Tested By:	G. Patton	Location	Yukon
Failure Mode:	Along Foliation 52°		Reviewed By	E. Kostyukov	Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test

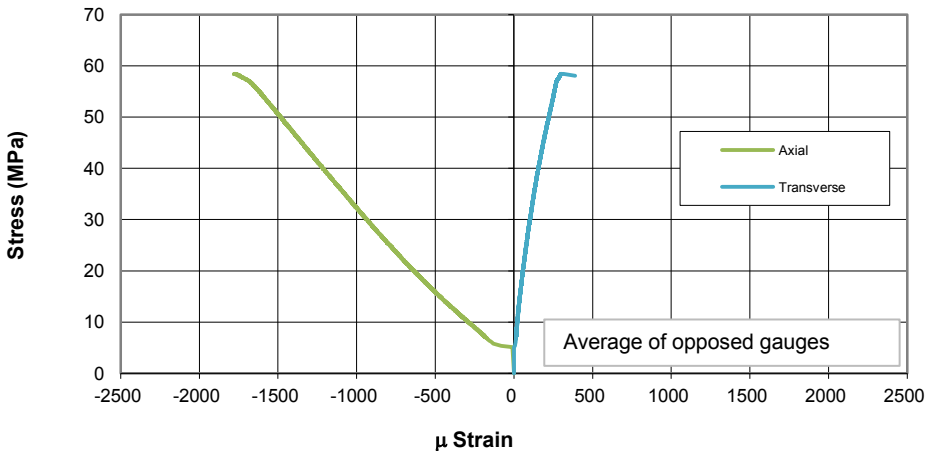


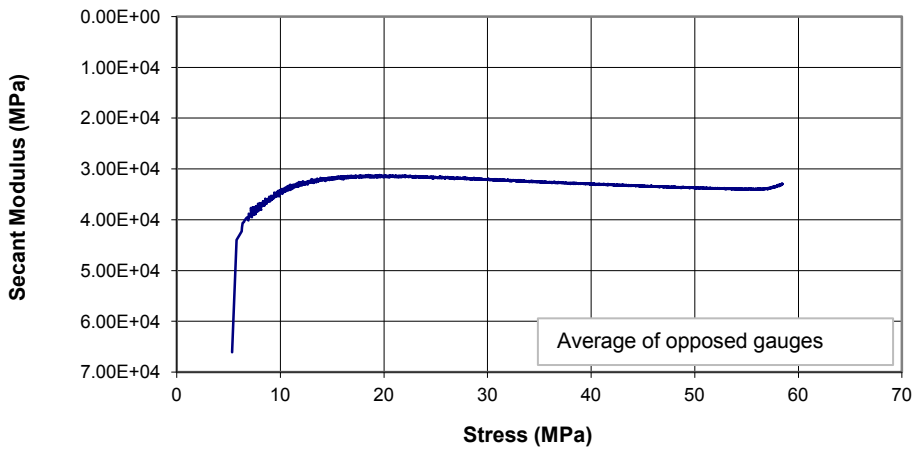
After Test

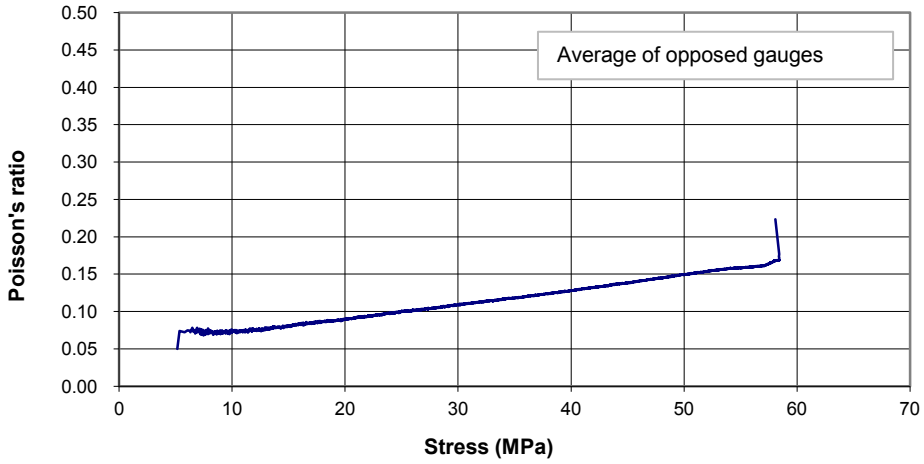
Test Summary			ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	117.5	MPa				
Secant Modulus, ε_{50}	33.2	GPa	Borehole:	BH-BGC12-76	Project No.:	12-1415-0029/9000
Poisson's Ratio, ν_{50}	0.14		Sample:	R2	Project:	Eagle Gold Detail Design Support
Height:	123.65	mm	Depth (m):	20.35		
Diameter:	61.07	mm	Tested By:	G. Patton	Location	Yukon
Failure Mode:	Along Foliation 31°		Reviewed By	E. Kostyukov	Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test



After Test

Test Summary

Peak Stress σ_{peak}	58.4	MPa
Secant Modulus, ε_{50}	32.0	GPa
Poisson's Ratio, ν_{50}	0.11	
Height:	125.76	mm
Diameter:	60.76	mm
Failure Mode:	Along Foliation 45°	

ASTM D7012-07 Method D
Modulus in Uniaxial Compression

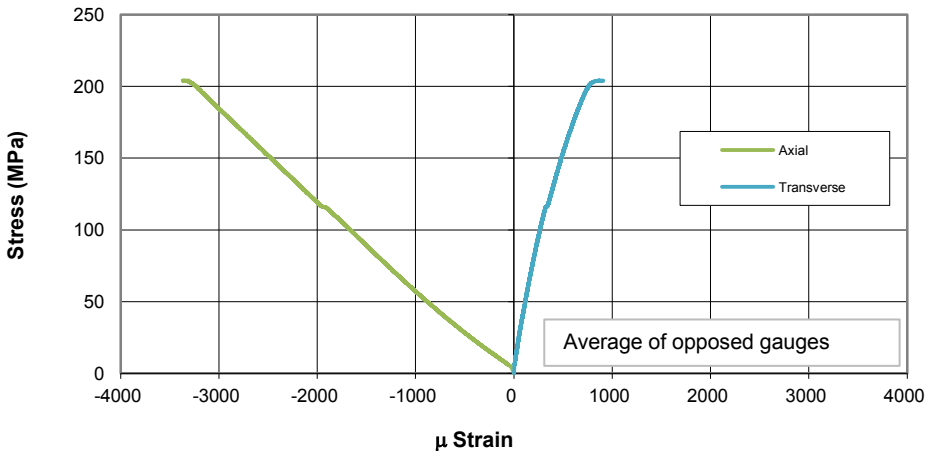
Borehole:	BH-BGC12-79
Sample:	R3
Depth (m):	37.30
Tested By:	G. Patton
Reviewed By	E. Kostyukov

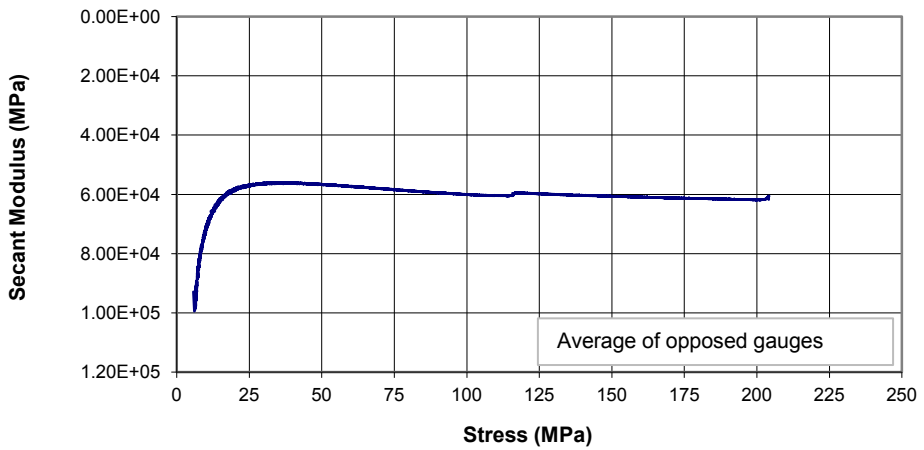
Project Details

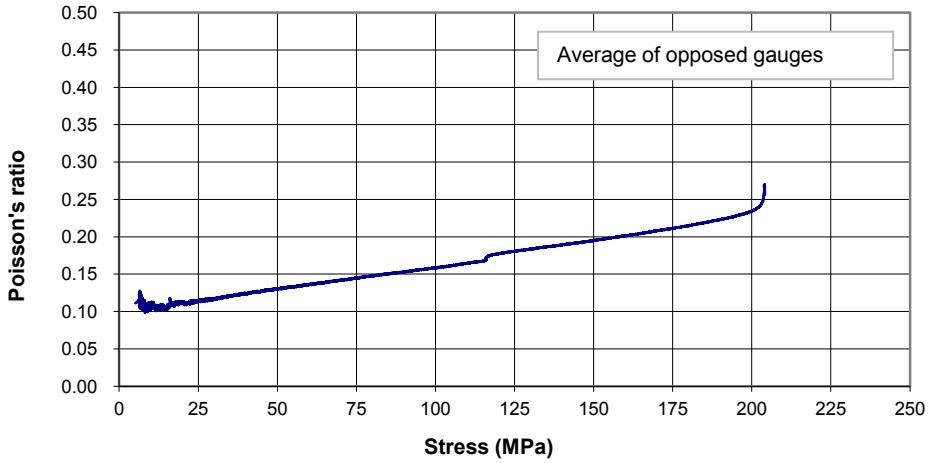
Project No.:	12-1415-0029/9000
Project:	Eagle Gold Detail Design Support
Location	Yukon
Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Golder Associates Ltd. Burnaby Laboratory
4280 - Still Creek Drive, Burnaby, BC V5C 6C6
Tel: + 1 (604) 296 4200 Fax: 1 + (604) 296 5253









Before Test



After Test

Test Summary

Peak Stress σ_{peak}	204.2	MPa
Secant Modulus, ε_{50}	60.2	GPa
Poisson's Ratio, ν_{50}	0.16	
Height:	127.33	mm
Diameter:	60.87	mm
Failure Mode:	Vertical	

ASTM D7012-07 Method D
Modulus in Uniaxial Compression

Borehole:	BH-BGC12-79
Sample:	R5
Depth (m):	33.30
Tested By:	G. Patton
Reviewed By	E. Kostyukov

Project Details

Project No.:	12-1415-0029/9000
Project:	Eagle Gold Detail Design Support
Location	Yukon
Client	BGC Engineering Inc.

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Specific Gravity and Absorption of Rock For Erosion Control

ASTM D6473-10

Project #:	11-1415-0029/9000
Short Title:	Eagle Gold Detail Design Support
Client	BGC Engineering Inc.
Location	Yukon
Lab ID	138

Borehole	BH-BGC12-79	BH-BGC12-79	BH-BGC12-75	BH-BGC12-75	BH-BGC12-76	BH-BGC12-76
Sample Number	R3	R5	R2	R3	R1	R2
Depth (m)	37.3	33.3	15.00	20.55	33.20	20.35
Bulk G_S (Oven Dry)	2.55	2.66	2.73	2.62	2.61	2.64
Bulk G_S (SSD)	2.59	2.67	2.75	2.65	2.63	2.65
Apparent G_S	2.65	2.67	2.78	2.69	2.67	2.68
% Absorption	1.37	0.15	0.62	0.92	0.96	0.56

Borehole						
Sample Number						
Depth (m)						
Bulk G_S (Oven Dry)						
Bulk G_S (SSD)						
Apparent G_S						
% Absorption						

Borehole						
Sample Number						
Depth (m)						
Bulk G_S (Oven Dry)						
Bulk G_S (SSD)						
Apparent G_S						
% Absorption						

Borehole						
Sample Number						
Depth (m)						
Bulk G_S (Oven Dry)						
Bulk G_S (SSD)						
Apparent G_S						
% Absorption						

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE TESTED	CHECKED BY	DATE CHECKED

Golder Associates Ltd.
500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
Tel: +1 (604) 296 4200 Fax: +1 (604) 298 5253 www.golder.com

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-75**
Project:	Eagle Gold Detail Design Support	**Sample Number:**	R3 BTS 1
Location:	Yukon	**Depth (m):**	20.55
Client:	BGC Engineering Inc.	**Lab ID No:**	138

Testing Results

Max Load (MN)	**0.0361**
Tensile Stress (MPa)	**13.5**

Sample Measurements

Diameter (mm)	60.49
Thickness (mm)	28.08
Area (cm^2)	28.74
Volume (cm^3)	80.70
Mass (g)	213.60
Moisture Content (%)	0.38
Wet Density (Kg/m^3)	2646.96
Dry Density (Kg/m^3)	2636.82

Failure Mode

Type: Along Discontinuity

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	BUR010025
Transducer ID	ELE
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-75**
Project:	Eagle Gold Detail Design Support	**Sample Number:**	R3 BTS 2
Location:	Yukon	**Depth (m):**	20.55
Client:	BGC Engineering Inc.	**Lab ID No:**	138

Testing Results

Max Load (MN)	**0.0269**
Tensile Stress (MPa)	**10.1**

Sample Measurements

Diameter (mm)	60.49
Thickness (mm)	28.06
Area (cm^2)	28.74
Volume (cm^3)	80.65
Mass (g)	210.00
Moisture Content (%)	0.38
Wet Density (Kg/m^3)	2603.89
Dry Density (Kg/m^3)	2593.92

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	BUR010025
Transducer ID	ELE
Ram Area cm^2	N/A
Data Logger	N/A

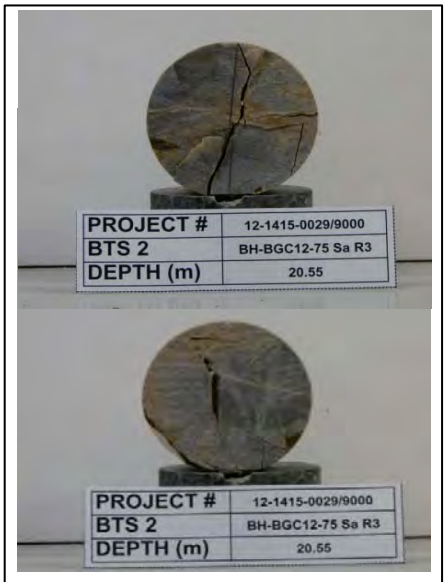
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-076**
Project:	Eagle Gold Detail Design Support	**Sample Number:**	R1 BTS 1
Location:	Yukon	**Depth (m):**	33.20
Client:	BGC Engineering Inc.	**Lab ID No:**	138

Testing Results

Max Load (MN)	**0.0227**
Tensile Stress (MPa)	**7.9**

Sample Measurements

Diameter (mm)	61.03
Thickness (mm)	29.79
Area (cm^2)	29.26
Volume (cm^3)	87.17
Mass (g)	223.20
Moisture Content (%)	0.22
Wet Density (Kg/m^3)	2560.65
Dry Density (Kg/m^3)	2554.97

Failure Mode

Type: Along Discontinuity

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

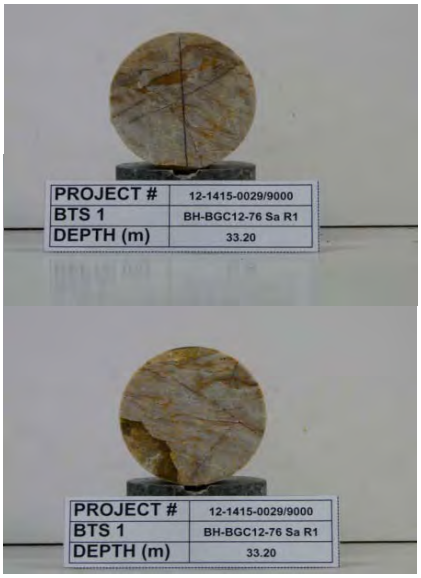
Calibration

Machine ID	BUR010025
Transducer ID	ELE
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-076**
Project:	Eagle Gold Detail Design Support	**Sample Number:**	R2 BTS 1
Location:	Yukon	**Depth (m):**	20.35
Client:	BGC Engineering Inc.	**Lab ID No:**	138

Testing Results

Max Load (MN)	**0.0452**
Tensile Stress (MPa)	**16.2**

Sample Measurements

Diameter (mm)	61.08
Thickness (mm)	28.96
Area (cm^2)	29.30
Volume (cm^3)	84.87
Mass (g)	222.00
Moisture Content (%)	0.09
Wet Density (Kg/m^3)	2615.87
Dry Density (Kg/m^3)	2613.64

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

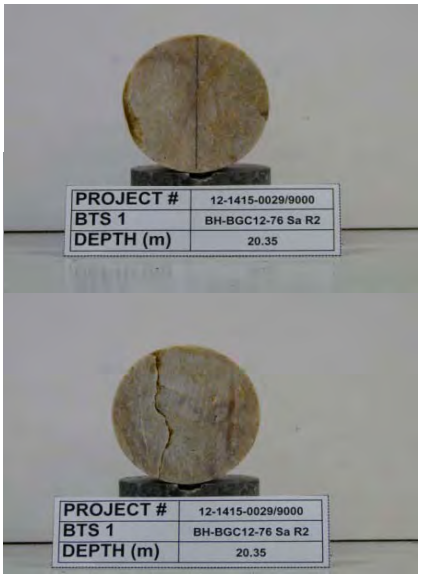
Calibration

Machine ID	BUR010025
Transducer ID	ELE
Ram Area cm^2	N/A
Data Logger	N/A

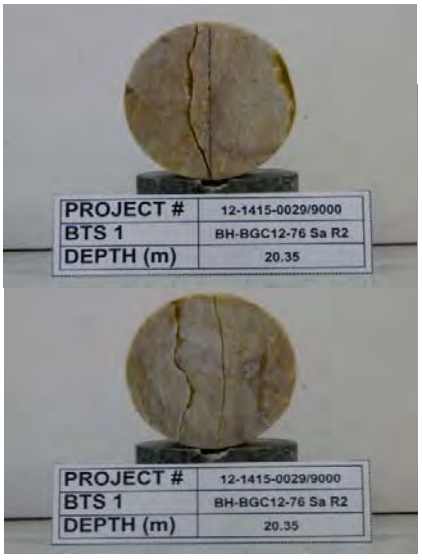
Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-076**
Project:	Eagle Gold Detail Design Support	**Sample Number:**	R2 BTS 2
Location:	Yukon	**Depth (m):**	20.35
Client:	BGC Engineering Inc.	**Lab ID No:**	138

Testing Results

Max Load (MN)	**0.0463**
Tensile Stress (MPa)	**17.1**

Sample Measurements

Diameter (mm)	61.07
Thickness (mm)	28.16
Area (cm^2)	29.29
Volume (cm^3)	82.50
Mass (g)	216.80
Moisture Content (%)	0.09
Wet Density (Kg/m^3)	2627.74
Dry Density (Kg/m^3)	2625.50

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

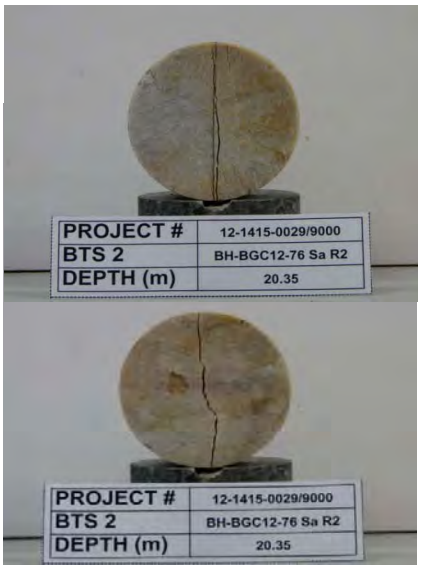
Machine ID	BUR010025
Transducer ID	ELE
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided



BEFORE TEST



AFTER TEST

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-079**
Project:	Eagle Gold Detail Design Support	**Sample Number:**	R3 BTS 1
Location:	Yukon	**Depth (m):**	37.30
Client:	BGC Engineering Inc.	**Lab ID No:**	138

Testing Results

Max Load (MN)	**0.0230**
Tensile Stress (MPa)	**7.5**

Sample Measurements

Diameter (mm)	60.81
Thickness (mm)	31.88
Area (cm^2)	29.04
Volume (cm^3)	92.60
Mass (g)	237.90
Moisture Content (%)	0.54
Wet Density (Kg/m^3)	2569.16
Dry Density (Kg/m^3)	2555.26

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	BUR010025
Transducer ID	ELE
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-079**
Project:	Eagle Gold Detail Design Support	**Sample Number:**	R3 BTS 2
Location:	Yukon	**Depth (m):**	37.30
Client:	BGC Engineering Inc.	**Lab ID No:**	138

Testing Results

Max Load (MN)	**0.0283**
Tensile Stress (MPa)	**9.6**

Sample Measurements

Diameter (mm)	60.84
Thickness (mm)	30.86
Area (cm^2)	29.07
Volume (cm^3)	89.71
Mass (g)	232.40
Moisture Content (%)	0.54
Wet Density (Kg/m^3)	2590.71
Dry Density (Kg/m^3)	2576.70

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	BUR010025
Transducer ID	ELE
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-079**
Project:	Eagle Gold Detail Design Support	**Sample Number:**	R5 BTS 1
Location:	Yukon	**Depth (m):**	33.30
Client:	BGC Engineering Inc.	**Lab ID No:**	138

Testing Results

Max Load (MN)	**0.0770**
Tensile Stress (MPa)	**26.0**

Sample Measurements

Diameter (mm)	60.88
Thickness (mm)	30.97
Area (cm^2)	29.11
Volume (cm^3)	90.16
Mass (g)	239.80
Moisture Content (%)	0.07
Wet Density (Kg/m^3)	2659.64
Dry Density (Kg/m^3)	2657.65

Failure Mode

Type: Vertical Splitting

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	BUR010025
Transducer ID	ELE
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-079**
Project:	Eagle Gold Detail Design Support	**Sample Number:**	R5 BTS 2
Location:	Yukon	**Depth (m):**	33.30
Client:	BGC Engineering Inc.	**Lab ID No:**	138

Testing Results

Max Load (MN)	**0.0383**
Tensile Stress (MPa)	**13.6**

Sample Measurements

Diameter (mm)	60.91
Thickness (mm)	29.42
Area (cm^2)	29.14
Volume (cm^3)	85.72
Mass (g)	227.30
Moisture Content (%)	0.07
Wet Density (Kg/m^3)	2651.79
Dry Density (Kg/m^3)	2649.80

Failure Mode

Type: Along Discontinuity

Load Orientation

Direction of loading axis with respect to bedding or foliation plane in degrees: 90

Calibration

Machine ID	BUR010025
Transducer ID	ELE
Ram Area cm^2	N/A
Data Logger	N/A

Comments

Lithology: Not Provided

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE TEST



AFTER TEST

G. Patton	August 13, 2012	E. Kostyukov	August 17, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

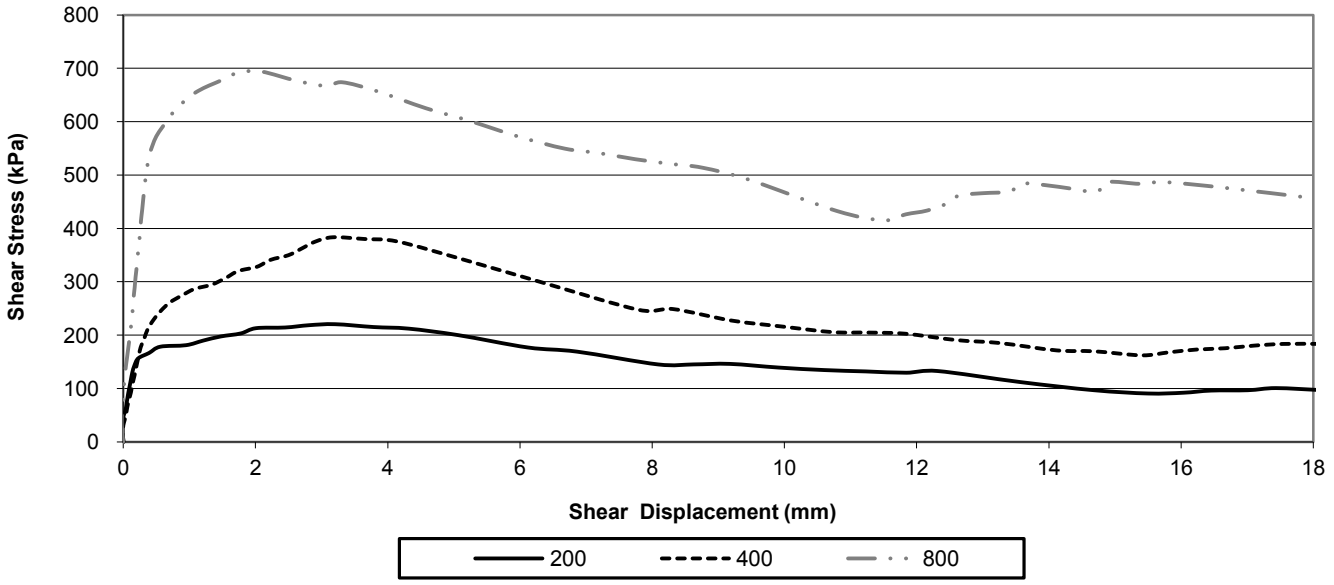
Direct Shear Strength Testing Under Constant Normal Force

Reference
ASTM D5607-08

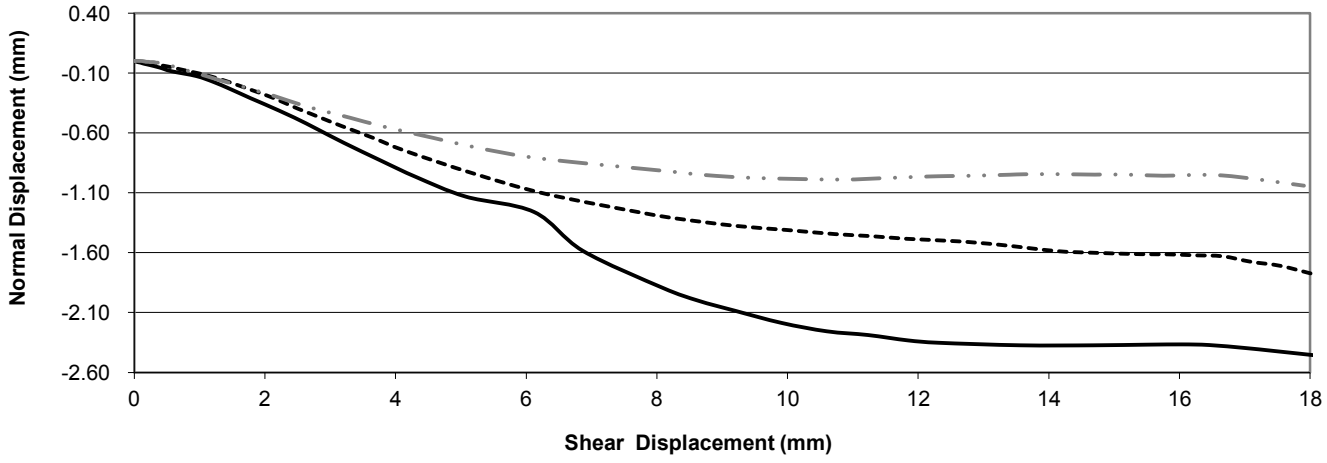
Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-75**
Client:	BGC ENGINEERING INC.	**Sample No.:**	R7
Project:	-	**Depth (m.):**	25.35
Location:	EAGLE GOLD	**Lab ID No:**	138

Specimen		Machine ID's	
Joint Type	OPEN FACE	Pressure Transducer	PT0001
Shape	Elliptical	Horizontal LVDT	ID0002
Joint Angle	30	Vertical LVDT	ID0003

Shear Displacement vs. Shear Stress



Shear Displacement vs. Normal Displacement



LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY:	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference
ASTM D5607-08

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-75**
Client:	BGC ENGINEERING INC.	**Sample No.:**	R7
Project:	-	**Depth (m.):**	25.35
Location:	EAGLE GOLD	**Lab ID No:**	138



BEFORE TEST



AFTER TEST

LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY:	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference
ASTM D5607-08

Client:	BGC ENGINEERING INC.	**Borehole:**	**BH-BGC12-75**
Project:	-	**Sample No.:**	R7
Location:	EAGLE GOLD	**Depth (m.):**	25.35
Project No.:	12-1415-0029/9000	**Lab ID No:**	138

Peak 1	
Normal Stress , kPa	200

Residual 1	
Normal Stress , kPa	400

Residual 2	
Normal Stress , kPa	800

Residual 3	
Normal Stress , kPa	-

Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm
0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00			
0.00	0.66	0.00	0.00	0.93	0.00	0.00	0.68	0.00			
0.00	3.57	0.00	0.00	4.87	0.00	0.00	4.12	0.00			
0.00	7.09	0.00	-0.01	12.03	0.00	-0.01	10.26	0.00			
-0.01	10.86	0.00	0.00	21.60	0.00	-0.01	17.47	0.00			
-0.01	15.16	0.00	0.00	31.49	0.00	-0.02	26.48	0.00			
-0.01	19.69	0.00	0.02	41.52	0.00	-0.02	35.53	0.00			
-0.01	24.85	0.00	0.04	53.42	0.00	-0.02	46.08	0.00			
-0.01	30.39	0.00	0.06	65.74	-0.01	-0.02	56.83	0.00			
-0.01	35.97	0.00	0.08	79.18	-0.01	-0.01	68.56	0.00			
0.00	41.96	0.00	0.11	93.00	-0.01	0.00	80.31	0.00			
0.00	49.29	0.00	0.14	108.29	-0.01	0.00	94.01	0.00			
0.03	57.10	0.00	0.17	124.55	-0.01	0.01	108.42	0.00			
0.04	65.30	-0.01	0.20	141.27	-0.02	0.03	123.89	0.00			
0.05	73.33	-0.01	0.23	158.97	-0.02	0.04	139.71	0.00			
0.06	83.31	-0.01	0.26	177.45	-0.02	0.06	156.41	0.00			
0.08	93.83	-0.01	0.32	194.32	-0.03	0.07	173.24	0.00			
0.10	104.76	-0.01	0.37	212.70	-0.03	0.09	190.68	0.00			
0.11	116.93	-0.02	0.46	229.40	-0.04	0.11	209.95	0.00			
0.14	129.94	-0.02	0.57	245.78	-0.05	0.13	228.96	0.00			
0.17	143.29	-0.03	0.70	261.24	-0.07	0.14	248.13	0.00			
0.23	156.67	-0.03	0.88	274.02	-0.09	0.16	268.70	0.00			
0.39	166.64	-0.06	1.07	286.65	-0.11	0.17	289.02	-0.01			
0.56	178.38	-0.08	1.34	294.87	-0.15	0.19	309.17	-0.01			
0.95	181.20	-0.13	1.55	307.24	-0.19	0.21	329.94	-0.01			
1.21	189.78	-0.17	1.74	320.36	-0.23	0.22	350.77	-0.01			
1.47	197.55	-0.24	2.02	328.34	-0.28	0.24	370.86	-0.01			
1.78	203.22	-0.31	2.22	341.24	-0.33	0.26	392.13	-0.01			
2.01	213.02	-0.36	2.49	350.00	-0.39	0.27	414.15	-0.01			
2.45	214.30	-0.47	2.70	362.82	-0.44	0.29	434.95	-0.01			

LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference ASTM D5607-08

Client:	BGC ENGINEERING INC.	**Borehole:**	**BH-BGC12-75**
Project:	-	**Sample No.:**	R7
Location:	EAGLE GOLD	**Depth (m.):**	25.35
Project No.:	12-1415-0029/9000	**Lab ID No:**	138

Peak 1	
Normal Stress , kPa	200

Residual 1	
Normal Stress , kPa	400

Residual 2	
Normal Stress , kPa	800

Residual 3	
Normal Stress , kPa	-

Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm
2.81	218.60	-0.57	2.90	375.48	-0.48	0.30	456.41	-0.01			
3.20	220.52	-0.68	3.17	383.66	-0.54	0.32	477.15	-0.01			
3.79	215.15	-0.84	3.65	380.35	-0.64	0.34	497.65	-0.01			
4.32	212.17	-0.97	4.15	375.57	-0.75	0.37	518.08	-0.01			
5.07	199.92	-1.13	5.19	340.22	-0.94	0.40	537.02	-0.02			
6.12	176.92	-1.26	6.29	300.61	-1.11	0.44	555.12	-0.02			
6.87	169.09	-1.59	7.81	247.38	-1.27	0.50	572.76	-0.03			
8.09	145.15	-1.90	8.31	249.21	-1.31	0.59	588.66	-0.04			
8.63	145.20	-2.00	9.20	227.58	-1.37	0.68	604.50	-0.06			
9.18	146.15	-2.08	9.98	216.07	-1.41	0.77	619.74	-0.07			
9.91	139.34	-2.19	10.72	205.87	-1.44	0.88	633.05	-0.09			
10.60	134.60	-2.26	11.27	205.02	-1.46	1.00	646.41	-0.11			
11.23	132.09	-2.29	11.83	202.89	-1.48	1.14	657.76	-0.13			
11.85	129.60	-2.33	12.60	190.91	-1.50	1.30	667.58	-0.16			
12.31	132.89	-2.35	13.25	185.54	-1.53	1.48	676.96	-0.19			
13.56	112.19	-2.37	14.12	171.63	-1.59	1.63	686.80	-0.21			
14.68	96.91	-2.37	14.69	169.88	-1.60	1.82	693.61	-0.24			
15.50	90.75	-2.37	15.40	162.37	-1.61	2.10	693.61	-0.28			
16.03	92.16	-2.37	15.81	167.99	-1.61	2.62	676.49	-0.38			
16.45	96.24	-2.37	16.23	173.18	-1.62	3.07	666.68	-0.44			
17.01	96.88	-2.40	16.66	175.62	-1.63	3.31	673.67	-0.48			
17.43	100.84	-2.42	17.09	180.52	-1.68	3.83	657.45	-0.55			
18.11	97.08	-2.46	17.54	183.74	-1.71	4.58	625.03	-0.64			
			18.08	183.81	-1.78	5.23	601.70	-0.72			
						5.98	571.84	-0.80			
						6.68	549.43	-0.84			
						7.20	541.02	-0.87			
						7.74	529.66	-0.90			
						8.28	520.81	-0.93			
						8.76	513.64	-0.95			

LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference ASTM D5607-08

Client:	BGC ENGINEERING INC.	**Borehole:**	**BH-BGC12-75**
Project:	-	**Sample No.:**	R7
Location:	EAGLE GOLD	**Depth (m.):**	25.35
Project No.:	12-1415-0029/9000	**Lab ID No:**	138

Peak 1		Residual 1		Residual 2		Residual 3	
Normal Stress , kPa	200	Normal Stress , kPa	400	Normal Stress , kPa	800	Normal Stress , kPa	-

Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm
						9.47	490.91	-0.98			
						10.79	432.66	-0.99			
						11.51	415.09	-0.98			
						11.84	426.34	-0.97			
						12.15	433.29	-0.96			
						12.44	445.87	-0.96			
						12.64	461.60	-0.96			
						13.00	465.97	-0.96			
						13.40	469.11	-0.95			
						13.62	483.97	-0.95			
						14.15	477.88	-0.95			
						14.71	468.84	-0.95			
						14.89	486.87	-0.95			
						15.37	483.47	-0.95			
						15.75	486.66	-0.96			
						16.65	476.09	-0.96			
						17.91	457.85	-1.04			

LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

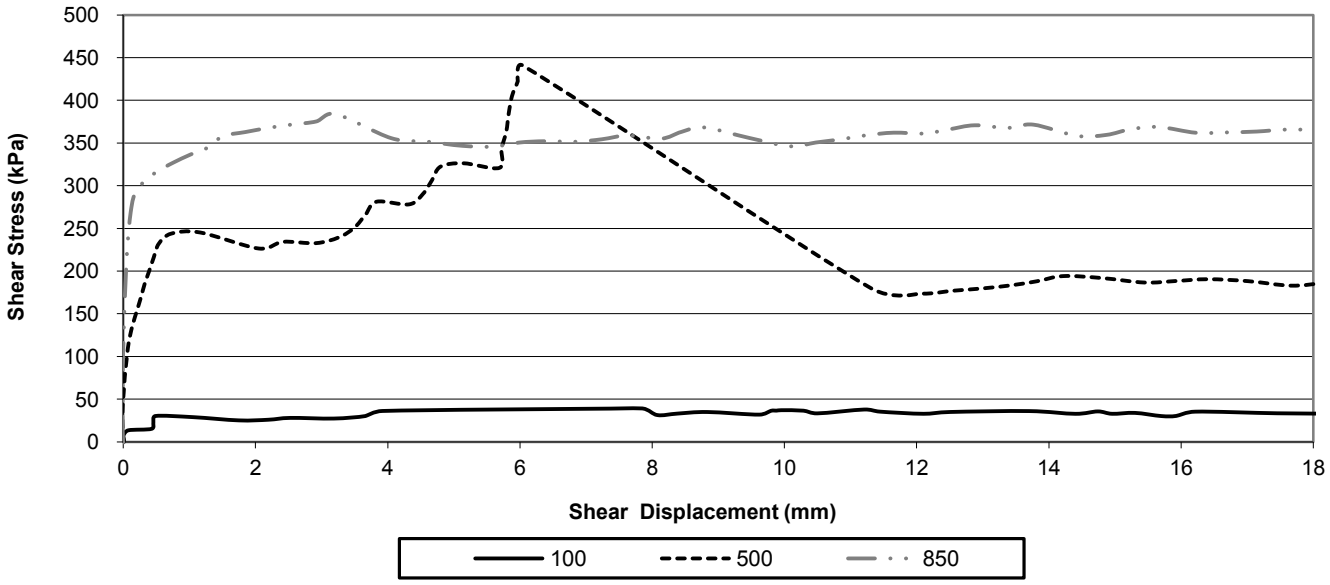
Direct Shear Strength Testing Under Constant Normal Force

Reference
ASTM D5607-08

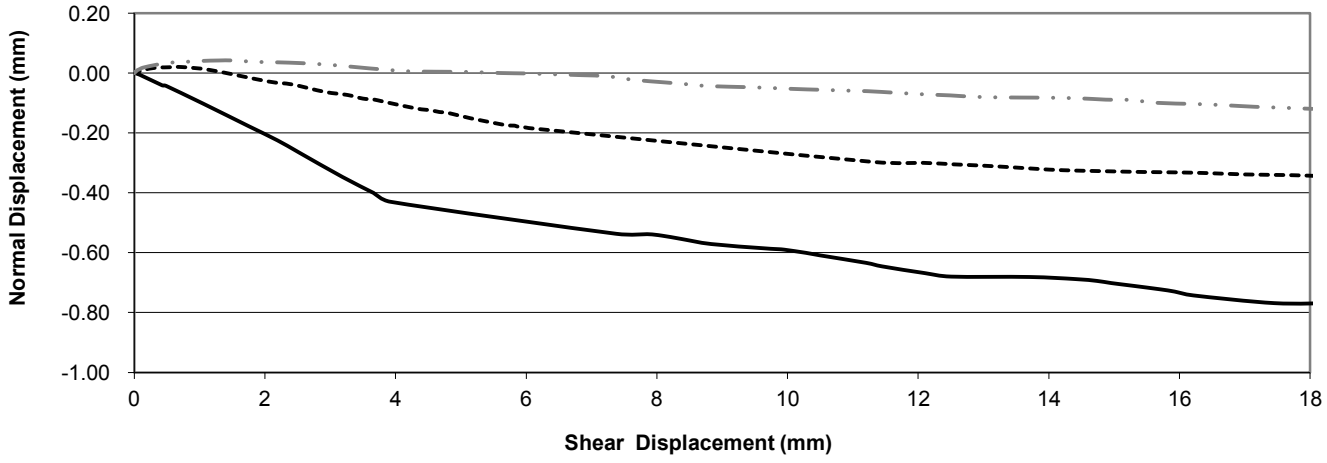
Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-79**
Client:	BGC ENGINEERING INC.	**Sample No.:**	R4
Project:	-	**Depth (m.):**	35.75
Location:	EAGLE GOLD	**Lab ID No:**	138

Specimen		Machine ID's	
Joint Type	OPEN FACE	Pressure Transducer	PT0001
Shape	Elliptical	Horizontal LVDT	ID0002
Joint Angle	27	Vertical LVDT	ID0003

Shear Displacement vs. Shear Stress



Shear Displacement vs. Normal Displacement



LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY:	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference
ASTM D5607-08

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-79**
Client:	BGC ENGINEERING INC.	**Sample No.:**	R4
Project:	-	**Depth (m.):**	35.75
Location:	EAGLE GOLD	**Lab ID No:**	138



BEFORE TEST



AFTER TEST

LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY:	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference
ASTM D5607-08

Client:	BGC ENGINEERING INC.	**Borehole:**	**BH-BGC12-79**
Project:	-	**Sample No.:**	R4
Location:	EAGLE GOLD	**Depth (m.):**	35.75
Project No.:	12-1415-0029/9000	**Lab ID No:**	138

Peak 1	
Normal Stress , kPa	100

Residual 1	
Normal Stress , kPa	500

Residual 2	
Normal Stress , kPa	850

Residual 3	
Normal Stress , kPa	-

Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm
0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00			
0.01	-0.15	0.00	0.00	-0.49	0.00	0.00	-0.70	0.00			
0.01	2.84	0.00	0.00	2.12	0.00	0.00	2.49	0.00			
0.00	8.03	0.00	-0.01	9.51	0.00	-0.01	11.28	0.00			
0.08	13.58	0.00	-0.01	17.88	0.00	-0.01	21.11	0.00			
0.43	15.30	-0.04	-0.01	26.34	0.00	-0.01	33.15	0.00			
0.45	22.78	-0.04	-0.01	36.45	0.00	-0.01	44.76	0.00			
0.49	30.32	-0.04	0.00	46.57	0.00	-0.01	58.66	0.00			
1.06	28.97	-0.10	0.01	57.47	0.00	-0.01	72.40	0.00			
1.75	25.18	-0.18	0.02	69.82	0.00	-0.01	86.72	0.00			
2.19	25.96	-0.23	0.03	82.35	0.00	0.00	101.99	0.00			
2.53	28.10	-0.27	0.05	95.71	0.00	0.00	118.12	0.00			
3.18	27.36	-0.35	0.07	109.94	0.01	0.01	135.08	0.00			
3.66	30.30	-0.40	0.10	123.99	0.01	0.02	152.70	0.00			
3.92	36.24	-0.43	0.15	138.57	0.01	0.02	170.45	0.01			
7.38	39.04	-0.54	0.20	153.27	0.01	0.04	189.04	0.01			
7.85	39.23	-0.54	0.27	168.77	0.02	0.05	208.61	0.01			
8.08	31.41	-0.54	0.32	184.54	0.02	0.06	228.51	0.01			
8.38	33.16	-0.55	0.39	200.53	0.02	0.08	248.70	0.01			
8.83	35.03	-0.57	0.46	216.26	0.02	0.11	269.07	0.02			
9.62	31.96	-0.59	0.54	232.30	0.02	0.17	288.99	0.02			
9.80	36.43	-0.59	0.73	244.07	0.02	0.31	304.33	0.03			
9.88	36.66	-0.59	1.17	245.32	0.01	0.52	316.90	0.03			
9.95	37.16	-0.59	2.05	226.58	-0.03	0.75	326.83	0.04			
10.29	36.60	-0.60	2.41	234.43	-0.04	1.02	336.45	0.04			
10.50	33.43	-0.61	2.91	232.88	-0.06	1.30	345.20	0.04			
11.21	37.94	-0.63	3.26	239.73	-0.07	1.50	357.91	0.04			
11.45	35.43	-0.65	3.50	251.15	-0.09	1.84	362.69	0.04			
12.11	32.92	-0.67	3.66	266.21	-0.09	2.19	367.56	0.04			
12.51	35.06	-0.68	3.83	281.44	-0.10	2.55	371.53	0.03			

LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference ASTM D5607-08

Client:	BGC ENGINEERING INC.	**Borehole:**	**BH-BGC12-79**
Project:	-	**Sample No.:**	R4
Location:	EAGLE GOLD	**Depth (m.):**	35.75
Project No.:	12-1415-0029/9000	**Lab ID No:**	138

Peak 1	
Normal Stress , kPa	100

Horz Disp mm	Shear Stress kPa	Vert Disp mm
13.70	36.11	-0.68
14.40	32.90	-0.69
14.74	35.70	-0.69
14.96	32.92	-0.70
15.30	34.01	-0.71
15.70	30.27	-0.72
15.93	30.44	-0.73
16.21	35.45	-0.74
17.46	33.52	-0.77
18.36	33.12	-0.77

Residual 1	
Normal Stress , kPa	500

Horz Disp mm	Shear Stress kPa	Vert Disp mm
4.32	278.32	-0.12
4.53	290.46	-0.12
4.67	306.43	-0.13
4.80	322.57	-0.13
5.15	326.46	-0.15
5.69	321.08	-0.17
5.72	343.40	-0.17
5.79	363.52	-0.18
5.83	384.50	-0.18
5.88	405.03	-0.18
5.97	422.53	-0.18
6.04	441.15	-0.18
11.31	180.08	-0.30
12.07	173.82	-0.30
12.55	177.16	-0.30
12.99	179.81	-0.31
13.43	183.49	-0.31
13.83	188.31	-0.32
14.22	194.31	-0.32
14.81	191.99	-0.33
15.45	186.73	-0.33
15.93	188.54	-0.33
16.41	190.63	-0.33
17.02	188.37	-0.34
17.67	183.07	-0.34
18.16	186.37	-0.34

Residual 2	
Normal Stress , kPa	850

Horz Disp mm	Shear Stress kPa	Vert Disp mm
2.92	375.18	0.03
3.21	383.93	0.02
4.05	355.58	0.01
4.60	351.55	0.00
5.13	346.63	0.00
5.60	345.72	0.00
5.99	350.46	0.00
6.38	352.02	0.00
6.85	351.43	-0.01
7.24	354.29	-0.01
7.63	358.66	-0.02
8.13	355.04	-0.03
8.44	362.98	-0.04
8.78	368.17	-0.04
9.46	355.99	-0.05
10.09	346.05	-0.05
10.47	350.50	-0.06
10.87	354.41	-0.06
11.23	358.96	-0.06
11.65	362.01	-0.07
12.11	361.04	-0.07
12.49	365.86	-0.07
12.88	370.66	-0.08
13.37	367.60	-0.08
13.76	371.39	-0.08
14.42	358.31	-0.08
14.87	359.42	-0.09
15.23	366.06	-0.09
15.66	368.69	-0.10
16.22	361.92	-0.10

Residual 3	
Normal Stress , kPa	-

Horz Disp mm	Shear Stress kPa	Vert Disp mm

LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference ASTM D5607-08

Client:	BGC ENGINEERING INC.	**Borehole:**	**BH-BGC12-79**
Project:	-	**Sample No.:**	R4
Location:	EAGLE GOLD	**Depth (m.):**	35.75
Project No.:	12-1415-0029/9000	**Lab ID No:**	138

Peak 1		Residual 1		Residual 2		Residual 3	
Normal Stress , kPa	100	Normal Stress , kPa	500	Normal Stress , kPa	850	Normal Stress , kPa	-

Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm
						16.69	362.33	-0.11			
						17.14	363.36	-0.11			
						17.56	365.58	-0.12			
						18.03	365.30	-0.12			

LP	8/20/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

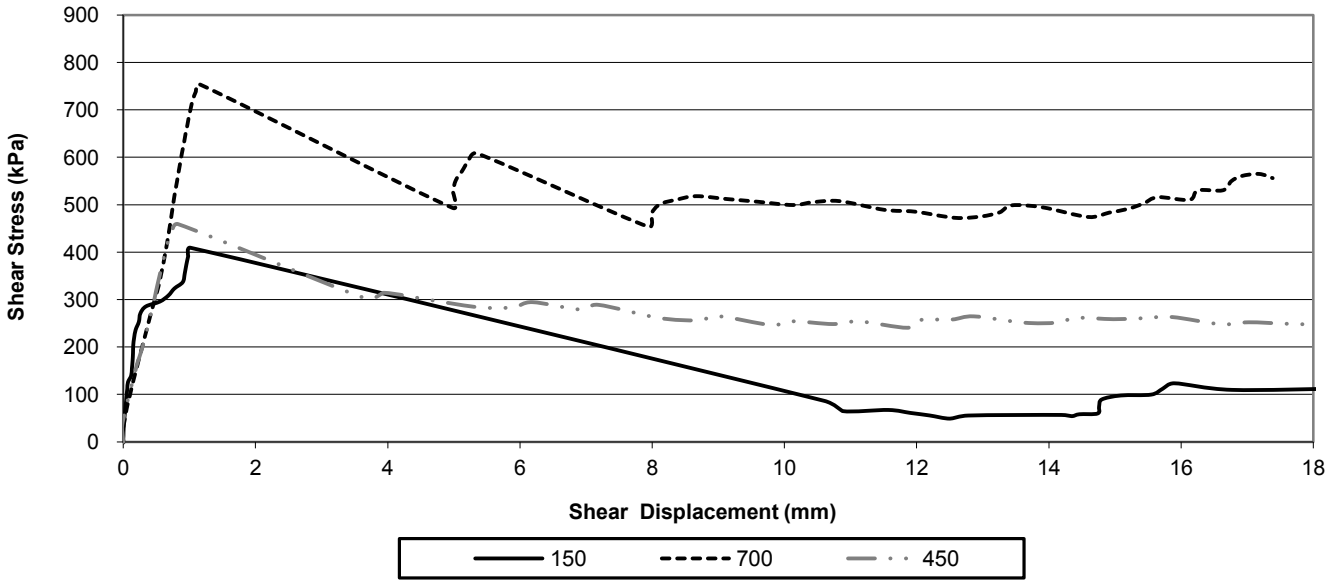
Direct Shear Strength Testing Under Constant Normal Force

Reference
ASTM D5607-08

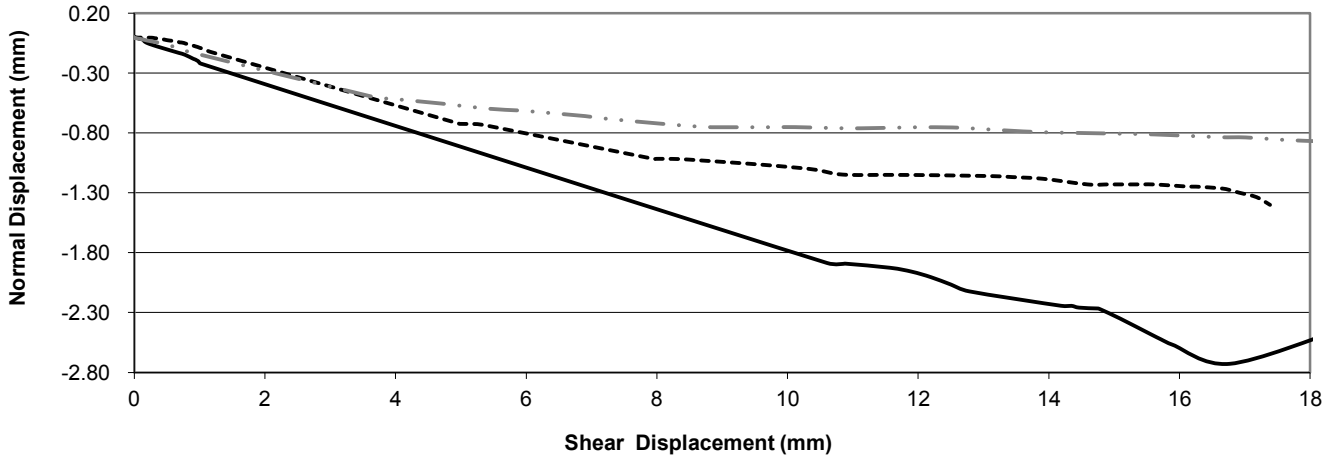
Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-79**
Client:	BGC ENGINEERING INC.	**Sample No.:**	R7
Project:	-	**Depth (m.):**	29.90
Location:	EAGLE GOLD	**Lab ID No:**	138

Specimen		Machine ID's	
Joint Type	OPEN FACE	Pressure Transducer	PT0001
Shape	Elliptical	Horizontal LVDT	ID0002
Joint Angle	24	Vertical LVDT	ID0003

Shear Displacement vs. Shear Stress



Shear Displacement vs. Normal Displacement



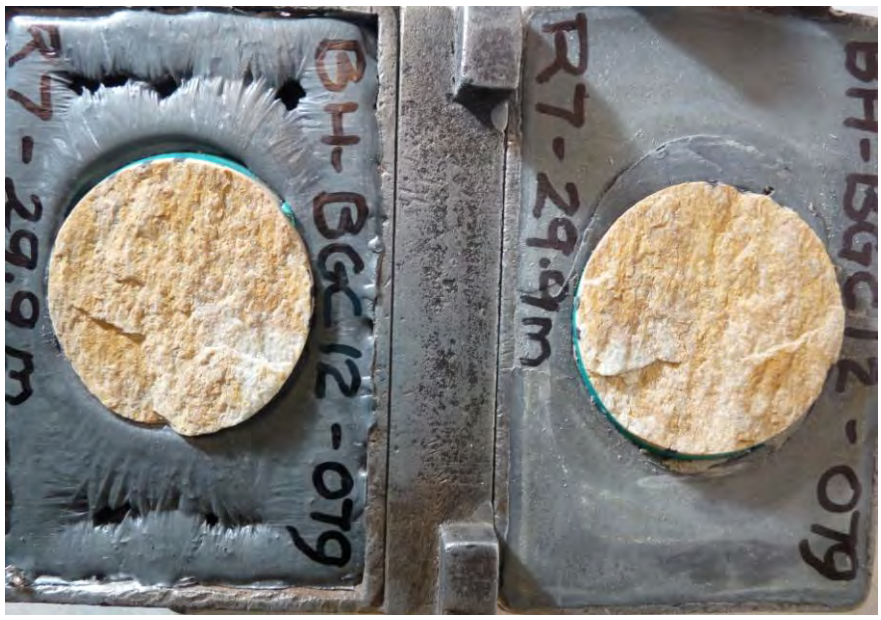
LP	8/22/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY:	DATE

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

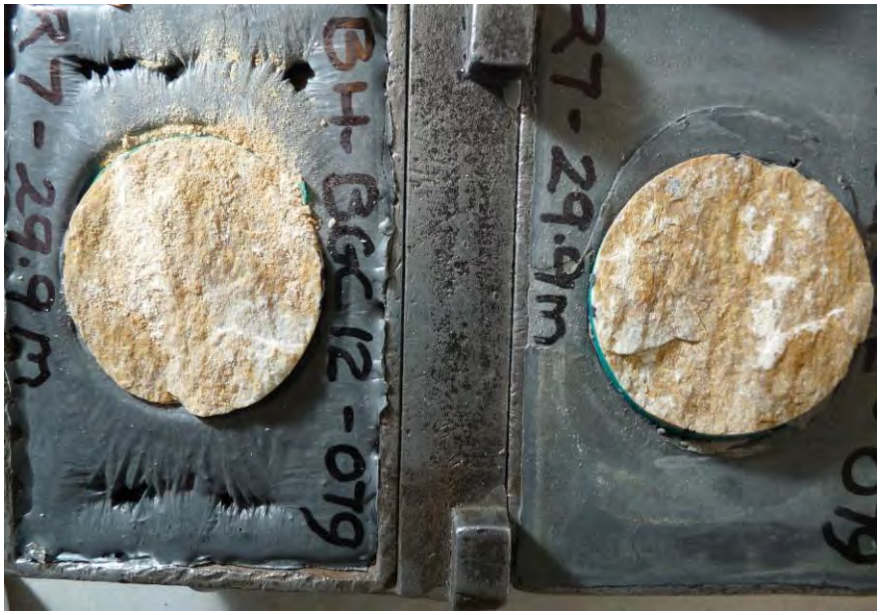
Direct Shear Strength Testing Under Constant Normal Force

Reference
ASTM D5607-08

Project No.:	12-1415-0029/9000	**Borehole:**	**BH-BGC12-79**
Client:	BGC ENGINEERING INC.	**Sample No.:**	R7
Project:	-	**Depth (m.):**	29.90
Location:	EAGLE GOLD	**Lab ID No:**	138



BEFORE TEST



AFTER TEST

LP	8/22/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY:	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference ASTM D5607-08

Client:	BGC ENGINEERING INC.	**Borehole:**	**BH-BGC12-79**
Project:	-	**Sample No.:**	R7
Location:	EAGLE GOLD	**Depth (m.):**	29.90
Project No.:	12-1415-0029/9000	**Lab ID No:**	138

Peak 1		Residual 1		Residual 2		Residual 3	
Normal Stress , kPa	150	Normal Stress , kPa	700	Normal Stress , kPa	450	Normal Stress , kPa	-

Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm
0.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.00			
0.00	-1.20	0.00	0.00	0.36	0.00	0.00	0.28	0.00			
0.00	-0.06	0.00	0.00	4.01	0.00	-0.01	2.95	0.00			
0.00	5.52	0.00	-0.01	11.95	0.00	-0.01	10.40	0.00			
0.00	12.72	0.00	0.00	22.21	0.00	-0.02	19.91	0.00			
0.00	20.86	0.00	0.00	32.84	0.00	-0.02	30.03	0.00			
0.00	30.57	0.00	0.02	44.32	0.00	-0.01	41.54	0.00			
0.01	40.65	0.00	0.03	57.13	0.00	0.01	54.13	-0.01			
0.02	51.43	0.00	0.05	70.54	0.00	0.03	66.01	-0.01			
0.02	62.03	0.00	0.07	83.66	0.00	0.05	79.85	-0.01			
0.03	74.00	0.00	0.10	97.38	0.00	0.08	94.47	-0.01			
0.04	86.23	0.00	0.12	112.52	0.00	0.10	110.12	-0.02			
0.05	98.79	-0.01	0.15	128.46	0.00	0.14	125.66	-0.02			
0.06	112.61	-0.01	0.18	144.96	0.00	0.17	141.50	-0.02			
0.07	126.07	-0.01	0.21	162.20	0.00	0.20	159.76	-0.03			
0.12	139.76	-0.02	0.24	179.87	0.00	0.24	177.02	-0.03			
0.13	154.88	-0.02	0.28	198.41	-0.01	0.28	195.10	-0.04			
0.14	170.70	-0.02	0.32	216.58	-0.01	0.32	214.13	-0.04			
0.15	186.91	-0.03	0.35	235.93	-0.01	0.35	233.47	-0.04			
0.15	203.47	-0.03	0.39	255.35	-0.01	0.39	254.18	-0.05			
0.16	219.61	-0.04	0.42	274.68	-0.02	0.42	274.53	-0.05			
0.19	236.46	-0.05	0.47	295.34	-0.02	0.46	295.01	-0.06			
0.23	253.15	-0.06	0.51	315.01	-0.03	0.49	316.25	-0.06			
0.26	270.89	-0.06	0.54	335.56	-0.03	0.52	337.00	-0.06			
0.34	285.55	-0.08	0.57	356.13	-0.03	0.56	357.81	-0.07			
0.55	295.75	-0.11	0.61	376.81	-0.03	0.59	379.34	-0.08			
0.68	308.53	-0.13	0.63	398.47	-0.03	0.64	399.64	-0.08			
0.77	323.28	-0.15	0.66	419.85	-0.04	0.67	420.72	-0.09			
0.90	336.66	-0.18	0.69	442.20	-0.04	0.73	441.58	-0.10			
0.93	354.70	-0.19	0.71	464.00	-0.04	0.83	458.74	-0.12			

LP	8/22/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference ASTM D5607-08

Client:	BGC ENGINEERING INC.	**Borehole:**	**BH-BGC12-79**
Project:	-	**Sample No.:**	R7
Location:	EAGLE GOLD	**Depth (m.):**	29.90
Project No.:	12-1415-0029/9000	**Lab ID No:**	138

Peak 1	
Normal Stress , kPa	150

Horz Disp mm	Shear Stress kPa	Vert Disp mm
0.95	373.47	-0.19
0.98	391.56	-0.20
1.01	409.21	-0.22
10.61	86.64	-1.89
10.88	65.20	-1.89
11.57	67.52	-1.93
11.91	61.32	-1.96
12.20	55.98	-2.01
12.50	49.25	-2.07
12.78	55.81	-2.12
14.19	57.03	-2.24
14.35	54.47	-2.24
14.46	58.49	-2.26
14.74	60.13	-2.27
14.76	75.12	-2.27
14.80	89.58	-2.28
15.09	98.04	-2.35
15.55	99.86	-2.48
15.72	112.15	-2.53
15.90	123.68	-2.57
16.77	109.84	-2.73
18.41	112.67	-2.45

Residual 1	
Normal Stress , kPa	700

Horz Disp mm	Shear Stress kPa	Vert Disp mm
0.74	485.78	-0.05
0.76	506.58	-0.05
0.78	527.52	-0.05
0.81	547.70	-0.06
0.84	568.80	-0.06
0.86	589.72	-0.07
0.89	609.45	-0.07
0.92	629.50	-0.07
0.94	648.96	-0.08
0.97	668.03	-0.08
0.99	685.42	-0.09
1.02	703.57	-0.09
1.05	721.40	-0.10
1.10	738.84	-0.11
1.15	754.06	-0.12
4.98	493.41	-0.72
4.99	527.10	-0.72
5.03	551.77	-0.72
5.12	571.10	-0.72
5.22	591.88	-0.72
5.35	608.44	-0.73
7.94	453.72	-1.02
7.99	481.20	-1.02
8.12	501.16	-1.02
8.37	510.69	-1.02
8.67	518.15	-1.03
9.14	512.05	-1.05
9.61	506.27	-1.06
10.13	499.49	-1.09
10.44	505.60	-1.11

Residual 2	
Normal Stress , kPa	450

Horz Disp mm	Shear Stress kPa	Vert Disp mm
3.66	302.57	-0.50
3.94	314.15	-0.51
4.69	297.60	-0.55
5.40	283.30	-0.60
5.89	283.63	-0.61
6.19	294.41	-0.63
6.90	278.92	-0.66
7.18	288.75	-0.68
8.09	261.35	-0.72
8.69	256.18	-0.75
9.01	264.62	-0.75
9.79	246.27	-0.75
10.12	254.08	-0.75
10.73	248.24	-0.76
11.13	253.84	-0.76
11.86	240.47	-0.75
12.05	256.80	-0.75
12.53	257.82	-0.75
12.86	264.50	-0.76
13.61	251.21	-0.79
14.12	251.33	-0.80
14.42	261.32	-0.80
14.98	258.54	-0.81
15.42	260.57	-0.81
15.86	263.03	-0.82
16.60	247.88	-0.84
17.02	252.04	-0.84
17.58	249.00	-0.86
18.09	246.93	-0.87

Residual 3	
Normal Stress , kPa	-

Horz Disp mm	Shear Stress kPa	Vert Disp mm

LP	8/22/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Strength Testing Under Constant Normal Force

Reference ASTM D5607-08

Client:	BGC ENGINEERING INC.	**Borehole:**	**BH-BGC12-79**
Project:	-	**Sample No.:**	R7
Location:	EAGLE GOLD	**Depth (m.):**	29.90
Project No.:	12-1415-0029/9000	**Lab ID No:**	138

Peak 1		Residual 1		Residual 2		Residual 3	
Normal Stress , kPa	150	Normal Stress , kPa	700	Normal Stress , kPa	450	Normal Stress , kPa	-

Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm	Horz Disp mm	Shear Stress kPa	Vert Disp mm
			10.84	507.60	-1.15						
			11.51	489.31	-1.15						
			11.97	485.49	-1.15						
			12.58	472.50	-1.15						
			12.97	475.37	-1.16						
			13.25	483.79	-1.16						
			13.44	498.90	-1.17						
			13.91	494.51	-1.18						
			14.59	474.32	-1.23						
			14.91	483.48	-1.23						
			15.19	491.10	-1.23						
			15.43	502.65	-1.23						
			15.65	515.99	-1.23						
			16.13	510.36	-1.25						
			16.25	530.37	-1.25						
			16.63	530.61	-1.26						
			16.76	549.75	-1.27						
			16.91	560.54	-1.30						
			17.18	565.04	-1.34						
			17.39	556.17	-1.40						

LP	8/22/2012	E.Kostyukov	August 24,2012
TESTED BY	DATE	CHECKED BY	DATE

APPENDIX L
LABORATORY TESTING SUMMARIES

LABORATORY TESTING SUMMARIES

1.0 INTRODUCTION

Laboratory testing was completed on selected samples to characterize the engineering properties of both soil and rock materials. Soil testing consisted of index testing which included: moisture content, Atterberg limits, grain size and specific gravity. Rock testing included: unconfined compressive strength (UCS) testing, Brazilian tensile strength (BTS) testing, specific gravity of intact core, and direct shear (DS) testing of selected rock discontinuities.

Rock and soil testing was completed by Golder Associates of Burnaby, BC.

2.0 REQUESTED TESTING

The soil tests requested are tabulated in Table L-1; the rock tests requested are tabulated in Table L-2.

3.0 TESTING RESULTS

Original laboratory reports are included in Appendix K. The grain size and hydrometer results are tabulated in Table L-3. The moisture content results are tabulated in Table L-4. Some moisture content results from samples collected in frozen ground in September 2012 auger holes were lower than expected given field observations of ice content. Some free water may have leaked during shipping and as a result some moisture contents may under represent the actual in-situ moisture content. The Atterberg limit results are tabulated in Table L-5. The specific gravity results for soil are tabulated in Table L-6. The specific gravity results for rock are tabulated in Table L-7. The UCS and BTS results are tabulated in Table L-8. The DS results are tabulated in Table L-9 and Table L-10.

Plasticity charts for soil samples are shown in Figure L-1. DS results are shown in Figure L-2.

Table L-1. Soil Samples Requested for Testing

Hole ID	Sample Number	Sample Depth From (m)	Sample Depth To (m)	Sample Type	Moisture Content	3" Minus Grain Size	Hydrometer	Atterberg Limits	Specific Gravity
					ASTM 2216	ASTM C136	ASTM 422	ASTM 4318	ASTM 854
Test Pits									
TP-BGC12-146	G1	1.5	1.7	GRAB	1	--	--	--	--
TP-BGC12-146	G2	2	2.2	GRAB	1	--	--	--	--
TP-BGC12-146	G3	3	3.2	GRAB	1	1	1	--	--
TP-BGC12-147	G1	0.5	0.7	GRAB	1	--	--	--	--
TP-BGC12-147	G2	1.2	1.4	GRAB	1	--	--	--	--
TP-BGC12-147	G3	3	3.2	GRAB	1	1	1	1	1
TP-BGC12-148	G1	1.4	1.6	GRAB	1	--	--	--	--
TP-BGC12-150	G1	0.8	1	GRAB	1	--	--	--	--
TP-BGC12-151	G1	1.1	1.2	GRAB	1	1	--	--	--
TP-BGC12-152	G1	0.95	1.05	GRAB	1	--	--	--	--
TP-BGC12-153	G1	1.25	1.35	GRAB	1	1	1	1	--
TP-BGC12-153	G2	2.35	2.45	GRAB	1	--	--	--	--
TP-BGC12-154	G1	3.75	3.85	GRAB	1	1	1	1	1
TP-BGC12-155	G1	0.95	1.05	GRAB	1	--	--	--	--
TP-BGC12-155	G2	2.35	2.45	GRAB	1	1	--	--	--
TP-BGC12-156	G1	0.95	1.05	GRAB	1	--	--	--	--
TP-BGC12-157	G1	1.15	1.25	GRAB	1	1	--	--	--
TP-BGC12-160	G1	0.95	1.05	GRAB	1	1	--	--	--
TP-BGC12-161	G1	1.95	2.05	GRAB	1	1	--	--	--
TP-BGC12-161	G2	3.6	3.7	GRAB	1	1	1	1	--
TP-BGC12-162	G1	2.45	2.55	GRAB	1	--	--	--	--
TP-BGC12-163	G1	1.95	2.05	GRAB	1	1	--	--	--
TP-BGC12-164	G1	2.65	2.75	GRAB	1	--	--	--	--

Hole ID	Sample Number	Sample Depth From (m)	Sample Depth To (m)	Sample Type	Moisture Content	3" Minus Grain Size	Hydrometer	Atterberg Limits	Specific Gravity
					ASTM 2216	ASTM C136	ASTM 422	ASTM 4318	ASTM 854
TP-BGC12-165	G1	3.4	3.5	GRAB	1	1	--	--	--
TP-BGC12-166	G1	2.45	2.55	GRAB	1	--	--	--	--
TP-BGC12-167	G1	2.75	2.85	GRAB	1	1	--	--	--
TP-BGC12-168	G1	2.45	2.55	GRAB	1	1	--	--	--
TP-BGC12-169	G1	2.75	2.85	GRAB	1	1	--	--	--
TP-BGC12-170	G1	5.9	6	GRAB	1	1	1	1	--
TP-BGC12-171	G1	1	1.1	GRAB	1	--	--	--	--
TP-BGC12-171	G2	2.75	2.85	GRAB	1	1	--	--	--
TP-BGC12-172	G1	2.05	2.15	GRAB	1	--	--	--	--
TP-BGC12-173	G1	3.4	3.5	GRAB	1	--	--	--	--
TP-BGC12-173	G2	4.5	4.6	GRAB	1	1	--	--	1
TP-BGC12-174	G1	2.9	3	GRAB	1	--	--	--	--
TP-BGC12-175	G1	2.6	2.7	GRAB	1	1	--	--	--
TP-BGC12-176	G1	1.2	1.3	GRAB	1	1	--	--	--
TP-BGC12-181	G1	1	1	GRAB	1	--	--	--	--
TP-BGC12-181	G2	3.5	3.5	GRAB	1	--	--	--	--
TP-BGC12-181	G3	4	4	GRAB	1	--	--	--	--
Boreholes									
BH-BGC12-75[1]	G1	40.0	40.2	GRAB	1	1	1	1	1
BH-BGC12-80	G1	1.2	1.2	GRAB	1	--	--	--	--
BH-BGC12-80	G2	2.0	2.0	GRAB	1	1	1	1	--
BH-BGC12-80	G3	3.3	3.3	GRAB	1	--	--	1	--
BH-BGC12-80	G4	3.0	3.0	GRAB	1	--	--	--	--
BH-BGC12-80	G5	3.6	3.6	GRAB	1	--	--	--	--
BH-BGC12-80	G6	4.1	4.1	GRAB	1	--	--	--	--
BH-BGC12-80	G7	4.3	4.3	GRAB	1	--	--	--	--

Hole ID	Sample Number	Sample Depth From (m)	Sample Depth To (m)	Sample Type	Moisture Content	3" Minus Grain Size	Hydrometer	Atterberg Limits	Specific Gravity
					ASTM 2216	ASTM C136	ASTM 422	ASTM 4318	ASTM 854
BH-BGC12-80	G8	4.7	4.7	GRAB	1	1	--	--	--
BH-BGC12-80	G9	5.3	5.3	GRAB	1	--	--	--	--
BH-BGC12-80	G10	6.0	6.0	GRAB	1	--	1	1	--
BH-BGC12-80	G13	18.6	18.9	GRAB	1	--	--	--	--
BH-BGC12-81	G1	0.5	0.6	GRAB	1	--	--	--	--
BH-BGC12-81	G2	0.8	0.9	GRAB	1	--	--	--	--
BH-BGC12-81	G3	1.4	1.5	GRAB	1	1	1	--	--
BH-BGC12-81	G4	1.0	1.0	GRAB	1	--	--	--	--
BH-BGC12-81	G5	1.8	1.8	GRAB	1	--	--	--	--
BH-BGC12-81	G6	2.9	3.1	GRAB	1	1	1	1	--
BH-BGC12-81	G7	3.5	3.5	GRAB	1	--	--	--	--
BH-BGC12-81	G8	3.9	3.9	GRAB	1	--	--	--	--
BH-BGC12-81	G9	4.5	4.5	GRAB	1	--	--	--	--
BH-BGC12-81	G10	5.1	5.1	GRAB	1	--	--	--	--
BH-BGC12-81	G11	5.6	5.8	GRAB	1	1	1	1	--
BH-BGC12-81	G12	6.2	6.2	GRAB	1	--	--	--	--
BH-BGC12-81	G13	6.8	6.8	GRAB	1	--	--	--	--
BH-BGC12-81	G14	7.1	7.1	GRAB	1	--	--	--	--
BH-BGC12-81	G15	8.2	8.3	GRAB	1	--	--	--	--
BH-BGC12-81	G16	10.9	11.1	GRAB	1	--	--	--	--
BH-BGC12-82	G1	2.2	2.4	GRAB	1	1	--	--	--
BH-BGC12-82	G2	3.8	3.8	GRAB	1	--	--	--	--
BH-BGC12-82	G3	5.2	5.2	GRAB	1	--	--	--	--
BH-BGC12-82	G4	6.0	6.0	GRAB	1	--	--	--	--
BH-BGC12-82	G5	6.8	6.8	GRAB	1	--	--	--	--
BH-BGC12-82	G6	7.8	7.8	GRAB	1	--	--	--	--
BH-BGC12-82	G7	8.2	8.2	GRAB	1	--	--	--	--

Hole ID	Sample Number	Sample Depth From (m)	Sample Depth To (m)	Sample Type	Moisture Content	3" Minus Grain Size	Hydrometer	Atterberg Limits	Specific Gravity
					ASTM 2216	ASTM C136	ASTM 422	ASTM 4318	ASTM 854
BH-BGC12-82	G8	9.3	9.4	GRAB	1	1	1	1	--
BH-BGC12-82	G10	14.2	14.2	GRAB	1	--	--	--	--
BH-BGC12-82	G12	18.8	18.8	GRAB	1	--	--	--	--
BH-BGC12-83	G2	1.9	2.1	GRAB	--	1	1	--	--
BH-BGC12-83	G4	4.9	5.0	GRAB	1	--	--	--	--
BH-BGC12-83	G5	18.6	18.6	GRAB	1	--	--	--	--
BH-BGC12-83	M1	0.6	1.1	SPT	1	--	--	--	--
BH-BGC12-83	M2	2.1	2.6	SPT	1	--	--	--	--
BH-BGC12-83	M5	6.7	7.0	SPT	1	--	--	--	--
BH-BGC12-83	M7	9.8	9.9	SPT	1	--	--	--	--
BH-BGC12-84	G1	0.6	0.9	GRAB	1	1	--	--	--
BH-BGC12-84	G2	2.3	2.4	GRAB	1	--	--	--	--
BH-BGC12-84	G4	6.8	6.8	GRAB	1	--	--	--	--
BH-BGC12-84	M3	4.0	4.1	SPT	1	--	--	--	--
BH-BGC12-84	M4	8.4	8.8	SPT	1	--	--	--	--
BH-BGC12-85	G6	8.2	8.4	GRAB	1	--	--	--	--
BH-BGC12-85	G8	23.5	23.5	GRAB	1	--	--	--	--
BH-BGC12-85	G9	25.0	25.0	GRAB	1	--	--	--	--
BH-BGC12-85	M2	2.4	2.9	SPT	1	--	--	--	--
BH-BGC12-85	M3	4.0	4.4	SPT	1	--	--	--	--
BH-BGC12-85	M5	5.5	5.9	SPT	1	--	--	--	--
BH-BGC12-85	M6	8.5	9.0	SPT	1	--	--	--	--
BH-BGC12-85	M7	10.1	10.4	SPT	1	--	--	--	--

NOTES:

1. BH-BGC12-75 sample G1 is taken from fault zone.

Table L-2. Rock Samples Requested for Testing

Final Test Hole Number	Sample Number	Average Depth (m)	Specific Gravity	UCS with Strain Measurement	Brazilian Tensile Strength	Direct Shear Constant Normal Force
			C127	**ASTM D7012**	**ASTM D3967**	**ASTM D5607-08**
BH-BGC12-75	R2	15.0	1	1	2	--
BH-BGC12-75	R3	20.6	--	1	2	--
BH-BGC12-75	R4	25.4	--	--	--	1
BH-BGC12-76	R1	33.2	1	1	2	--
BH-BGC12-76	R2	20.4	--	1	2	--
BH-BGC12-79	R3	37.3	1	1	2	--
BH-BGC12-79	R4	35.8	--	--	--	1
BH-BGC12-79	R5	33.3	--	1	2	--
BH-BGC12-79	R5	29.9	--	--	--	1

NOTES:

1. BH-BGC12-76, Sample R1, only sufficient material to complete one BTS test, rather than the usual two tests.

Table L-3. Grain Size and Hydrometer Results (ASTM C136 and ASTM 422)

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Gravel (%)[1]	Sand (%)[2]	Fines (%)	USCS Classification	Lithology Unit
Test Pits								
TP-BGC12-146	G3	3	3.2	28	48	24	SM	COLLUVIUM
TP-BGC12-147	G3	3	3.2	12	43	45	SM-SC	COLLUVIUM
TP-BGC12-151	G1	1.1	1.2	43	53	4	SW	COLLUVIUM
TP-BGC12-153	G1	1.25	1.35	0	4	96	ML	COLLUVIUM
TP-BGC12-154	G1	3.75	3.85	0	3	97	ML	COLLUVIUM
TP-BGC12-155	G2	2.35	2.45	47	28	25	GM-GC	COLLUVIUM
TP-BGC12-157	G1	1.15	1.25	53	32	15	GM-GC	COLLUVIUM
TP-BGC12-160	G1	0.95	1.05	51	33	16	GM-GC	COLLUVIUM
TP-BGC12-161	G1	1.95	2.05	60	18	22	GM	COLLUVIUM
TP-BGC12-161	G2	3.6	3.7	1	9	90	ML	COLLUVIUM
TP-BGC12-163	G1	1.95	2.05	43	35	22	GM-GC	COLLUVIUM
TP-BGC12-165	G1	3.4	3.5	49	34	17	GM-GC	COLLUVIUM
TP-BGC12-167	G1	2.75	2.85	6	29	65	ML	COLLUVIUM
TP-BGC12-168	G1	2.45	2.55	5	18	77	ML	COLLUVIUM
TP-BGC12-169	G1	2.75	2.85	57	26	17	GM-GC	COLLUVIUM
TP-BGC12-170	G1	5.9	6	15	30	55	CL	ALLUVIUM?
TP-BGC12-171	G2	2.75	2.85	28	44	28	SM-SC	COLLUVIUM
TP-BGC12-173	G2	4.5	4.6	48	35	17	GM-GC	COLLUVIUM
TP-BGC12-175	G1	2.6	2.7	36	45	19	SM-SC	COLLUVIUM
TP-BGC12-176	G1	1.2	1.3	54	25	21	GC	COLLUVIUM

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Gravel (%)[1]	Sand (%)[2]	Fines (%)	USCS Classification	Lithology Unit
Bore Holes								
BH-BGC12-75	G1	40.2	40.4	43	23	34	GC	GOUGE
BH-BGC12-80	G4	3	3	19	50	31	SM	COLLUVIUM
BH-BGC12-80	G8	4.7	4.7	46	41	13	GM	COLLUVIUM
BH-BGC12-80	G10	6.4	6.4	5	16	79	CL	COLLUVIUM
BH-BGC12-81	G3	1.4	1.5	21	46	33	SM	COLLUVIUM
BH-BGC12-81	G6	2.9	3.05	10	31	59	ML	COLLUVIUM
BH-BGC12-81	G11	5.6	5.8	29	40	31	GM	COLLUVIUM
BH-BGC12-82	G1	2.2	2.4	42	40	18	GM	COLLUVIUM
BH-BGC12-82	G8	9.3	9.4	17	45	38	SM	COLLUVIUM
BH-BGC12-83	G2	1.9	2.1	32	29	39	-	COLLUVIUM
BH-BGC12-84	G1	0.6	0.9	40	33	27	GM	COLLUVIUM

NOTES:

1. Gravel is considered to be particles smaller than 3 inches (76.2 mm) and larger than the #4 sieve (4.75 mm).
2. Sand is considered to be particles smaller than the #4 sieve (4.75 mm) and larger than the #200 sieve (0.075 mm).

Table L-4. Moisture Content Results (ASTM 2216)

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Moisture Content (%)	Lithology Unit
Test Pits					
TP-BGC12-146	G1	1.5	1.7	18	COLLUVIUM
TP-BGC12-146	G2	2	2.2	22	COLLUVIUM
TP-BGC12-146	G3	3	3.2	2	COLLUVIUM
TP-BGC12-147	G1	0.5	0.7	9	COLLUVIUM
TP-BGC12-147	G2	1.2	1.4	4	COLLUVIUM
TP-BGC12-147	G3	3	3.2	8	COLLUVIUM
TP-BGC12-148	G1	1.4	1.6	6	SLIGHTLY WEATHERED METASEDIMENTARY ROCK
TP-BGC12-150	G1	0.8	1	14	COLLUVIUM
TP-BGC12-151	G1	1.1	1.2	5	COLLUVIUM
TP-BGC12-152	G1	0.95	1.05	18	COLLUVIUM
TP-BGC12-153	G1	1.25	1.35	60	COLLUVIUM
TP-BGC12-153	G2	2.35	2.45	16	COLLUVIUM
TP-BGC12-154	G1	3.75	3.85	25	COLLUVIUM
TP-BGC12-155	G1	0.95	1.05	21	COLLUVIUM
TP-BGC12-155	G2	2.35	2.45	14	COLLUVIUM
TP-BGC12-156	G1	0.95	1.05	6	COLLUVIUM
TP-BGC12-157	G1	1.15	1.25	10	COLLUVIUM
TP-BGC12-160	G1	0.95	1.05	6	COLLUVIUM
TP-BGC12-161	G1	1.95	2.05	9	COLLUVIUM
TP-BGC12-161	G2	3.6	3.7	37	COLLUVIUM
TP-BGC12-162	G1	2.45	2.55	16	COLLUVIUM
TP-BGC12-163	G1	1.95	2.05	13	COLLUVIUM
TP-BGC12-164	G1	2.65	2.75	21	COLLUVIUM
TP-BGC12-165	G1	3.4	3.5	10	COLLUVIUM
TP-BGC12-166	G1	2.45	2.55	17	COLLUVIUM
TP-BGC12-167	G1	2.75	2.85	29	COLLUVIUM
TP-BGC12-168	G1	2.45	2.55	21	COLLUVIUM
TP-BGC12-169	G1	2.75	2.85	9	COLLUVIUM
TP-BGC12-170	G1	5.9	6	15	ALLUVIUM?
TP-BGC12-171	G1	1	1.1	14	COLLUVIUM

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Moisture Content (%)	Lithology Unit
TP-BGC12-171	G2	2.75	2.85	9	COLLUVIUM
TP-BGC12-172	G1	2.05	2.15	21	COLLUVIUM
TP-BGC12-173	G1	3.4	3.5	12	COLLUVIUM
TP-BGC12-173	G2	4.5	4.6	7	COLLUVIUM
TP-BGC12-174	G1	2.9	3	14	COLLUVIUM
TP-BGC12-175	G1	2.6	2.7	17	COLLUVIUM
TP-BGC12-176	G1	1.2	1.3	6	COLLUVIUM
TP-BGC12-181	G1	1	1	7.8	FILL
TP-BGC12-181	G2	3.5	3.5	14.2	FILL
TP-BGC12-181	G3	4	4	7.8	FILL
Boreholes					
BH-BGC12-75	G1	40.0	40.2	13	GOUGE
BH-BGC12-80	G1	1.2	1.2	12.8	COLLUVIUM
BH-BGC12-80	G4	3	3	16.6	COLLUVIUM
BH-BGC12-80	G3	3.3	3.3	25.6	COLLUVIUM
BH-BGC12-80	G5	3.6	3.6	25.3	COLLUVIUM
BH-BGC12-80	G6	4.1	4.1	14.3	COLLUVIUM
BH-BGC12-80	G7	4.3	4.3	13.5	COLLUVIUM
BH-BGC12-80	G8	4.7	4.7	21	COLLUVIUM
BH-BGC12-80	G9	5.3	5.3	12.7	COLLUVIUM
BH-BGC12-80	G10	6.4	6.4	42.4	COLLUVIUM
BH-BGC12-80	G13	18.6	18.9	7.5	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK
BH-BGC12-81	G1	0.5	0.6	17.7	COLLUVIUM
BH-BGC12-81	G2	0.8	0.9	13.2	COLLUVIUM
BH-BGC12-81	G4	1	1	15.9	COLLUVIUM
BH-BGC12-81	G3	1.4	1.5	13.6	COLLUVIUM
BH-BGC12-81	G5	1.8	1.8	8.5	COLLUVIUM
BH-BGC12-81	G6	2.9	3.05	23.1	COLLUVIUM
BH-BGC12-81	G7	3.5	3.5	17.2	COLLUVIUM
BH-BGC12-81	G8	3.9	3.9	23.7	COLLUVIUM
BH-BGC12-81	G9	4.5	4.5	11.4	COLLUVIUM
BH-BGC12-81	G10	5.1	5.1	17.2	COLLUVIUM

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Moisture Content (%)	Lithology Unit
BH-BGC12-81	G11	5.6	5.8	39.3	COLLUVIUM
BH-BGC12-81	G12	6.2	6.2	11.7	COLLUVIUM
BH-BGC12-81	G13	6.8	6.8	14.5	COLLUVIUM
BH-BGC12-81	G14	7.1	7.1	16.1	COLLUVIUM
BH-BGC12-81	G15	8.2	8.3	12	COLLUVIUM
BH-BGC12-81	G16	10.9	11.1	9.9	COLLUVIUM
BH-BGC12-82	G1	2.2	2.4	7.2	COLLUVIUM
BH-BGC12-82	G2	3.8	3.8	11.6	COLLUVIUM
BH-BGC12-82	G3	5.2	5.2	11.6	COLLUVIUM
BH-BGC12-82	G4	6	6	20.1	COLLUVIUM
BH-BGC12-82	G5	6.8	6.8	18	COLLUVIUM
BH-BGC12-82	G6	7.8	7.8	6.7	COLLUVIUM
BH-BGC12-82	G7	8.2	8.2	3.3	COLLUVIUM
BH-BGC12-82	G8	9.3	9.4	10.9	COLLUVIUM
BH-BGC12-82	G10	14.2	14.2	9.8	COLLUVIUM
BH-BGC12-82	G12	18.8	18.8	9.5	COLLUVIUM
BH-BGC12-83	M1	0.6	1.05	13.9	COLLUVIUM
BH-BGC12-83	G2	1.9	2.1	10.9	COLLUVIUM
BH-BGC12-83	M2	2.13	2.58	12.1	COLLUVIUM
BH-BGC12-83	G4	4.9	5	3.7	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK
BH-BGC12-83	M5	6.71	6.95	1.3	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK
BH-BGC12-83	M7	9.76	9.91	3.2	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK
BH-BGC12-83	G5	18.6	18.6	9.5	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK
BH-BGC12-84	G1	0.6	0.9	9.7	COLLUVIUM
BH-BGC12-84	G2	2.3	2.4	9.9	COLLUVIUM
BH-BGC12-84	M3	4	4.1	6.4	COLLUVIUM
BH-BGC12-84	G4	6.8	6.8	6.7	COLLUVIUM
BH-BGC12-84	M4	8.44	8.84	5.5	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Moisture Content (%)	Lithology Unit
BH-BGC12-85	M2	2.44	2.89	12.7	FILL
BH-BGC12-85	M3	3.96	4.41	10.7	FILL
BH-BGC12-85	M4	5.59	5.94	25.8	FILL
BH-BGC12-85	G6	8.2	8.4	9.9	COLLUVIUM
BH-BGC12-85	M6	8.54	8.99	5.6	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK
BH-BGC12-85	M7	10.06	10.36	9.8	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK
BH-BGC12-85	G8	23.5	23.5	12.5	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK
BH-BGC12-85	G9	25	25	14.3	HIGHLY TO COMPLETELY WEATHERED METASEDIMENTARY ROCK

Table L-5. Atterberg Limit Results (ASTM 4318)

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	Fines Classification	Lithology Unit
Test Pits								
TP-BGC12-147	G3	3	3.2	23	18	5	CL-ML	COLLUVIUM
TP-BGC12-153	G1	1.25	1.35	--	--	--	Non Plastic	COLLUVIUM
TP-BGC12-154	G1	3.75	3.85	40	28	12	ML	COLLUVIUM
TP-BGC12-161	G1	1.95	2.05	35	26	9	ML	COLLUVIUM
TP-BGC12-161	G2	3.6	3.7	23	21	2	ML	COLLUVIUM
Boreholes								
BH-BGC12-75	G1	40.0	40.2	29	18	11	CL	GOUGE
BH-BGC12-80	G4	3	3	24	20	4	CL-ML	COLLUVIUM
BH-BGC12-80	G3	3.3	3.3	27	23	4	ML	COLLUVIUM
BH-BGC12-80	G10	6.4	6.4	35	19	16	CL	COLLUVIUM
BH-BGC12-81	G6	2.9	3.05	31	24	7	ML	COLLUVIUM
BH-BGC12-81	G11	5.6	5.8	26	22	4	ML	COLLUVIUM
BH-BGC12-82	G8	9.3	9.4	22	20	2	ML	COLLUVIUM

Table L-6. Specific Gravity Soil Results (ASTM 854)

Hole ID	Sample Number	Depth From (m)	Depth To (m)	Average Specific Gravity	Lithology Unit
Test Pits					
TP-BGC12-147	G3	3	3.2	2.64	COLLUVIUM
TP-BGC12-154	G1	3.75	3.85	2.73	COLLUVIUM
TP-BGC12-173	G2	4.5	4.6	2.82	COLLUVIUM
Borehole					
BH-BGC12-75	G1	40.0	40.2	2.87	GOUGE

Table L-7. Specific Gravity Rock Results (ASTM C127)

Hole ID	Sample Number	Average Depth (m)	Specific Gravity Rock			Lithology Unit
			Oven Dry	SSD[1]	Apparent	
BH-BGC12-75	R2	15.0	2.73	2.75	2.78	METASEDIMENTARY ROCK
BH-BGC12-75	R3	20.6	2.62	2.65	2.69	METASEDIMENTARY ROCK
BH-BGC12-76	R1	33.2	2.61	2.63	2.67	METASEDIMENTARY ROCK
BH-BGC12-76	R2	20.4	2.64	2.65	2.68	METASEDIMENTARY ROCK
BH-BGC12-79	R3	37.3	2.55	2.59	2.65	METASEDIMENTARY ROCK
BH-BGC12-79	R5	33.3	2.66	2.67	2.67	METASEDIMENTARY ROCK

NOTES:

1. SSD = Saturated surface dry.

Table L-8. Unconfined Compressive Strength Test and Brazilian Tensile Strength Test Results (ASTM D7012 and D3967)

Hole ID	Sample Number	Average Depth (m)	UCS (MPa)[1]	Young's Modulus (GPa)	Poisson Ratio	Brazilian Tensile		Lithology Unit
						Test 1 (MPa)	Test 2 (MPa)	
BH-BGC12-75	R3	20.6	18.9	56.7	--[2]	13.5[3]	10.1	METASEDIMENTARY ROCK
BH-BGC12-76	R1	33.2	43.6	33.7	0.05	7.9[3]	--[4]	METASEDIMENTARY ROCK
BH-BGC12-76	R2	20.4	117.5	33.2	0.14	16.2	17.1	METASEDIMENTARY ROCK
BH-BGC12-79	R3	37.3	58.4	32.0	0.11	7.5	9.6	METASEDIMENTARY ROCK
BH-BGC12-79	R5	33.3	204.2	60.2	0.16	26.0	13.6[3]	METASEDIMENTARY ROCK

NOTES:

1. UCS samples BH-BGC12-75-R3, BH-BGC12-76-R1 and R2, BH-BGC12-79-R3 broke along foliation.
2. Invalid Poisson ratio test.
3. BTS samples BH-BGC12-75-R3 (test 1), BH-BGC12-76-R1 (test 1) and BH-BGC12-79-R5 (test 2) broke along discontinuities in the rock.
4. Insufficient material for a second test.

Table L-9. Direct Shear Constant Normal Test Results (ASTM D5607-08)

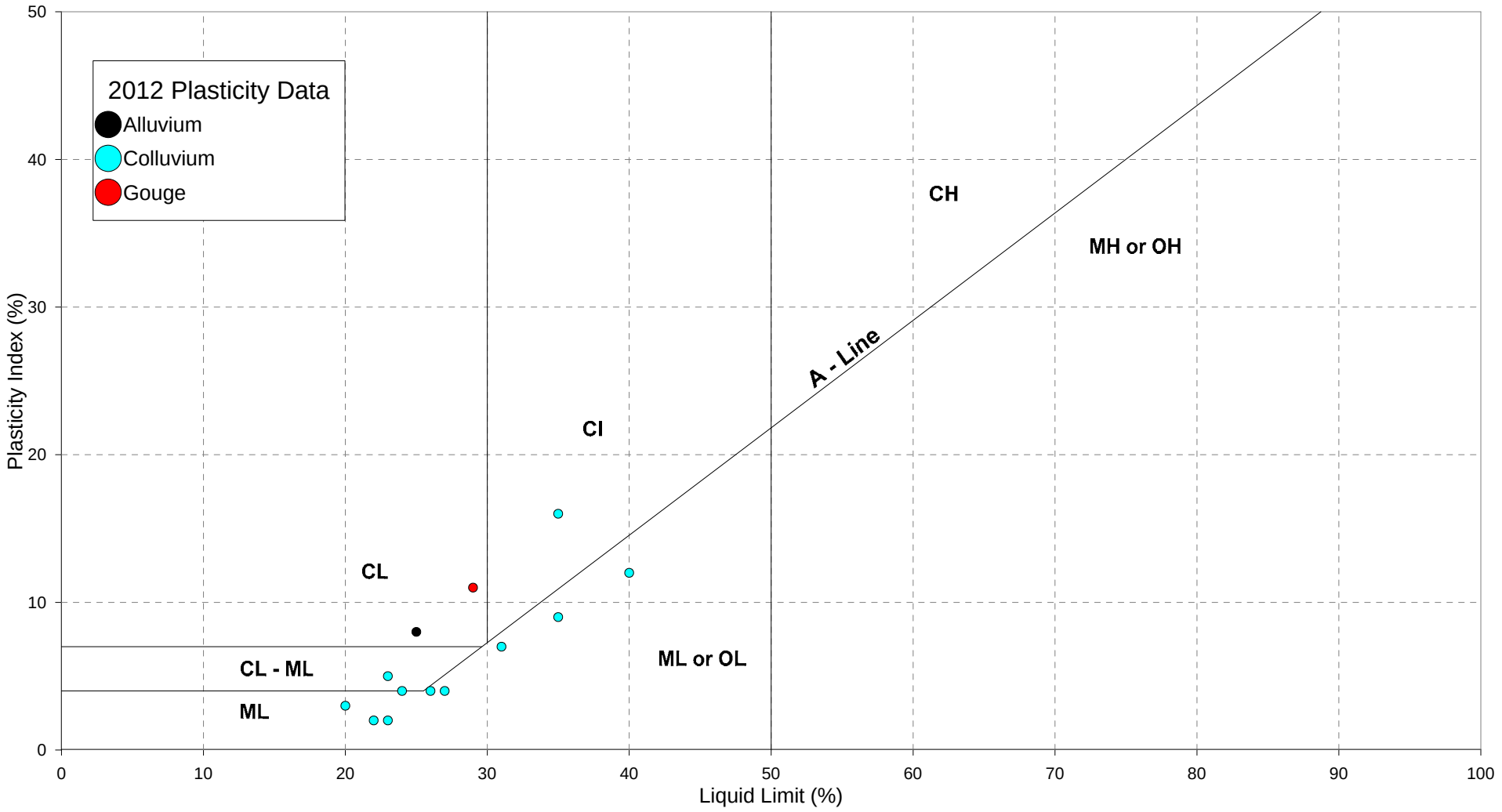
Hole ID	Sample Number	Average Depth (m)	Test Type	Normal Stress (kPa)	Peak Shear Stress (kPa)	Residual Shear Stress (kPa)	Lithology Unit
BH-BGC12-75	R4	25.4	Peak	200	220.5	132.9	METASEDIMENTARY ROCK
			1-Residual	400	383.7	169.0	
			2-Residual	800	693.6	484.0	
BH-BGC12-79	R4	35.8	Peak	100	39.2	36.1	METASEDIMENTARY ROCK
			1-Residual	500	245.3	232.9	
			2-Residual	850	383.9	370.0	
BH-BGC12-79	R7	29.9	Peak	150	409.2	57.0	METASEDIMENTARY ROCK
			1-Residual	700	754.1	485.0	
			2-Residual	450	458.7	256.0	

Note: Normal and shear stresses shown are obtained from interpreted peak and shear strengths as presented in the Laboratory Reports (Appendix K).

Table L-10. Interpreted Joint Strengths from Direct Shear Testing

	Phi (º)
Peak Strength	38 º
Residual Strength	29 º

FIGURES



SCALE:	DATE:	DRAWN:	DESIGNED:	CHECKED:	APPROVED:
NTS	NOV 2012	CA	EB	KH	AA

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Vancouver, BC
Phone: (604) 684 5900

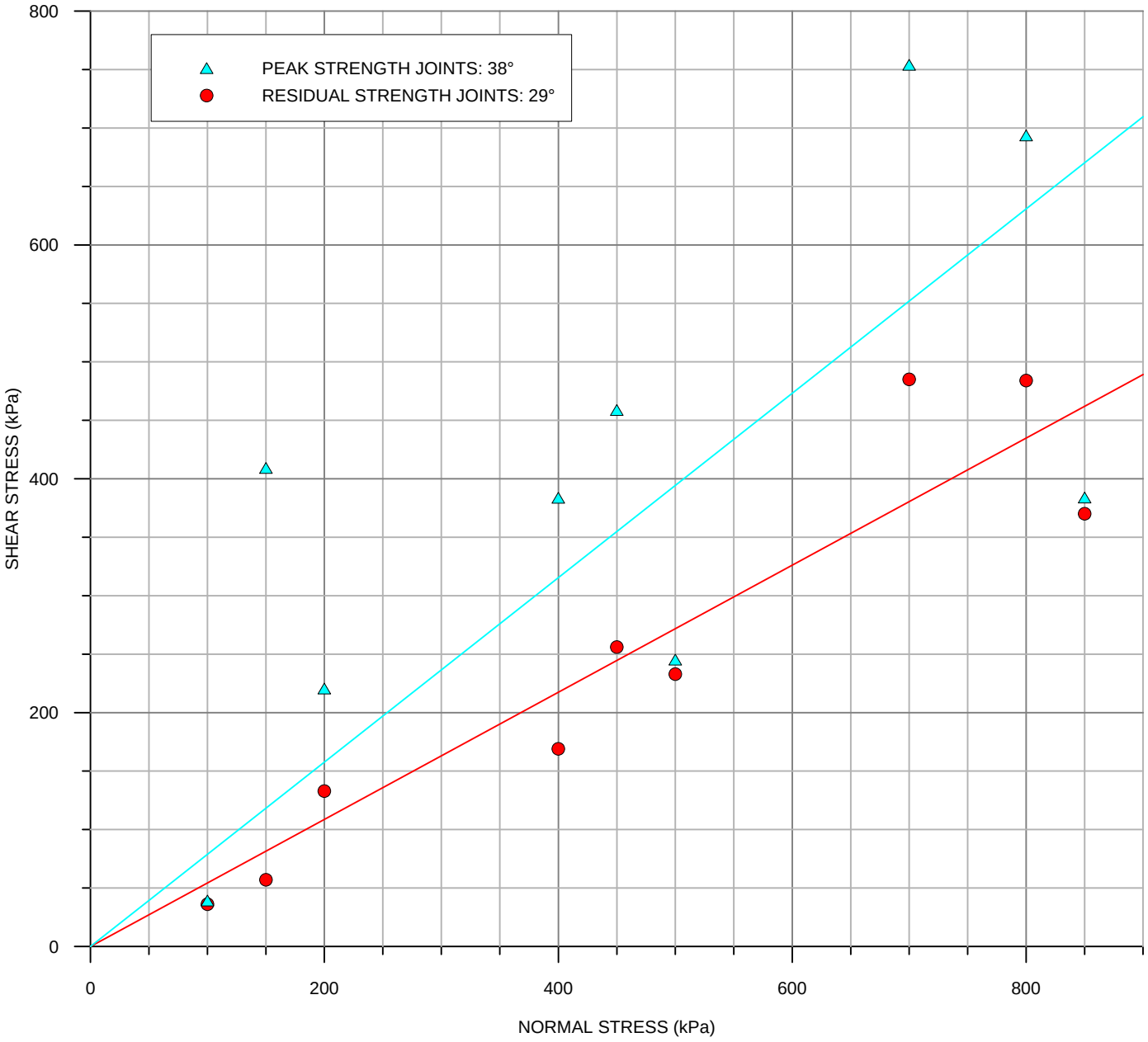
PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: Plasticity Chart
All samples from 2012 field program

CLIENT: VICTORIA GOLD CORP.

PROJECT No.	FIG No.	REV.
0792-009	L-1	0

FIGURE TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012



NOTES:
1. NORMAL AND SHEAR STRESSES SHOWN ARE OBTAINED FROM INTERPRETED PEAK AND RESIDUAL STRENGTHS AS PRESENTED IN THE LABORATORY REPORTS (APPENDIX K).

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

SCALE:	NTS	DESIGNED:	KH
DATE:	NOV 2012	CHECKED:	DW
DRAWN:	EB	APPROVED:	PQ

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PROJECT:
EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE:
SMALL SCALE DIRECT SHEAR TESTING RESULTS

CLIENT:
VICTORIA GOLD CORP

PROJECT No.:	FIG No.:	REV.:
0792-009	L-2	0

N:\BGC\Projects\0792 Victoria Gold\009 EGP 2012 Detail Design\06 Reporting\01 Data Report\03 Working Appendices\Laboratory Testing Results Plots and Summary Tables\2012 DS plot\Grapher plots

FIGURE TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT", NOV 2012.

APPENDIX M
POINT LOAD TESTING

POINT LOAD TESTING

1.0 INTRODUCTION

Point load testing was carried out during the site investigation program to estimate the intact strength of the metasedimentary rock and, where possible, the intrusive rock. This appendix documents the findings of the point load testing undertaken during the 2012 mine site infrastructure geotechnical investigations for the Eagle Gold project.

2.0 TESTING DETAILS

All point load tests were carried out by BGC personnel on site, using a PIL-7 model point load tester manufactured by Roctest. The suggested (ISRM 1985) method for determining point load strength was followed. One hundred and fifty three (153) core samples of rock obtained by diamond drilling were tested; of those tests, 77 were invalid, as outlined by ISRM (1985), due to incomplete development of the fracture surface. Therefore, only 76 valid tests were performed. The details of the valid point load tests are reported in Table L-1.

Table M-1. Point Load Test Results

Drill Hole	Sample Depth (m)	Test Type[1]	Rock Type[2]	Load Direction[3]	I_{s50} (MPa)	Comments
BH-BGC12-75	8.1	D	SED	X	3.9	
BH-BGC12-75	11.8	D	SED	//	0.7	Stepped across foliation
BH-BGC12-75	12.6	D	SED	//	1.4	Along foliation
BH-BGC12-75	14.2	D	SED	//	2.4	
BH-BGC12-75	14.7	D	SED	X	1.4	
BH-BGC12-75	17.4	D	SED	X	3.1	
BH-BGC12-75	22.6	D	SED	//	2.4	
BH-BGC12-75	24.0	D	SED	X	3.3	
BH-BGC12-75	28.1	D	SED	//	0.5	
BH-BGC12-75	34.9	D	SED	X	0.5	
BH-BGC12-75	36.0	D	SED	//	2.3	
BH-BGC12-75	36.6	D	SED	//	2.6	
BH-BGC12-75	37.6	D	SED	X	0.1	Stepped across foliation
BH-BGC12-76	4.8	D	SSED	//	1.5	
BH-BGC12-76	9.5	D	SSED	//	0.2	
BH-BGC12-76	10.8	D	SSED	//	1.0	
BH-BGC12-76	12.4	D	SSED	//	0.6	
BH-BGC12-76	12.6	D	SSED	//	0.6	
BH-BGC12-76	14.0	D	SSED	//	2.8	

Drill Hole	Sample Depth (m)	Test Type[1]	Rock Type[2]	Load Direction[3]	I_{s50} (MPa)	Comments
BH-BGC12-76	14.6	D	SSED	//	0.0	
BH-BGC12-76	16.3	D	SSED	//	1.5	
BH-BGC12-76	17.6	D	SSED	//	0.4	
BH-BGC12-76	18.4	D	SSED	//	0.5	
BH-BGC12-76	19.3	D	SSED	//	1.8	
BH-BGC12-76	20.5	D	SSED	//	1.1	
BH-BGC12-76	21.1	D	SED	//	1.7	
BH-BGC12-76	26.0	D	SED	//	0.8	
BH-BGC12-76	27.0	D	SED	//	1.1	
BH-BGC12-76	27.3	D	SED	//	1.4	
BH-BGC12-76	28.3	D	SED	X	1.2	
BH-BGC12-76	29.7	D	SED	//	0.9	
BH-BGC12-76	31.3	D	SED	//	0.3	Stepped across foliation planes
BH-BGC12-76	37.0	D	SED	//	0.5	
BH-BGC12-76	38.6	D	SED	//	1.5	
BH-BGC12-76	39.6	D	SED	//	0.3	stepped over foliation
BH-BGC12-76	40.4	D	SED	//	2.7	
BH-BGC12-76	41.6	D	SED	//	1.8	
BH-BGC12-77	16.2	D	SSED	X	0.5	sample fractured partly along foliation plane
BH-BGC12-77	19.2	D	SSED	X	0.3	
BH-BGC12-78	16.5	D	SSED	//	0.1	
BH-BGC12-78	17.1	D	SSED	//	0.3	
BH-BGC12-78	19.2	D	SSED	//	0.7	
BH-BGC12-78	21.3	D	SSED	//	1.0	
BH-BGC12-79	6.6	D	SSED	//	0.7	
BH-BGC12-79	7.2	D	SSED	//	0.6	
BH-BGC12-79	8.2	D	SSED	//	3.3	Quartz Rich
BH-BGC12-79	10.4	D	SSED	//	1.2	
BH-BGC12-79	11.4	D	SSED	//	6.9	
BH-BGC12-79	11.6	D	SSED	//	6.8	
BH-BGC12-79	13.1	D	SSED	//	7.4	
BH-BGC12-79	14.5	D	SSED	//	11.0	

Drill Hole	Sample Depth (m)	Test Type[1]	Rock Type[2]	Load Direction[3]	I_{s50} (MPa)	Comments
BH-BGC12-79	14.7	D	SSED	//	7.2	
BH-BGC12-79	16.4	D	SSED	//	6.7	
BH-BGC12-79	17.9	D	SSED	//	1.8	
BH-BGC12-79	18.2	D	SSED	//	1.5	
BH-BGC12-79	21.0	D	SSED	//	1.0	
BH-BGC12-79	22.5	D	SSED	//	0.5	
BH-BGC12-79	23.7	D	SSED	//	2.1	
BH-BGC12-79	25.1	D	SED	//	5.1	
BH-BGC12-79	27.9	D	SED	//	0.7	
BH-BGC12-79	28.2	D	SED	//	1.6	
BH-BGC12-79	29.8	D	SED	//	2.9	
BH-BGC12-79	30.4	D	SED	//	3.0	
BH-BGC12-79	30.9	D	SED	//	3.1	
BH-BGC12-79	31.8	D	SED	//	9.0	
BH-BGC12-79	32.6	D	SED	//	4.7	
BH-BGC12-79	36.0	D	SED	//	0.4	
BH-BGC12-79	39.4	D	SED	//	4.9	
BH-BGC12-79	39.9	D	SED	//	2.4	
BH-BGC12-79	41.7	D	INT	N/A	6.0	
BH-BGC12-79	42.6	D	SED	//	2.7	
BH-BGC12-79	43.1	D	SED	//	3.3	
BH-BGC12-79	44.9	D	SED	//	0.4	
BH-BGC12-79	46.4	D	SED	//	3.1	
BH-BGC12-79	49.2	D	SED	//	2.9	
BH-BGC12-79	49.7	D	SED	//	3.3	

Note:

1. Test type: “D” signifies a diametrical test where the sample is loaded perpendicular to the core axis.
2. Rock type: “INT” signifies intrusive, “SED” signifies metasedimentary, “SSED” signifies surface weathered metasedimentary.
3. Load direction: “//” signifies loading parallel to foliation, “X” signifies loading oblique to foliation.

3.0 REFERENCES

International Society for Rock Mechanics (ISRM). 1985. Suggested Method for Determining Point Load Strength. Int. J. Rock Mech. Min. Sci. & Geomech. Abstr. Vol 22, No. 2, pp. 51-60.

APPENDIX N
PLACER TAILINGS SAMPLING

PLACER TAILINGS

1.0 PURPOSE

This appendix summarizes the placer tailings sampling completed in July 2012. Samples were collected from the placer tailings within the footprint of the proposed heap leach embankment and events ponds, as requested by Victoria Gold Corp. (Victoria) for testing for potential use as concrete aggregate.

2.0 BACKGROUND

The Eagle Gold project area has been exploited by placer mining since about 1898 (LeBarge et al., 2002). This historical activity has resulted in substantial volumes of reworked overburden materials (placer tailings) in valley bottoms in the region. A significant proportion of the Dublin Gulch valley bottom is filled with placer tailings, which are in places as much as 20 m thick. Similarly, the reach of Haggart Creek immediately adjacent to, and south of, the project area contains deposits of placer tailings.

The placer tailings consist of highly variable materials, with a wide range of grain sizes and relative densities. The materials range from isolated deposits of cobbles and boulders, to gravelly sand or sandy gravel, to loose silty sand or soft sandy silt. The latter materials appear to be confined to specific areas, which are inferred from aerial photographs to have been sediment control ponds.

3.0 SAMPLING

Placer tailings have previously been sampled for concrete aggregate testing in 2010 and 2011 (see Figure N-1). Results of concrete aggregate testing on placer tailings samples from 2010 and 2011 can be found in BGC site investigation reports for 2010 and 2011 (BGC 2011, BGC 2012a).

In July 2012, samples from 15 discrete locations within Dublin Gulch were collected (see Figure N-1 and Table N-1). Areas where placer tailings will be removed for construction of the heap leach embankment and the events ponds were targeted as directed by Victoria. At each location, cobbles and coarse gravel (typically greater than 50 mm) were sampled. Photos of each sampling location and a brief description of the in-situ material at each location are included in this appendix. Samples were submitted to Victoria to arrange laboratory testing. Testing results from this sampling were unavailable at the time of writing this report.

Table N- 1. 2012 Placer Tailing Sampling Locations

Sample ID	Easting (m)	Northing (m)	Elevation (masl)
PT1	459379	7101036	848
PT2	459409	7101138	854
PT3	459314	7101064	849
PT4	459264	7101009	845
PT5	459194	7101045	838
PT6	458963	7100973	827
PT7	459265	7100938	845
PT8	459265	7100938	845
PT9	458976	7100874	826
PT10	459095	7100892	836
PT11	459068	7101003	830
PT12	458916	7100944	827
PT13	458745	7100939	819
PT14	458775	7100823	820
PT15	458879	7100869	816

4.0 REFERENCES

BGC Engineering Inc. 2011. Eagle Gold Project 2010 Geotechnical Investigation for Mine Site Infrastructure Factual Data Report, Victoria Gold Corporation.

BGC Engineering Inc. 2012a. Eagle Gold Project 2011 Geotechnical Investigation for Mine Site Infrastructure Factual Data Report, Victoria Gold Corporation.

LeBarge, W.P., Bond, J.D., Hein, F.J. 2002. Placer gold deposits of the Mayo area, central Yukon. Bulletin 13. Exploration and Geological Services Division, Yukon Region.



Placer Tailings Sampling Location 1

SAND (SW) fine to coarse sand, gravelly, trace to some cobbles, trace silt, well graded, flat, angular, reddish brown, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 2

COBBLES AND BOULDERS, trace gravel, poorly graded, equidimensional, some flat, subangular, grey, granodiorite, some metasediments.



Placer Tailings Sampling Location 3

SAND (SW) fine to coarse sand, gravelly, trace cobbles, well graded, flat, angular, reddish brown, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 4

SAND (SW) fine to coarse sand, gravelly, trace cobbles, well graded, flat, angular, reddish brown, metasedimentary clasts, trace granodiorite clasts.



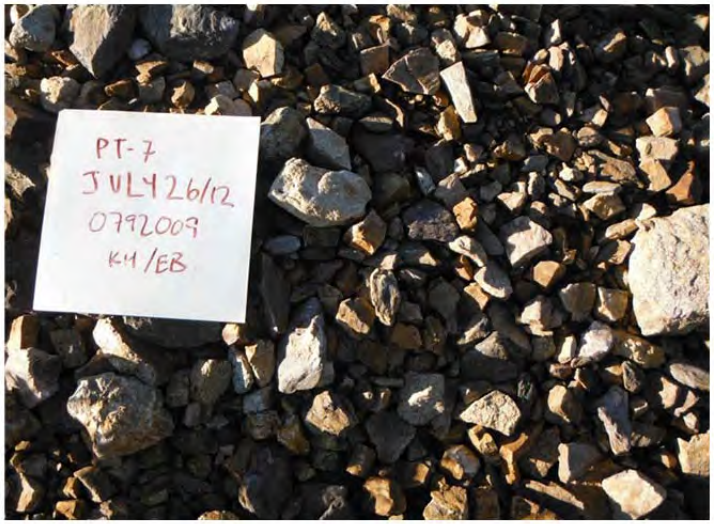
Placer Tailings Sampling Location 5

SAND (SW) fine to coarse sand, gravelly, some cobbles, trace silt, well graded, flat, some equidimensional, angular, reddish brown, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 6

SAND (SW) fine to coarse sand, some gravel, trace silt, trace cobbles, well graded, flat, angular, reddish brown, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 7

GRAVEL AND COBBLES trace boulders, poorly graded, equidimensional, angular, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 8

GRAVEL AND COBBLES poorly graded, equidimensional, some flat, angular, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 9

SAND (SM) fine to coarse sand, some silt, some gravel, trace cobbles, well graded, flat, some equidimensional, angular, greyish brown, metasedimentary clasts, some granodiorite clasts.



Placer Tailings Sampling Location 10

COBBLES some gravel, trace sand, trace boulders, poorly graded, equidimensional, whitsh red, some flat, angular, metasedimentary clasts.



Placer Tailings Sampling Location 11

SAND (SP-SM) fine sand, gravelly, trace to some silt, trace cobbles, poorly graded, flat, angular, reddish brown, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 12

SAND (SW) fine to coarse sand, gravelly, trace cobbles, well graded, flat, angular, reddish brown, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 13

SAND (SW) fine to coarse sand, gravelly, some cobbles, trace boulders, well graded, flat and equidimensional, angular to subangular, reddish brown, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 14

SAND (SW) fine to coarse sand, some gravel, trace silt, trace cobbles, well graded, flat and equidimensional, angular, reddish brown, metasedimentary clasts, trace granodiorite clasts.



Placer Tailings Sampling Location 15

SAND (SW) fine to coarse sand, cobbley, some gravel, trace boulders, well graded, flat and equidimensional, angular to subangular, white, red, grey, metasedimentary clasts, some granodiorite clasts.

7101500 7101000 7100500

459500

459000

N

HEAP LEACH FACILITY

HEAP EMBANKMENT

CONVEYOR

PROPOSED TOPSOIL STOCKPILE

STUTTLE GULCH

100 DAY STORAGE

EVENTS PONDS

PLANT SITE AREA

LOWER DUBLIN SOUTH POND

LAYDOWN AREA

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

LEGEND

PLACER TAILINGS SAMPLING LOCATIONS

2010

2011

2012

PROPOSED INFRASTRUCTURE LAYOUT

EXISTING ROAD

STREAM

SCALE 1:5000

50 0 50 100 150

METRES

NOTES:
1. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM WARDROP MARCH 28, 2012.

NAD 1983 UTM Zone 8N

AS A MUTUAL PROTECTION TO OUR CLIENT, THE PUBLIC, AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT. AUTHORIZATION FOR ANY USE AND/OR PUBLICATION OF THIS REPORT OR ANY DATA, STATEMENTS, CONCLUSIONS OR ABSTRACTS FROM OR REGARDING OUR REPORTS AND DRAWINGS, THROUGH ANY FORM OF PRINT OR ELECTRONIC MEDIA, INCLUDING WITHOUT LIMITATION, POSTING OR REPRODUCTION OF SAME ON ANY WEBSITE, IS RESERVED PENDING BGC'S WRITTEN APPROVAL. IF THIS REPORT IS ISSUED IN AN ELECTRONIC FORMAT, AN ORIGINAL PAPER COPY IS ON FILE AT BGC ENGINEERING INC. AND THAT COPY IS THE PRIMARY REFERENCE WITH PRECEDENCE OVER ANY ELECTRONIC COPY OF THE DOCUMENT, OR ANY EXTRACTS FROM OUR DOCUMENTS PUBLISHED BY OTHERS.

REV.	DATE	REVISION NOTES	DRAWN	CHECK	APPR.
0	NOV 2012	ISSUED WITH FINAL REPORT	LL	DW	AA
B	OCT 2012	ISSUED FOR COMMENT WITH SECOND DRAFT	LL	DW	PQ
A	AUG 2012	ISSUED FOR COMMENT	LL	DW	AA

SCALE: 1:5,000
DATE: NOV 2012
DRAWN: LL
DESIGNED: KH
CHECKED: DW
APPROVED: AA

PROFESSIONAL SEAL:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
2012 GEOTECHNICAL INVESTIGATION
FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT

TITLE: PLACER TAILINGS SAMPLING LOCATIONS

PROJECT No.:	DWG No.:	REV.:
0792009	N-1	0

X:\Projects\0792 Victoria Gold\009\Workspace\20121011_REPORT_Eagle_Gold_Project_2012_Geotech_Investigation_FINAL\N1_Placer_Tailings_Sampling_Locations.mxd Date: Tuesday, November 13, 2012 Time: 2:56 PM

DWG TO BE READ WITH BGC REPORT TITLED "EAGLE GOLD PROJECT 2012 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FACTUAL DATA REPORT" DATED NOVEMBER 2012

APPENDIX A-3
2017 GEOTECHNICAL INVESTIGATION

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

VICTORIA GOLD CORPORATION

EAGLE GOLD PROJECT

2016 HEAP LEACH FACILITY GEOTECHNICAL INVESTIGATION

FINAL

PROJECT NO.: 0792016 DATE: June 20, 2017
DOCUMENT NO.:

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 500 - 980 Howe Street
Vancouver, BC Canada V6Z 0C8
Telephone (604) 684-5900
Fax (604) 684-5909

June 20, 2017
Project No.: 0792016

Mark Ayranto
Victoria Gold Corporation
Suite 584 – Bentall Four
1055 Dunsmuir Street
Vancouver, BC V7X 1K8

Dear Mr. Ayranto,

Re: 2016 HEAP LEACH FACILITY GEOTECHNICAL INVESTIGATION- FINAL

Please find attached a draft copy of our above-referenced report for your review and comment. We trust this meets your current requirements.

Yours sincerely,

BGC ENGINEERING INC.
per:

Troy Meyer, PE, P.Eng.
Principal Geological Engineer

EXECUTIVE SUMMARY

This report summarizes the findings of geotechnical site investigation work conducted by BGC Engineering Inc. (BGC) for Victoria Gold Corporation in September and October 2016. The purpose of the geotechnical investigation is to increase knowledge of subsurface conditions at the Eagle Gold Project's proposed locations for the Heap Leach Facility (HLF) and associated event pond areas. Contributed knowledge from this geotechnical investigation is supplementary to previously collected data from prefeasibility and feasibility studies for the development of an open pit heap leach gold mine.

The geotechnical investigation program involved the excavation of 23 test pits, advancement of six HTW-size cored boreholes to depths of 31.8 to 50.2 m, and the installation of one standpipe piezometer in borehole BH-BGC16-091. This borehole was the deepest of the six boreholes (50.2 m) and was positioned in the center of the HLF embankment. Laboratory testing included soil grab samples and rock core samples. Soil samples were taken from test pits for soil index testing, including particle size analysis and Atterberg limits. Larger samples were taken from the event pond test pits for flexible wall permeameter tests, consolidated undrained triaxial tests, and standard proctor tests to assess their suitability as borrow materials. Visual description of overburden materials was done in accordance to BGC's description system. Core samples from five of the six boreholes were collected for uniaxial compressive stress tests and point load testing to help classify rock mass strength and other properties. Rock mass characterization was done in accordance with BGC's rock core logging field procedures. Material type designations were given to rock encountered in test pits and boreholes ranging from Type 3 rock with lower strength characteristics to Type 1 with higher strength characteristics.

Overburden materials consist of organic veneers, colluvium, and highly to completely weathered bedrock, in stratigraphic order. Overburden is underlain by moderately weathered to fresh bedrock. The organic veneer varies from 0.0 to 0.4 m below ground surface and includes a mixture of dark brown organic topsoil, moss, and roots. Colluvium varies from 0.0 to 7.6 m below ground surface in test pits and boreholes. Colluvium materials include a mixture of greyish to reddish brown silt, sand and gravel. Bedrock in the area is metasedimentary in composition. Highly weathered to completely weathered bedrock was observed in some test pits and boreholes within the top 10 m of bedrock. Moderately weathered to fresh bedrock occurs from 0.4 to 8.3 m below ground surface in boreholes and test pits. Frozen ground was encountered in six test pits (TP- BGC16-187, 188, 199, 200, 201 and 203) and one borehole (BH-BGC16-088). The test pits and borehole with observed frozen ground are scattered between the area of the event ponds and the toe of the HLF embankment. Frozen ground, including visible and non-visible designations, was encountered within colluvium gravels and sands from 0.4 to 5.2 m below ground surface. The deepest observed frozen ground was in BH-BGC16-088 at 6.7 m. Three samples from test pits TP-BGC16-187, 199 and 200 were tested for volumetric ice content. The ice content ranged from 20 to 35 percent, classifying the soil samples as ice-rich. Ice-rich soils require ripping and removal during construction.

Groundwater levels were taken in five of the six boreholes after drilling and observed in two of 23 test pits as seepage during excavation. The observed depths to groundwater in boreholes ranged from 3.1 to 11.1 m below ground surface.

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... **i**
TABLE OF CONTENTS ..... **iii**
LIST OF TABLES ..... **iv**
LIST OF APPENDICES ..... **iv**
LIST OF DRAWINGS ..... **iv**
LIMITATIONS ..... **v**
1.0 INTRODUCTION **1**
1.1. Background **1**
1.2. Project Description **1**
1.3. Previous Investigation **1**
1.4. Scope of Work **2**
2.0 SITE CONDITIONS **3**
2.1. Surficial Geology **3**
2.2. Bedrock Geology **3**
3.0 GEOTECHNICAL INVESTIGATION **4**
3.1. Overview **4**
3.2. Test Pitting **6**
3.3. Geotechnical Borehole Drilling **6**
3.4. Standpipe Piezometers **7**
3.5. Laboratory Testing **7**
3.5.1. Soil Index Testing 7
3.5.2. Rock Strength Testing 9
3.5.3. Borrow Source Testing 11
4.0 OBSERVED SUBSURFACE CONDITIONS **14**
4.1. Material Types **14**
4.2. Material Descriptions **14**
4.2.1. Overburden 14
4.2.1.1. Organics 14
4.2.1.2. Colluvium 15
4.2.2. Highly to Completely Weathered (Type 3) Bedrock 15
4.2.3. Moderately Weathered to Fresh Bedrock (Type 1 and 2) Bedrock) 15
4.2.4. Frozen Ground 16
4.2.5. Groundwater Conditions 17
5.0 CLOSURE **18**
REFERENCES **19**

LIST OF TABLES

Table 3-1. Test pit locations and completion data. 4
Table 3-2. Borehole locations and completion data. 5
Table 3-3. Summary of soil testing. 7
Table 3-4. Particle size analysis (ASTM D-422). 8
Table 3-5. Atterberg limits (ASTM D-4318 Method B). 9
Table 3-6. Summary of rock testing. 9
Table 3-7. Summary of Unconfined Compressive Strength test results (ASTM D7012, ASTM 4543). 10
Table 3-8. Summary of Point Load Test Results (ASTM D5731). 10
Table 3-9. Summary of Borrow Source Testing. 11
Table 3-10. Standard Proctor Density (ASTM D698). 11
Table 3-11. Flexible Wall Permeameter (ASTM D-5084-10 Method C). 12
Table 3-12. Isotropically Consolidated Undrained Triaxial Compression (CIU). 12
Table 3-13. Isotropically Consolidated Undrained Triaxial Compression (CIU) Continued. 13

LIST OF APPENDICES

APPENDIX A TERMINOLOGY FOR TEST PIT AND BOREHOLE LOGS
APPENDIX B TEST PIT LOGS
APPENDIX C TEST PIT PHOTOS
APPENDIX D BOREHOLE LOGS
APPENDIX E BOREHOLE PHOTOS
APPENDIX F LAB TEST REPORT

LIST OF DRAWINGS

DRAWING 01 General Site Location
DRAWING 02 Surficial Geology
DRAWING 03 Frozen Ground Observations

LIMITATIONS

BGC Engineering Inc. (BGC) prepared this document for the account of Victoria Gold Corporation. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves, all documents and drawings are submitted for the confidential information of our client for a specific project. Authorization for any use and/or publication of this document or any data, statements, conclusions or abstracts from or regarding our documents and drawings, through any form of print or electronic media, including without limitation, posting or reproduction of same on any website, is reserved pending BGC's written approval. A record copy of this document is on file at BGC. That copy takes precedence over any other copy or reproduction of this document.

1.0 INTRODUCTION

1.1. Background

Victoria Gold Corporation (VIT) is planning the construction of a heap leach facility as part of their Eagle Gold Mine Project. BGC Engineering Inc. (BGC) was retained by VIT to complete supplemental geotechnical investigations for the Heap Leach Facility (HLF; also referred to as the Primary Heap Leach Facility in the 2016 Feasibility Study Technical Report for the Eagle Gold Project). This report presents factual data resulting from geotechnical investigations performed in September and October 2016. This work was conducted to investigate subsurface conditions at the proposed locations for the HLF and associated event pond areas.

1.2. Project Description

The Eagle Gold property is located within the Yukon Territory approximately 45 km north of Mayo, and 15 km northwest of Elsa as shown in Drawing 01. The mine will comprise an open pit and heap leach pad; haul roads; waste rock storage areas; process plant; crushers and conveyors; truck shop; camp; water diversion structure; process water ponds; drainage ditches; sediment control structures and various ancillary facilities.

The current layout for the proposed mine facilities was received from AllNorth on November 9, 2016. The layout of the HLF was provided by the DOWL consulting firm (DOWL 2016). This report presents the investigation methods and results within the proposed footprint of these mine facilities.

1.3. Previous Investigation

Site conditions at the Eagle Gold site relevant to the HLF have been partially described in several reports as follows:

- BGC Engineering Inc. 2010. Site Facilities Geotechnical Investigation Factual Data Report. Eagle Gold Project, Victoria Gold Corporation, prepared March 10, 2010.
- BGC Engineering Inc. 2011. 2010 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation, prepared November 17, 2011.
- BGC Engineering Inc. 2012a. 2011 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation, prepared January 12, 2012.
- BGC Engineering Inc. 2012b. 2011 Geotechnical Investigation for Mine Site Infrastructure, Foundation Report. Eagle Gold Project, Victoria Gold Corporation, prepared January 31, 2012.
- BGC Engineering Inc. 2012. 2012 Geotechnical Investigation for Mine Site Infrastructure, Foundation Report. Eagle Gold Project, Victoria Gold Corporation, prepared November 30, 2012.

In 2009, BGC was engaged to gather factual data describing subsurface conditions at the proposed heap leach and waste rock storage facility locations. The work involved the excavation of 69 test pits and advancement of seven boreholes. Thermistor strings were installed in three boreholes to gather temperature data. Dynamic cone penetration profiles were obtained at two borehole locations to obtain information about material consistency. Dynamic cone soundings were attempted in two other holes and met with refusal. Groundwater monitoring wells were installed by Stantec Inc. in two of the seven BGC boreholes. In addition, Stantec supervised the logging and installation of several other monitoring wells around the site.

In 2010, BGC was engaged to develop a geotechnical site investigation program in support of the feasibility study for proposed mine site infrastructure. A total of 49 test pits and 25 drill holes were completed to characterize the overburden material and bedrock conditions. Additionally, three cut slopes were logged for exposed soil and rock conditions, and core from one client-drilled condemnation hole was logged for geotechnical purposes. Laboratory testing was completed on selected samples for moisture content, and representative samples were tested for Atterberg limits and grain size analysis. Various other lab tests were completed on bulk samples of placer tailings being considered for potential use as select fill or aggregate.

In 2011, BGC was engaged to develop a supplemental geotechnical site investigation. The 2011 geotechnical site investigation program was conducted between June and August 2011, and the field activities involved the excavation of 96 test pits, advancement of 46 drill holes (29 diamond-core holes and 17 auger holes), and mapping of 59 outcrops (natural exposures, existing road cuts and drill pad cuts) to characterize subsurface conditions relevant for foundation and earthworks design. Samples were taken from select test pits and boreholes for index testing of soil and rock. Bulk samples of rock and placer tailings were analyzed for a range of parameters related to the potential for re-use as select fill or aggregate.

1.4. Scope of Work

BGC was engaged in 2016 to provide further geotechnical investigation work to address gaps in the data required in support of final design of the HLF. The 2016 geotechnical site investigation program was conducted in September and October 2016, in the area encompassing the heap leach embankment PLS sump, event ponds 1, 2 and 3, and contingency pond locations at the HLF. Field activities involved the excavation of 23 pits and advancement of six drill holes to characterize subsurface conditions relevant for foundation and earthworks design. Samples were taken from select test pits and boreholes for index and specialized testing of soil and rock.

This report presents factual data only from the 2016 investigation, and does not include engineering interpretation of the data.

2.0 SITE CONDITIONS

2.1. Surficial Geology

Overburden soils encountered on the sloping ground at the HLF site typically consist of a veneer of organic soils overlying a blanket of colluvium, which overlies weathered bedrock. The scope of the 2016 geotechnical site investigation encompassed mostly the surficial colluvium deposits (see Drawing 02). Previous site investigations described portions of the site investigation area in greater detail using United Soil Classification System (USCS) classifications (BGC 2012a). The colluvium consists of Pleistocene and Holocene-aged deposits. Material composition of these deposits includes silt, sands and gravels derived from shattered and weathered bedrock. The deposition of these materials has occurred via creep, sheet wash and other common mass wasting transport mechanisms. The Dublin Gulch valley bottom is predominately alluvium and placer mining tailings. The placer mining deposits are native surficial materials reworked by placer mining operations (Bond 1998).

Frost fracturing and permafrost is common at the latitude of the project site making shallow subsurface processes and rock/soil characteristics more complex (BGC 2012b). Frozen ground is located intermittently throughout the HLF site (see Drawing 03) and typically occurs on north and east facing slopes in the Dublin Gulch valley.

2.2. Bedrock Geology

Geologic conditions in the Dublin Gulch area have been strongly influenced by the geotectonic forces that produced the Eagle Zone deposit. The Eagle Zone deposit is in the Potato Hills stock which outcrops above Haggart Creek. The primary component of the Potato Hills stock is an intrusive medium-grained phaneritic granodiorite dated at approximately 93 million years (Smit et al. 1995). The host rock in the Dublin Gulch area is a primarily clastic metasedimentary rock from the Upper Proterozoic to Lower Cambrian assigned to the Hyland Group. The metasedimentary clastic rocks consist primarily of quartzites and phyllites. Minor components of schists and carbonates are present in the metasedimentary clastic rocks. Intrusions within the Hyland Group have altered the clastic rocks into quartz-biotite, argillaceous rocks into sericite-biotite-chlorite schist and the carbonates into marble (Stephens et al. 2004).

3.0 GEOTECHNICAL INVESTIGATION

3.1. Overview

The site of the proposed HLF facilities is currently heavily forested with mountain boreal flora typical of the area. Access roads to field work locations were cut through the forest on a site-by-site basis to allow passage of the skid-mounted drill and excavation equipment.

The field work for this 2016 geotechnical site investigation included 23 test pits and six boreholes. Borehole and test pit locations were proposed by DOWL and are within areas to be covered by the heap leach embankment PLS sump, event ponds 1, 2 and 3, and contingency ponds (DOWL 2016). The locations of boreholes and test pits were surveyed by BGC staff following completion using a handheld GPS unit and should be considered approximate. Borehole and test pit locations and general completion details are summarized in Table 3-1 and Table 3-2.

Table 3-1. Test pit locations and completion data.

Hole ID	Easting (UTM)	Northing (UTM)	Zone	Elevation (m)	Test Pit Depth (m)	Survey Method	Area
TP-BGC16-182	459633	7101483	8W	928	7.2	Handheld GPS	Ann Gulch
TP-BGC16-183	459623	7101477	8W	92	4.6	Handheld GPS	Ann Gulch
TP-BGC16-184	459517	101389	8W	903	5.0	Handheld GPS	Ann Gulch
TP-BGC16-185	459533	7101426	8W	914	4.0	Handheld GPS	Ann Gulch
TP-BGC16-186	459451	101387	8W	04	5.4	Handheld GPS	Ann Gulch
TP-BGC16-187	459459	7101417	8W	10	1.3	Handheld GPS	Ann Gulch
TP-BGC16-188	459328	7101370	8W	919	0.9	Handheld GPS	Ann Gulch
TP-BGC16-189	459190	7101281	8W	906	4.6	Handheld GPS	Ann Gulch
TP-BGC16-190	459247	7101285	8W	904	4.6	Handheld GPS	Ann Gulch
TP-BGC16-191	459366	7101236	8W	947	4.7	Handheld GPS	Ann Gulch
TP-BGC16-192	458850	7101229	8W	887	4.25	Handheld GPS	Ann Gulch
TP-BGC16-193	458778	7101247	8W	883	5.5	Handheld GPS	Ann Gulch

Hole ID	Easting (UTM)	Northing (UTM)	Zone	Elevation (m)	Test Pit Depth (m)	Survey Method	Area
TP-BGC16-194	458741	7101277	8W	879	4.5	Handheld GPS	Ann Gulch
TP-BGC16-195	458731	7101354	8W	883	2.5	Handheld GPS	Ann Gulch
TP-BGC16-196	459517	7101560	8W	925	6.0	Handheld GPS	Ann Gulch
TP-BGC16-197	459561	7101499	8W	920	5.2	Handheld GPS	Ann Gulch
TP-BGC16-198	458526	7101144	8W	826	5.0	Handheld GPS	Ann Gulch
TP-BGC16-199	458636	7101165	8W	844	2.5	Handheld GPS	Haggart Creek
TP-BGC16-200	458611	7101251	8W	843	2.3	Handheld GPS	Haggart Creek
TP-BGC16-201	458521	7101280	8W	811	1.3	Handheld GPS	Haggart Creek
TP-BGC16-202	459395	7101497	8W	930	5.0	Handheld GPS	Ann Gulch
TP-BGC16-203	459308	7101474	8W	930	4.5	Handheld GPS	Ann Gulch
TP-BGC16-204	459458	7101498	8W	914	6.1	Handheld GPS	Ann Gulch

Table 3-2. Borehole locations and completion data.

Hole ID	Easting (UTM)	Northing (UTM)	Zone	Elevation (m)	Borehole Depth (m)	Survey Method	Area
BH-BGC16-086	459458	7101498	8W	910	31.75	Handheld GPS	Ann Gulch
BH-BGC16-087	459516	7101553	8W	917	35.05	Handheld GPS	Ann Gulch
BH-BGC16-088	459321	7101369	8W	927	35.05	Handheld GPS	Ann Gulch
BH-BGC16-089	459448	7101383	8W	888	33.22	Handheld GPS	Ann Gulch
BH-BGC16-090	459630	7101485	8W	928	36.42	Handheld GPS	Ann Gulch
BH-BGC16-091	459536	7101485	8W	911	50.24	Handheld GPS	Ann Gulch

Soil samples were taken from test pits for soil index testing including particle size analysis and Atterberg limits. Larger samples were taken from the event pond test pits for flexible wall permeameter tests, consolidated undrained triaxial tests, and standard Proctor tests to assess their suitability as borrow materials. Visual description of overburden materials was done in accordance with BGC's description system as outlined in Appendix A. The format of the description system is based upon the Canadian Foundation Engineering Manual (CFEM), 4th Edition, the American Society for Testing and Materials (ASTM) Standard D2488-09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) and ASTM Standard D2487-11 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification Procedure).

Ice-rich soils encountered in test pits were described using BGC's field procedure for description and classification of ice-rich soils. The field procedure is based upon the USCS and Standard Practice for Description and Identification of Soils (ASTM D4083) as seen in Appendix A.

Core samples from five of the six boreholes were collected for Unconfined Compressive Strength (UCS) tests and Point Load Testing (PLT) to help classify rock mass strength and other properties. Rock mass characterization was done in accordance to BGC's rock core logging field procedures. BGC rock core logging field procedure is based on international organizations, published research, and current technical manuals. Field procedures include the use of a core description log and discontinuity log in combination to generate a borehole log as outlined in Appendix A.

3.2. Test Pitting

Test pits were completed between September 6 and 18, 2016, with a Caterpillar 325 DL excavator using a toothed bucket. Test pit depths ranged from 0.9 to 7.2 m below ground surface. The final depth of each pit was determined by refusal in bedrock or frozen ground, or by the maximum reach of the excavator. The primary purpose of the test pits was to characterize overburden materials and conditions in areas not investigated in previous site investigation programs. Test pit logs are compiled in Appendix B. Test pit photos are compiled in Appendix C.

3.3. Geotechnical Borehole Drilling

The boreholes were drilled with a skid mounted rotary KD 1000-03 between September 7 and 15, 2016. The drill skid was moved into position using an excavator via temporary access roads. Borehole depths ranged from 31.8 to 50.2 m below ground surface. Borehole end depths were defined at least 10 m into bedrock with Rock Quality Designation (RQD) ≥ 50. BH-BGC16-091 was drilled to a greater depth to obtain a reference core from relatively deeper bedrock material with respect to adjacent boreholes. The primary purpose of the boreholes was to determine the depth of overburden materials and characterize bedrock materials and conditions in areas not investigated in previous site investigation programs. Borehole logs are compiled in Appendix D. Borehole photos are compiled in Appendix E.

3.4. Standpipe Piezometers

One standpipe piezometer was installed in borehole BH-BGC16-091, located in the center of the proposed heap leach embankment. The standpipe consists of a 2" PVC pipe, slotted at the bottom to allow water to enter, and backfilled with sand through the slotted portion and grouted above. The slotted portion of the PVC is located between 44.1 and 47.2 m. The sand filter zone is between 42.6 m and the end of hole at 50.2 m. The borehole space above 42.6 m was grouted to the ground surface. An illustration of this installation is located within the BH-BGC16-091 borehole log in Appendix D. The purpose of the standpipe piezometer is to allow monitoring of ground water levels in the area.

3.5. Laboratory Testing

Laboratory testing of soil and rock samples was completed at BGC's laboratory in Fredericton, New Brunswick. Testing included soil index testing, rock strength testing and borrow source testing. Laboratory reports are included in Appendix F. Tabulated summaries of testing are included in Tables 3-3, 3-6, and 3-9. Tabulated results from testing are included in Tables 3-4, 3-5, 3-7, 3-8, 3-10, 3-11 and 3-12.

3.5.1. Soil Index Testing

Grab samples for soil testing were recovered from test pit walls in test pits TP-BGC16-182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, and 202. Soil index testing of disturbed soil samples was conducted to further characterize the encountered materials and to confirm field descriptions. Detailed observations for soil index testing are provided in Appendix F. Table 3-3 below provides a summary of laboratory soil index tests completed. Particle size analysis tests were conducted on 19 samples. Two of the 19 samples were blended samples. A summary of these results is included in Table 3-4. Atterberg limits tests were conducted on two samples. A summary of these results is included in Table 3-5.

Table 3-3. Summary of soil testing.

Soil Index Testing		
Laboratory Test	**Testing Standard**	**Number of Tests**
Particle Size Analysis	ASTM D-422	19
Atterberg limits	ASTM D-4318 Method B	2

Table 3-4. Particle size analysis (ASTM D-422).

Test Pit (#)	Grab (#)	Depth From (m)	Depth To (m)	Water Content (%)	Cobble (%)	Gravel (%)	Sand (%)	Fines (%)	USCS Class
TP-BGC16-182	G02	1.5	1.8	7.1	0	33	36	30	GP
TP-BGC16-182	G01	2.0	2.5	10.2	23	65	9	3	-
TP-BGC16-183	G01	0.7	1.5	10.3	0	51	34	15	GM
TP-BGC16-183	G02	1.5	1.8	15.0	0	25	32	43	-
TP-BGC16-184	G01	0.15	0.35	12.7	0	47	35	17	GM
TP-BGC16-187	G02	0.7	1.4	15.0	0	31	36	32	-
TP-BGC16-189	G02	3.8	4.6	12.1	0	44	19	37	-
TP-BGC16-191	G01	0.25	1.1	6.1	0	76	17	7	GP-GM
TP-BGC16-193	G02	3.5	5.5	3.2	5	92	2	1	GP
TP-BGC16-194	G01	0.2	2.5	10.5	0	27	41	32	-
TP-BGC16-195	G01	0.2	1.5	8.6	0	40	34	25	-
TP-BGC16-196	G01	0.0	1.75	10.8	0	42	32	26	-
TP-BGC16-197	G01	0.15	1.5	6.0	0	75	15	10	-
TP-BGC16-198	G02	2	5	13.1	0	34	32	33	-
TP-BGC16-199	G02	1.2	2.5	18.1	0	43	34	23	GM
TP-BGC16-200	G02	1.5	2.3	8.2	0	51	42	7	GP-GM
TP-BGC16-201	G01	0.2	0.85	11.9	0	51	34	15	-
Blended Sample (1)	-	-	-	-	0	28	35.4	36.6	SM
Blended Sample (2)	-	-	-	-	0	31.5	37.8	30.7	SM
Average				**10.5**	**1.5**	**46.7**	**29.3**	**22.3**	**-**

Notes:

1. Blended Sample (1) is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, 202, 202 (G02), 202 (G03).
2. Blended Sample (2) is a mix of the following test pits: TP-BGC16-185, 186, 186(G02), 189, 193, 198, 199, 200, 201 (G02).

Table 3-5. Atterberg limits (ASTM D-4318 Method B).

Test Pit (#)	LL (%)	PL (%)	PI (%)	USCS Class
Blended Sample (1)	30.7	25.0	5.7	ML
Blended Sample (2)	Non-Plastic	Non-Plastic	Non-Plastic	Non-Plastic

Notes:

1. Blended Sample (1) is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, 202, 202 (G02), 202(G03).
2. Blended Sample (2) is a mix of the following test pits: TP-BGC16-185, 186, 186(G02), 189, 193, 198, 199, 200, 201 (G02).

3.5.2. Rock Strength Testing

Rock core samples were taken from portions of boreholes BH-BGC16-086, 087, 088, 089 and 091. Rock strength testing of core samples was conducted to further characterize the encountered materials and to confirm field descriptions. Detailed observations for rock strength testing are provided in Appendix F. Table 3-6 below provides a summary of laboratory rock strength tests completed. Five rock core samples from five boreholes were selected for UCS laboratory testing. A summary of completed and valid tests is provided in Table 3-7. Three or four samples were tested from each borehole using Point Load Tests (PLT). Twelve PLT samples were tested diametrically and four PLT samples were tested axially. A summary of completed and valid tests is provided in Table 3-8.

Table 3-6. Summary of rock testing.

Rock Strength Testing		
Laboratory Tests	**Testing Standard**	**Number of Tests**
Unconfined Compressive Strength	ASTM D7012, ASTM 4543	5
Point Load Tests	ASTM D5731	16

Table 3-7. Summary of Unconfined Compressive Strength test results (ASTM D7012, ASTM 4543).

Sample ID	Depth (m)	Load (kN)	UCS (MPa)
BH-BGC16-086 (UCS01)$_1$	22.74 to 23.19	79.4	20.0
BH-BGC16-087 (UCS01)$_2$	33.38 to 33.70	68.8	17.3
BH-BGC16-088 (UCS01)$_3$	30.81 to 30.97	126.6	31.9
BH-BGC16-089 (UCS01)$_2$	21.10 to 21.32	248.4	63.0
BH-BGC16-091 (UCS01)$_1$	36.21 to 36.42	116.7	29.5
	Average	**128.0**	**32.36**

Notes:

1. Sample failed along a pre-existing plane of weakness parallel to its bedding/foliations.
2. Sample failed along a pre-existing plane of weakness parallel to and perpendicular to its bedding/foliations.
3. Sample failed along a pre-existing plane of weakness perpendicular to its bedding/foliations.

Table 3-8. Summary of Point Load Test Results (ASTM D5731).

Sample	Test Type	Load (P) kN	De2, mm^2	De, mm	Is, MPa	F	Is$_{50}$, MPa	UCS (Sc), MPa
BH-BGC16-086 PLT 01	d‖	3.30	5028	-	0.66	1.17	0.77	17
BH-BGC16-086 PLT 02	d‖	14.44	5035	-	2.87	1.17	3.36	76
BH-BGC16-086 PLT 03	d[1]	0.14	5031	-	0.03	1.17	0.03	1
BH-BGC16-086 PTL04	d	9.74	5045	-	1.93	1.17	2.26	51
BH-BGC16-087 PLT 01	a.1[1]	4.24	5691	4469	0.74	1.20	0.90	20
BH-BGC16-087 PLT 02	a.1[1]	5.18	5540	4351	0.94	1.20	1.12	25
BH-BGC16-087 PLT 03	d	2.12	5045	-	0.42	1.17	0.49	11
BH-BGC16-088 PLT 01	a.1[1]	4.73	5376	4220	0.88	1.19	1.05	23
BH-BGC16-088 PTL 02	d‖	10.95	5051	-	2.17	1.17	2.54	58
BH-BGC16-088 PTL 03	d‖	2.58	5055	-	0.51	1.17	0.60	14
BH-BGC16-089 PLT 01	a.1[1]	0.12	4118	3233	0.03	1.12	0.03	1
BH-BGC16-089 PLT 02	d‖	7.63	5017	-	1.52	1.17	1.78	40
BH-BGC16-089 PLT 03	d	0.39	5041	-	0.08	1.17	0.09	2
BH-BGC16-091 PLT 01	d‖	0.28	5027	-	0.06	1.17	0.06	1
BH-BGC16-091 PLT 02	d‖	6.92	5020	-	1.38	1.17	1.61	37
BH-BGC16-091 PLT 03	d	3.42	5027	-	0.68	1.17	0.80	18
Average		**4.76**	**5072**	**4068**	**0.93**	**1.17**	**1.09**	**25**

Notes:

1. d= diametrical, a= axial, b= block, i= irregular lump, .1= perpendicular to plane of weakness, ‖= parallel to plane of weakness, [1]Fracture Surface only passed through one loading point.

3.5.3. Borrow Source Testing

Grab samples for borrow source testing were recovered from test pits TP-BGC16-185, 186, 187,188, 189, 190, 192, 193, 198, 199, 200, 201, and 202. Borrow source testing was conducted to further characterize the encountered materials and to confirm field descriptions. Detailed observations for borrow source testing are provided in Appendix F. Table 3-9 provides a summary of borrow source laboratory tests completed. Standard Proctor density tests were conducted on nine blended samples. A summary of these results is included in Table 3-10. Flexible wall permeameter tests were conducted on two blended samples. A summary of these results is included in Table 3-11. Isotopically consolidated undrained triaxial compression tests were conducted on six blended samples. A summary of these results is included in Table 3-12 and Table 3-13.

Table 3-9. Summary of Borrow Source Testing.

Borrow Source Testing		
Laboratory Tests	**Testing Standard**	**Number of Tests**
Standard Proctor Density	ASTM D698	2
Flexible Wall Permeameter	ASTM D-5084-10 Method C	2
Isotopically Consolidated Undrained Triaxial Compression	ASTM 4767	6

Table 3-10. Standard Proctor Density (ASTM D698).

Test Pit (#)	Optimum Water Content (%)	Maximum Dry Density (kg/m^3)
Blended Sample (1)	6.1	1921
Blended Sample (1)	9.3	1971
Blended Sample (1)	10.7	1977
Blended Sample (1)	12.0	1964
Blended Sample (1)	13.9	1904
Blended Sample (2)	8.7	1947
Blended Sample (2)	10.2	1990
Blended Sample (2)	11.4	1993
Blended Sample (2)	13.1	1948

Notes:

1. Blended Sample (1) is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, 202, 202(G02), 202 (G03).
2. Blended Sample (2) is a mix of samples from the following test pits: TP-BGC16-185, 186, 186(G02), 189, 193, 198, 199, 200, 201(G02).

Table 3-11. Flexible Wall Permeameter (ASTM D-5084-10 Method C).

Test Pit (#)	Bulk Density (g/cm^3)	Water Content (%)	Degree of Saturation Sr (%)	Hydraulic Conductivity K (cm/s)
Blended Sample (1)	2.16	14.8	91.6	2.2E-06
Blended Sample (2)	2.22	11.6	87.8	2.3E-07

Notes:

1. Blended Sample (1) is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, 202, 202 (G02), 202(G03).
2. Blended Sample (2) is a mix of samples from the following test pits: TP-BGC16-185, 186, 186(G02), 189, 193, 198, 199, 200, 201 (G02).

Table 3-12. Isotropically Consolidated Undrained Triaxial Compression (CIU).

Test (#)	Water Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Void Ratio (e)	Specific Gravity	Degree of Sat. Sr (%)	LL	PL	PI
CIU 1	10.7	2.22	2.00	0.35	2.70	83.0	NP	NP	NP
CIU 2	10.9	2.13	1.92	0.41	2.70	72.4	30.7	25.0	5.7
CIU 3	11.1	2.23	2.00	0.35	2.70	86.2	NP	NP	NP
CIU 4	10.8	2.14	1.93	0.40	2.70	73.3	30.7	25.0	5.7
CIU 5	11.0	2.22	2.00	0.35	2.70	84.5	NP	NP	NP
CIU 6	11.0	2.12	1.91	0.42	2.70	71.5	30.7	25.0	5.7
Average	**10.9**	**2.18**	**1.96**	**0.38**	**2.70**	**78.5**	**30.7**	**25.0**	**5.7**

Notes:

1. CIU 1 is a mix of samples from the following test pits: TP-BGC16-185, 186, 189, 193, 198, 199, 200, and 201.
2. CIU 2 is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, and 202.
3. CIU 3 is a mix of samples from the following test pits: TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201.
4. CIU 4 is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, and 202.
5. CIU 5 is a mix of samples from the following test pits: TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201.
6. CIU 6 is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, and 202.
7. NP = Non-plastic sample
8. Degree of saturation Sr (%) is before saturation. CIU tests were backpressure-saturated to b-values ≥0.98 before shearing.

Table 3-13. Isotropically Consolidated Undrained Triaxial Compression (CIU) Continued.

Test (#)	Su (kPa)	Su/p'	Φ'_{max} (°)	$\Phi'_{20\%}$ (°)
CIU 1	153	1.02	42.8	42.8
CIU 2	109	0.73	43.6	42.8
CIU 3	289	0.96	39.1	38.3
CIU 4	179	0.60	40.5	39.1
CIU 5	425	0.71	39.1	38.3
CIU 6	238	0.40	38.3	36.9
Average	**230**	**0.74**	**41**	**40**

Notes:

1. CIU 1 is a mix of samples from the following test pits: TP-BGC16-185, 186, 189, 193, 198, 199, 200, and 201.
2. CIU 2 is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, and 202.
3. CIU 3 is a mix of samples from the following test pits: TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201.
4. CIU 4 is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, and 202.
5. CIU 5 is a mix of samples from the following test pits: TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201.
6. CIU 6 is a mix of samples from the following test pits: TP-BGC16-187, 188, 190, 192, and 202.

4.0 OBSERVED SUBSURFACE CONDITIONS

4.1. Material Types

Rock has been classified as Type 1, 2 or 3. Type 3 rock is usually the first "rock-like" material underlying the overburden soil materials, however, sharp contacts between overburden and Type 2 or Type 1 rock have been observed occasionally. Type 3 rock is defined as rock that is highly or less weathered (i.e., W4 or better), and has intact strength greater than R0 (i.e., minimum UCS strength 1 MPa). It is expected that Type 3 rock can generally be excavated with normal excavating equipment, with approximately 40 percent requiring ripping.

Type 2 rock is defined as rock with Geological Strength Index (GSI) (Hoek and Marinos 2000) or Rock Mass Rating (RMR) of 30 or greater (Bieniawski 1976) and core recovery during drilling of 50 percent or greater. Alternatively, where GSI and RMR data are unavailable, average RQD of 10 or greater serves as an equivalent criterion. It is expected that Type 2 rock will generally require ripping, with approximately 35 percent that can be excavated with normal excavation equipment.

Type 1 rock is defined as having GSI, RMR or average RQD exceeding 40. It is expected that Type 1 rock will mostly require ripping, potentially hard ripping, with approximately 10-20 percent requiring blasting (BGC 2012b).

Test pit materials were given material type designations based upon comparable field descriptions such as strength, fracture characteristics and weathering classification. Borehole cores were given material type designations based upon the traditional suite of classification parameters including RMR, RQD, recovery percentage and weathering grade (BGC 2012a).

4.2. Material Descriptions

4.2.1. Overburden

Overburden thickness was up to 7.6 m in test pits and boreholes where the bedrock contact was confirmed. In several test pits, the base of the overburden was not encountered due to refusal in frozen ground or the limited reach of the excavator. Overburden materials consist of organics, colluvium, and highly to completed weathered bedrock, in stratigraphic order. Placer tailings are present in the Dublin Gulch valley bottom (BGC 2012b), but were not encountered in the site investigation area.

4.2.1.1. Organics

The organic veneer varied from 0.0 to 0.4 m below ground surface based upon test pit observations. The composition of this organic veneer included a mixture of dark brown organic topsoil, moss, and roots. Roots formed a root mat consisting of a variety of root sizes ranging from rootlets to large tree roots. Vegetation supported at the surface by the root mat included trees, shrubs, minor grasses and lichen.

4.2.1.2. Colluvium

Colluvium varied from 0.0 to 7.6 m below ground surface in test pits and boreholes. Colluvium materials included a mixture of greyish to reddish brown silt, sand and gravel. The primary grain size described in the logs and confirmed in laboratory tests using grab samples was gravel. Tests indicated primarily poorly graded gravel (GP) or silty gravel (GM), per USCS classification. Blended samples from test pits over greater grab sample intervals indicated primarily silty sand (SM) per USCS classification. Grading varied from well graded to poorly graded with most descriptions and samples indicating materials that were gap graded or poorly graded. Fine grained materials were low plasticity or non-plastic where encountered.

4.2.2. Highly to Completely Weathered (Type 3) Bedrock

A zone of highly weathered to completely weathered bedrock was observed in some test pits and boreholes. The occurrence of this zone was within the top 10 m of bedrock. The bedrock in this zone was a metasedimentary rock with dark brown to reddish grey colouration. Rock strength in highly weathered portions of the bedrock varied from very weak (R1) to weak (R2). The structure of these portions of the bedrock was foliated. Weathering of the bedrock was observed as oxidization and seepage which occurred along the rock foliations. Completely weathered portions of the bedrock were described as soils and lacked the well-defined foliated structure of the highly weathered portions of the bedrock. These soils were typically described as a homogenous, weakly cemented, well graded gravel and sand.

4.2.3. Moderately Weathered to Fresh Bedrock (Type 1 and 2) Bedrock)

Weathering and associated changes in strength decreases with depth. Moderately weathered to fresh bedrock occurs from 0.4 to 8.3 m below ground surface in boreholes and test pits. This bedrock was metasedimentary in composition with primarily grey with brown to reddish grey colouration. Intact rock strength of the encountered rock types was variable, with strength ranging between very weak (R1) and very strong (R5). The average intact strength was estimated to be R3 (25 - 50 MPa) in the bedrock. Bedrock strength varied across the site depending upon the degree of weathering and structure of the rock. The rock mass quality and characteristics were inferred from observations in boreholes using the Rock Mass Rating (RMR) system. Rock Mass Rating values of 20 to 30 (poor) were observed from 1.8 to 10.5 m below ground surface. Rock Mass Rating values between 40 and 80 (fair to good) were observed below 10.5 m below ground surface. Shear and fault gouge-filled zones lowered RMR values below 10.5 m below ground surface and were observed in zones up to 2.5 m thick. These zones typically had higher fracture frequencies and lower core recoveries, rock strength and RQD values.

4.2.4. Frozen Ground

Frozen ground, in contrast to permafrost, which is defined by temperature and time, is soil or rock in which part or all the pore water has turned into ice. Frozen ground was encountered in six test pits (TP-BGC16-187, 188, 199, 200, 201 and 203) and one borehole (BH-BGC16-088). The test pits and borehole with observed frozen ground were scattered between the area of the event ponds and the toe of the HLF embankment, at elevations from 810 to 925 m and located in southeast, south and west facing slopes. Frozen ground was encountered within colluvium gravels and sands from 0.4 to 5.2 m below ground surface, although several of the test pits did not fully penetrate the frozen ground. The deepest observed frozen ground was in BH-BGC16-088 at 6.7 m. This depth coincides with the bedrock contact. Frozen bedrock was not observed below this depth.

Composition of the frozen ground was variable across the site. Frozen states included visible and nonvisible designations. Visible ice was observed in the six test pits and the borehole. Visible ice descriptions included individual ice crystals (Vx) and random ice formations (Vr). Nonvisible ground ice was encountered in BH-BGC16-088 and test pit TP-BGC16-203. Nonvisible ice descriptions included poorly bonded and well bonded ice (Nf, Nbn and Nbe). Cryostratigraphy of ice included structureless, lenticular, layered and irregular structural descriptors.

Ice-rich frozen ground is defined as frozen ground with ice content (volumetric content) between 15 and 50 percent. Ground with a volumetric ice content in this range requires ripping and removal (BGC 2016). Three samples were taken from grab samples in frozen portions of test pits TP-BGC16- 187, 199 and 200 to determine the volumetric ice content. Samples were chosen for ice content evaluation that had accompanying lab results with variables that included mass of solids, grain size distribution and soil moisture content. Calculations for determining ice content combined equations for specific gravity, water density, moisture content and water to ice volume change. Several variables within the equations required definition based on assumed material properties and environmental conditions. Specific gravity was defined as 2.7 in congruence with the CIU triaxial compression testing value. The temperature controlling material properties was defined as zero degrees Celsius. Water density was defined as 0.999 g/cm^3 (USGS 2017) and the specific weight of water was defined as 9.805 kN/m^3 based on zero degrees Celsius (Finnemore 2002). Water-ice volume change was defined as 9.0 percent (Ophardt 2003). Samples were assumed to be in a fully saturated state such that the volume of voids was numerically equivalent to the volume of water present in the soil mass. Volumetric ice contents in the three test pit samples based upon these variables were classified as ice-rich with contents ranging from 20 to 35 percent. As noted above, this material will need to be ripped and removed from foundation areas during construction.

4.2.5. Groundwater Conditions

The observed groundwater depths in boreholes ranged from 3.1 to 11.1 m below ground surface. Groundwater levels were measured in five of the six boreholes at the end of a drilling day or in the following morning. The groundwater level in Borehole BH-BGC16-089 was not measured during drilling, but after installation of a standpipe piezometer. Seepage was observed in two of 23 test pits.

5.0 CLOSURE

We trust the above satisfies your requirements at this time. Should you have any questions or comments, please do not hesitate to contact us.

Yours sincerely,

BGC ENGINEERING INC.
per

Troy Meyer, PE, P.Eng.
Principal Geological Engineer

Reviewed by:

Roy Mayfield, Ph.D., PE
Principal Geotechnical Engineer

TM/RM/rm/bm

REFERENCES

BGC Engineering Inc. 2010. Site Facilities Geotechnical Investigation Factual Data Report. Eagle Gold Project, Victoria Gold Corporation, prepared March 10, 2010.

BGC Engineering Inc. 2011. 2010 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, Victoria Gold Corporation, prepared November 17, 2011.

BGC Engineering Inc. 2012a. November 30, 2012 Geotechnical Investigation for Mine Site Infrastructure Factual Data Report. Report Prepared for Eagle Gold Project, Victoria Gold Corporation. prepared November 30, 2012.

BGC Engineering Inc. 2012b. 2011 Geotechnical Investigation for Mine Site Infrastructure, Foundation Report. Eagle Gold Project, Victoria Gold Corporation, prepared Jan 31, 2012.

BGC Engineering Inc. 2016. Heap Leach Facility Foundation Improvement Plan. Eagle Gold Project, Victoria Gold Corporation, prepared Dec 22, 2016.

Bieniawski, Z.T. 1976. Rock mass classification in rock engineering. In Exploration for Rock Engineering, proc. of the symp., (ed. Z.T. Bieniawski) 1, 97-106. Cape Town: Balkema.

Bond, J.D. 1998. Surficial Geology of Dublin Gulch, Central Yukon. Geoscience Map 1998-6. Indian and Northern Affairs Canada, Exploration and Geological Services Division, Yukon Region.

Canadian Geotechnical Society. (CGS). 2006. Canadian Foundation Engineering Manual

(CFEM) 4th Edition. Canadian Geotechnical Society. Richmond, British Columbia.

DOWL. 2016. Primary Heap Leach Facility Design. Eagle Gold Project, StrataGold Corporation, prepared November 9, 2016.

Hoek, E, and P G Marinos. 2000. Predicting tunnel squeezing problems in weak heterogeneous rock masses. Tunnels and Tunnelling International 132, no. 11: 45-51.

Finnemore, J. E. 2002. Fluid Mechanics with Engineering Applications. New York: McGraw-Hill.

Ophardt, C.E. 2003. Virtual Chembook. Elmhurst College. Available from http://chemistry.elmhurst.edu/vchembook/122Adensityice.html [accessed May 23, 2017].

Smit, J.,Sieb, M., and Swanson, C., 1995. Summary Information on the Dublin Gulch Project, Yukon Territory. In: Yukon Exploration and Geology, 1995, Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 33-36.

Stephens, J.R., Mair, J.L., Oliver, N.H.S., Hart, C.J.R., and Baker, T., 2004. Structural and mechanical controls on intrusion-related deposits of the Tombstone Gold Belt, Yukon, Canada, with comparisons to other vein-hosted ore-deposit types. Journal of Structural Geology 26: 1025-1041.

USGS. 2017. Water Density-Water's density varies with temperature [online]. Available from https://water.usgs.gov/edu/density.html [accessed May 23, 2017].

APPENDIX A
TERMINOLOGY FOR TEST PIT AND BOREHOLE LOGS

Field Procedure

REF:	**12-50 [2014.1]**	**DATE:**	**October 21, 2014**
REVIEWED BY:	**Bob Powell**		
SUBJECT:	**Field Description of Soils**		

1. INTRODUCTION

This document presents the format on how soil should be described in the field by BGC Engineering Inc. (BGC) personnel. Understand, however that on certain projects, there may be a project defined system that must be used. Variation from the system presented below must be confirmed by the Project Manager.

The primary purpose of this document is to provide references associated with the accompanying laminated soil description sheet.

The format of the description system is based upon the Canadian Foundation Engineering Manual, 4th Edition (CFEM 2006), ASTM Standard D2488-09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) and ASTM Standard D2487-11 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification Procedure).

Note this system is considered a soil description system and not a soil classification system. The primary objective of this system is to have consistency between staff when describing a soil.

The parameters to describe coarse and fine grained soils are outlined below. These parameters have been divided into three categories:

- Required – all soil descriptions must contain these items;
- Where applicable – all soil descriptions must contain these items if they are applicable to the material being described; and
- If relevant – soil descriptions should contain these items as requested by the Project Manager or technical lead, or at the discretion of the logger based on their relevance to the purpose of the field program.

As scale can be important when describing a soil be sure to consider this when selecting a descriptor. For example; a soil could appear homogeneous in a small sample whereas within a test pit the soil could appear stratified.

Note the BGC Standard for Field Description of Soil does not use USCS Group Symbols (e.g. ML, GW, CH, and SP). However, if it is considered beneficial to the project by the BGC Project Manager to use USCS Group Symbols, they may be used.

If USCS Group Symbols are to be used, carry out the appropriate laboratory testing to confirm the Group Symbol as detailed in ASTM D2487. If laboratory testing is not conducted this needs to be noted in the report, and that the Group Symbols used were field estimates based on tactile and visual observations as detailed in ASTM D2488.

2. COARSE GRAINED (CG) SOILS

Coarse grained soils should be described in the order presented and using the parameters in Table 1. The criteria and source for each parameter are outlined below, along with codes for the field form, where appropriate.

Table 1 - Coarse Grained (CG) Soil Descriptors

	Order		Descriptor
Required	1	CG1	Primary Constituent
	2	CG2	Particle Size Range
	3	CG3	Secondary Constituent(s)
	4	CG4	Gradation
	5	CG5	Relative Density/Compactness Condition
	6	CG6	Particle Angularity and Shape
	7	CG7	Colour
	8	CG8	Moisture Condition
	9	CG9	Structure
If Applicable	10	CG10	Cementation
	11	CG11	Odour
	12	CG12	Weathering
	13	CG13	Foreign Materials
If Relevant	14	CG14	Mineralogy or Rock Type
	15	CG15	Maximum Particle Size
	16	CG16	Fine Fraction Description
	17	CG17	Genesis/Geologic Interpretation

2.1. Constituents and Particle Size Ranges (CG1, CG2 & CG3)

Definitions of constituents as boulders, cobbles, gravel, sand and fines are based on grain size breaks presented in ASTM D2487 and summarized in Table 2. The primary constituent should be in ALL CAPS. Where observable, the particle size range (fine, medium, coarse) for the primary constituent should be provided.

Secondary constituents should be capitalized and qualified quantitatively following Table 3 (CFEM 2006), where proportions of each constituent are estimated by weight. When necessary, and if a hydrometer test is performed, the secondary constituent determination for silt and clay should be based on the 0.002 mm grain size boundary.

Table 2 - Constituent Definitions (ASTM D2487)

Constituent	Particle Size Range	Field Form Code	Particle Size Range mm (U.S. Standard Sieve Size)
Boulders			>300 (12”)
Cobbles			75 (3”) to 300 (12”)
Gravel	Coarse	C	19 (3/4”) to 75 (3”)
	Fine	F	4.75 (No. 4) to 19 (3/4”)
Sand	Coarse	C	2.0 (No. 10) to 4.75 (No. 4)
	Medium	M	0.425 (No. 40) to 2.0 (No. 10)
	Fine	F	0.075 (No. 200) to 0.425 (No. 40)
Silt & Clay*			<0.075 (No. 200)

*Note that if silt and clay cannot be distinguished, the term “fines” can be used in the description.

Table 3 - Secondary Constituent Qualifiers (CFEM 2006)

Qualifier	Percentage (by weight)
Trace	<10%
Some	10 – 20%
y/ey	20 – 35%
And	>35%

2.2. Gradation (CG4)

The gradation of the material should be described following Table 4.

Table 4 - Gradation

Description	Criteria	Field Form Code
Well Graded	Range of particle sizes	W
Gap Graded	Range of particle sizes with some absent	G
Uniformly Graded	Uniform size of particles	U

2.3. Relative Density/Compactness Condition (CG5)

The relative density or compactness condition of the soil should be estimated from Standard Penetration Testing (ASTM 1586-11) or from manual field tests as described in Table 5. If the manual field tests described below are not used, comments as to method of determining relative density/compactness condition should be included in the description such as use of a rock pick.

Table 5 - Relative Density/Compactness Condition (CFEM 2006, Coduto 1999)

Description	Field Form Code	Approximate Relative Density	SPT – N	Empirical Field Observation
Very Loose	VL	0 – 15	<4	Easily penetrated with 1/2" (12 mm) rebar by hand
Loose	L	15 – 35	4 – 10	Easily penetrated with 1/2" (12 mm) rebar by hand
Compact	C	35 – 65	10 – 30	Penetrated 12" (305 mm) with 1/2" (12 mm) rebar with a 5-lb. (2.3 kg) hammer
Dense	D	65 – 85	30 – 50	Penetrated 12" (305 mm) with 1/2" (12 mm) rebar with a 5-lb. (2.3 kg) hammer
Very Dense	VD	85 – 100	>50	Penetrated 1” to 2" (25 to 51 mm) with 1/2" (12 mm) rebar with a 5-lb. (2.3 kg) hammer

2.4. Particle Angularity and Shape (CG6)

The angularity and the shape of the particle should be described following Table 6 and Table 7, from ASTM D2488. Where particles are approximately equal in all dimensions, equidimensional should be used to describe such particles (CFEM 2006).

Table 6 - Particle Angularity (ASTM D2488)

Description	Field Form Code	Criteria
Rounded	R	Smooth, curved sides, no edges
Subrounded	SR	Plane sides but well rounded edges
Subangular	SA	Similar to angular, some round edges
Angular	A	Sharp edges, unpolished surfaces

Table 7 - Particle Shape (ASTM D2488, CFEM 2006)

Description	Field Form Code	Criteria
Flat	F	Width/thickness > 3
Elongated	E	Length/width > 3
Flat and Elongated	FE	Meets both of the above criteria
Equidimensional	Q	Equal extents

2.5. Colour (CG7)

A primary colour should be identified and may be modified with another colour (eg. yellowish) and/or light or dark. Soils should be described in their moist condition where possible.

Mottled should be used to described alternating colours in a natural soil. Mixed should be used to describe alternating colours in a fill soil. Field form codes are provided in Table 8.

Table 8 - Colour Field Form Codes

Colour	Field Form Code
Pink	PK
Red	RD
Yellow	YW
Brown	BR
Green	GR
Blue	BL
White	WH
Grey	GY
Black	BK
Purple	PR
Tan	TN
Orange	OR
Light	L
Dark	D

2.6. Moisture Condition (CG8)

Moisture conditions should be described following Table 9, from ASTM D2488.

Table 9 - Moisture Condition for Coarse Grained Soils (ASTM D2488)

Description	Field Form Code	Criteria
Dry	D	Absence of moisture, dusty, dry to the touch, forms a dry cone
Moist	M	Damp but no visible water
Wet	W	Visible free water, usually soil is below the water table

2.7. Structure (CG9)

Where possible to observe, the undisturbed structure of the soil should be described with one of the terms in Table 10, or others as appropriate. Thickness of layers or size of lenses should be noted. Descriptors below are somewhat scale dependent and the scale of observation (road cut, test pit, SPT sample) should be considered when selecting a structure descriptor.

Table 10 - Structure Descriptors for Coarse Grained Soils (modified from ASTM D2488)

Description	Field Form Code	Definition
Stratified	S	Layers > 6 mm (1/4”)
Homogeneous	HM	Similar colour and appearance throughout
Heterogeneous	HT	Colour and appearance vary throughout
Lensed	LN	Inclusion of small pockets of different soils

2.8. Cementation (CG10)

Cementation between clasts should be described according to Table 11, from ASTM D2488. Reaction of the sample with HCl should also be checked as this may indicate the presence of carbonates. Other cementing agents that are nonreactive to HCl may also be present, and should be included in the description if observed, such as iron.

Table 11 - Cementation (ASTM D2488)

Description	Field Form Code	Criteria
Weak	W	Crumbles or breaks with handling or little finger pressure
Moderate	M	Crumbles or breaks with considerable finger pressure
Strong	S	Will not crumble or break with finger pressure

2.9. Odour (CG11)

Describe the odour of the sample if unusual, e.g. organic or hydrocarbon.

2.10. Weathering (CG12)

Indicators of weathering, such as oxidation or other discolouration or weakening of clasts, should be noted. If the soil is a tropical residual soil, please refer to appropriate description and classification methods for these types of soils.

2.11. Foreign Materials (CG13)

Foreign materials, such as roots, shells, or construction debris, should be noted if present.

2.12. Mineralogy or Rock Type (CG14)

Where observed or relevant, the mineralogy or rock type of particles/clasts should be noted.

2.13. Maximum Particle Size (CG15)

If relevant, the maximum particle size observed, in millimeters, should be noted.

2.14. Fine Fraction Description (CG16)

If relevant, the properties of fines within the material should be described following the parameters outlined below in Section 3.0.

2.15. Genesis/Geologic Description (CG17)

The genesis or geologic description of the material should be noted in brackets at the end of the description, (eg. Ablation Till, Fill). If possible, this should be identified in the field, and if not, should be assigned upon review of the description in context of the full suite of site characterization information available.

2.16. Example Coarse Grained Soil Descriptions

SAND

Fine, some silt, trace coarse sand, gap graded, loose, subrounded, grey, moist, stratified, weakly-cemented nodules up to 75 mm diameter, primarily quartz.

GRAVEL

Fine to coarse, silty, sandy, well graded, compact, subrounded, equidimensional with some flat particles, medium brown, wet, heterogeneous, slight organic odour, trace of roots and amorphous organics, maximum size 50 mm. (Fluvial)

3. FINE GRAINED (FG) SOILS

Fine grained soils should be described using the parameters in Table 12 and in the order presented. The criteria and source for each parameter are outlined below. The primary constituent (silt or clay) is based on the soil's behaviour rather than its grain size.

Table 12 - Fine Grained Soil Parameters

	Order		Parameter
Required	1	FG1	Primary Constituent
	2	FG2	Secondary Constituent(s)
	3	FG3	Plasticity
	4	FG4	Consistency
	5	FG5	Colour
	6	FG6	Moisture Condition
	7	FG7	Structure
If Applicable	8	FG8	Cementation
	9	FG9	Odour
	10	FG10	Sensitivity
	11	FG11	Weathering
	12	FG12	Foreign Materials
If Relevant	13	FG13	Dry Strength
	14	FG14	Dilatancy
	15	FG15	Coarse Fraction Description
	16	FG16	Genesis/Geologic Interpretation

3.1. Primary and Secondary Constituents (FG1 & FG2)

Refer to Section 2.1. As noted above, the primary constituent of a fine grained soil (silt or clay) is determined based on the soil's behaviour, rather than its grain size. Methods of distinguishing silt and clay are outlined in Table 13. When necessary, and if a hydrometer test is performed, the secondary constituent determination for silt and clay should be based on the 0.002 mm grain size boundary.

Table 13 - Distinguishing Silt and Clay

Silt	Clay
High or rapid dilatancy	Slow to no dilatancy
Low dry strength	High dry strength
Feels gritty	Feels smooth

Sticks to hands, even when dry, but clouds off when hands clapped together	Sticky to touch when wet, stick to hands, even when dry, and generally must be scraped off

3.2. Plasticity (FG3)

Plasticity should be described as non-plastic, low or high, following Table 14 modified from ASTM D2488 and Figure 1, once laboratory results are available. Other systems for defining plasticity (eg. Casagrande) are available and may need to be used depending on project needs.

To help determine plasticity, cut the soil with a pocket knife; a soil with significant sheen, when cut, tends to have higher plasticity than those with a duller appearance, when cut.

The Plastic Limit (PL) is defined as the moisture content at which 3 mm (1/8”) threads can be rolled. By doing a similar type tactile evaluation in the field, this can also be used to assess the plasticity of a material, as described in Table 14.

Table 14 - Plasticity (ASTM D2488)

Description	Field Form Code	Criteria
Non-plastic (silts only)	N	A 3 mm (1/8”) thread cannot be rolled at any water content.
Low	L	A 3 mm (1/8”) thread can be rolled (with some difficulty or ease) but cannot be rerolled after reaching the PL. A lump cannot be formed, or crumbles when drier than the PL.
High	H	It takes considerable time rolling and kneading to reach the PL. The 3 mm (1/8”) thread can be rerolled several times after reaching the PL. A lump can be formed without crumbling when drier than the PL.

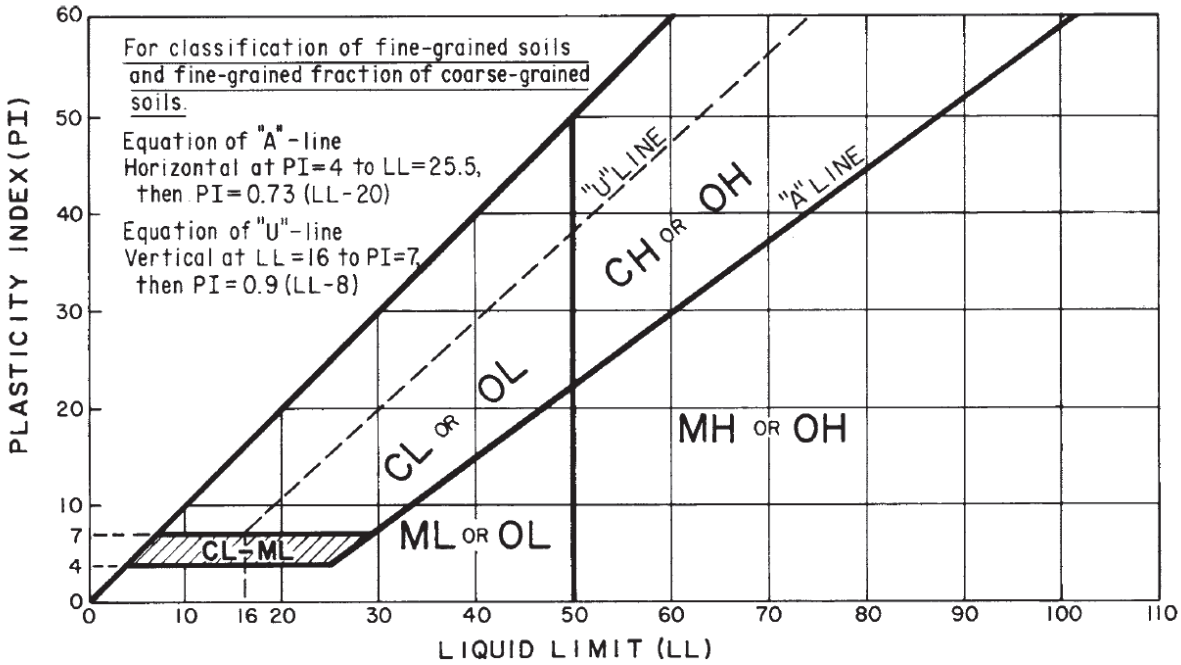


Figure 1 - Plasticity Chart (ASTM D2487)

3.3. Consistency (FG4)

The consistency of the soil should be estimated from field vane tests (ASTM D2573-08), Standard Penetration Testing (ASTM 1586-11) or from manual field tests (CFEM 2006) as described in Table 15.

Table 15 Consistency (CFEM 2006, Terzaghi, Peck and Mesri 1996)

Description	Field Form Code	Undrained Shear Strength (s_u) psf/kPa	SPT-N	Empirical Field Observation
Very Soft	S1	<250 <12	<2	Easily penetrated several centimeters by the fist
Soft	S2	250 – 500 12 – 25	2 – 4	Easily penetrated several centimeters by the thumb
Firm	S3	500 – 1000 25 – 50	4 – 8	Can be penetrated several centimeters by the thumb with moderate effort
Stiff	S4	1000 – 2000 50 – 100	8 – 15	Readily indented by the thumb, but penetrated only with great effort
Very Stiff	S5	2000 – 4000 100 – 200	15 – 30	Readily indented with thumbnail
Hard	S6	>4000	>30	Indented with difficulty by the thumbnail

		>200		

3.4. Colour (FG5)

Colour should be described as discussed in Section 2.5.

3.5. Moisture Condition (FG6)

For fine grained soils, the moisture conditions should be described as the soils condition relative to the Plastic Limit, as described in Table 16. At the soil's natural water content a thread of the soil should be rolled in the palm. If the thread starts to break or crumble when it is near 3 mm (1/8") in diameter, its natural water content is no drier than the Plastic Limit.

If the soil is described as non-plastic, the moisture condition should be described as discussed in Section 2.6 (CG8).

Table 16 - Moisture Condition for Fine Grained Soils

Description and Field Form Code	Criteria
DTPL	Drier than the Plastic Limit (thread is >3 mm (1/8") in diameter)
NPL	Near the Plastic Limit (thread is approximately 3 mm (1/8") in diameter)
WTPL	Wetter than the Plastic Limit (thread is <3 mm (1/8") in diameter)

3.6. Structure (FG7)

Where possible to observe, the undisturbed structure of the soil should be described with one of the terms in Table 17, or others as appropriate. Thickness of layers or size of blocks and lenses should be noted. Descriptors below are somewhat scale dependent and the scale of observation (road cut, test pit, SPT sample) should be considered when selecting a structure descriptor.

Table 17 - Structure Descriptors for Fine Grained Soils (modified from ASTM D2488)

Description	Field Form Code	Definition
Stratified	S	Layers > 6 mm (1/4”)
Laminated	L	Layers < 6 mm (1/4”)
Lensed	LN	Inclusion of small pockets of different soils
Fissured	F	Breaks along definite planes with effort
Slickensided	SS	Polished or glossy facture surfaces when exposed, sometimes striated
Blocky	B	Breaks easily into small angular lumps
Homogeneous	HM	Similar colour and appearance throughout
Heterogeneous	HT	Colour and appearance vary throughout

3.7. Cementation (FG8)

Cementation should be described as discussed in Section 2.8.

3.8. Odour (FG9)

Odour should be described as discussed in Section 2.9.

3.9. Sensitivity (FG10)

The ratio of intact to remoulded undrained shear strength should be estimated if vane testing has been completed and reported using the descriptors in Table 18 (CFEM 2006, Terzaghi, Peck and Mesri 1996).

Table 18 - Sensitivity of Fine Grained Soils (CFEM 2006, Terzaghi, Peck and Mesri 1996)

Description	Field Form Code	Intact Undrained Shear Strength/Remoulded Undrained Shear Strength
Low Sensitivity	LS	<2
Medium Sensitivity	MS	2 – 4
Sensitive	S	4 – 8
Extra Sensitive	ES	8 – 16
Quick Clay	QC	>16

3.10. Weathering (FG11)

Weathering should be described as discussed in Section 2.10.

3.11. Foreign Materials (FG12)

Foreign materials should be described as discussed in Section 2.11.

3.12. Dry Strength (FG13)

To determine a dry strength, an approximately 25 mm (1") diameter ball of material finer than 0.5 mm (the No. 40 sieve, fine sand and finer), should be air-dried. The strength of this specimen should be evaluated following Table 19 (ASTM D2488). High dry strength is indicative of high clay content, with low dry strength being indicative of low clay content.

Table 19 - Dry Strength (ASTM D2488)

Description	Field Form Code	Criteria
None	N	The dry specimen crumbles into powder with mere pressure of handling
Low	L	The dry specimen crumbles into powder with some finger pressure
Medium	M	The dry specimen breaks into pieces or crumbles with considerable finger pressure
High	H	The dry specimen cannot be broken with finger pressure. Specimen will break into pieces between thumb and a hard surface
Very High	VH	The dry specimen cannot be broken between the thumb and a hard surface

3.13. Dilatancy (FG14)

Dilatancy should be measured following ASTM D2488. To determine dilatancy, mould a 12 mm (1/2") diameter ball, adding water if necessary, into a soft consistency. Smooth the sample into the palm of one hand and strike the hand vigorously against the other, noting the appearance of water on the surface of the sample. Squeeze the sample and note the appearance of water. Dilatancy can be described using Table 20. High dilatancy is indicative of high silt (or fine sand) content and low to no dilatancy is indicative of low silt content.

Table 20 - Dilatancy (ASTM D2488)

Description	Field Form Code	Criteria
None	N	No visible change in the specimen
Slow	S	Water appears slowly on the surface of the specimen and does not disappear or disappears slowly upon squeezing
Rapid	R	Water appears quickly on the surface of the specimen during shaking and disappears quickly upon squeezing

3.14. Coarse Fraction Description (FG15)

If relevant, the properties of coarse fraction within the material should be described following the parameters outlined above in Section 2.0.

3.15. Genesis/Geologic Description (FG16)

The genesis or geologic description of the material should be noted in brackets at the end of the description, (eg. Loess, Marine Clay). If possible, this should be identified in the field, and if not, should be assigned upon review of the description in context of the full suite of site characterization information available.

3.16. Example Fine Grained Soil Descriptions

CLAY

Trace sand, high plasticity, firm, dark grey, NPL, slickensided, trace of small shells 10 mm size, no dilatancy. (Marine Clay)

SILT

Trace fine sand, low plasticity, stiff, light brown, DTPL, fissured, medium dry strength.

REFERENCES

American Society for Testing and Materials. Standard D1586-11: Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils. Developed by Sub-Committee D18.02. West Conshocken, PA.

American Society for Testing and Materials. Standard D2487-11: Standard Practice for Classification of Soil for Engineering Purposes (Unified Soil Classification System). Developed by Sub-Committee D18.07. West Conshocken, PA.

American Society for Testing and Materials. Standard D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Developed by Sub-Committee D18.07. West Conshocken, PA.

American Society for Testing and Materials. Standard D2573-08: Standard Test Method for Field Vane Shear Test in Cohesive Soil. Developed by Sub-Committee D18.02. West Conshocken, PA.Canadian Geotechnical Society. 2006. Canadian Foundation Engineering Manual (CFEM) 4th Edition.

Coduto, D. P. 1999. Geotechnical Engineering Principles and Practices. Prentice Hall, Upper Saddle River, New Jersey.

Terzaghi, K., R.B. Peck, and G. Mesri. 1996. Soil Mechanics in Engineering Practice, 3rd ed. John Wiley and Sons, New York.

Field Procedure

REF:	**13-50 [2016.1]**	**DATE:**	**June 1, 2016**
REVIEWED BY:	**Derek Kinakin**		
SUBJECT:	**Rock Core Logging**		

TABLE OF CONTENTS

TABLE OF CONTENTS i
LIST OF TABLES ii
LIST OF FIGURES iii
LIST OF APPENDICES iii
1. Geotechnical Data 1
1.1. Purpose of this Document 1
1.2. Standards and References 1
2. Data Collection preparation 2
2.1. Tools 2
2.2. Field Forms and Reference Sheets 2
2.3. Manual Overview 2
2.4. Core Logger Responsibilities 3
2.4.1. Core Photography 3
2.4.2. Depth Control 4
2.4.3. Geo-mechanical Logging 5
2.4.4. Packer Testing 5
2.4.5. Sample Collection 5
2.4.6. Drilling Observations 5
2.4.7. Borehole Completions 5
3. Core Description 6
3.1. Cored Intervals and Drill Runs 6
3.2. Geological Description 8
3.2.1. Colour 8
3.2.2. Grain Size 8
3.2.3. Fabric 8
3.2.4. Unit 8
3.3. Total Core Recovery Length 9
3.4. RQD Length 10
3.5. Longest Stick 11
3.6. Number of Natural Discontinuities 12
3.7. Number of Mechanical Breaks 14
3.8. Number of Discontinuity Sets 15

3.9. Average Joint Condition 16
3.10. Strength Grade 17
3.11. Weathering / Alteration Grade 18
4. Discontinuity Description 19
4.1. Discontinuity Depth To 20
4.2. Aperture and Infilling Type 21
4.3. Infilling Type and Strength 22
4.4. Joint Roughness Coefficient (JRC) 23
4.5. Joint Wall Compressive Strength (JWCS) 25
4.6. Type 26
4.7. Orientation 27
4.8. Joint Roughness Number (Jr) 28
4.9. Joint Alteration Number (Ja) 29
5. Engineering Summary Log 30
5.1. Initial Observations (At the Rig) 30
5.2. Detailed Rock Mass Descriptions (Core Shack) 31
5.3. Geology / Intact Rock Description 32
5.3.1. Rock Type 32
5.3.2. Rock Quality Ranking 34
5.3.3. Degree of Weathering / Alteration 34
5.3.4. Rock Strength 34
5.3.5. Colour 34
5.3.6. Grain Size 34
5.3.7. Fabric/Texture 35
5.3.8. Additional Geologic Descriptions 35
5.4. Geomechanical / Rock Mass Description (may be optional) 35
5.4.1. Fracture Frequency / Spacing 35
5.4.2. Number of Major Discontinuity Sets 35
5.4.3. Discontinuity Set Descriptions 35
5.5. Example Descriptions 36
5.6. Rock Naming Resources 36
6. Other field tasks 37
6.1. Point Load Testing 38
REFERENCES 39

LIST OF TABLES

Table 1. Core Symbols 4
Table 2. Joint Condition 16

Table 3. ISRM field estimate of uniaxial compressive rock strength (after ISRM, 1981). 17
Table 4. Soil strength grades for soil-like discontinuity infills 22
Table 5. Common discontinuity types, definitions, and suggested codes. 26
Table 6. Joint Roughness Parameter (Jr) descriptions (NGI, 2013) 28
Table 7. Joint Alteration Parameter (Ja) descriptions (NGI, 2013) 29
Table 8. Basic Rock Naming by Genetic Origin and Grain Size 33
Table 9. Spacing Description Definitions - ISRM. 35

LIST OF FIGURES

Figure 1. Measuring RQD length from rock core. 10
Figure 2. The number of discontinuities in each interval can be counted directly from the core. 12
Figure 3. The discontinuity number for these intervals can be estimated by dividing the interval length by the average size of the core pieces. 12
Figure 4. Example discontinuity counting procedure 13
Figure 5. Examples of (A) spun core and (B) a break from hammer strength testing. 14
Figure 6. Weathering grades of residual soils (Fookes, 1997). 18
Figure 7. Definitions of aperture / infilling thickness for open discontinuities 21
Figure 8. Joint roughness tool 23
Figure 9. Qualitative descriptions for JRC values. 24
Figure 10. Oriented core measurements. 27
Figure 11. Categories of joint wall contact conditions (NGI, 2013) 28

LIST OF APPENDICES

APPENDIX A BGC DATA COLLECTION FORMS AND REFERENCE SHEETS

1. GEOTECHNICAL DATA

The need for geotechnical data arises soon after the initial indication of an ore body or the onset of a civil project. During scoping level through to construction, many processes will be influenced by the geotechnical characteristics of rock masses of the project site, including:

- excavation geometry (drift / tunnel size, pit slope / rock cut angles)
- blast design
- support requirements
- materials management
- ore processing (grinding, milling)
- waste rock / fill character (durability, grain size).

1.1. Purpose of this Document

This manual is aimed at BGC staff completing drilling investigations in rock for mine development and civil engineering projects. The purpose of this manual is to standardize procedures for collecting basic geotechnical parameters from drill core. The recommended parameters included satisfy the requirements for a “basic geotechnical description” of a rock mass (ISRM, 1981), as well as provide a foundation for characterization of the rock mass according to more complex classification systems (RMR, Q, etc.). Quantitative or semi-quantitative parameters are recommended to improve the repeatability of the estimates by multiple workers. While this document provides a core logging system applicable to many types of projects and locations, the recommended methods should be reviewed on a project by project basis. Extensions to this manual may be required based on project specific requirements.

1.2. Standards and References

BGC applies industry recognised best standards and practices in all of its work. Procedures recommended within this manual are based on suggested methods from international organizations, refereed published research, and current technical manuals; as well as the accumulated experience of BGC personnel. Sources for procedures are cited and those based on BGC experience or “in-house” methods are identified.

2. DATA COLLECTION PREPARATION

2.1. Tools

Measurements and simple tests are used to estimate the basic geotechnical parameters during core logging. The minimum required tools for basic geotechnical core logging include:

- Safety glasses
- Measuring tapes (in metres or decimal feet, depending on units used for project)
- Rock hammer (22 oz., sometimes called a “geologists pick”)
- Pocket knife (a fixed blade or locking blade knife should be used; this knife will be used on rock core samples and is likely to be damaged)
- Camera (for core photos and to record unusual features)
- Paint pen / grease pencil / crayon for marking the core
- Carpenters protractor (or core goniometer)
- Clip boards for field forms
- Field notebook for additional notes and observations
- Pencils.

2.2. Field Forms and Reference Sheets

Examples of typical logging forms used by BGC are provided in Appendix A. Project specific forms may be required, it is important to review the information required for your project and the expected conditions so that you can modify procedures / forms accordingly before beginning a field program. BGC commonly produces laminated reference sheets (“cheat sheets”) for use by the core loggers for quick reference during core description and discontinuity logging; examples of these are also provided in Appendix A.

2.3. Manual Overview

The geotechnical parameters are divided into three sections which follow the three basic field logging forms used by BGC (Appendix A): the “core description” log, the “discontinuity” log, and the “engineering summary” log. The first two should be completed at the drill rig, using triple tube splits so that the core is as undisturbed as possible if they are available. The engineering summary log should be used to record major features and observations during drilling and be completed in the core shack considering the entire length of the hole. A basic description of each parameter found on the logs is provided along with procedures for its estimation. Appropriate reference diagrams and charts are included. To help with the practical use of the manual, many parameters are described on a separate page with space left for project / property specific notes. These pages can be removed, or copied, from the document and posted in the core shack for reference by the field staff.

In addition to the logging form templates and reference sheets previously noted, appendices providing information for point load testing and templates of useful core logging tools are included.

2.4. Core Logger Responsibilities

There are many tasks that core loggers are responsible for at the rig, which may include:

- Core photography
- Depth control
- Geomechanical logging
- Packer testing
- Sample collection
- Reading water levels and noting drill fluid returns
- Boxing the core
- Installing piezometers or other instruments
- Observing the entire drilling process.

What information is critical for each project may change, make sure that you know the purpose of the drilling you are doing and how the data will likely be used ahead of undertaking a site investigation program. The following sections provide some guidance on how to complete the somewhat standard field tasks.

2.4.1. Core Photography

One of the most important tasks core loggers will do at the drill rig is photograph undisturbed core in the splits. These photos may be later used to confirm televiewer data and will be the best resource for answering questions about the intact rock mass from those reviewing the designs. At a minimum core logging personnel should be required to take one photograph that captures the entire length of each core run and photographs of each full core box. Photos of the core run can be taken on the table or bench in the logging shack, for the core boxes they can be taken on the floor of the core shack or the ground from above. The resolution of modern digital cameras allows for multiple core boxes to be captured in a single frame; reducing the total number of photographs needed for the program.

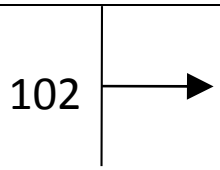
These photographs must be in focus, centered and have a minimum of clutter surrounding the core; as many photos as needed should be taken to ensure a good quality photograph is obtained. Proper core photos require that the core be cleaned prior to photographing; take the time to properly wash the core. The following are also required in all core photographs:

- A scale - make sure the measuring tape you use is in focus and readable
- A white board with the project name, project number, hole ID, date, interval number(s), and depth from and to (if this information is not clearly visible on the boxes)
- The depths with 1 metre increments, major structures, mechanical breaks and samples marked on the core with a paint pen or grease pencil as per the colour and symbol requirements defined by the project manager, an example of these is provided in Table 1

- Wet core – some structural features do not show up on dry core so make sure to wet it down with a spray bottle or paint brush (if there is structure that is more apparent dry, take one each of dry and wet).

Try to keep your core logging tools out of these photos and your work area as clear as possible, sloppy pictures reflect badly on you and on BGC. Core photos should be regularly downloaded from the camera to a computer and/or back-up external hard drive. A systematic naming convention for the image files should be used.

Table 1. Core Symbols

Item	Colour	Symbol
Whole Metre Depth	White	
Major Structures	Red	
PLT Samples	Yellow	
Mechanical Breaks	Blue	

Notes:

1. Major structures should be identified using the logging codes described in Section 4.6.
2. The numbers in the Whole Metre Depth and Major Structures symbols indicate the depth in metres.
3. Colour indicates what colour of paint pen or grease pencil should be used to draw the symbol.

2.4.2. Depth Control

As the on-site BGC personnel at your drill rig you are always responsible for knowing the depth of the hole and where each interval starts and stops. Make sure you and the driller have a system to do this before starting. Some basic advice:

- Zero depth should always be ground or another constant (i.e. lake level if drilling on a barge) and not be related to temporary surfaces (i.e. pad decking or casing)
- Measure everything yourself – at least once

- When in doubt – pull the rods and count them.

2.4.3. Geo-mechanical Logging

Follow the procedures outlined in Sections 3.0 and 4.0

2.4.4. Packer Testing

Procedures for packer testing (frequency and interval lengths) will be specified by the project manager or technical lead. Refer to the packer testing memo for detailed instructions.

2.4.5. Sample Collection

Sample types required and collection frequency will be specified by the project manager or technical lead. Ensure that you have the required supplies to properly preserve the samples and that you keep a record of the depths and types collected.

2.4.6. Drilling Observations

Notes and logs collected by the core logger form the BGC permanent record for our site investigations; they must be complete and cover all observations made in the field. Examples include: colour and amount of drilling return fluid, surface and ground water comments, a site description, and description of drilling conditions (i.e. rate, problems, and solutions). These can be recorded on a daily shift record, in your notebook, or on the engineering summary log (Section 5.0)

2.4.7. Borehole Completions

Holes must be completed in an appropriate way, whether this is backfilling, capping, or installing an instrument. What is to be done will be specified by the technical lead or project manager, refer to the appropriate design memo for detailed instructions.

3. CORE DESCRIPTION

The core description log has been designed to record information required to complete rock mass classification and provide a basic description of the rock. It includes “interval observations” or observations which are logged for a length of core described by a “from” and “to” distance. All distances should be measured from the drill hole collar (ground surface). The geotechnical core description includes observations of the intact rock strength, as well as the “blockiness” of the recovered core. Parameters to be logged include:

- Cored interval and drill run number
- Colour (modifier, primary)
- Texture
- Fabric
- Unit
- Total core recovery length
- Rock quality designation (RQD) length
- Longest stick
- Number of natural discontinuities
- Number of mechanical breaks
- Number of discontinuity sets
- Average joint condition
- Strength grade
- Weathering / alteration grade

3.1. Cored Intervals and Drill Runs

The “interval” is the most important concept in logging geotechnical parameters from drill core as it describes the location and extent of all the other parameters logged. Run blocks do not determine geological unit breaks and they should not be used to indiscriminately determine geotechnical interval breaks. During the data processing phase of work, it is important that breaks in the geotechnical and geological units have been accounted for when determining the geotechnical intervals for logging.

Intervals should be determined by the core logger following guidance of the project geologist or engineer as all of the other geotechnical parameters are collected with reference to the interval. Use intervals for CLEAR AND DISTINCT changes; if in doubt, DO NOT split the run into intervals. To determine the geotechnical interval, BGC recommends:

1. Each interval should be defined as the distance along the core centre line from the collar and should include a “from” (start) and a “to” (end) distance. The start and end of each interval is can be determined by:
    - Rock unit contacts
    - Major changes in weathering or alteration
    - Major changes in fracture density (size of core pieces)
    - Any other boundaries used by the geologists to break the rock mass into units (e.g. mineralized versus barren rock)
    - Run blocks (intervals cannot contain core from more than 1 run)
2. Intervals should be between 0.3 m (1 ft) and 3 m (10 ft) in length.
3. Interval breaks that are not run blocks should be marked on the core. This is done at the drill rig prior to completing the core description log.
4. If a depth correction is made for incorrect run blocks or errors from the drill, these corrections must be carried through the geotechnical interval breaks to ensure consistency with the geological data.

Project / Property Specific Notes:

3.2. Geological Description

BGC collects a very simple geologic description for each interval as part of the core description log. This description includes colour, texture, fabric, alteration, and basic rock types. Reference tables should be developed for each project and provided to the field staff to ensure that consistent codes and descriptions are being used. Typical BGC reference sheets for descriptions and codes are provided in Appendix A.

3.2.1. Colour

Two or three colour descriptors are to be collected, a modifier (“light,” “-,” or “dark”), a primary colour (“green”) and an optional secondary colour (“brownish”). Examples of the description include: “light grey,” “dark green,” “brownish orange” and “light greenish blue.” Abbreviations and codes are used when recording these observations on the core description log (Appendix A). Colour may be important when trying to differentiate between weathering grades or alteration types.

3.2.2. Grain Size

Estimate the primary grain size of the unit. Examples include “fine” or “coarse”. This may refer to the groundmass of intact rock or the dominant grain size of a fault zone.

3.2.3. Fabric

The fabric observed in the core will reflect some type of grain or crystal alignment, persistent anisotropy of the rock grain size distribution (e.g. foliation or bedding) or a physical change that has occurred in the rock mass due to veining or shear processes (e.g. stockwork or microfracturing).

3.2.4. Unit

A unit should be identified for each logged interval. These units may be identified by alteration types (chemical or physical changes to minerals), rock types, or some other criteria set by the technical lead or project manager. A list of possible units should be provided to the core loggers prior to the start of the drilling program.

A sample list of units has been compiled (Appendix A), for most projects site specific units may need to be defined with aid from the project geologists. Appropriate codes should be developed for each unit, some examples include phyllic (PHY), sandstone (SST), or oxide (OXD).

3.3. Total Core Recovery Length

Total core recovery (TCR) is a measure of the all core within a logging interval. The lengths of all pieces of core recovered are summed to determine the total recovered length; the size of core pieces, material competency, or condition of the core is not considered when determining TCR.

TCR can provide a preliminary indication of zones where drilling fluids are eroding fine grained materials or the presence of voids; however, it provides limited value when used on its own. Like most parameters logged from core, its value increases significantly when other observations are available for comparison. In addition to providing a first indication of zones of poor rock mass quality or drilling problems, total recovery can be used to check the correctness of the run block depths provided by the drillers.

When core logging is conducted at the drill rig using triple-tube methods, measuring TCR is straight-forward, the measurements are typically completed with the core laid out in one-half of the core tube splits. However, when core is logged after being placed in core boxes, measuring TCR requires greater attention, as the staff will have to measure the individual pieces of the disturbed core to estimate the total recovered length. In zones of badly broken or brecciated rock, gravel/soil sized pieces should be clustered together closely prior to measuring TCR. Importantly:

- TCR should not be greater than the run or interval length
- If “extra” core occurs in a run, it may be OK to add the extra core length to the next run.

Where multiple intervals and core loss (or gain) occur between two run blocks, a judgment must be made for which interval(s) will be recorded as having the difference. Appropriate strategies include:

- distribute core loss (or gain) over all intervals between the core blocks
- record the interval nearest the first core block as having the difference
- select the interval that contains the most fractured rock as having the difference
- record the core loss as a separate interval between two intervals of core (min 0.3 m, for when loss occurs at a contact, or due to a major fault)

A mix of strategies may be appropriate or the project engineer or geologist may dictate a single strategy for consistency. For programs where core hole televiewer programs are conducted, these downhole images may assist in identifying the major zones of core loss.

Project / Property Specific Notes:

3.4. RQD Length

The rock quality designation (RQD) is a type of modified core recovery measurement (Deere and Deere, 1989). The drill core must consist of “hard and sound” rock to be considered in the RQD. For each interval, the total length of all core pieces longer than 0.10 m (10 cm; 4 in) as measured along the core axis (“center line”), should be determined and recorded (Figure 1). Core pieces that are very weak (strength grade $\leq$ R1) or are weathered / altered to a soil-like material are not to be included in the RQD length.

Mechanical breaks should be ignored for the purpose of measuring RQD length. Where a mechanical break is identified, treat the core pieces on either side as a continuous piece of core for the purpose of the measurement.

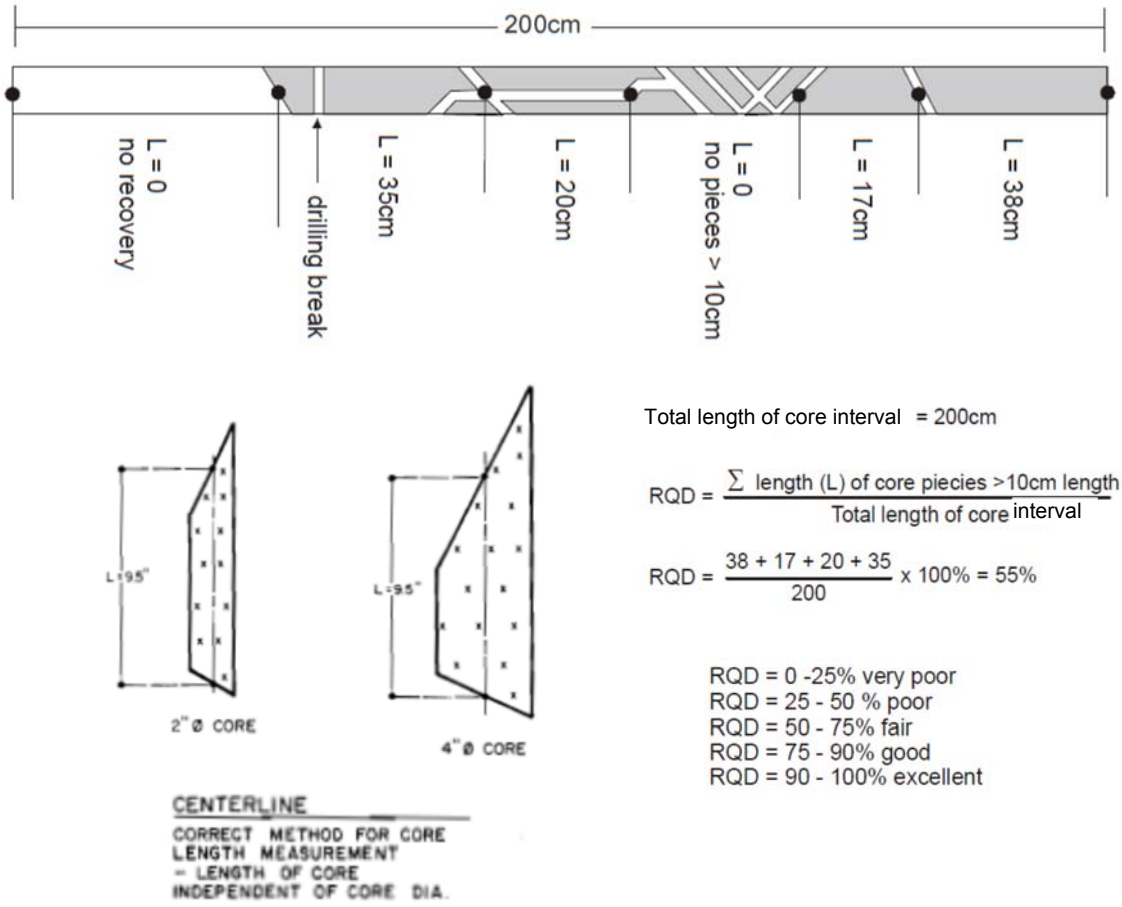


Figure 1. Measuring RQD length from rock core.

Project / Property Specific Notes:

3.5. Longest Stick

Proposed as an extension and addition to the logging of RQD (Call, 1979), the measurement of the longest stick (LS) of core in each logging interval can help to overcome the limited sensitivity of RQD to block size. The LS measurement helps to define the maximum size of the in-situ blocks, improving the understanding of the overall block size distribution (McDonough, 1977). This distribution can be important to estimating fragmentation for blasting or caving design.

The longest piece of core, as measured along the core axis, in each interval should be recorded. Core pieces that are very weak (strength grade $\leq$ R1) or are weathered / altered to a soil-like material are not to be considered for the longest stick length.

Mechanical breaks should be ignored for the purpose of measuring longest stick length. Where a mechanical break is identified, treat the core pieces on either side as a continuous piece of core for the purpose of the measurement.

Project / Property Specific Notes:

3.6. Number of Natural Discontinuities

The number of geological discontinuities ('fractures', 'joints', etc.) within each interval is counted and recorded. Breaks in the core from the process of drilling or boxing the drill core (mechanical breaks) are not included in this count. Mechanical breaks are identified by sharp core edges at the break and often clean breakage surfaces (no infill, no discolouration). If in doubt, treat the break as a natural feature and include it in the count.

Where discontinuities with thick infillings, faults, or zones of soil-like material are encountered count 1 discontinuity per 1 cm of infilling, fault zone, or soil zone thickness along the core centre line.

For intervals that have closely spaced discontinuities too numerous to count, resulting in discs of core (possible in bedded, laminated, or foliated rocks), the number of discontinuities can be estimated by measuring the average size of the core pieces and dividing the interval length by the average piece size. "Default" numbers for highly fractured rock should not be used.



Figure 2. The number of discontinuities in each interval can be counted directly from the core.



Figure 3. The discontinuity number for these intervals can be estimated by dividing the interval length by the average size of the core pieces.

Example:

Depth From (m)	Depth To (m)	Fracture Count	Total	Comments
71.63	73.15	13 + 5 + 9	27	13 fractures plus 5 cm and 9 cm zones of fault gouge (with average particle size <1 cm)
73.15	74.68	67	67	67 cm zone of fault gouge (with average particle size <1 cm)
79.25	80.77	16 + 5 + 20 + 9	50	32 cm zone of broken rock (average particle size = 2 cm) plus 5 fractures plus 20 cm zone of fault gouge (average particle size <1 cm) plus 22 cm of broken rock (average particle size = 2.5 cm)

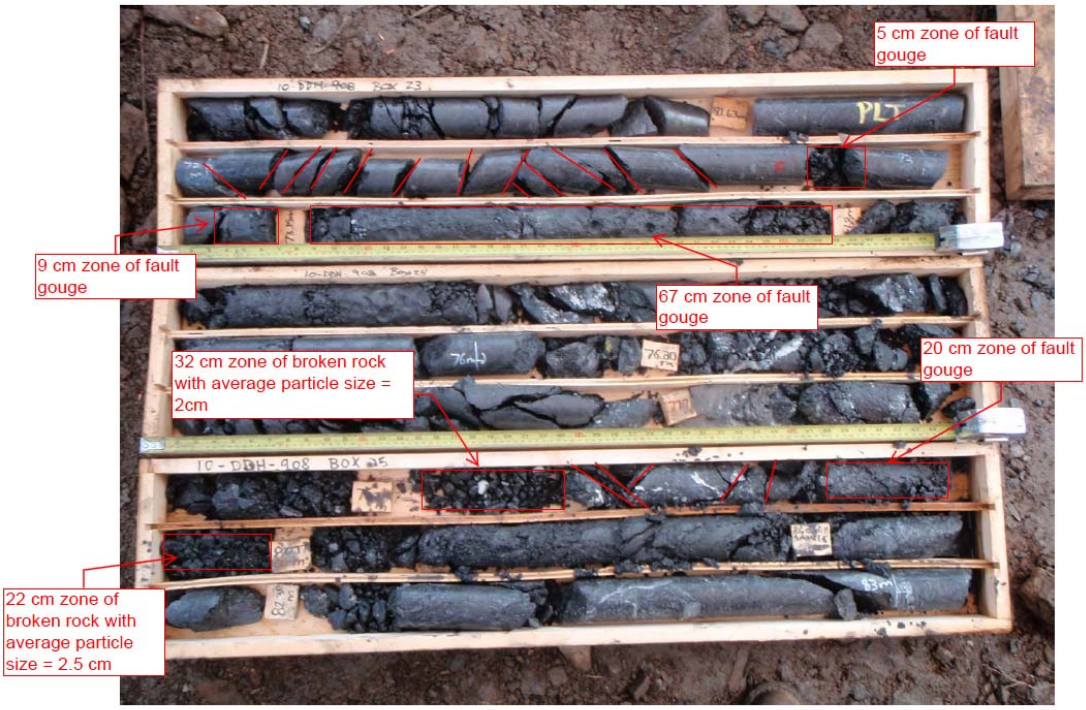


Figure 4. Example discontinuity counting procedure

Project / Property Specific Notes:

3.7. Number of Mechanical Breaks

During the drilling and core logging process mechanical breaks are created in the core. They are typically developed along planes of weakness in the rock mass. They can be identified by sharp core edges at the break and often clean breakage surfaces (no infill, no discolouration). If in doubt, treat the break as a natural feature. This parameter is a count of those breaks induced by the process of drilling or handling during logging of the drill core. It should be noted that breaks induced during hammer strength testing or intentional breaks during boxing of the core should not be counted in this metric. Mechanical breaks can be caused by:

- Handling: dropping / banging the core tube during core extraction, grinding/crushing when the core lifter case is removed from the cure tube
- Drilling: disking (horizontal fracture creation) due to stress relief, drillers pulling back and re-advancing to try and get past a blocked tube

Other drilling induced artifacts can influence the appearance of core once recovered, circular marks on the core face “spinning” can be created when the core gets out of line along a natural or mechanical break during drilling and grinds on the piece above / below.

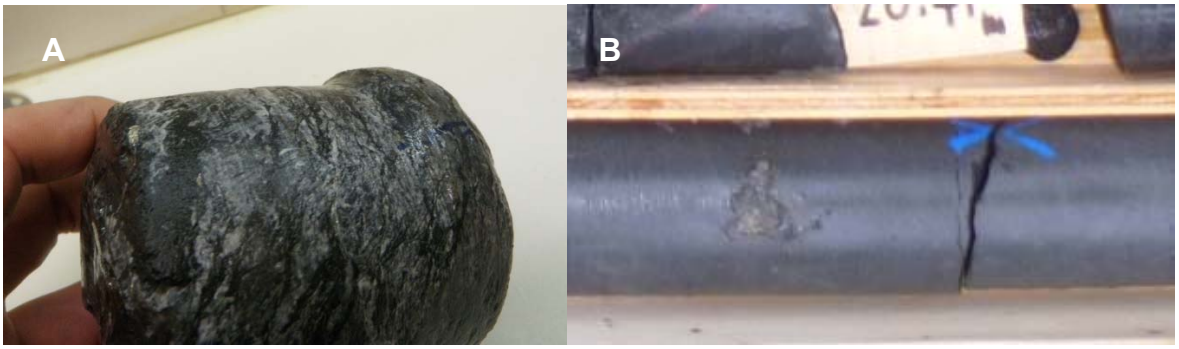


Figure 5. Examples of (A) spun core and (B) a break from hammer strength testing.

If you notice a large number of drilling induced core damage – bring it to the attention of your driller. There may be nothing that can be done, but some ways to improve the core recovery/condition include: more or less water (depending on the situation that you have), less feed pressure on the bit face, drill bit selection, or changing the core removal procedures (from the core tube). In particular, having the helper use a rubber mallet to free the first piece of core and the core spring within the lifter case can significantly reduce the amount of damage to that first piece of core. Remember that the driller is the expert and that if you explain the problem and why it’s important to fix they’ll be more likely to help you. If you are concerned that things aren’t being done properly or need procedures to improve, start by involving the BGC field supervisor, or maybe the drill foreman; if you still cannot get things to improve attempt other avenues that might include the project manager (BGC) or client geologists.

Project / Property Specific Notes:

3.8. Number of Discontinuity Sets

A discontinuity set may represent a major fabric element, such as bedding or foliation, or may be a minor joint set or fault related set of fractures. Interpreting the number of sets present in drill core can be very difficult. This parameter is meant to give an initial indication of the rock mass fabric and any zones of increased fracturing.

The number of joint sets value may be used to estimate the NGI Q parameter “joint set number” (Jn). Be careful not to include mechanical breaks in this number. It may take a few runs to see all of the sets present, it is ok to extrapolate forwards and backwards to estimate this parameter, but make sure that if there are changes occurring in the structural fabric they aren’t missed by averaging the sets over long sections of the core. Use whole numbers only, so if you have 2 sets and no other distinct features, use 2, if there are other features use 3.

This can be a slightly conservative approach, as it is difficult to determine at the core scale whether widely spaced discontinuities form sets.

Project / Property Specific Notes:

3.9. Average Joint Condition

The joint condition (Jc) is a numeric index which summarises the typical surface properties and infilling of discontinuities within an interval. The joint condition can be a preliminary indication of the shear strength of a discontinuity, when used by experience rock mechanics practitioners.

The Jc will be logged based the descriptions proposed by Bieniawski (1976), as provided in Table 2. An average joint condition should be estimated considering the typical character of all the discontinuities of the interval. To approximate an average joint condition all the discontinuities of the interval can be examined, a representative one chosen, and the Jc of this discontinuity can then be logged; or, the individual parameters of the discontinuities can be examined (roughness, separation, wall rock condition) and a Jc value be determined based on the average properties.

Careful consideration of the standard descriptions and provided notes will show that certain properties can assist in narrowing down the possible Jc values. For example, first considering the aperture/infilling thickness of a discontinuity can lead you directly to the Jc value, greater than 1 mm and only the '6' and '0' values are possible, greater than 5 mm the value is '0', <1 mm and the roughness and strength of the joint walls must be considered. For determining the Jc the definition of infilling must be well understood. For example a 5 cm quartz vein with a separation on one side does not mean that there is 50 mm of infill the quartz should be treated as part of the rock and the separation logged as a discontinuity, BGC uses R2 as a cut off for veins to be considered as 'wall rock.'

Table 2. Joint Condition

RATING	Condition of Discontinuity (RMR 1976)	BGC Notes
25	Very rough surface; not continuous; no separation; unweathered wall rock	Includes intervals with no discontinuities; JRC > 15
20	Slightly rough surfaces; separation <1 mm; slightly weathered walls	> R3 wall rock; interlocking discontinuities with 8 < JRC < 14
12	Slightly rough surfaces; separation <1 mm; highly weathered walls	< R3 wall rock and slightly rough OR $\geq$ R3 planar/smooth surfaces with no infill
6	Slickensided surfaces or gouge < 5 mm thick or separation 1 to 5 mm; continuous	Veins $\leq$ R1 or Mohs # $\leq$ ~3 included as "infilling"
0	Soft gouge >5mm or separation > 5 mm; continuous joints	Veins $\leq$ R1 or Mohs # $\leq$ ~3 included as "infilling"

Project / Property Specific Notes:

3.10. Strength Grade

This parameter is sometimes called “hardness”; however “strength grade” is preferred to reduce confusion between this parameter and mineral hardness scales. Simple field tests are utilised to estimate the average uniaxial compressive strength (UCS) grade of the rock for each interval. The grades (R0 – R6) provide an indication of the relative strength differences between the rock units encountered during drilling; half grades may be assigned for intermediate strengths.

The diagnostic tests reflect the influence of mineralogy and particle (crystal or grain) bond quality. Multiple tests are usually required for each grade to increase the reliability of the estimate for each interval. The average grade for the interval should be recorded.

Table 3. ISRM field estimate of uniaxial compressive rock strength (after ISRM, 1981).

Grade*	Term	Uniaxial Comp. Strength (MPa)	Point Load Index (MPa)	Field estimate of strength	Examples
R6	Extremely Strong	> 250	>10	Specimen can only be chipped with a geological hammer	Fresh basalt, chert, diabase, gneiss, granite, quartzite
R5	Very strong	100 - 250	4 - 10	Specimen requires many blows of a geological hammer to fracture it	Amphibolite, sandstone, basalt, gabbro, gneiss, granodiorite, limestone, marble, rhyolite, tuff
R4	Strong	50 - 100	2 - 4	Specimen requires more than one blow of a geological hammer to fracture it	Limestone, marble, phyllite, sandstone, schist, shale
R3	Medium strong	25 - 50	1 - 2	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single blow from a geological hammer	Claystone, coal, concrete, schist, shale, siltstone
R2	Weak	5 - 25	**	Can be peeled with a pocket knife with difficulty, shallow indentation made by firm blow with point of a geological hammer	Chalk, rocksalt, potash
R1	Very weak	1 - 5	**	Crumbles under firm blows with point of a geological hammer, can be peeled by a pocket knife	Highly weathered or altered rock
R0	Extremely Weak	0.25 - 1	**	Indented by thumbnail	Stiff fault gouge

Project / Property Specific Notes:

3.11. Weathering / Alteration Grade

The weathering or alteration grade provides an indication of the condition of the rock mass with respect to its deterioration to a soil like material through disintegration or decomposition via surficial weathering processes or hydrothermal alteration. For each interval a description of the weathering or alteration should be provided according to the grades provided in Figure 7. For BGC's purposes weathering grade IA should be recorded as 1 and IB as 1.5; no other half grades can be assigned.

Where possible the colour and friability of the rock should be compared to a completely unweathered (fresh) sample of the same unit. Descriptions of the weathering grade should be included for each geological description completed by the geologist in their geological log.

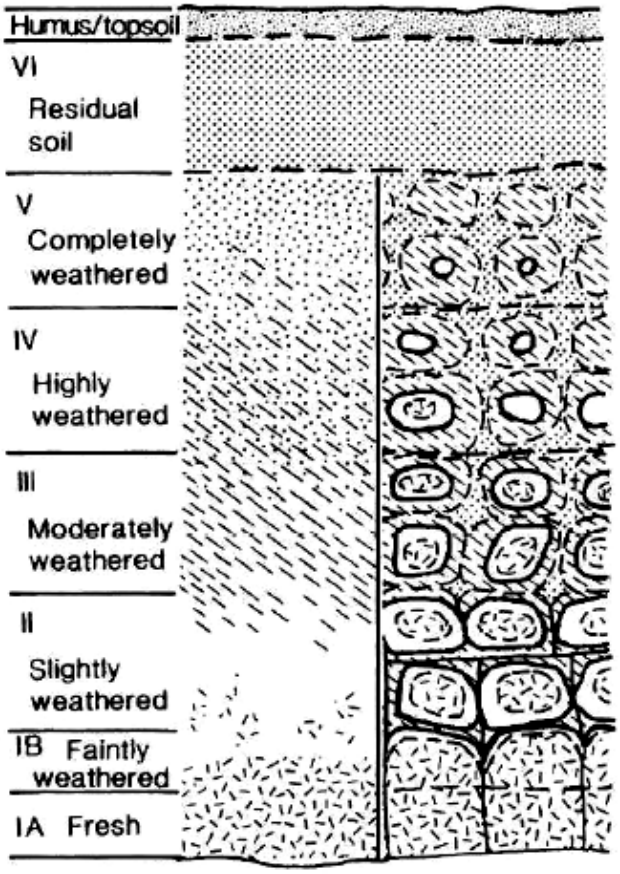


Figure 6. Weathering grades of residual soils (Fookes, 1997).

Project / Property Specific Notes:

4. DISCONTINUITY DESCRIPTION

Engineering in rock provides different challenges than those faced in soil or concrete because rock is a discontinuous material; the rock mass is made of blocks defined by joints, bedding, faults, etc. (discontinuities). The geological and engineering properties of the discontinuities are often important for engineering design. The level of effort in discontinuity data collection must be decided on by the technical lead for the project; with consideration of the data required for design and the practical limitations of the field program schedule. BGC typically records every discontinuity intersected in our geotechnical boreholes, if this is not required or not practical for a particular project guidance on what should be recorded should be provided to the field staff by the technical lead or project manager.

Discontinuity data should be collected as point observations; aperture / infilling thickness is to be recorded for each structure so that there is a complete description.

The following sections describe the observations that should be made for geologically logged discontinuities:

- Discontinuity Depth To
- Infilling Thickness
- Infilling Type
- Infilling Strength
- Joint Roughness Coefficient (JRC)
- Joint Wall Strength
- Type
- Orientation (alpha angle, beta angle, quality)

For projects using the Q' rock mass classification system (Barton, 1974) two additional discontinuity parameters are required:

- Joint Roughness number (Jr)
- Joint Alteration number (Ja)

Discussion regarding the density of data collection is provided at the end of this chapter.

4.1. Discontinuity Depth To

The discontinuity location should be recorded as the total downhole distance along the core from the collar to the intersection of the top of the structure with the core axis. The aperture or infilling thickness record will describe the width of the structure so that no other depths are needed. Where multiple discontinues occur at the same depth, it is usually useful to add additional significant figures to the depth measurement to differentiate between the features: two discontinuities at 352.21 m could be recorded as 352.211 and 352.212. Many database and 3D geological modeling software tools interpret over lapping depths as errors; these can be avoided with this data collection approach.

Project / Property Specific Notes:

4.2. Aperture and Infilling Width

When logging from the core box, accurate estimates of infilling type and thickness can be difficult, however the presence and type of infilling or coating can determine the shear strength of the rock block-to-block contacts. Aperture is a measure of space between two sides of a discontinuity; the width of infill is measured if infilling is present. Where either are measure, they should be measured perpendicular to the discontinuity face. If the values are variable, use the measurement along the core axis and note the variability as a comment. Aperture is best measured in the splits, or fit back together by hand in the core shack, as it will likely increase when the core is placed into the core box. Infilling may be lost due to washing during drilling. Care should be taken when making either measurement.

For the discontinuities logged, the presence or absence (just as important) of infillings should be noted. Types of infillings or coatings may include soil materials (clay, silts, sand), minerals (talc, chlorite, calcite), or disintegration/decomposition products (gouge, rock fragments). The types of infillings should be noted using project appropriate codes and the thickness should be recorded using the standard units of the project. Default values should be avoided and where no infill is observed in a closed discontinuity, a zero thickness should be recorded.

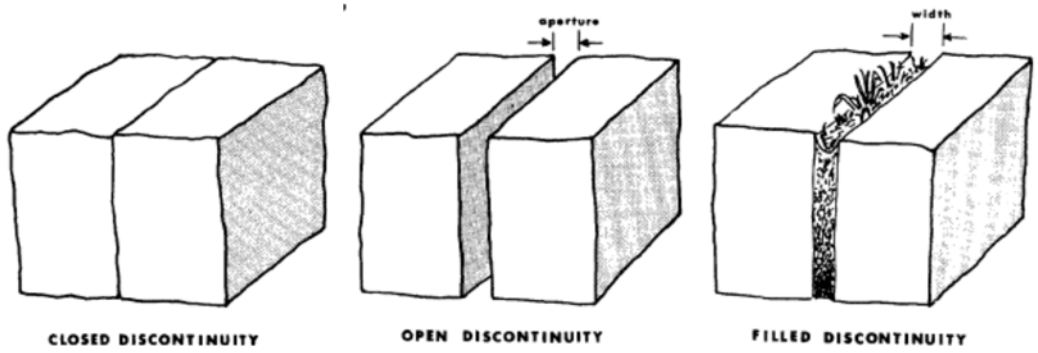


Figure 7. Definitions of aperture / infilling thickness for open discontinuities

Project / Property Specific Notes:

4.3. Infilling Type and Strength

The types of infilling in each discontinuity logged should be identified; it should also be noted if no infilling is present. Infill types may include: minerals (talc, calcite, etc.), clay, fault gouge, disintegrated rock, or decomposed rock. A list of possible infill types should be provided for the project. In addition to the type of infill, the strength of the infill should be noted. The strength of the infill may be similar to soils (S1 to S6), as noted in the table below, or similar to rock (R0 to R6) as noted in Table 2.

Table 4. Soil strength grades for soil-like discontinuity infills

Grade	Description	Field Identification	SPT N (Uncorrected)	Approx. range of unaxial compressive strength (kPa)	Undrained Shear strength (kPa)
S1	Very soft	Easily penetrated several inches by fist	<2	<25	<12
S2	Soft	Easily penetrated several inches by thumb	2-4	25-50	12-25
S3	Firm	Can be penetrated several inches by thumb with moderate effort	4-8	50-100	25-50
S4	Stiff	Readily indented by thumb but penetrated only with great effort	8-15	100-250	50-100
S5	Very stiff	Readily indented by thumbnail	15-30	250-500	100-200
S6	Hard	Indented with difficulty by thumbnail	>30	>500	>200

Project / Property Specific Notes:

4.4. Joint Roughness Coefficient (JRC)

The surface roughness of the logged discontinuities should be estimated. The roughness of these surfaces can influence the rock block-to-block shear strength and therefore the engineering behaviour of the rock mass. A simple roughness index (JRC) has been developed based on the maximum amplitude of the peaks and valleys (asperities) of the discontinuity surface at the drill core scale. BGC has developed a simple tool to assist in this semi-quantitative assessment (Appendix C); the discontinuity should be compared with the amplitude classes on the tool, for those asperity profiles that have an amplitude of 4 mm or greater the angle of the asperities becomes significant. Angles of 20° or greater (as shown by the reference lines on the tool) should be assigned the higher of the two JRC values shown on the tool. Qualitative descriptions (Figure 10) equivalent to the JRC index numbers can also be included in the geological description completed by the geologist.

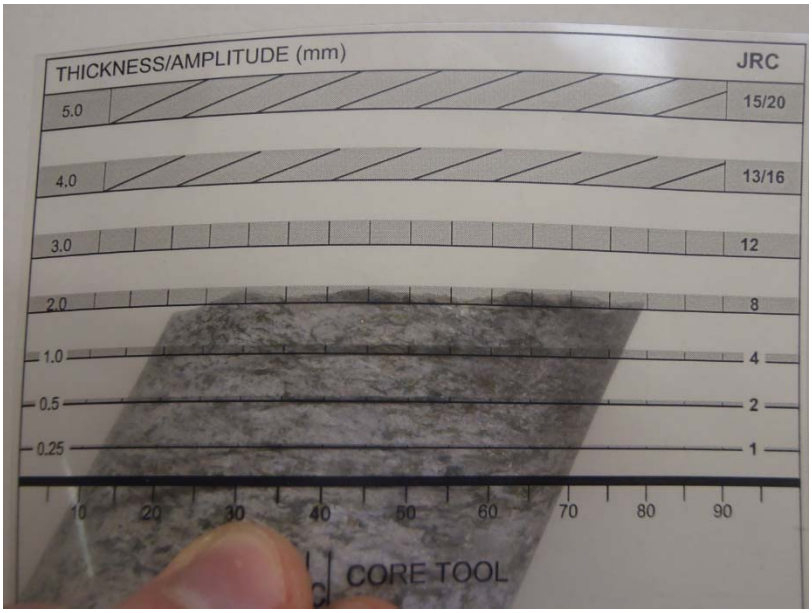


Figure 8. Joint roughness tool

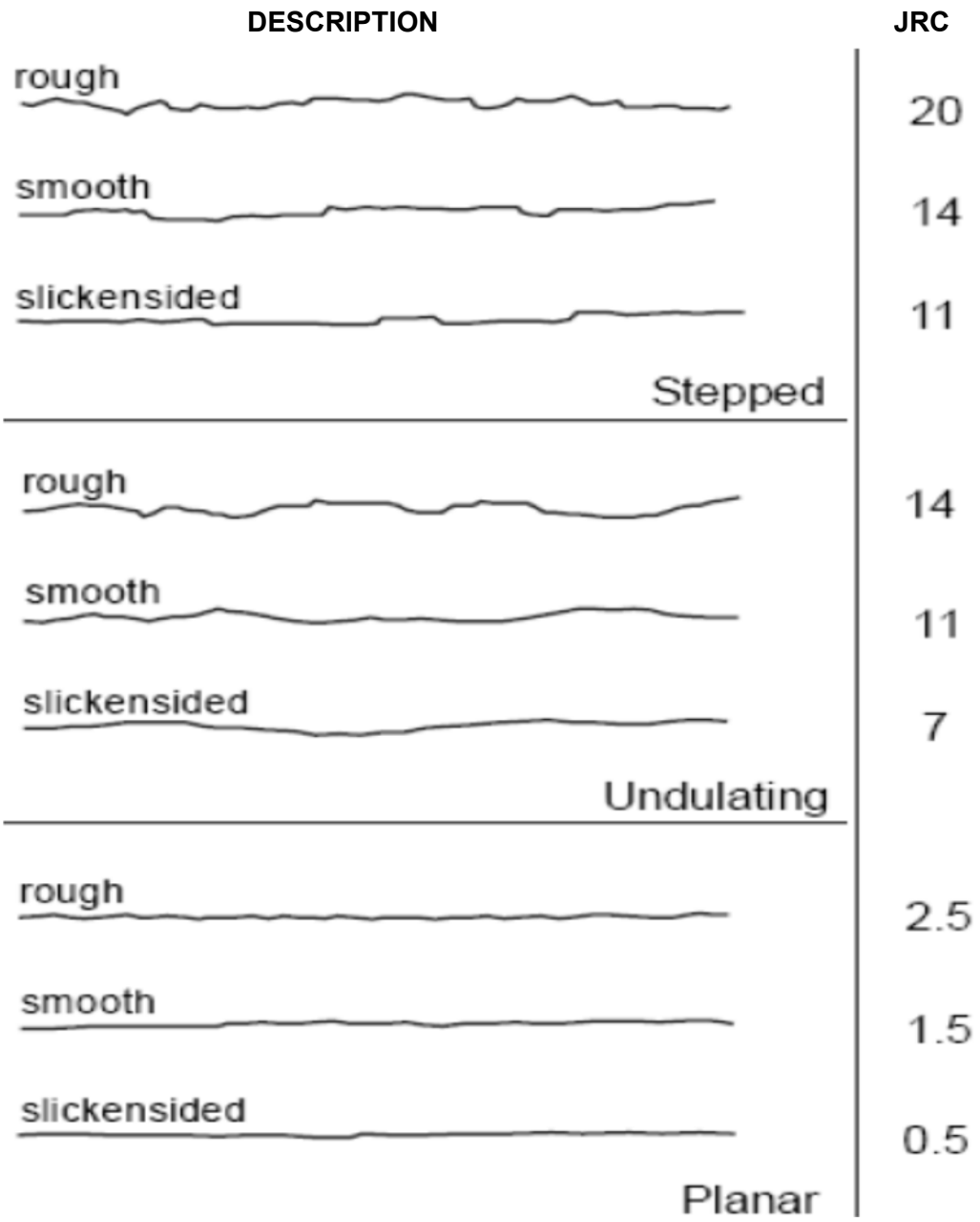


Figure 9. Qualitative descriptions for JRC values.

4.5. Joint Wall Compressive Strength (JWCS)

The joint wall compressive strength of discontinuities is a parameter related to infilling and weathering / alteration of the joint walls. Differences between the JWCS and the strength grade can be indications of decomposition of the rock mass adjacent to discontinuities or other effects of the infilling.

The scale used for JWCS is identical to the one used for strength grade (Table 2) with simple field tests utilised to estimate the JWCS of each discontinuity. Due to the scale and nature of joint walls, the diagnostic tests performed using a pocket knife or fingernail are typically the only ones that can be completed. This can mean that strengths above R4 cannot be properly classified. In cases where this is encountered, if the strength of the joint wall appears to be the same as the intact rock, the value determined from the core description log should be used.

Project / Property Specific Notes:

4.6. Type

Discontinuity types, or at least names and definitions of types, often vary from project to project based on the background of those involved in the work. BGC recommends using the minimum number of discontinuities types with clear definitions. A common set of types used in engineering geology is provided in Table 5. This suggested break down is simple, but when combined with the other discontinuity observations, should cover most cases.

These simple codes can be combined into compound codes including one separation type with one structure type: 'FB' for 'fault // to bedding' or 'JO' for 'joint along foliation'. These compound codes are extremely useful when determining the important discontinuity sets for a project site.

Table 5. Common discontinuity types, definitions, and suggested codes.

Group	Type	Definition	Code
Separations	Fault	Displacement evident. Zones or fillings of brecciated rock, soil-like gouge, mylonitic, and or cataclastic fabrics are typical.	F
	Shear	Displacement evident. Discrete plane which is polished or slickensided, no infill.	S
	Joint	Little to no displacement. May be infilled with weathered material or have mineral coatings.	J
Structures	Bedding	Layering due to sedimentary deposition. May be open or closed.	B
	Foliation	Surface of easy splitting in a metamorphic rock defined by the preferred orientation of metamorphic minerals.	O
	Vein	Geological discontinuity with mineral infilling.	V
	Contact	Boundary between two geological units.	C

Project / Property Specific Notes:

4.7. Orientation

For drilling programs where core orientation is conducted, the orientation of individual discontinuities and geological structures can be determined from: the alpha (α) angle of the discontinuity, the beta (β) angle of the discontinuity, and the downhole survey data for the core hole. If core orientation is not used, only the alpha angle of logged discontinuities is recorded.

The alpha angle is the angle of intersection of between the discontinuity surface and the core axis (Figure 11). This can be measured with a goniometer, carpenters protractor, or even a Douglas-style protractor. The alpha angle is always a positive angle between 0° to 90°.

The beta angle is measured around the circumference of the core, clock-wise from the reference line provided from the core orientation method (Ball-Mark, Ezy-Mark, ACT, clay-imprint, various scribe systems, etc.) to the tip of the discontinuity farthest down-hole (Figure 11). The beta angle can be measured using a linear protractor sized for the core diameter used for the program (Appendix B).

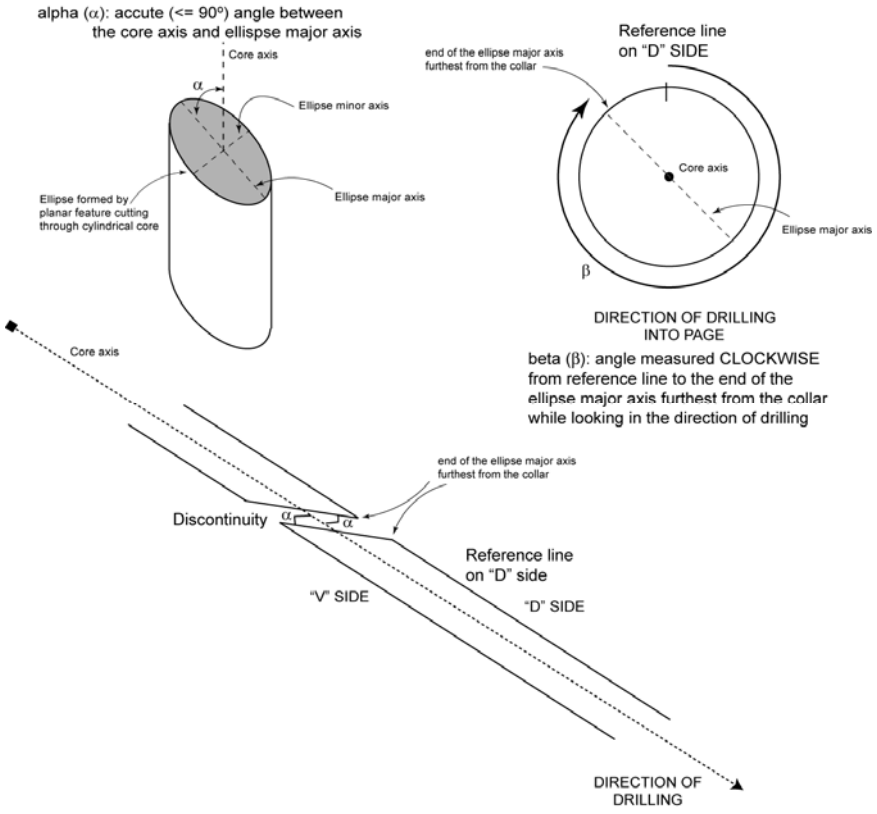


Figure 10. Oriented core measurements.

Project / Property Specific Notes:

4.8. Joint Roughness Number (Jr)

The joint roughness parameter of the Q system describes the small and intermediate scale character of the joint wall surfaces. When determining Jr the thickness of joint infilling must be considered, Figure 11. When infilling thickness is greater than the small scale roughness (asperity height) and rock wall contact will not occur during shearing roughness is not significant and a Jr of 1 should be assigned. For hard rock masses without joints, Jr = 4; for soft rock masses (UCS < 0.25 MPa) without joints, Jr =1. Add 1 to the Jr if the mean spacing of the relevant joint set is greater than 3 m. Table 6 below provides typical joint roughness descriptions and corresponding Jr values.

Table 6. Joint Roughness Parameter (Jr) descriptions (NGI, 2013)

3 Joint Roughness Number		J_r
a) Rock-wall contact, and b) Rock-wall contact before 10 cm of shear movement		
A	Discontinuous joints	4
B	Rough or irregular, undulating	3
C	Smooth, undulating	2
D	Slickensided, undulating	1.5
E	Rough, irregular, planar	1.5
F	Smooth, planar	1
G	Slickensided, planar	0.5

Note: i) Description refers to small scale features and intermediate scale features, in that order

c) No rock-wall contact when sheared		
H	Zone containing clay minerals thick enough to prevent rock-wall contact when sheared	1

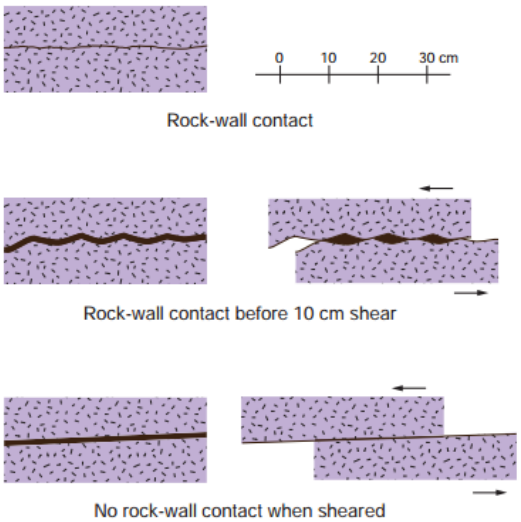


Figure 11. Categories of joint wall contact conditions (NGI, 2013)

4.9. Joint Alteration Number (Ja)

The joint alteration parameter (Ja) of the Q system describes the thickness and strength of joint infilling. Three categories have been developed for Ja based on the degree of rock wall contact during shearing of a discontinuity: a, rock walls are in contact; b, rock walls will contact before 10 cm of shear displacement; and c, no rock wall contact when sheared, Figure 11 illustrates these joint wall configurations. Table 7 below provides detailed descriptions of joint infillings and corresponding Ja values.

Table 7. Joint Alteration Parameter (Ja) descriptions (NGI, 2013)

4 Joint Alteration Number		Φ_r approx.	J_a
a) Rock-wall contact (no mineral fillings, only coatings)			
A	Tightly healed, hard, non-softening, impermeable filling, i.e., quartz or epidote.		0.75
B	Unaltered joint walls, surface staining only.	25-35°	1
C	Slightly altered joint walls. Non-softening mineral coatings; sandy particles, clay-free disintegrated rock, etc.	25-30°	2
D	Silty or sandy clay coatings, small clay fraction (non-softening).	20-25°	3
E	Softening or low friction clay mineral coatings, i.e., kaolinite or mica. Also chlorite, talc gypsum, graphite, etc., and small quantities of swelling clays.	8-16°	4
b) Rock-wall contact before 10 cm shear (thin mineral fillings)			
F	Sandy particles, clay-free disintegrated rock, etc.	25-30°	4
G	Strongly over-consolidated, non-softening, clay mineral fillings (continuous, but <5mm thickness).	16-24°	6
H	Medium or low over-consolidation, softening, clay mineral fillings (continuous, but <5mm thickness).	12-16°	8
J	Swelling-clay fillings, i.e., montmorillonite (continuous, but <5mm thickness). Value of J_a depends on percent of swelling clay-size particles.	6-12°	8-12
c) No rock-wall contact when sheared (thick mineral fillings)			
K	Zones or bands of disintegrated or crushed rock. Strongly over-consolidated.	16-24°	6
L	Zones or bands of clay, disintegrated or crushed rock. Medium or low over-consolidation or softening fillings.	12-16°	8
M	Zones or bands of clay, disintegrated or crushed rock. Swelling clay. J_a depends on percent of swelling clay-size particles.	6-12°	8-12
N	Thick continuous zones or bands of clay. Strongly over-consolidated.	16-24°	10
O	Thick, continuous zones or bands of clay. Medium to low over-consolidation.	12-16°	13
P	Thick, continuous zones or bands with clay. Swelling clay. J_a depends on percent of swelling clay-size particles.	6-12°	13-20

5. ENGINEERING SUMMARY LOG

The “core description” and “discontinuity” logs provide detailed observations for each core interval and discontinuity. The “engineering summary” log allows for qualitative descriptions of geotechnical units or zone which may span multiple interval or runs. In addition, important discontinuities, geological contacts, or other features can be highlighted. Finally, graphical representations or sketches of the core can be completed on the log to illustrate zones of lost core, fault zones, or geological units.

The logs are divided into two sections by observation type:

1. Interval observations where the locations of the observations are defined by a “depth from” and a “depth to”. Examples include geological units, weathering horizons, or alteration zones.
2. Point observations of features where the locations of the observations are defined by a single depth value or “depth to”. Examples include faults or geological contacts.

Some of the information for this log may be summarised from the “core description” or “discontinuity” log. The qualitative description of the zone should include the following items in the order and format for the project as provided by the technical lead or project manager.

This log cannot always be completed at the rig; it requires interpretation of the entire borehole to locate unit breaks and to consider the big picture. Subtle changes in fracture density or geology can be easily missed when logging core at the rig because you can’t lay out the boxes in the limited space or there is not enough time between drill runs. For this reason the engineering summary log should be filled out in two parts, it should be started at the rig and record major visible unit breaks, large features, and drilling observations. Afterwards those logs should be reviewed with the core boxes and detailed descriptions of the rock mass be recorded; this can be completed by the core logger(s) or field supervisor or a combination, depending on the project and time available.

5.1. Initial Observations (At the Rig)

There are a number of observations that can only be made at the rig during core logging; at a minimum the logger should record these on the engineering summary log:

- Geotechnical information:
    - Large faults – describe infilling in detail
    - Weathering grade and strengths
    - Major contacts
- Hydrogeologic information:
    - Zones of lost fluid return
    - Colour of return fluid (if drilling with water or polymer)
    - Depth of first water encountered
    - Artesian conditions (flow rate, pressures – can be qualitative if not measurable)

- Drilling information:
    - Mislatches / zones that have to be redrilled
    - Approximate advance rates
    - Zones of difficult drilling and the suspected reason
- And any other observations regarding the core, drilling, or site.

These are primarily the data that are recorded on the right of the engineering summary log.

5.2. Detailed Rock Mass Descriptions (Core Shack)

Detailed Rock Mass Descriptions may be completed either at the drill rig during core logging or afterward in the core shack depending on the project set-up. In either case they should follow the procedure described below.

There are several components to describing rock from core logging: geology / intact rock, and geomechanics / rock mass. The level of detail / scale of description required can vary from project to project and it is important to consider the purpose of the data collected before collecting it. For example open pit drilling is typically focused on geomechanical and structural data collection, and logged by exploration geologists after geotechnical logging at the rig. In this case it is less important that BGC describe the geology/intact rock because we would be duplicating effort. In this case detailed descriptions can be compiled from the geological logs produced by the exploration geologists and geotechnical data collected during core logging after the field program. However, lots of projects BGC works on do not have on site geologist experts. For these projects the detailed log needs to be completed in the field, and additional time must be taken by the field engineer to complete a full description while on site.

In order to complete the rock mass descriptions, the logger must break down the hole into homogeneous units; at a minimum breaks should be made at geological contacts, weathering horizons, and where there are major changes in blockiness (RQD/FI) or strength. Below is an outline for the descriptions:

Geology / Intact Rock Description.

Order	Descriptor
1a	Rock type(s) (+percentage)
1b	Rock Mass Quality (add in the office)
2	Weathering Grade
3	Intact Strength
4	Colour
5	Grain Size
6	Fabric / Texture
7	Additional Geological comments

Geomechanical / Rock Mass Description (Optional depending on project).

Order	Descriptor
1	RQD (range of values)
2	Fracture spacing (range of values)
3	Dominant Sets: type, aperture, infilling, roughness, spacing, alpha angle

Additional Data for Detailed Log:

1. Major Faults / Features – thickness, infilling
2. Lab Testing Results
3. Hydrogeologic observations
4. Drilling observations
5. SPT and other samples

The purpose is to provide detailed geological and geotechnical descriptions of the rock material types as part of the field mapping and borehole core logging procedures. Each parameter is described in detail in the following sections or referenced to the relevant descriptions from the Core Description or Discontinuity logs in Sections 3.0 and 4.0.

5.3. Geology / Intact Rock Description

5.3.1. Rock Type

To the best of your ability identify the names and types of rock encountered during field mapping and borehole logging. The first step in rock type identification is to identify which genetic group they belong to: sedimentary, pyroclastic, igneous, or metamorphic. Before heading to a project site, familiarise yourself with the geologic environment so that you know what type of rocks types to expect – for example in the Rockies of Alberta you would expect primarily young sedimentary rocks; while in the shield of Ontario and Quebec metamorphic rocks dominate. If there is any doubt, consult colleagues and/or local (on-site) geologists with a representative sample from the borehole. The following table outlines many of the basic rock types; additional references are provided at the end of this section for further reading on rock identification.

Table 8. Basic Rock Naming by Genetic Origin and Grain Size

Genetic Group		Sedimentary		Pyroclastic	Metamorphic		Igneous		
Typical Structure		Bedded			Foliated	Homo-Geneous	Homogeneous		
Composition		Grains Of Rock, Quartz, Feldspar, And Minerals	>50% Grains Of Carbon-Ate Minerals	At Least 50% Of The Grains Have A Volcanic Origin			FELSIC Contains Light Coloured Minerals: Quartz, Feldspar, Mica		MAFIC Dark Minerals
							Acid Rocks	Intermediate Rocks	Basic Rocks
Grain Size	**Very Coarse To Coarse (Gravel Sized)**	Rounded Grains: CONGLOMERATE Angular Grains: BRECCIA	Limestone	Rounded Grains: AGGLOMERATE Angular Grains: VOLCANIC BRECCIA	Strongly Aligned Minerals / Linearly Banded: GNEISS Intergrown Crystals: PEGMATITE	Primarily Calcite: MARBLE Primarily Quartz: QUARTZITE	Grains Of Quartz, Potassium Feldspar (K-Spar), And Plagioclase: GRANITE No Quartz, K-Spar Rich: SYENITE No Quartz, Equal K-Spar / Plagioclase MONZONITE Bimodal Grain Distribution: PORPHYRY	DIORITE	GABBRO
	Medium (Sand Sized)	Clean (<5% Fines): SANDSTONE >5% Fines: GREYWACKE		TUFF	Undulating Foliation +/- Very Large Porphyroblasts: SCHIST				
	Fine (Silt And Clay Sized)	SILTSTONE SHALE (Fissile)		Fine Grained TUFF	Micaceous: PHYLLITE Bedding// Cleavage: SLATE	HORNFELS	RHYOLITE	ANDESITE	BASALT
	Glassy						OBSIDIAN		TACHYLYTE

5.3.2. Rock Quality Ranking

For many BGC projects Rock Mass Rating (RMR) is used to rank rock mass quality. It can be estimated in the core shack or office from core logging data, add a qualifier to the rock name:

- RMR 0-20: Very Poor
- RMR 20-40: Poor
- RMR 40-60: Fair
- RMR 60-80: Good
- RMR 80-100: Very Good.

Some projects, e.g. tunneling or underground mining, prefer the Q system for evaluating rock mass quality, it can be estimated in the core shack or office from core logging data, add a qualifier to the rock name:

- Q 0.001-0.01: Exceptionally Poor
- Q 0.01-0.1: Extremely Poor
- Q 0.1-1: Very Poor
- Q 1-4: Poor
- Q 4-10: Fair
- Q 10-40: Good
- Q 40-100: Very Good
- Q 100-400: Extremely Good
- Q >400: Exceptionally Good

For every project indicate which rock quality ranking system was used in the core log legend.

5.3.3. Degree of Weathering / Alteration

The weathering / alteration grade should be estimated using the scale developed by Fookes presented in Section 3.11.

5.3.4. Rock Strength

The rock strength should be estimated using the ISRM strength grade scale presented in Section 3.10.

5.3.5. Colour

Describe the colour of the rock mass using the method presented in Section 3.2.

5.3.6. Grain Size

Describe the average grain size and distribution using the method presented in Section 3.2.

5.3.7. Fabric/Texture

Describe the fabric of the rock mass using the method presented in Section 3.2. Additional site specific terms may be required.

5.3.8. Additional Geologic Descriptions

E.g. the presence / concentration of site specific indicator minerals, alteration types, veining, flysch grades / GSI structure description

5.4. Geomechanical / Rock Mass Description (may be optional)

5.4.1. Fracture Frequency / Spacing

Provide a range of values to describe the blockiness of the rock mass. The true spacing of discontinuities can be typically measured directly from natural outcrops or on engineered cuts as the perpendicular distance between adjacent discontinuities of the same set using the following ISRM (1981) classification. For core logging, estimate the average spacing of all discontinuities – details of the individual discontinuity set spacing can be included in the set description.

Table 9. Spacing Description Definitions - ISRM.

Description	Discontinuity Spacing
Extremely Close Spacing	< 20 mm
Very Close Spacing	20-60 mm
Close Spacing	60-200 mm
Moderate Spacing	200-600mm
Wide Spacing	600-2000mm
Very Wide Spacing	2000-6000mm
Extremely Wide Spacing	> 6000 mm

5.4.2. Number of Major Discontinuity Sets

Estimate the number of discontinuity sets in the rock mass as described in Section 3.8.

5.4.3. Discontinuity Set Descriptions

- Type – indicate the type of discontinuity as described in Section 4.6
- Aperture – estimate the average aperture / infilling thickness for the discontinuity set as described in Section 4.2
- Infilling – describe the typical infilling materials for the discontinuity set
- Roughness – estimate the average roughness (and JRC) of the discontinuity set as described in Section 4.4.
    - Rough (JRC >12)
    - Slightly Rough (12 > JRC > 6)

- Smooth (6 > JRC > 2)
- Polished (2 > JRC > 0)
- Slickensided (Any JRC with aligned mineral growth indicating shear movements).

- Orientation – estimate the average / range of alpha angle, which is defined as the angle, in degrees, of the maximum dip of the discontinuity with respect to the core axis. Where possible (when orienting core) estimate the average / range of beta angle, which is defined as the clockwise circumferential angle from the core reference line to the furthest downhole point of a discontinuity. See Section 4.7.
- Additional Comments – add any other relevant information.

5.5. Example Descriptions

Poor Quality SILTSTONE

Moderately to slightly weathered, weak to moderately strong, dark grey fresh surfaces, dark orangey brown weathered surfaces, fine grained, bedded, occasional calcite veins up to 5 mm thick.

Closely spaced discontinuities form two dominant sets:

1. Bedding parallel joints with aperture ranging from 1 to 3 mm, typically infilled with disintegrated rock, slightly rough to smooth, typical alpha angles 10-20° TCA.
2. Cross joints, ranging from tight to 2 mm aperture, typically no infilling, rough to slightly rough, typically alpha angles 60-80° TCA.

From 12.5 to 14 m Mislatch: interval had to be re-drilled, no core recovered.

From 16.3 to 16.7 m: FAULT ZONE: CLAY (CL) and SILT (ML), low plastic, hard, dark grey, moist, no visible structure, slow dilation.

Very Good Quality GNEISS

Fresh, strong to very strong, banded black, pink, and white, medium to coarse grained, foliated, random quartz veining.

Widely spaced discontinuities appear to be randomly oriented.

Good Quality TUFF

Fresh, medium strong to strong, light bluish grey, fine to medium grained, foliated, quartz vein stockwork (~25% of rock mass) typically along foliation ranging from 5 to 25 mm thick, pyrite content ranges from 2 to 10%.

Moderately spaced discontinuities are primarily foliation parallel joints, tight to 2 mm aperture, sericite infilling often present, slightly rough, typical alpha angles 45° TCA.

5.6. Rock Naming Resources

Blatt, Harvey and Tracy, Robert J., 1996. Petrology: Igenous, Sedimentary, and Metamorphic Second Edition. New York: W.H. Freeman and Company.

Boggs, Sam Jr., 2001. Principles of Sedimentology and Stratigraphy Third Edition. New Jersey: Prentice Hall Inc.

Goodman, Richard E., 1989. Introduction to Rock Mechanics Second Edition – Appendix 3: Identification of Rocks and Minerals. John Wiley and Sons.

6. OTHER FIELD TASKS

6.1. Point Load Testing

The point load strength test provides an index test useful for characterizing the relative strength of rocks. The test can be performed near or at the sampling site, allowing for large numbers of observations to be collected. The results of the test may be used to predict other strength parameters (e.g. uniaxial compressive strength, uniaxial tensile strength) if correlations have been established.

A data collection form template is provided in Appendix A. The standard reference for the point load test is provided in Appendix D. BGC can provide a set of calculations for the conversion of test machine gauge readings to the point load index (Is_{50}) once the machine details for the project have been confirmed.

In addition to the guidance provided by the test standard (Appendix D), BGC has also provided recommendations specific to exploration drilling programs below:

1. Determine the maximum pressure gauge capacity of the PLT machine. Clearly post a test pressure limit well below this maximum to ensure that staff members doing the tests do not damage the equipment.
2. Unless the rock is strongly anisotropic (bedded / laminated, foliated), perform diametral tests (i.e. loading across the axis of the specimen) only.
3. Core diameter must be known and indicated for each test.
4. Perform one (1) test every 4-6 m within the same lithological unit.
5. Perform two (2) tests each time the lithology changes along the core.
6. Perform two (2) tests each time the alteration type changes along the core.
7. Only successful tests (“good breaks”) are counted and recorded for the database.
8. Be clear on the units being recorded from the machine gauge.
9. While core technicians are capable of doing the testing, it is advisable that the geologist marks the locations for testing on the core during the quick log and interval layout for consistency.
10. Each PLT sample should be free of any major flaws that will influence the test results (i.e. micro fractures) and should measure at least twice the diameter (i.e. 9 cm for NQ3 core) along the core axis.

Project / Property Specific Notes:

REFERENCES

Caltrans, 2007. Soil and Rock Logging, Classification, and Presentation Manual. State of California, Department of Transportation, Division of Engineering Services, Geotechnical Services. 93 pages.

Deere D., Deere, D. 1989. Rock Quality Designation after 20 years. US Army Corp. of Engineers. 91 pages.

Hoek, E. 1999. Putting Numbers to Geology – An Engineer's Viewpoint. Quarterly Journal of Engineering Geology, Vol. 3, No. 1, pp. 1-19.

International Society of Roc Mechanics (ISRM). 1977. International Society for Rock Mechanics Commission of Standardization of Laboratory and Field Tests: Suggested Methods for the Quantitative Description of Discontinuities in Rock Masses. Committee on Field Tests, Document No. 4, pp. 319-368.

International Society of Roc Mechanics (ISRM). 1981. International Society for Rock Mechanics: Commission of Classification of Rocks and Rock Masses, Basic Geotechnical Description of Rock Masses. International Journal of Rock Mechanics, Mineral Science, and Geomechanics. Vol. 18, pp. 85-110.

International Society of Roc Mechanics (ISRM). 1981. Suggested methods for determining hardness and abrasiveness of rocks. In: Brown ET Editor. Rock characterization, testing and monitoring: ISRM suggested Methods. Oxford: Pergamon; 1981. p. 95-96.

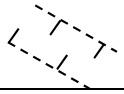
NGI, 2013. Using the Q-System: Rock mass classification and support design. NGI handbook. Oslo, April 2013.

Palmstrom, A. 1995. RMi – a rock mass characterization system for rock engineering purposes: Appendix 3. PhD. Thesis, Oslo University, Norway. 68 pages.

APPENDIX A
BGC DATA COLLECTION FORMS AND REFERENCE SHEETS

LEGEND FOR GRAPHIC LOG

The Graphic Log should be filled in using the symbols below.

	Joint (J)	Little to no displacement. May be infilled with weathered material or have mineral coatings.
	Shear (S)	Displacement evident. Discrete plane which is polished or slickensided, no infill.
	Fault (F)	Displacement evident. Zones or fillings of brecciated rock, soil-like gouge, mylonitic, and or cataclastic fabrics are typical.
	Foliation (O)	Surface of easy splitting in a metamorphic rock defined by the preferred orientation of metamorphic minerals.
	Bedding (B)	Layering due to sedimentary deposition. May be open or closed.
	Contact (C)	Boundary between two geological units.
	Vein (V)	Geological discontinuity with mineral infilling.
	No Recovery	Zones in the core where nothing is recovered.
	Rubble Zones	For zones in the core that have been reduced to rock fragments, either by the drilling process or due to a high density of discontinuities.
	Dyke Contacts	Dashed contact lines with marks showing the intruded material.

Field Procedure

REF:	**12-51 [2013.1]**	**DATE:**	**June 05, 2013**
REVIEWED BY:	**Lukas Arenson**		
SUBJECT:	**Field Description and Classification of Frozen Soils**		

Field Description and Classification of Frozen Soils

(For rock, use standard rock classification and make note of the cryogenic texture and ice contained within the fractures or fissures as per Figure 1.)

Definition: Frozen soil is a defined as a soil in which part or all of the pore water has turned into ice.

Standard Practice for Description of Frozen Soils follows 4 steps:

Step I: Describe the soil phase

Identify soil phase independent of the frozen state using the Unified Soil Classification System. Description should include primary soil type, secondary soil type, particle size, gradation, angularity, colour, etc.

Step II: Characterize the frozen state

Determine whether the soil is frozen (contains ice). Soils that have visible ice are denoted with the designation V. If ice content isn't immediately visible, scrape the core with your knife. This will make ice lenses much more apparent. Using a flashlight will also help seeing ice content. If there is no visible ice, feel the temperature of the sample with your hand and try to push a knife through the sample. A frozen sample will be very cold to the touch and impenetrable. Frozen soils with nonvisible ice use designation N. Note that the edge of a frozen sample may be disturbed, i.e. thawed, by drilling or because it was exposed to the surface. Sometimes it also helps to break the sample in order to obtain a fresh sample surface.

Step III: Describe the ice (Use Figure 2)

For non-visible ice (N): determine whether the ice is poorly bonded (friable material that is easily broken under light to moderate pressure) or well bonded (ice has cemented the material into a hard solid mass and is resistant to chipping and breaking under pressure). Poorly bonded is denoted by the symbol Nf. Well bonded is denoted by the symbol Nb. Additionally, estimate the amount of excess ice by thawing a small sample in your hand or sealed plastic bag. If water is released quickly, i.e. the sample gets very muddy, there is most likely excess ice. This is denoted by the symbol Nbe. No excess ice is denoted as Nbn.

For visible ice (V): estimate the percent of visible ice in the sample and record if you see individual ice crystals (designation Vx); ice coatings on particles (Vc); random or irregularly oriented ice

formations (Vr) ; and stratified or distinctly oriented ice formations (Vs). Note: it is easy to over-estimate percent of visible ice. Record if the percent of ice content or structure changes with depth.

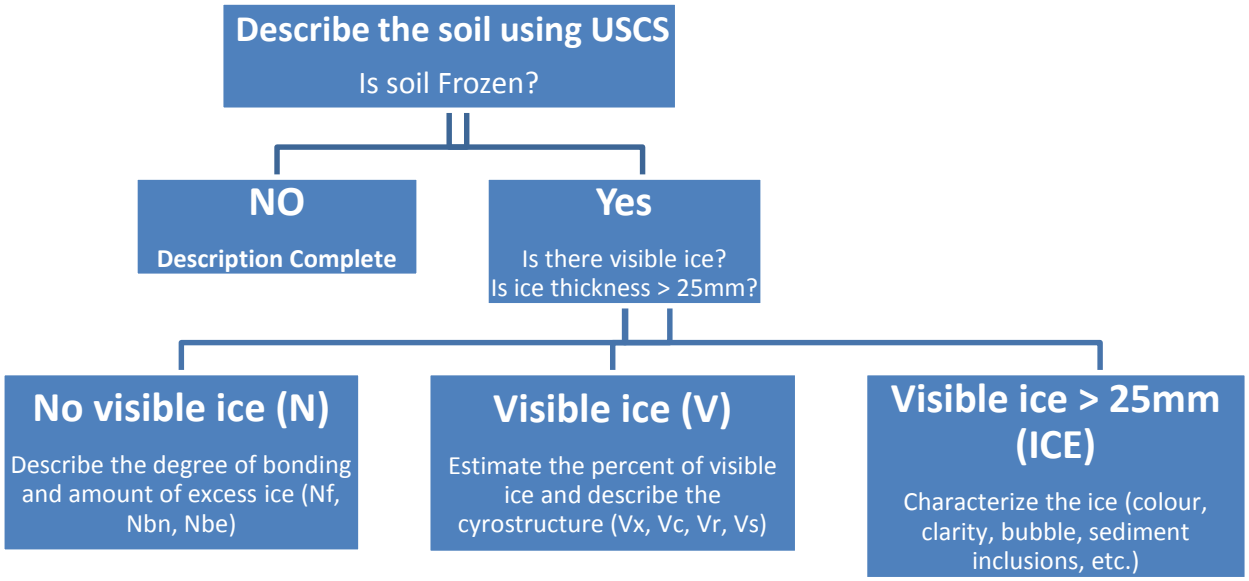
For ice inclusions 25 mm or greater, use the designation ICE or ICE + soil type and describe the characteristics of the ice including:

- Colour (colourless, white, stained, etc.)
- Clarity (clear, transparent, cloudy, opaque, etc.)
- Bubble content (visually estimate percent)
- Bubble size (in mm)
- Bubble shape (round, elongate, tubular). Note if the elongated bubbles have a preferential direction compared to the ground surface.
- Sediment inclusions or lenses (visually estimate percent and thickness of lenses).
- Any other inclusions, such as organics.
- If ice is candled or columnar (little ice columns sticking together)

Note: ground ice content is provided as volumetric ice content, i.e. V_{ice}/V_{tot}.

Step IV: Describe the Cryostratigraphy (Use Figure 3)
In addition to the systematic description of the ground ice (Step III) the cryostratigraphy should be described / mapped if possible. Figure 3 provides a classification scheme that includes different types of cryostructures present in mainly ice-rich sediments, such as: '*structureless*' (SI) — refers to frozen sediment in which ice is not visible and consequently lacks a cryostructure; '*lenticular*' (Le) — lens-like ice bodies that are described by inclination, thickness, length, shape and relationship to adjacent cryostructures; '*layered*' (La) — continuous bands of ice, sediment or a combination of both; '*regular-reticulate*' (R) — a regular three-dimensional net-like structure of ice veins surrounding a block of structureless soil; '*irregular-reticulate*' (Ri) — an irregular three-dimensional net-like structure of
ice veins surrounding a mud-rich block; '*crustal*' (Cr) —refers to the ice crust or rim around a rock clast and gravel; '*suspended*' (Su) — refers to grains, aggregates and rock clasts suspended in ice. If possible, ice bodies should be described by adding information such as vein ice (ice wedge) or thermokarst-cave ice, and syngenetic or epigenetic in nature.
Additional information on cryostratigraphy mapping can be found in French and Shur (2010).

Field descriptions should also include notes about the surficial terrain, in particular it is important to report features such as polygonal ground, proximity to lakes, peat plateaus and other landforms that will give context to the environment of the drill / test pit log.



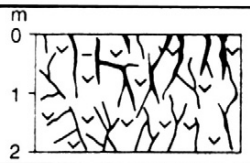
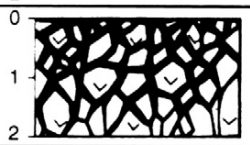
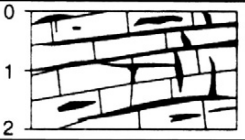
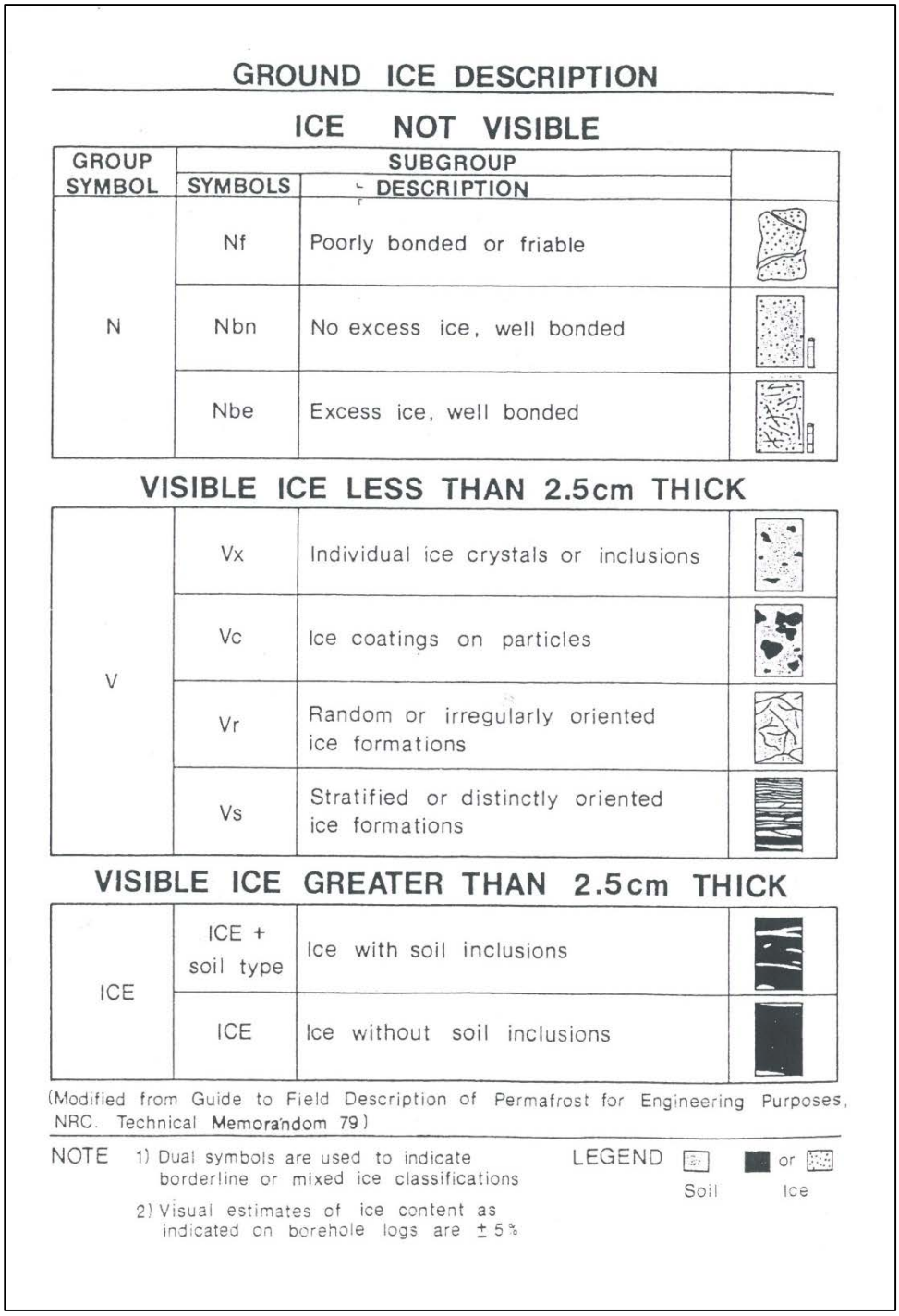
Cryogenic texture	Name	Rock type
	Fissured	All rocks
	Fissured-widened	All rocks
	Fissured-veiny	All rocks with joints, fissures, bedding planes and faults
	Stratal-fissured	All sedimentary rocks and metamorphic deposits
	Stratal-fissured-karst	Carbonate rocks
	Karst-fissured-vein	Carbonate rocks with joints and fissures

Figure 1: Cryogenic textures associated with solid and semi-solid rocks (Mel'nikov and Spesivtsev, 2000).



GROUND ICE DESCRIPTION

ICE NOT VISIBLE

GROUP SYMBOL	SUBGROUP SYMBOLS	SUBGROUP DESCRIPTION	
N	Nf	Poorly bonded or friable	
	Nbn	No excess ice, well bonded	
	Nbe	Excess ice, well bonded	

VISIBLE ICE LESS THAN 2.5cm THICK

V	Vx	Individual ice crystals or inclusions	
	Vc	Ice coatings on particles	
	Vr	Random or irregularly oriented ice formations	
	Vs	Stratified or distinctly oriented ice formations	

VISIBLE ICE GREATER THAN 2.5cm THICK

ICE	ICE + soil type	Ice with soil inclusions	
	ICE	Ice without soil inclusions	

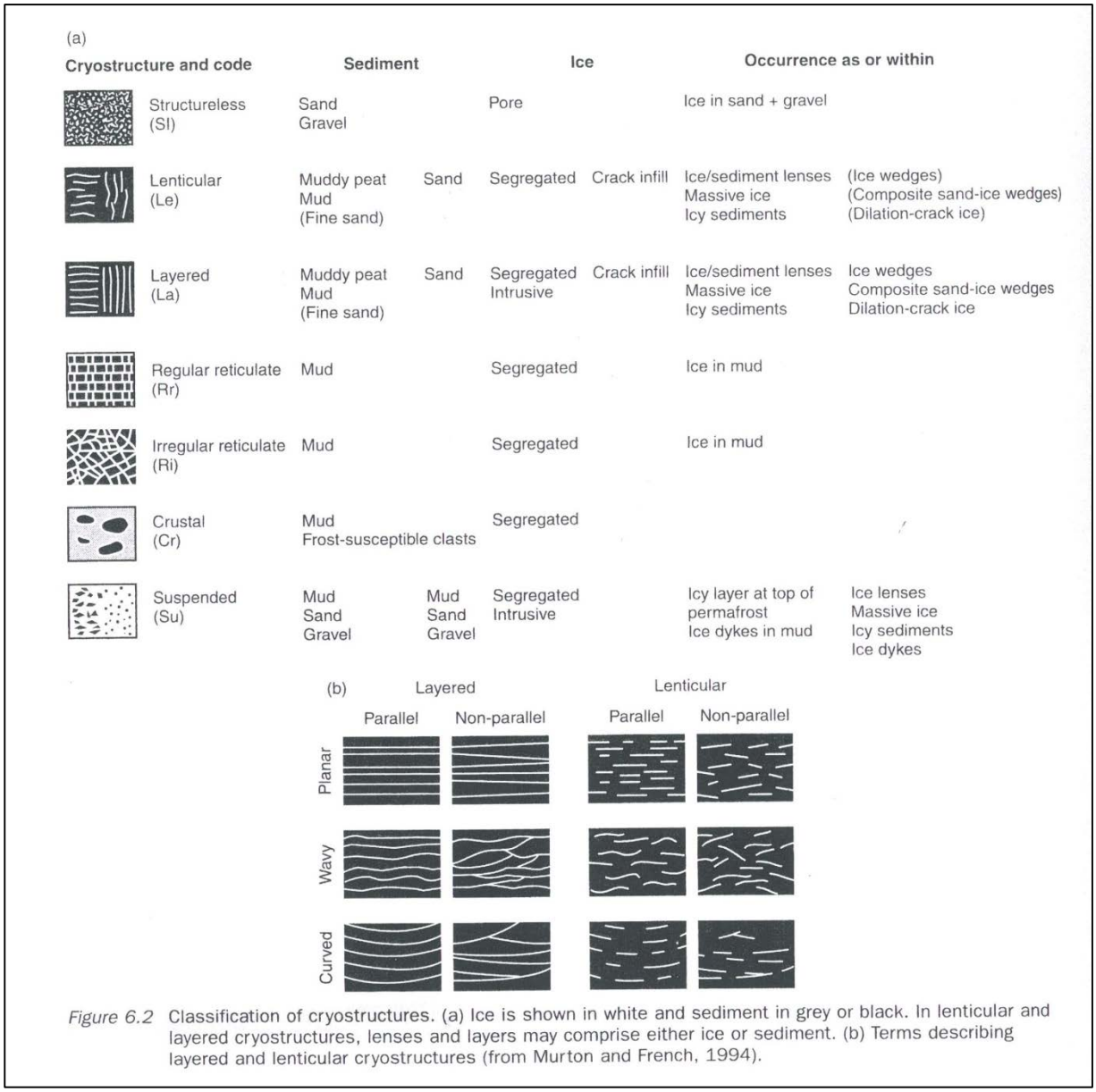
(Modified from Guide to Field Description of Permafrost for Engineering Purposes, NRC. Technical Memorandom 79)

NOTE 1) Dual symbols are used to indicate borderline or mixed ice classifications

2) Visual estimates of ice content as indicated on borehole logs are ± 5%

LEGEND Soil or Ice

Figure 2: Ground Ice Description. American Society for Testing and Materials. Standard D4083: Standard Practice for Description of Frozen Soils (Visual-Manual Procedure). Developed by Sub-Committee D18.03. West Conshohocken, PA. 6 p.



(a)

Cryostructure and code	Sediment		Ice		Occurrence as or within	
Structureless (Sl)	Sand Gravel		Pore		Ice in sand + gravel	
Lenticular (Le)	Muddy peat Mud (Fine sand)	Sand	Segregated	Crack infill	Ice/sediment lenses Massive ice Icy sediments	(Ice wedges) (Composite sand-ice wedges) (Dilation-crack ice)
Layered (La)	Muddy peat Mud (Fine sand)	Sand	Segregated Intrusive	Crack infill	Ice/sediment lenses Massive ice Icy sediments	Ice wedges Composite sand-ice wedges Dilation-crack ice
Regular reticulate (Rr)	Mud		Segregated		Ice in mud	
Irregular reticulate (Ri)	Mud		Segregated		Ice in mud	
Crustal (Cr)	Mud Frost-susceptible clasts		Segregated			
Suspended (Su)	Mud Sand Gravel	Mud Sand Gravel	Segregated Intrusive		Icy layer at top of permafrost Ice dykes in mud	Ice lenses Massive ice Icy sediments Ice dykes

Figure 6.2 Classification of cryostructures. (a) Ice is shown in white and sediment in grey or black. In lenticular and layered cryostructures, lenses and layers may comprise either ice or sediment. (b) Terms describing layered and lenticular cryostructures (from Murton and French, 1994).

Figure 3. Classification of cryostructures. French, H.M. 1996. The periglacial environment. *Addison & Wesley, Longman, London*, 2nd edition, 345 pp.

APPENDIX B
TEST PIT LOGS

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-182

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,633E, 7,101,483N
GROUND ELEVATION (m): 928
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 16 Sep 16
FINISH DATE: 16 Sep 16
FINAL DEPTH OF PIT (m): 7.2
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	G02			SAND Gravelly, silty, some cobbles, trace clay, well graded, loose, equidimensional to flat, subangular to angular, reddish brown, moist, heterogeneous, weak cementation, no odour, faint oxidation, trace organics, maximum observed particle size = 130 mm. [COLLUVIUM] Sample G02 – Laboratory analysis results: 33.5 % gravel, 36.2 % sand, 30.3 % fines. Moisture content: 10.2%
4			3		METASEDIMENTARY ROCK Reddish brown with zones of dark grey, medium strong to strong (R3.5), moderately weathered (W3), weathering occurs in layers, foliated, foliation is subhorizontal, blocky masses of intact rock, oxidized. [TYPE 3 BEDROCK]
6	G	G01	2.5		METASEDIMENTARY ROCK Brownish grey, strong (R4), slightly to moderately weathered (W2.5), weathering occurs in layers, strongly foliated, foliation is subhorizontal, blocky sections, abundant micas, degrades to cobbley gravel. [TYPE 3 BEDROCK] Sample G01 – Laboratory analysis results: 22.7 % cobbles, 64.8 % gravel, 9.4 % sand, 3.1 % fines.
8					END OF TEST PIT @ 7.2 m (REFUSAL IN BEDROCK) Notes: 1. Test pit performed at the base of cut slope from 3.5 to 7.2 m. 2. From 0.0 to 3.5 m, soil was logged from the cut slope of the drill pad.

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines

Moisture Content
W_p% W% W_L%
20 40 60 80

(Continued on next page)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-182

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,633E, 7,101,483N
GROUND ELEVATION (m): 928
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 16 Sep 16
FINISH DATE: 16 Sep 16
FINAL DEPTH OF PIT (m): 7.2
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION	Su - kPa (40, 80, 120, 160) / VANE FIELD LAB / PEAK ◆ ■ / REMOLD ◇ □ / ▲ UC/2 / △ Pocket Pen /2 / ★ % Fines / Moisture Content W_P% × W% ○ W_L% × (20, 40, 60, 80)
8					3. Wall sloughing occurred below 5.2 m. 4. Groundwater was not encountered.	
9						
10						
11						
12						
13						
14						
15						
16						

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-183

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,623E, 7,101,477N

GROUND ELEVATION (m): 892

DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL

OPERATOR: EWING

START DATE: 16 Sep 16

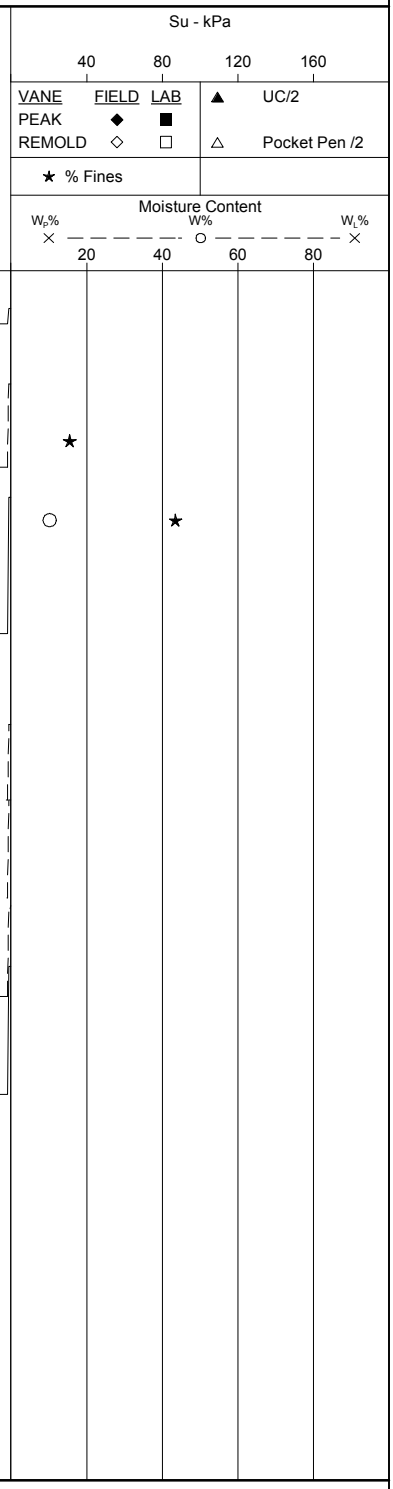
FINISH DATE: 16 Sep 16

FINAL DEPTH OF PIT (m): 4.6

LOGGED BY: CR

REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat, moss.
1	G	G01			SAND AND SILT Gravelly, well graded, compact, equidimensional to flat, subrounded to subangular, reddish brown, moist, homogeneous, weak cementation, no odour, faint oxidation, trace roots, maximum observed particle size = 20 mm, fines are low plasticity, slow dilatancy, drier than plastic limit. [COLLUVIUM]
2	G	G02	4		GRAVEL Sandy, some silt, poorly graded, compact, equidimensional to flat, subrounded to angular, greyish brown, moist, heterogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 60 mm. [COLLUVIUM] Sample G01 – Laboratory analysis results: 51.0 % gravel, 33.5 % sand, 15.5 % fines.
3			3		SILT Sandy, gravelly, low plasticity, stiff, reddish brown with zones of greyish brown, moist, stratified, weak cementation, no odour, no dilatancy, coarse paticles are equidimensional to flat, subangular to angular, abundant micas. [DECOMPOSED METASEDIMENTARY BEDROCK] Sample G02 – Laboratory analysis results: 25.0 % gravel, 31.5 % sand, 43.5 % fines. Moisture content- 10.2 %.
4			3.5		METASEDIMENTARY ROCK Reddish brown, medium strong to strong (R3.5), moderately weathered (W3), weathering occurs in layers, foliated, foliation is subhorizontal. [TYPE 3 BEDROCK]
			2.5		METASEDIMENTARY ROCK Reddish brown, medium strong (R3), moderately to highly weathered (W3.5), weathering occurs in layers, foliated, foliation is subhorizontal. [TYPE 3 BEDROCK]
5					METASEDIMENTARY ROCK Reddish brown, strong (R4), slightly to moderately weathered (W2.5), weathering occurs in layers, foliated, foliation is subhorizontal, blocky. [TYPE 3 BEDROCK]
					END OF TEST PIT @ 4.6 m (MAXIMUM REACH)
6					Notes: 1. Groundwater was not encountered. 2. Test pit located on a slope.
7					
8					



EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-184

LOCATION: ANN GULCH

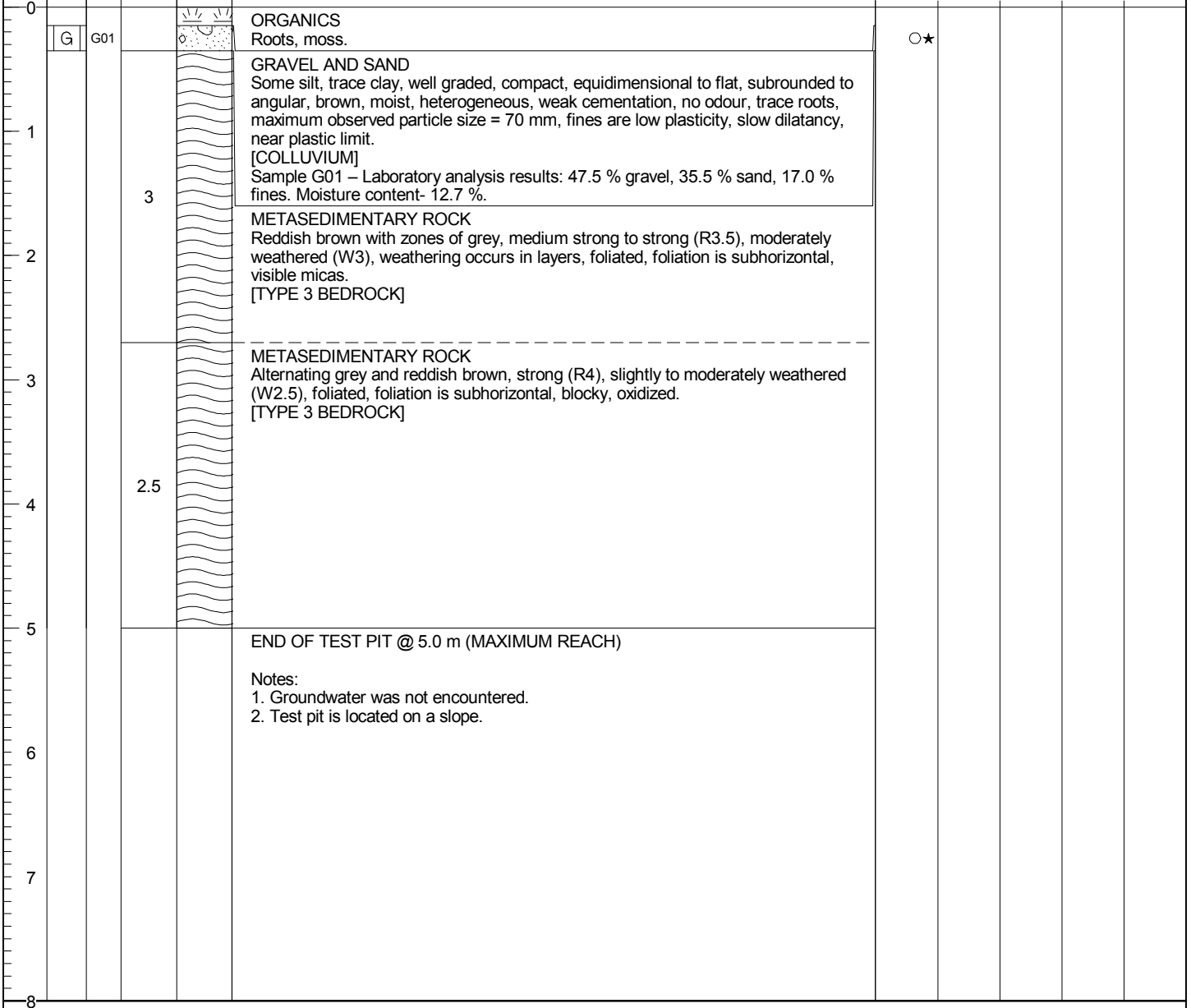
SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,517E, 7,101,389N
GROUND ELEVATION (m): 903
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 16 Sep 16
FINISH DATE: 16 Sep 16
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	G01			ORGANICS Roots, moss.
			3		GRAVEL AND SAND Some silt, trace clay, well graded, compact, equidimensional to flat, subrounded to angular, brown, moist, heterogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 70 mm, fines are low plasticity, slow dilatancy, near plastic limit. [COLLUVIUM] Sample G01 – Laboratory analysis results: 47.5 % gravel, 35.5 % sand, 17.0 % fines. Moisture content- 12.7 %.
1					
2					METASEDIMENTARY ROCK Reddish brown with zones of grey, medium strong to strong (R3.5), moderately weathered (W3), weathering occurs in layers, foliated, foliation is subhorizontal, visible micas. [TYPE 3 BEDROCK]
3			2.5		METASEDIMENTARY ROCK Alternating grey and reddish brown, strong (R4), slightly to moderately weathered (W2.5), foliated, foliation is subhorizontal, blocky, oxidized. [TYPE 3 BEDROCK]
4					
5					END OF TEST PIT @ 5.0 m (MAXIMUM REACH) Notes: 1. Groundwater was not encountered. 2. Test pit is located on a slope.
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_p% W% W_L%
20 40 60 80



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-185

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,533E, 7,101,426N
GROUND ELEVATION (m): 914
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 16 Sep 16
FINISH DATE: 16 Sep 16
FINAL DEPTH OF PIT (m): 4.0
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	G01			ORGANICS Roots, moss.
					SAND Silty, some gravel, trace clay, poorly graded, compact, equidimensional to flat, subrounded to angular, brown, moist, heteregeneous, weak cementation, no odour, trace roots, maximum observed particle size = 65 mm, fines are non-plastic, slow dilatancy, drier than plastic limit. [COLLUVIUM]
1			3.5		METASEDIMENTARY ROCK Alternating grey and brown, medium strong (R3), moderately to highly weathered (W3.5), weathering occurs in layers, foliated, foliation is subhorizontal. [TYPE 3 BEDROCK]
2					
3			2.5		METASEDIMENTARY ROCK Reddish brown, strong (R4), slightly to moderately weathered (W2.5), foliated, blocky, oxidized, dominant discontinuities are subhorizontal (along foliation) and 10 to 15 cm apart vertically. [TYPE 3 BEDROCK]
4					END OF TEST PIT @ 4.0 m (REFUSAL ON BEDROCK) Notes: 1. Groundwater was not encountered. 2. Test pit is located on a slope.
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content
W_p% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-186

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,451E, 7,101,387N
GROUND ELEVATION (m): 904
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 16 Sep 16
FINISH DATE: 16 Sep 16
FINAL DEPTH OF PIT (m): 5.4
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Roots, moss.
1	G	G01			SAND Gravelly, some silt, well graded, compact, equidimensional to flat, subangular to angular, greyish brown, moist, homogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 70 mm, fines are non-plastic, slow dilatancy, near plastic limit. Rock clasts show orange weathering. [COLLUVIUM]
2					
3					GRAVEL AND SAND Some cobbles, trace boulders, trace silt, well graded, compact, equidimensional to flat, subangular to angular, brown, moist, homogeneous, weak cementation, no odour, lenses of black decomposed organic debris, abundant micas, maximum observed particle size = 300 mm. [COLLUVIUM]
4	G	G02			
5					
6					END OF TEST PIT @ 5.4 m (MAXIMUM REACH) Notes: 1. Test pit performed at the base of cut slope from 1.5 to 5.4 m. 2. From 0.0 to 1.5 m, soil was logged from the cut slope of the drill pad. 3. Groundwater was not encountered.
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-187

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,459E, 7,101,417N
GROUND ELEVATION (m): 910
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 16 Sep 16
FINISH DATE: 16 Sep 16
FINAL DEPTH OF PIT (m): 1.3
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat, moss.
	G	G01			SILT Sandy, some gravel, trace clay, low plasticity, stiff, alternating brown and black, moist, stratified, weak cementation, no odour, trace roots, no dilatancy, coarse particles are equidimensional to flat, subangular to angular, maximum observed particle size = 60 mm. [COLLUVIUM]
1	G	G02			SAND Gravelly, silty, trace cobbles, poorly graded, compact, equidimensional to flat, subangular to angular, brown with lenses of black, frozen, homogeneous, weak cementation, no odour, maximum observed particle size = 125 mm, poorly to well bonded, random or irregularly oriented ice formations and individual ice crystals or inclusions (Vr and Vx), visible ice is less than 2.5 cm thick, typically clear, some white, stratal-fissured, lenticular to structureless. [COLLUVIUM] Sample G02 – Laboratory analysis results: 31.2 % gravel, 36.4 % sand, 32.4 % fines. Moisture content- 15.0 %. Ice content- 30.2%.
2					
3					END OF TEST PIT @ 1.3 m (REFUSAL IN FROZEN GROUND)
4					Notes: 1. Groundwater was not encountered. 2. Test pit is located on a slope.
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_p% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-188

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,328E, 7,101,370N
GROUND ELEVATION (m): 919
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 16 Sep 16
FINISH DATE: 16 Sep 16
FINAL DEPTH OF PIT (m): 0.9
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	G01			SILT Sandy, some to trace clay, some gravel, low plasticity, firm, alternating brown and black, moist, heterogeneous, weak cementation, no odour, trace roots, slow dilatancy, coarse particles are poorly graded, equidimensional to flat, angular, maximum observed particle size = 25 mm. Ground is frozen below 0.35 m. Well bonded, individual ice crystals or inclusions (Vx), visible ice is less than 1.0 cm thick, typically clear, some white, stratal-fissured, lenticular to structureless, occurring in discontinuous layers. [COLLUVIUM]
1					END OF TEST PIT @ 0.9 m (REFUSAL IN FROZEN GROUND)
2					Notes: 1. Groundwater was not encountered. 2. Test pit located near drill pad of BH-BGC16-088.
3					
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-189

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,190E, 7,101,281N
GROUND ELEVATION (m): 906
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 16 Sep 16
FINISH DATE: 16 Sep 16
FINAL DEPTH OF PIT (m): 4.6
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat, moss.
0	G	G01			SAND Gravelly, some silt, well graded, compact, equidimensional to flat, subangular to angular, brown with zones of dark brown, moist, heterogeneous, weak cementation, no odour, woody debris, maximum observed particle size = 50 mm. [COLLUVIUM]
4	G	G02			GRAVEL And silt, some sand, some cobbles and boulders, poorly graded, compact, equidimensional to flat, subrounded to angular, brown with zones of reddish brown, moist, heterogeneous, weak cementation, no odour, oxidized, maximum observed particle size = 300 mm. [COLLUVIUM] Sample G02 – Laboratory analysis results: 43.8 % gravel, 19.4 % sand, 36.8 % fines.
5					END OF TEST PIT @ 4.6 m (MAXIMUM REACH) Notes: 1. Groundwater was not encountered.

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-190

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,247E, 7,101,285N
GROUND ELEVATION (m): 904
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 16 Sep 16
FINISH DATE: 16 Sep 16
FINAL DEPTH OF PIT (m): 4.6
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Topsoil, roots, moss.
1	G	G01			SILT Sandy, some gravel, trace clay, trace cobbles, low plasticity, firm, brown with zones of dark brown, moist, homogeneous, weak cementation, no odour, trace roots, drier than plastic limit, slow dilatancy, coarse fraction is poorly graded, compact, equidimensional to flat, subangular to angular, maximum observed particle size = 95 mm. [COLLUVIUM]
2					
3			3		METASEDIMENTARY ROCK Reddish brown with zones of dark grey, medium strong (R3), moderately weathered (W3), weathering occurs in layers, foliated, foliation is subhorizontal, oxidized. [TYPE 3 BEDROCK]
4					
5					END OF TEST PIT @ 4.6 m (MAXIMUM REACH) Notes: 1. Groundwater was not encountered.
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_p% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-191

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,366E, 7,101,236N

GROUND ELEVATION (m): 947

DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL

OPERATOR: EWING

START DATE: 16 Sep 16

FINISH DATE: 16 Sep 16

FINAL DEPTH OF PIT (m): 4.7

LOGGED BY: CR

REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat, trees.
1	G	G01	5		GRAVEL Some sand, trace silt, trace cobbles, poorly graded, compact, equidimensional to flat, subangular to angular, brown, moist, heterogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 100 mm. [COLLUVIUM] Sample G01 – Laboratory analysis results: 76.0 % gravel, 17.5 % sand, 6.5 % fines.
2			3		GRAVEL AND SAND Well graded, compact, equidimensional to flat, subangular to angular, grey to brown with zones of reddish brown, moist, homogeneous, weak cementation, no odour, abundant micas. [TYPE 3 METASEDIMENTARY ROCK]
3			2.5		METASEDIMENTARY ROCK Grey to brown with zones of reddish brown, medium strong (R3), moderately weathered (W3), weathering occurs in layers, foliated, foliation is subhorizontal, oxidized, abundant micas. [TYPE 3 BEDROCK] METASEDIMENTARY ROCK Alternating reddish brown and grey, medium strong to strong (R3.5), slightly to moderately weathered (W2.5), weathering occurs in layers, foliated, foliation is subhorizontal, blocky, oxidized, abundant micas. [TYPE 3 BEDROCK]
4					
5					END OF TEST PIT @ 4.7 m (MAXIMUM REACH) Notes: 1. Groundwater was not encountered. 2. Test pit is located on a slope.
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-192

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 458,850E, 7,101,229N

GROUND ELEVATION (m): 887

DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL

OPERATOR: EWING

START DATE: 17 Sep 16

FINISH DATE: 17 Sep 16

FINAL DEPTH OF PIT (m): 4.3

LOGGED BY: CR

REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0	G	G01			ORGANICS Root mat, moss.
1					SILT Gravelly, some sand, trace clay, trace cobbles, low plasticity, firm, brown, moist, homogeneous, weak cementation, no odour, faint oxidation, trace roots, slow dilatancy, coarse particles are poorly graded, compact, equidimensional to flat, subrounded to angular, maximum observed particle size = 80 mm. [COLLUVIUM]
2					
3					GRAVEL Sandy, some silt, some cobbles and boulders, poorly graded, compact, equidimensional to flat, subrounded to angular, alternating brown and dark brown with zones of reddish brown, moist, heterogeneous, weak cementation, no odour, faint oxidation, maximum observed particle size = 300 mm. [COLLUVIUM]
4					END OF TEST PIT @ 4.25 m (MAXIMUM REACH) Notes: 1. Groundwater was not encountered.
5					
6					
7					
8					

Su - kPa

40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content

W_p% × — — — — — ○ — — — — — × W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-193

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458,778E, 7,101,247N
GROUND ELEVATION (m): 883
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 17 Sep 16
FINISH DATE: 17 Sep 16
FINAL DEPTH OF PIT (m): 5.5
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat, moss.
0.5	G	G01			SAND Gravelly, some silt, well graded, compact, equidimensional to flat, subangular to angular, brown, moist, heterogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 50 mm. [COLLUVIUM]
3			5		GRAVEL AND SAND Well graded, compact, equidimensional to flat, subangular to angular, brownish grey, moist, homogeneous, weak cementation, no odour, abundant micas. [COMPLETELY WEATHERED METASEDIMENTARY ROCK].
3.5	G	G02	3.5		METASEDIMENTARY ROCK Grey with zones of reddish brown, medium strong (R3), moderately weathered to highly weathered (W3.5), weathering occurs in layers, foliated, foliation is subhorizontal, oxidized, abundant micas, degrades to gravel. [TYPE 3 BEDROCK] Sample G02 – Laboratory analysis results: 5.3 % cobbles, 91.7 % gravel, 1.9 % sand, 1.1 % fines. Moisture content- 3.2 %.
5.5					END OF TEST PIT @ 5.5 m (MAXIMUM REACH) Notes: 1. Groundwater was not encountered.

Su - kPa
40 80 120 160
VANE FIELD LAB
PEAK ◆ ■
REMOLD ◇ □
▲ UC/2
△ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-194

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 458,741E, 7,101,277N

GROUND ELEVATION (m): 879

DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL

OPERATOR: EWING

START DATE: 17 Sep 16

FINISH DATE: 17 Sep 16

FINAL DEPTH OF PIT (m): 4.5

LOGGED BY: CR

REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat, moss.
1	G	G01			SAND Silty, gravelly, trace cobbles, poorly graded, compact, equidimensional to flat, subangular to angular, brown, moist, homogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 135 mm, fines are low plasticity, slow dilatancy, drier than plastic limit. [COLLUVIUM] Sample G01 – Laboratory analysis results: 26.9 % gravel, 41.4 % sand, 31.7 % fines. Moisture content- 10.5 %.
2					
3			5 3.5 3		GRAVEL AND SAND Poorly graded, compact, equidimensional to flat, subangular to angular, grey with zones of dark grey, moist, homogeneous, weak cementation, no odour, abundant micas. [COMPLETELY WEATHERED METASEDIMENTARY ROCK] METASEDIMENTARY ROCK Reddish brown to grey, medium strong (R3), moderately to highly weathered (W3.5), weathering occurs in layers, foliated, foliation is subhorizontal, oxidized. [TYPE 3 BEDROCK]
4					METASEDIMENTARY ROCK Brown to grey with zones of reddish brown, medium strong to strong (R3.5), moderately weathered (W3), weathering occurs in layers, foliated, foliation is subhorizontal, blocky, oxidized, abundant micas. [TYPE 3 BEDROCK]
5					END OF TEST PIT @ 4.5 m (REFUSAL IN BEDROCK) Notes: 1. Groundwater was not encountered.
6					
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-195

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458,731E, 7,101,354N
GROUND ELEVATION (m): 883
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 17 Sep 16
FINISH DATE: 17 Sep 16
FINAL DEPTH OF PIT (m): 2.5
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					**ORGANICS** Root mat, moss.
0 – 1	G	G01			**GRAVEL** Sandy, silty, trace clay, trace cobbles, well graded, compact, equidimensional to flat, subangular to angular, alternating brown and grey, moist, homogeneous, weak cementation, no odour, visible roots, maximum observed particle size = 100 mm, fines are low plasticity, slow dilatancy, near plastic limit. [COLLUVIUM] Sample G01 – Laboratory analysis results: 40.1 % gravel, 34.4 % sand, 25.5 % fines. Moisture content- 8.6 %.
1 – 2			3.5		**METASEDIMENTARY ROCK** Grey to brown with zones of reddish brown, medium strong (R3), moderately to highly weathered (W3.5), weathering occurs in layers, foliated, foliation is subhorizontal, oxidized. [TYPE 3 BEDROCK]
2			2.5		**METASEDIMENTARY ROCK** Reddish brown to grey, strong (R4), slightly to moderately weathered (W2.5), weathering occurs in layers, foliated, foliation is subhorizontal, blocky, oxidized. [TYPE 3 BEDROCK]
3					END OF TEST PIT @ 2.5 m (REFUSAL IN BEDROCK) Notes: 1. Groundwater was not encountered.
4 – 8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-196

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,517E, 7,101,560N
GROUND ELEVATION (m): 925
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 17 Sep 16
FINISH DATE: 17 Sep 16
FINAL DEPTH OF PIT (m): 6.0
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					**ORGANICS** Root mat, moss.
					GRAVEL Sandy, silty, trace clay, trace cobbles, well graded, compact, equidimensional to flat, subrounded to angular, brown with zones of reddish brown, moist, homogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 150 mm, fines are low plasticity, near plastic limit, slow dilatancy. [COLLUVIUM]
1	G	G01			Sample G01 – Laboratory analysis results: 41.6 % gravel, 32.3 % sand, 26.1 % fines. Moisture content- 10.8 %.
2					
3			5		**GRAVEL AND SAND** Well graded, compact, equidimensional to flat, subangular to angular, grey to brown with zones of reddish brown, moist, homogeneous, weak cementation, no odour, abundant micas. [COMPLETELY WEATHERED METASEDIMENTARY ROCK]
4			4		**METASEDIMENTARY ROCK** Reddish brown, weak (R2), highly weathered (W4), weathering occurs in layers, foliated, foliation is subhorizontal, oxidized. [TYPE 3 BEDROCK]
5					
6					END OF TEST PIT @ 6.0 m (MAXIMUM REACH)
7					Notes: 1. Test pit performed at the base of cut slope from 0.8 to 6.0 m. 2. From 0.0 to 0.8 m, soil was logged from the cut slope of the drill pad for BH-BGC16-087. 3. Groundwater was encountered at 3.0 m depth. 4. Sloughing of test pit walls occurred below 3.0 m.
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

○ ★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-197

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,561E, 7,101,499N

GROUND ELEVATION (m): 920

DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL

OPERATOR: EWING

START DATE: 17 Sep 16

FINISH DATE: 17 Sep 16

FINAL DEPTH OF PIT (m): 5.2

LOGGED BY: CR

REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat, moss.
1	G	G01			GRAVEL Some sand, trace silt, gap graded, loose, equidimensional to flat, subangular to angular, reddish brown with zones of grey, moist, heterogeneous, weak cementation, no odour, black woody debris and roots, maximum observed particle size = 250 mm. [COLLUVIUM] Sample G01 – Laboratory analysis results: 75.3 % gravel, 15.0 % sand, 9.7 % fines. Moisture content- 6.0 %.
2			3		METASEDIMENTARY ROCK Alternating grey and reddish brown, medium strong to strong (R3.5), moderately weathered (W3), weathering occurs in layers, foliated, foliation is subhorizontal, oxidized, visible micas. [TYPE 3 BEDROCK]
3			2.5		METASEDIMENTARY ROCK Alternating grey to reddish brown, strong (R4), slightly to moderately weathered (W2.5), weathering occurs in layers, foliated, foliation is subhorizontal, blocky, oxidized. [TYPE 3 BEDROCK]
4					
5					
6					END OF TEST PIT @ 5.2 m (REFUSAL IN BEDROCK) Notes: 1. Groundwater was not encountered. 2. Test pit located on a slope.
7					
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_p% W% W_L%

20 40 60 80

○★

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-198

LOCATION: ANN GULCH

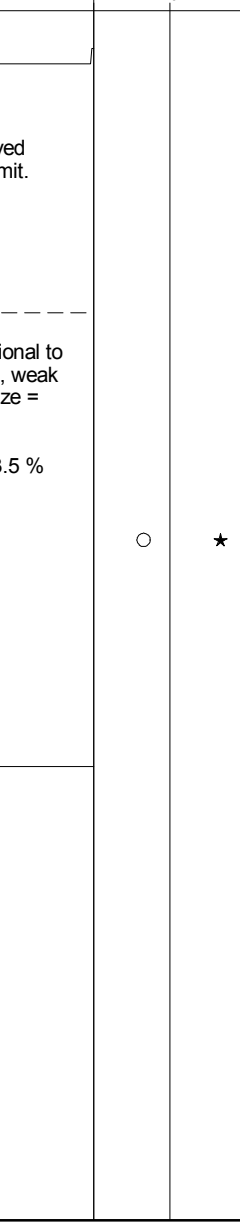
SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458,526E, 7,101,144N
GROUND ELEVATION (m): 826
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 17 Sep 16
FINISH DATE: 17 Sep 16
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Roots, trees.
1	G	G01			SAND Gravelly, some silt, trace clay, trace cobbles, gap graded, compact, equidimensional to flat, subangular to angular, brown to dark brown, moist, heterogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 170 mm, fines are non-plastic, slow dilatancy, near plastic limit. [COLLUVIUM]
2					
3	G	G02			GRAVEL Silty, sandy, trace clay, trace cobbles, poorly graded, compact, equidimensional to flat, subrounded to subangular, brown to dark brown, moist, homogeneous, weak cementation, no odour, no foreign materials, maximum observed particle size = 200 mm, fines are non-plastic, slow dilatancy, near plastic limit. [COLLUVIUM] Sample G02 – Laboratory analysis results: 34.2 % gravel, 32.3 % sand, 33.5 % fines. Moisture content- 13.1 %.
4					
5					END OF TEST PIT @ 5.0 m (MAXIMUM REACH) Notes: 1. Groundwater was not encountered.
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_p% W% W_L%
20 40 60 80



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-199

LOCATION: HAGGART CREEK

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458,636E, 7,101,165N
GROUND ELEVATION (m): 844
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 18 Sep 16
FINISH DATE: 18 Sep 16
FINAL DEPTH OF PIT (m): 2.5
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Roots, moss.
0.5	G	G01			SILT AND SAND Gravelly, trace clay, trace cobbles, poorly graded, compact, equidimensional to flat, subrounded to subangular, dark brown, moist, heterogeneous, weak cementation, no odour, woody debris, maximum observed particle size = 130 mm, fines are non-plastic, slow dilatancy, drier than plastic limit. [COLLUVIUM]
1.5	G	G02			GRAVEL Sandy, silty, some cobbles, gap graded, compact, equidimensional to flat, subrounded to angular, dark brown to brown, frozen, heterogeneous, weak cementation, no odour, no foreign materials, maximum observed particle size = 250 mm, well bonded, individual ice crystals or inclusions (Vx), visible ice is less than 2.5 cm thick, typically clear, some white, stratal-fissured, lenticular to structureless, occurring in discontinuous layers. [COLLUVIUM] Sample G02 – Laboratory analysis results: 43.0 % gravel, 34.0 % sand, 23.0 % fines. Moisture content- 18.1 %. Ice content- 34.4%.
2.5					END OF TEST PIT @ 2.5 m (REFUSAL IN FROZEN GROUND)

Notes:
1. Groundwater was not encountered.

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-200

LOCATION: HAGGART CREEK

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458,611E, 7,101,251N
GROUND ELEVATION (m): 843
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 18 Sep 16
FINISH DATE: 18 Sep 16
FINAL DEPTH OF PIT (m): 2.3
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat, moss.
1	G	G01			SAND Gravelly, some silt, trace cobbles, well graded, compact, equidimensional to flat, subrounded to angular, brown, moist, homogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 100 mm, fines are low plasticity, slow dilatancy, near plastic limit. [COLLUVIUM]
2	G	G02			GRAVEL AND SAND Trace silt, trace cobbles, gap graded, compact, equidimensional to flat, subrounded to subangular, brown with some pinkish grey cobbles, frozen, heterogenous, weak cementation, no odour, maximum observed particle size = 225 mm, well bonded, individual ice crystals or inclusions (Vx), visible ice is less than 2.5 cm thick, ice is clear, stratal-fissured, layered to lenticular, occurring in discontinuous layers. [COLLUVIUM] Sample G02 – Laboratory analysis results: 51.1 % gravel, 41.6 % sand, 7.3 % fines. Moisture content- 8.2 %. Ice content- 19.2%.
3					END OF TEST PIT @ 2.3 m (REFUSAL IN FROZEN GROUND)
4					Notes: 1. Groundwater was not encountered. 2. Test pit is located on a slope.
5					
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-201

LOCATION: HAGGART CREEK

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 458,521E, 7,101,280N
GROUND ELEVATION (m): 811
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 18 Sep 16
FINISH DATE: 18 Sep 16
FINAL DEPTH OF PIT (m): 1.3
LOGGED BY: CR
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Roots, moss.
	G	G01			SAND AND GRAVEL Silty, trace clay, poorly graded, compact, equidimensional to flat, subrounded to angular, brown, moist, homogeneous, weak cementation, no odour, trace roots, maximum observed particle size = 50 mm, fines are non-plastic, slow dilatany, near plastic limit. [COLLUVIUM] Sample G01 – Laboratory analysis results: 34.8 % gravel, 42.1 % sand, 23.1 % fines. Moisture content- 11.9 %.
1	G	G02			
2					SAND Gravelly, some silt, some cobbles, trace boulders, well graded, compact, equidimensional to flat, subrounded to angular, greyish brown, frozen, heterogenous, no odour, no foreign materials, maximum observed particle size = 300 mm, poorly to well bonded, random or irregularly oriented ice formations and individual ice crystals or inclusions (Vr and Vx), visible ice is less than 2.5 cm thick, typically clear, some white, stratal-fissured, lenticular to structureless. [COLLUVIUM]
3					END OF TEST PIT @ 1.3 m (REFUSAL IN FROZEN GROUND) Notes: 1. Groundwater was not encountered.
4					
5					
6					
7					
8					

Su - kPa
40 80 120 160

VANE	FIELD	LAB	
PEAK	◆	■	▲ UC/2
REMOLD	◇	□	△ Pocket Pen /2

★ % Fines

Moisture Content
W_p% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-202

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,395E, 7,101,497N
GROUND ELEVATION (m): 930
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 06 Sep 16
FINISH DATE: 06 Sep 16
FINAL DEPTH OF PIT (m): 5.0
LOGGED BY: SHA
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					**ORGANICS** Root mat, moss.
					GRAVEL AND SILT Some sand, trace clay, trace cobbles, well graded, compact, equidimensional to flat, subangular to angular, reddish brown, moist, heterogeneous, weak cementation, faint oxidation, maximum observed particle size = 100 mm, silt is low plasticity, drier than plastic limit. [COLLUVIUM]
1					
					SILT AND GRAVEL Trace to some sand, trace clay, trace cobbles, low plasticity, stiff, greyish brown, drier than plastic limit, heterogeneous, weak cementation, very faint metallic odour, faint oxidation, slow dilatancy, gravel is fine to coarse, angular to subangular, maximum observed particle size = 100 mm. [COLLUVIUM]
2					
3					
					GRAVEL AND SILT Cobbley, trace sand, well graded, compact, equidimensional to flat, subangular to angular, brown, moist, heterogeneous, weak cementation, faint oxidation, silt is low plasticity, drier than plastic limit, maximum observed particle size = 100 mm. [COLLUVIUM]
4					
5					END OF TEST PIT @ 5.0 m (MAXIMUM REACH) Notes: 1. Groundwater was not encountered.
6					
7					
8					

Su - kPa
40 80 120 160
VANE FIELD LAB ▲ UC/2
PEAK ◆ ■
REMOLD ◇ □ △ Pocket Pen /2
★ % Fines
Moisture Content
W_P% W% W_L%
20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-203

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS
CO-ORDINATES (m): 459,308E, 7,101,474N
GROUND ELEVATION (m): 930
DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL
OPERATOR: EWING

START DATE: 06 Sep 16
FINISH DATE: 06 Sep 16
FINAL DEPTH OF PIT (m): 4.5
LOGGED BY: SHA
REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Root mat, moss.
					SILT Gravelly, trace sand, trace clay, low plasticity, firm, greyish brown, drier than plastic limit, heterogeneous, weak cementation, no odour, faint oxidation, trace roots, no dilatancy, gravel is subangular to angular, equidimensional to flat, moist, maximum observed particle size = 50 mm. [COLLUVIUM]
1					
2					Soil is frozen below 1.8 m. Well bonded, some excess ice (Nbe) visible ice occurs in discontinuous lenses up to 1 mm thick and several cm long, visible ice is clear, colourless.
					SAND AND SILT Fine to medium, some coarse gravel, trace clay, gap graded, loose, subangular to angular, flat to equidimensional, grey to orange, moist, heterogeneous, weak cementation, no odour, oxidation occurs in mm to cm scale lenses, maximum observed particle size = 20 mm, silt is low plasticity, drier than plastic limit, no dilatancy, soil is frozen, well bonded, some excess ice (Nbe) visible ice occurs in discontinuous lenses up to 1 mm thick and several cm long, clear, colourless. [COLLUVIUM]
3					
					SAND Gravelly, some silt, some clay, well graded, loose to compact, angular, equidimensional to flat, greyish brown, moist, heterogeneous, weak cementation, no odour, oxidation occurs in lenses, maximum observed particle size = 55 mm, silt/clay is low plasticity, drier than plastic limit, soil is frozen, well bonded, irregularly oriented ice formations (Vr), visible ice is clear, colourless, visible ice occurs as discontinuous lenses up to 4 mm thick and several cm long, clear, colourless. [COLLUVIUM]
4					
5					END OF TEST PIT @ 4.5 m (REFUSAL IN FROZEN GROUND)
6					
7					
8					

Su - kPa: 40, 80, 120, 160

VANE	FIELD	LAB		
PEAK	◆	■	▲	UC/2
REMOLD	◇	□	△	Pocket Pen /2

★ % Fines

Moisture Content: W_P% × — W% ○ — W_L% × (20, 40, 60, 80)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

EGP (TESTPIT) EGP_TESTPIT.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

TEST PIT # TP-BGC16-204

LOCATION: ANN GULCH

SURVEY METHOD: Handheld GPS

CO-ORDINATES (m): 459,458E, 7,101,498N

GROUND ELEVATION (m): 914

DATUM: UTM NAD 83

EXCAVATOR: CATERPILLAR 325 DL

OPERATOR: EWING

START DATE: 15 Sep 16

FINISH DATE: 15 Sep 16

FINAL DEPTH OF PIT (m): 6.1

LOGGED BY: CR

REVIEWED BY:

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	WEATHERING GRADE	SYMBOL	LITHOLOGIC DESCRIPTION
0					ORGANICS Roots, moss.
					SAND Silty, some gravel, trace cobbles, well graded, compact, equidimensional to flat, subrounded to angular, greyish brown, moist, homogeneous, weak cementation, no odour, no foreign materials, abundant micas, maximum observed particle size = 250 mm. [COLLUVIUM]
2			5		GRAVEL AND SAND Well graded, compact, equidimensional to flat, subangular to angular, dark brown, moist, homogeneous, weak cementation, no odour, abundant micas. [COMPLETELY WEATHERED METASEDIMENTARY ROCK]
3			4		METASEDIMENTARY ROCK Brown, weak (R2), highly weathered (W4), weathering occurs in layers, foliated, foliation is subhorizontal, oxidized, visible micas. [TYPE 3 BEDROCK]
4			3		METASEDIMENTARY ROCK Brown, medium strong to strong (R3.5), moderately weathered (W3), weathering occurs in layers, foliated, foliation is subhorizontal, fractured, blocky, more massive than above, visible micas. [TYPE 3 BEDROCK]
6					END OF TEST PIT @ 6.1 m Notes: 1. Logged from the cut slope of the drill pad for BH-BGC16-086. 2. Groundwater was not encountered. 3. No samples collected.
8					

Su - kPa

40 80 120 160

VANE FIELD LAB ▲ UC/2

PEAK ◆ ■

REMOLD ◇ □ △ Pocket Pen /2

★ % Fines

Moisture Content

W_P% W% W_L%

20 40 60 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

APPENDIX C
TEST PIT PHOTOS



TP-BGC16-182 – Detail of side wall at 5.2 m.



TP-BGC16-182 – Detail of side wall at 7.2 m.



TP-BGC16-182 – Back wall of final test pit; pit completed at 7.2 m.



TP-BGC16-183 – View of back wall at 1.5 m.



TP-BGC16-183 – Detail of side wall at 4.6 m.



TP-BGC16-183 – Back wall of final test pit; pit completed at 4.6 m.



TP-BGC16-183 – Post backfilling.



TP-BGC16-184 – Detail of side wall at 0.85 m.



TP-BGC16-184 – Back wall of final test pit; pit completed at 5.0 m.



TP-BGC16-184 – Detail of side wall at 5.0 m.



TP-BGC16-184 – Detail of side wall at 5.0 m.



TP-BGC16-185 – Detail of sidewall at 0.85 m.



TP-BGC16-185 – Back wall of final test pit; pit completed at 4.0 m.



TP-BGC16-185 – Detail view of sidewall at 4.0 m.



TP-BGC16-185 – Post backfilling.



TP-BGC16-186 – Detail of sidewall at 0.6 m.



TP-BGC16-186 – Side wall of final test pit; pit completed at 5.4 m.



TP-BGC16-186 – Pre-excavation.



TP-BGC16-186 – Post backfilling.



TP-BGC16-187 – Sidewall of final test pit; pit completed at 1.3 m. Putty knife at top of permafrost zone.



TP-BGC16-187 – Detail of visible ice.



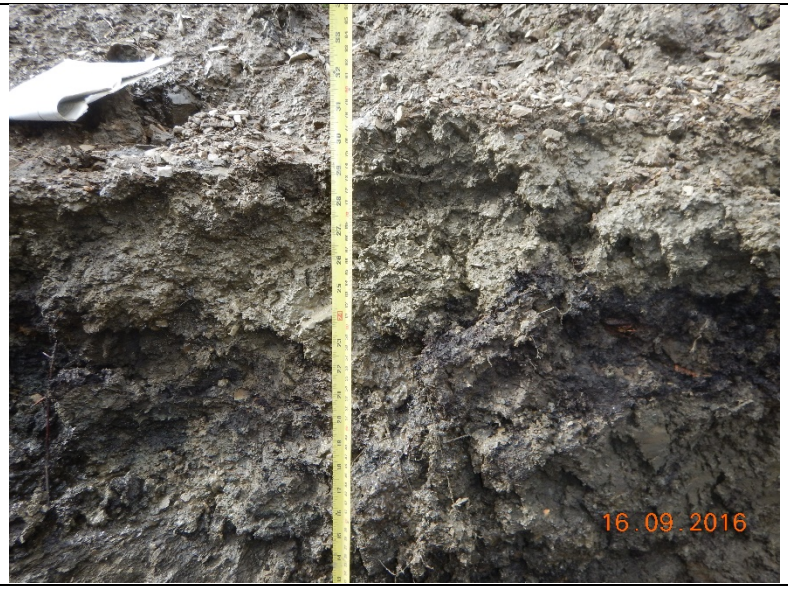
TP-BGC16-187 – Detail view of frozen soil with visible ice.



TP-BGC16-187 – Post backfilling.



TP-BGC16-188 – Sidewall of final test pit; pit completed at 0.9 m.



TP-BGC16-188 – Detail of sidewall at 0.9 m.



TP-BGC16-188 – Detail view of frozen soil with visible ice.



TP-BGC16-188 – Post backfilling.



TP-BGC16-189 – Detail of sidewall at 1.3 m.



TP-BGC16-189 – Detail of sidewall at 4.6 m.



TP-BGC16-189 – Sidewall of final test pit; pit completed at 4.6 m.



TP-BGC16-189 – Post backfilling.



TP-BGC16-190 – Detail of sidewall at 1.3 m.



TP-BGC16-190 –Sidewall of final test pit; pit completed at 4.6 m.



TP-BGC16-190 – Detail of sidewall at 4.6 m.



TP-BGC16-190 – Post backfilling.



TP-BGC16-191 – Detail of sidewall at 1.3 m.



TP-BGC16-191 – Detail of sidewall at 4.7 m.



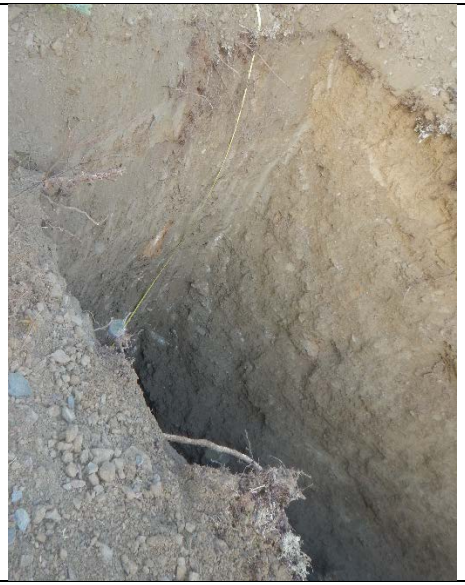
TP-BGC16-191 – Sidewall of final test pit; pit completed at 4.7 m.



TP-BGC16-191 – Post backfilling.



TP-BGC16-192 – Detail of sidewall at 0.6 m.



TP-BGC16-192 – Detail of sidewall at 4.25 m.



TP-BGC16-192 – Sidewall of final test pit; pit completed at 4.25 m.



TP-BGC16-192 – Post backfilling.



TP-BGC16-193 – Detail of sidewall at 0.6 m.



TP-BGC16-193 – Detail of sidewall at 5.5 m.



TP-BGC16-193 – Sidewall of final test pit; pit completed at 5.5 m.



TP-BGC16-193 – Post backfilling.



TP-BGC16-194 – Detail of sidewall at 1.0 m.



TP-BGC16-194 – Sidewall of final test pit; pit completed at 4.5 m.



TP-BGC16-194 – Detail of sidewall at 4.5 m.



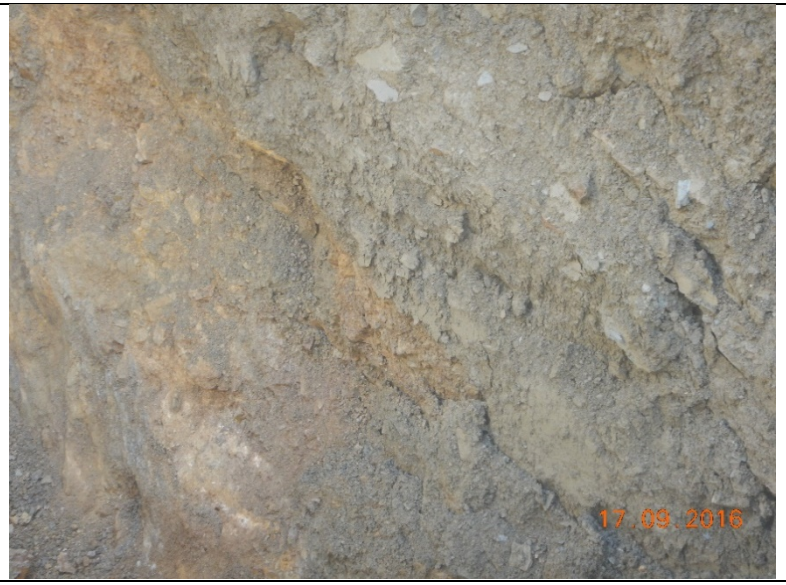
TP-BGC16-194 – Post backfilling.



TP-BGC16-195 – Detail of sidewall at 1.1 m.



TP-BGC16-195 – Sidewall of final test pit; pit completed at 2.5 m.



TP-BGC16-195 – Detail of sidewall at 2.5 m.



TP-BGC16-195 – Post backfilling.



TP-BGC16-196 – Detail of sidewall at 0.8 m.



TP-BGC16-196 – Sidewall of final test pit; pit completed at 6.0 m.



TP-BGC16-196 – Detail of sidewall at 6.0 m.



TP-BGC16-196 – Post backfilling.



TP-BGC16-197 – Detail of sidewall at 1.1 m.



TP-BGC16-197 – Sidewall of final test pit; pit completed at 5.2 m.



TP-BGC16-197 – Detail of sidewall at 5.2 m.



TP-BGC16-197 – Post backfilling.



TP-BGC16-198 – Detail of sidewall at 1.1 m.



TP-BGC16-198 – Sidewall of final test pit; pit completed at 5.0 m.



TP-BGC16-198 – Detail of sidewall at 5.0 m.



TP-BGC16-198 – Post backfilling.



TP-BGC16-199 – Detail of sidewall at 1.0 m.



TP-BGC16-199 – Sidewall of final test pit; pit completed at 2.5 m.



TP-BGC16-199 – Prior to test pitting.



TP-BGC16-199 – Post backfilling.



TP-BGC16-200 – Detail of sidewall at 1.0 m.



TP-BGC16-200 – Sidewall of final test pit; pit completed at 2.3 m.



TP-BGC16-200 – Detail of rock and frozen soil.



TP-BGC16-200 – Post backfilling.



TP-BGC16-201 – Detail of sidewall at 0.85 m.



TP-BGC16-201 – Sidewall of final test pit; pit completed at 1.3 m.



TP-BGC16-201 – Detail of test pit wall at 1.3 m.



TP-BGC16-201 – Post backfilling.



TP-BGC16-202 – Detail of sidewall at 1.2 m.



TP-BGC16-202 – Back wall of final test pit; pit completed at 5.0 m.



TP-BGC16-202 – Detail of test pit wall at 5.0 m.



TP-BGC16-201 – Post backfilling.



TP-BGC16-202 – Prior to test pitting.



TP-BGC16-202 – Post backfilling.



TP-BGC16-203 – Prior to test pitting.



TP-BGC16-203 – Post backfilling.

	
TP-BGC16-203 – Detail of test pit material from 2.8 – 4.5 m.	TP-BGC16-203 – Detail of visible ice.
	
TP-BGC16-203 – Back wall of final test pit; pit completed at 4.5 m.	TP-BGC16-203 –Detail of test pit at 4.5 m.



TP-BGC16-204 – Logged from cut slope at pad for BH-BGC16-086.



TP-BGC16-204 – Detail of transition from soil to Type 1 bedrock with dark, decomposed bedrock layer.



TP-BGC16-204 – Detail of Type 1 Bedrock.



TP-BGC16-204 –Detail of Type 2 bedrock.

APPENDIX D
BOREHOLE LOGS

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-086

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,458E, 7,101,498N
GROUND ELEVATION (m) : 910
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE : HTW
FLUID : Water and polymer
CASED TO (m) : 1.22

START DATE : 08 Sep 16
FINISH DATE : 09 Sep 16
FINAL DEPTH (m) : 31.8
DEPTH TO TOP OF ROCK (m) : 1.2
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL Trace sand, poorly graded, compact, angular, flat, dark orangish grey, wet, homogeneous, no cementation. [COLLUVIUM]		
1				Rock encountered at 1.22 m depth. Refer to rock log.		
2						
3						
4						
5						
6						
7						
8						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-086

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,458E, 7,101,498N
GROUND ELEVATION (m) : 910
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 08 Sep 16
FINISH DATE : 09 Sep 16
FINAL DEPTH (m) : 31.8
DEPTH TO TOP OF ROCK (m) : 1.2
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

0 to 1.22 m - See BH-BGC16-086 soil log.

Poor METASEDIMENTARY ROCK
Reddish grey, moderately to highly weathered (W3 to W4), very weak (R1), foliated, fine grained, locally silicifed, three joint sets; one set is parallel to foliation with typical dip angle of 3° to 35°, one steeply dipping set typically dips at 70° to 85° and the third set dips at 35° to 60°, typical fault gouge material is crushed rock with some iron staining, joint surfaces are typically planar and smooth to slightly rough.
[TYPE 3 BEDROCK]

2.75 - 2.95 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, fault gouge is stiff (S4).

3.89 - 3.97 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, fault gouge is stiff to very stiff (S4.5).
4.01 - 4.06 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, fault gouge is stiff to very stiff (S4.5).
4.53 - 4.85 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, foult gouge is very stiff (S5).

7.77 m - Water level measured after drilling activities on September 10, 2017.

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-086

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,458E, 7,101,498N
GROUND ELEVATION (m) : 910
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 08 Sep 16
FINISH DATE : 09 Sep 16
FINAL DEPTH (m) : 31.8
DEPTH TO TOP OF ROCK (m) : 1.2
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

8.39 m - 6 mm thick healed joint at 60°.

9.71 - 9.77 m - Shear zone, foliation intensity increases, fractures are along foliation and < 1 mm apart, fault gouge is hard (S6).

Fair METASEDIMENTARY ROCK
Reddish grey, slightly weathered (W2), weak to medium strong (R2.5), foliated, fine grained, locally silicified, three joint sets, one set is parallel to foliation with typical dip angle of 3° to 35°, typical fault gouge material is crushed rock with some iron staining and quartz, joint surfaces are typically planar and slightly rough.
[TYPE 2 BEDROCK]

12.23 - 12.29 m - Shear zone, foliation intensity increases, fractures are along foliation and < 1 mm apart, fault gouge is very stiff to hard (S5.5).

13.4 m - Bedrock becomes strong (R4) below 13.4 m.

14.2 m - Steeply dipping joint (58-90°) with iron staining.

15.70 m - 16.02 m - High quartz content.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-086

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,458E, 7,101,498N
GROUND ELEVATION (m) : 910
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 08 Sep 16
FINISH DATE : 09 Sep 16
FINAL DEPTH (m) : 31.8
DEPTH TO TOP OF ROCK (m) : 1.2
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

16.48 - 16.76 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, fault gouge is very stiff (S5).

17.08 - 17.23 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, fault gouge is stiff (S4).

19.03 m - Steeply dipping joint (85°).

Below 20.32 m - Bedrock becomes faintly to slightly weathered (W1.5), very strong (R5) [TYPE 1 BEDROCK]

20.78 m - Steeply dipping joint (75°).

21.84 - 23.98 m - Bedrock becomes brownish grey.

Below 22.4 m - Bedrock becomes fresh, medium strong to strong (R3.5 - R4.5).

22.74 - 23.19 m - Sample UCS01: unconfined compressive strength, 20.0 Mpa.

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-086

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,458E, 7,101,498N
GROUND ELEVATION (m) : 910
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 08 Sep 16
FINISH DATE : 09 Sep 16
FINAL DEPTH (m) : 31.8
DEPTH TO TOP OF ROCK (m) : 1.2
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
24			Below 23.98 - Bedrock becomes whitish grey.
25			
26			25.87 - Steeply dipping joint (63°), 3 mm sand and fines fault gouge.
27			26.82 - 26.85 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, fault gouge is mica-rich crushed rock and clay, fault gouge is stiff (S4).
28			
29			28.65 - 28.91 m - Fault gouge is sand, gravel and fines, firm to stiff (S3.5).
30			30.00 m - Steeply dipping joint (70°), 1 mm separation, quartz sand fault gouge.
31			
32			END OF BOREHOLE @ 31.75 m.

CORE RECOVERY % (20 40 60 80)

WEATHERING GRADE (1 2 3 4 5)

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) (20 40 60 80)

RQD % (20 40 60 80)

RMR (20 40 60 80)

DEPTH (m)

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-086

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,458E, 7,101,498N
GROUND ELEVATION (m) : 910
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 08 Sep 16
FINISH DATE : 09 Sep 16
FINAL DEPTH (m) : 31.8
DEPTH TO TOP OF ROCK (m) : 1.2
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	RQD % (20 40 60 80)	RMR (20 40 60 80)	DEPTH (m)
32			Notes: 1. Borehole terminated at target depth. 2. No instrumentation installed. 3. No recovery recorded in overburden from 0 to 1.22 m. Core run count started at 1.22 m.							32
33										33
34										34
35										35
36										36
37										37
38										38
39										39
40										40

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-087

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,516E, 7,101,553N
GROUND ELEVATION (m) : 917
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE : HTW
FLUID : Water and polymer
CASED TO (m) : 6.34

START DATE : 09 Sep 16
FINISH DATE : 10 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 7.6
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm	Su - kPa 40 80 120 160 / ★ % FINES / ● SPT (blows/300mm) / RECOVERY 20 40 60 80 / MOISTURE CONTENT & SPT N W_P% W% W_L% 20 40 60 80
0				GRAVEL Sandy, some silt, well graded, compact, angular to subangular, equidimensional to flat, greyish brown, moist, heterogeneous, no odour, faint oxidation, trace organics, maximum observed particle size = 35 mm, coarsens with depth, silt is low plasticity. [COLLUVIUM]			
1							
2							
				2.65 m - Water level measured after drilling activities on September 11, 2017.			
3							
				3.40 m - No organics.			
4							
				4.62 m - Maximum observed particle size = 55 mm.			
5							
				5.64 m - Maximum observed particle size = 70 mm.			
6							
7							
				Rock encountered at 7.57 m depth. Refer to rock log.			
8							

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-087

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,516E, 7,101,553N
GROUND ELEVATION (m) : 917
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 6.34

START DATE : 09 Sep 16
FINISH DATE : 10 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 7.6
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	RQD % (20 40 60 80)	RMR (20 40 60 80)	DEPTH (m)
0			0 to 7.57 m - See BH-BGC16-087 soil log.							0
7.57			Poor METASEDIMENTARY ROCK Reddish grey, moderately to highly weathered (W3 - W4), extremely weak to weak (R0 - R2.5), foliated,							8

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-087

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,516E, 7,101,553N
GROUND ELEVATION (m) : 917
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 6.34

START DATE : 09 Sep 16
FINISH DATE : 10 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 7.6
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

fine grained, two joint sets, one is parallel to foliation with dip angles ranging from 1° - 22°, and the second dips at around 48°.
[TYPE 3 BEDROCK]

9.14 m - Slightly to moderately weathered (W2.5), fault gouge is weak to medium strong (R2.5).

10.23 - 10.35 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm to 10 mm apart, fault gouge is very stiff (S5).

Fair METASEDIMENTARY ROCK
Reddish grey, slightly to moderately weathered (W2 - W2.5), weak to medium strong (R2.5 - R3), foliated, fine grained, three joint sets, one is parallel to foliation with dip angles 18° - 34°, one is steeply dipping at 60° - 77°, and the third has dip angles ranging from 40° - 55°.
[TYPE 2 BEDROCK]

12.70 - 12.80 m - Shear zone, fractures are parallel to foliation and < 1 mm to 5 mm apart, fault gouge is very stiff (S5).

13.20 - 13.30 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, fault gouge is very stiff (S5).

13.67 - 13.97 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm to 10 mm apart, fault gouge is very stiff (S5).

Fair METASEDIMENTARY ROCK
Reddish grey, faintly to slightly weathered (W2 - W2.5), medium strong to strong (R3 - R4), foliated, fine grained, three joint sets, one is parallel to foliation with dip angles 10° - 20°, one is steeply dipping at 55° - 65°, and the third has dip angles ranging from 35° - 40°.
[TYPE 1 BEDROCK]

14.40 - 14.65 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm to 5 mm apart, fault gouge is stiff (S4).

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-087

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,516E, 7,101,553N
GROUND ELEVATION (m) : 917
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 6.34

START DATE : 09 Sep 16
FINISH DATE : 10 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 7.6
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

16.80 - 16.86 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, iron staining, fault gouge is very stiff (S5).

17.68 - 17.76 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, iron staining, fault gouge is stiff to very stff (S4.5).

18.85 m - Bedrock faintly weathered (W1.5).

Fair SULPHIDE VEIN
Dark grey, fresh (W1), medium strong to strong (R3 to R4.5), homogeneous, contact angle with metasediment is 72°.
[TYPE 1 BEDROCK]
20.79 - 21.44 - Fault zone fault gouge is brecciated sand, gravel and fines and is extremely weak (R0).

Fair METASEDIMENTARY ROCK
Grey, fresh (W1), medium strong (R3), foliated, fine grained, three joint sets, one is parallel to foliation with dip angles 12° - 34°, one is steeply dipping at 72° - 77°, and the third has dip angles ranging from 51° - 55°.
[TYPE 1 BEDROCK]

22.71 - 22.86 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and <1 to 2 mm apart, fault gouge is crushed rock and clay, stiff to very stiff (S4.5).

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-087

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,516E, 7,101,553N
GROUND ELEVATION (m) : 917
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 6.34

START DATE : 09 Sep 16
FINISH DATE : 10 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 7.6
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

25.62 - 26.10 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and <1 mm to 10 cm apart, fault gouge is very weak (R1).
25.92 - 26.07 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm apart, fault gouge is crushed rock and clay, stiff to very stiff (S4.5).
26.21 - 30.28 m - Bedrock becomes light grey, very strong (R5), with increased quartz content.

26.87 m - Steeply dipping joint (77°).

28.56 - 29.20 m - Six steeply dipping joints (72° - 77°), spaced approximately 10 cm apart.

Below 30.28 m - Bedrock becomes grey, medium strong to strong (R3 - R4).

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-087

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,516E, 7,101,553N
GROUND ELEVATION (m) : 917
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 6.34

START DATE : 09 Sep 16
FINISH DATE : 10 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 7.6
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
32			32.20 m - Joint at 51°.
33			33.38 - 33.70 m - Sample UCS01: unconfined compressive strength, 17.3 Mpa.
34			33.88 m - Joint at 55°.
35			END OF BOREHOLE @ 35.1 m. Notes: 1. Borehole terminated at target depth. 2. No instrumentation installed. 3. No recovery recorded in overburden from 0 to 7.57 m. Core run count started in bedrock at 7.57 m.
36			
37			
38			
39			
40			

CORE RECOVERY % — 20 40 60 80

WEATHERING GRADE — 1 2 3 4 5

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) — 20 40 60 80

RQD % — 20 40 60 80

RMR — 20 40 60 80

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-088

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,321E, 7,101,369N
GROUND ELEVATION (m) : 927
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE : HTW
FLUID : Water and polymer
CASED TO (m) : 5.79

START DATE : 10 Sep 16
FINISH DATE : 11 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				CASING - No recovery.		
3				SAND Gravelly, silty, trace clay, well graded, loose, angular, flat to equidimensional, reddish brown, moist, heterogeneous, weak cementation, no odour, some oxidation, trace woody organics, maximum observed particle size = 45 mm. [FILL] 3.06 m - Water level measured after drilling activities on September 12, 2017.		
4				SILT Sandy, some gravel to gravelly, trace clay, well graded, low plasticity, firm to stiff, reddish brown, heterogeneous, slow dilatancy, some oxidation, trace woody organics, maximum observed particle size = 45 mm, frozen, Nbe, excess ice is colourless to white, undetermined structure. [COLLUVIUM]		
6				GRAVEL AND SAND Some silt, well graded, compact, angular to subangular, flat to equidimensional, reddish brown and grey, moist, heterogeneous, some oxidation, maximum observed particle size = 65 mm, frozen, Nf to Nbn, poorly to well bonded, no excess ice observed. [COMPLETELY WEATHERED BEDROCK]		
7				Rock encountered at 6.71 m depth. Refer to rock log.		
8						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-088

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,321E, 7,101,369N
GROUND ELEVATION (m) : 927
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 5.79

START DATE : 10 Sep 16
FINISH DATE : 11 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	RQD % (20 40 60 80)	RMR (20 40 60 80)	DEPTH (m)
0			0 to 6.71 m - See BH-BGC16-088 soil log.							0
6.71			Fair METASEDIMENTARY ROCK Dark reddish grey, slightly to moderately weathered (W2 - W2.5), weak to medium strong (R2.5 - R3), foliated, fine to medium grained, foliation ranges from 1° to 45°, three joint sets, one is parallel to foliation with typical dip angles ranging from 21° to 53°, a second is steeply dipping between 56° and 75°, and the third dips at 46° to 58°. [TYPE 2 BEDROCK]							7
8										8

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

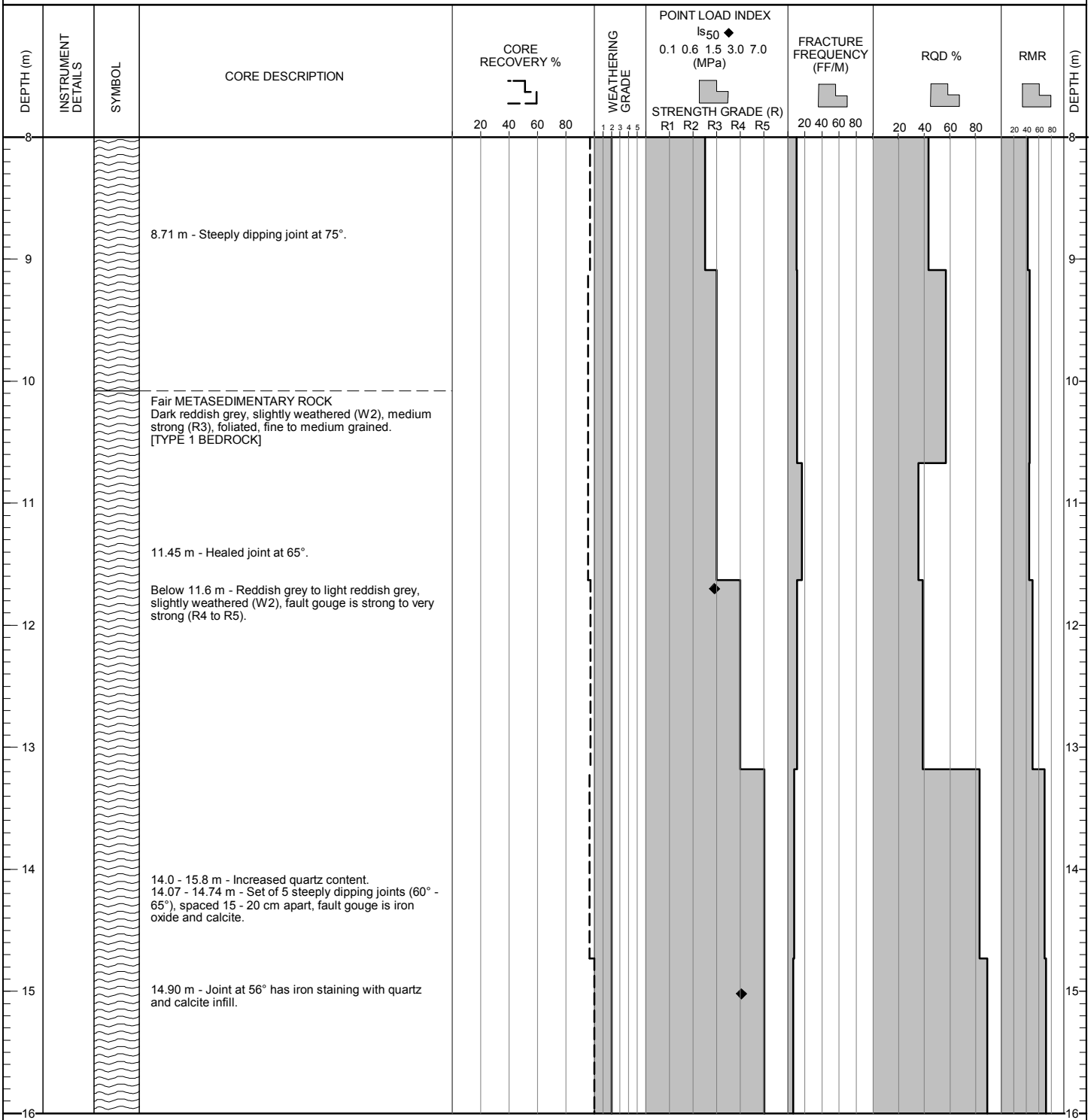
DRILL HOLE # BH-BGC16-088

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,321E, 7,101,369N
GROUND ELEVATION (m) : 927
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 5.79

START DATE : 10 Sep 16
FINISH DATE : 11 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :



(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-088

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,321E, 7,101,369N
GROUND ELEVATION (m) : 927
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 5.79

START DATE : 10 Sep 16
FINISH DATE : 11 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
16			
17			16.92 - 16.96 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 to 5 mm apart, fault gouge is extremely weak (R0).
18			18.14 - 18.35 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 mm to 20 mm apart. Below 18.3 m - Bedrock becomes medium strong (R3). 19.36 m - Two intersecting joints at 60° and 54°.
19			
20			19.97 - Healed joint at 53°, quartz and iron oxide present in fault gouge.
21			
22			21.53 - 21.57 m - Shear zone, fault gouge is crushed rock, iron oxide, and clay, fault gouge is stiff (S4).
23			23.12 m - 2.5 cm thick quartz vein, parallel to foliation.
24			23.70 - 24.05 m - Shear zone, foliation intensity increases, fault gouge is crushed rock and clay with

CORE RECOVERY % (20 40 60 80)
WEATHERING GRADE (1 2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (20 40 60 80)
RQD % (20 40 60 80)
RMR (20 40 60 80)

(CONTINUED ON NEXT PAGE)

DRILL HOLE # BH-BGC16-088

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,321E, 7,101,369N
GROUND ELEVATION (m) : 927
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 5.79

START DATE : 10 Sep 16
FINISH DATE : 11 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
24			iron oxide staining and is very stiff to hard (S5.5).
			24.55 m - Joint at 50°.
25			
26			26.12 m - Joint at 52°.
27			
28			28.20 m - Joint at 58°.
29			29.17 m - Jagged joint at 54°.
30			30.23 m - Joint at 55°.
31			30.81 - 30.97 m - Sample UCS01: unconfined compressive strength, 31.9 Mpa.
32			

CORE RECOVERY % (20 40 60 80)

WEATHERING GRADE (1 2 3 4 5)

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) (20 40 60 80)

RQD % (20 40 60 80)

RMR (20 40 60 80)

DEPTH (m)

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-088

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,321E, 7,101,369N
GROUND ELEVATION (m) : 927
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 5.79

START DATE : 10 Sep 16
FINISH DATE : 11 Sep 16
FINAL DEPTH (m) : 35.1
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
32			32.04 m - Joint at 61°.
			32.53 m - 1 cm thick quartz vein along a joint at 54°.
			32.80 m - Joint at 85° with iron oxide staining.
33			
			33.61 m - Joint at 66°.
34			
35			END OF BOREHOLE @ 35.1 m.
			Notes: 1. Borehole terminated at target depth. 2. No instrumentation installed. 3. No recovery recorded in overburden from 0 to 2.74 m. Core run count started at 2.74 m.
36			
37			
38			
39			
40			

CORE RECOVERY % (20 40 60 80)

WEATHERING GRADE (1 2 3 4 5)

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) (20 40 60 80)

RQD % (20 40 60 80)

RMR (20 40 60 80)

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-089

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,448E, 7,101,383N
GROUND ELEVATION (m) : 888
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE : HTW
FLUID : Water and polymer
CASED TO (m) : 7.47

START DATE : 12 Sep 16
FINISH DATE : 13 Sep 16
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				CASING - No recovery.		
2.67				GRAVEL AND SILT Some sand, trace clay, well graded, angular to subangular, equidimensional, reddish brown, moist, heterogeneous, faint organic odour, faint oxidation, trace woody debris, maximum observed particle size = 65 mm, silt is low plasticity, near plastic limit, slow dilatancy. [COLLUVIUM]		
6.65				Rock encountered at 6.65 m depth. Refer to rock log.		
8						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%: 20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-089

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,448E, 7,101,383N
GROUND ELEVATION (m) : 888
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 7.47

START DATE : 12 Sep 16
FINISH DATE : 13 Sep 16
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	RQD % (20 40 60 80)	RMR (20 40 60 80)	DEPTH (m)
0			0 to 6.65 m - See BH-BGC16-089 soil log.							0
6.65			Poor METASEDIMENTARY BEDROCK Dark reddish grey, moderately weathered (W3), weak (R2), foliated, fine to medium grained, foliation is at approximately 20°. [TYPE 3 BEDROCK]							6.65
7.47			Poor METASEDIMENTARY ROCK Dark reddish grey, slightly to moderately weathered (W2.5 - W3), weak to medium strong (R2 - R2.5), foliated, fine to medium grained, foliation dips at 11° - 24°, two joint sets, one at approximately 55° dip and a second at approximately 30° dip. [TYPE 2 BEDROCK]							7.47
8										8

(CONTINUED ON NEXT PAGE)

DRILL HOLE # BH-BGC16-089

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,448E, 7,101,383N
GROUND ELEVATION (m) : 888
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 7.47

START DATE : 12 Sep 16
FINISH DATE : 13 Sep 16
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

8

7.25 m - Joint at 47°.
8.05 - Joint at 29°.

9

9.16 - 9.29 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 15°, fault gouge is very stiff (S5).

10

9.85 - 9.96 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 22°, fault gouge is very stiff (S5).

Fair METASEDIMENTARY ROCK
Dark reddish grey, slightly weathered (W2), medium strong (R3), foliated, fine to medium grained, three joint sets, one is parallel to foliation and dips 4° to 35°, the second set dips steeply at 67° - 77°, and a third intermediate set has dip angles ranging between 39° and 54°.
[TYPE 1 BEDROCK]
10.18 - 10.24 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 12°, fault gouge is very stiff (S5).

11

11.60 m - Joint parallel to foliation at 28°.

12

12.06 m - Joint at 53°.

12.46 - 12.56 m - Shear zone with iron staining, foliation intensity increases, fractures are parallel to foliation at 15°, fault gouge is stiff (S4).

13

14

14.35 - 14.43 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 28°, fault gouge is extremely weak (R0).

15

15.10 m - Joint at 39°.

16

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-089

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,448E, 7,101,383N
GROUND ELEVATION (m) : 888
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 7.47

START DATE : 12 Sep 16
FINISH DATE : 13 Sep 16
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

16.35 m - Joint at 43°.

16.90 - 16.94 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 20°, fault gouge is hard (S6).

17.54 - 17.59 m - Quartz vein parallel to foliation at 30°.
Below 17.6 m - Bedrock becomes dark grey, faintly weathered (W1.5).

19.08 - 19.20 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 20°, fault gouge extremely weak (R0).
19.33 m - Joint at 54°.

Below 20.88 m - Bedrock becomes fresh.

21.10 - 21.32 m - Sample UCS01: unconfined compressive strength, 63.0 Mpa.

21.93 m - Jagged joint at 39°.

22.71 m - Joint at 45°.
22.87 m - Joint at 26°.

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-089

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,448E, 7,101,383N
GROUND ELEVATION (m) : 888
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 7.47

START DATE : 12 Sep 16
FINISH DATE : 13 Sep 16
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

Below 23.98 m - Bedrock becomes strong (R4).
24.11 m - Joint at 68°.
25.55 m - Joint at 67°.
25.87 m - Joint at 41°.
27.18 m - Joint at 77°.
28.26 m - Joint at 47°.
28.64 m - Joint at 55°.
29.42 m - Joint at 68°.
30.40 - Joint at 55°.

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-089

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,448E, 7,101,383N
GROUND ELEVATION (m) : 888
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 7.47

START DATE : 12 Sep 16
FINISH DATE : 13 Sep 16
FINAL DEPTH (m) : 33.2
DEPTH TO TOP OF ROCK (m) : 6.7
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	RQD % (20 40 60 80)	RMR (20 40 60 80)	DEPTH (m)
32			32.04 m - Joint at 57°.							32
33			END OF BOREHOLE @ 33.2 m. Notes: 1. Borehole terminated at target depth. 2. No instrumentation installed. 3. No ground water levels measured. 4. No recovery recorded in overburden from 0 to 6.65 m. Core run count started in rock at 6.65 m.							33
34										34
35										35
36										36
37										37
38										38
39										39
40										40

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-090

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,630E, 7,101,485N
GROUND ELEVATION (m) : 928
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE : HTW
FLUID : Water and polymer
CASED TO (m) : 1.22

START DATE : 07 Sep 16
FINISH DATE : 07 Sep 16
FINAL DEPTH (m) : 36.4
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				GRAVEL AND SAND Some silt to silty, trace clay, well graded, compact, angular to subangular, greyish brown, equidimensional, moist, homogeneous, weak cementation, no odour, faint oxidation, maximum observed particle size = 60 mm. [COLLUVIUM]		
3				Rock encountered at 3.10 m depth. Refer to rock log.		

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N: W_P% W% W_L%: 20, 40, 60, 80

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 6/13/17

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-090

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,630E, 7,101,485N
GROUND ELEVATION (m) : 928
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 07 Sep 16
FINISH DATE : 07 Sep 16
FINAL DEPTH (m) : 36.4
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
0			0 to 3.10 m - See BH-BGC16-090 soil log.
3			Poor METASEDIMENTARY ROCK Dark reddish grey, moderately weathered (W3), very weak (R1), foliated, fine grained, foliation dips at 15° - 32°. [TYPE 3 BEDROCK]
3			Poor METASEDIMENTARY ROCK Dark reddish grey, slightly to moderately weathered (W2-W3), medium strong (R3), foliated, fine grained, 3 joint sets, one is parallel to foliation and dips at 5° to 25°, one is steeply dipping at 55° to 75°, and a third intermediate dips between 35° and 40°. [TYPE 2 BEDROCK]
4.88			4.88 - 5.64 m - Bedrock beocmes moderately weathered (W3), very weak (R1). 4.95 - 5.70 m - Highly fractured zone, fracture spacing is 1 - 5 mm, not all fractures persist across the full diameter of the core.
5.97			5.97 m - Steep joint at 65°. 6.07 m - Steep joint at 65°.
7			Steep joint at 65°.
7			Steep joint at 75°.
8			

CORE RECOVERY % (20 40 60 80)
WEATHERING GRADE (1 2 3 4 5)
POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5
FRACTURE FREQUENCY (FF/M) (20 40 60 80)
RQD % (20 40 60 80)
RMR (20 40 60 80)

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-090

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,630E, 7,101,485N
GROUND ELEVATION (m) : 928
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 07 Sep 16
FINISH DATE : 07 Sep 16
FINAL DEPTH (m) : 36.4
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

Fair METASEDIMENTARY ROCK
Dark reddish grey, slightly to moderately weathered (W2 - W3), medium strong (R3), foliated, fine grained, 2 distinguishable joint sets, one is parallel to foliation at 10° to 45°, and the second is an intermediate set dipping from 32° to 42° .
[TYPE 1 BEDROCK]

8.74 - 8.95 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 10° and < 1 mm apart, fault gouge is stiff (S4).

9.30 - 9.40 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 20° and < 1 mm to 10 mm apart, fault gouge is stiff (S4).

11.05 m - Water level measured after drilling activities on September 8, 2017.

13.00 - 13.10 m - Shear zone, foliation intensity increases, fault gouge is crushed rock and fines and is very stiff (S5).

14.55 - 14.60 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 32° and < 1 to 5 mm apart.

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-090

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,630E, 7,101,485N
GROUND ELEVATION (m) : 928
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 07 Sep 16
FINISH DATE : 07 Sep 16
FINAL DEPTH (m) : 36.4
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

16.88 - 16.96 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 5°, fault gouge is very stiff (S5).

18.50 - 18.52 m - Shear zone, fault gouge is crushed rock and fines, stiff (S4), angled at 25°.

19.60 - 20.46 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 25° and < 1 mm to 5 mm apart, fault gouge is very stiff (S5), zone contains several fractured quartz veins.
19.97 - 20.02 m - Quartz vein at 23°, vein infill is very strong (R5).

Poor METASEDIMENTARY ROCK
Dark reddish grey, slightly weathered (W2), medium strong (R3), foliated, fine to medium grained, locally silicified, 1 distinguishable joint set, parallel to foliation and dipping at 22° to 33°.
[TYPE 2 BEDROCK]

21.31 - 21.35 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 12° and < 1 mm to 5 mm apart, fault gouge is stiff (S4).
21.53 - 21.76 m - Shear zone, foliation intensity increases, fractures are parallel to foliation at 5° and < 1 mm to 5 mm apart, fault gouge is very stiff (S5).
21.90 - 22.05 m - Shear zone, foliation intensity increases, fractures are parallel to foliation and < 1 to 10 mm apart.

22.80 - 22.94 m - Shear zone, foliation intensity increases, foliation is parallel to foliation at 37° and < 1 mm to 10 mm apart, fault gouge is very stiff (S5).
23.16 - 23.62 m - Fault gouge is light grey, moderately weathered (W3), and is very weak (R1).

Fair METASEDIMENTARY ROCK
Reddish grey to light grey, slightly weathered (W2), weak to medium strong (R1.5 - R3), foliated, fine to

(CONTINUED ON NEXT PAGE)

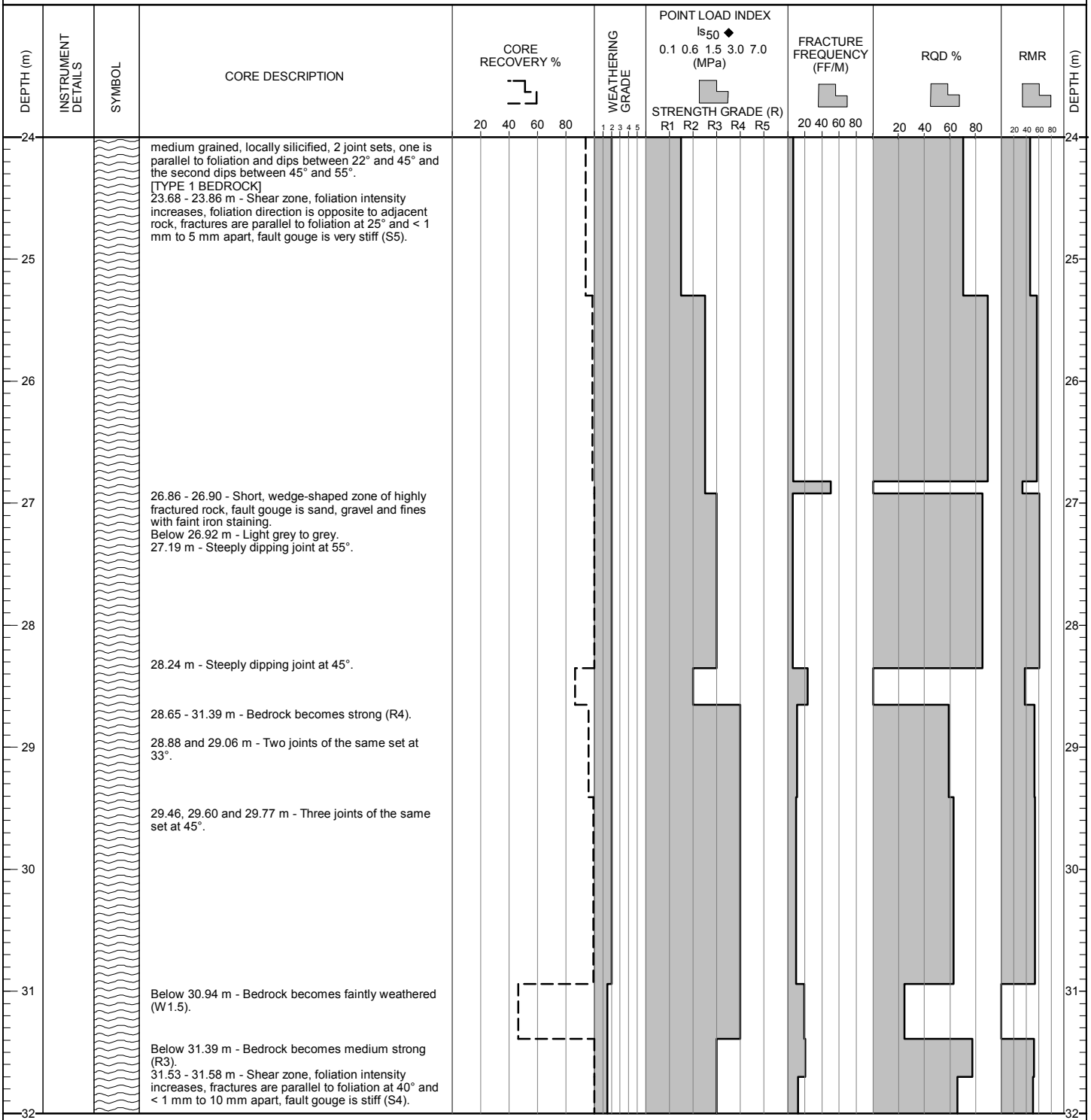
DRILL HOLE # BH-BGC16-090

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,630E, 7,101,485N
GROUND ELEVATION (m) : 928
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 07 Sep 16
FINISH DATE : 07 Sep 16
FINAL DEPTH (m) : 36.4
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : SHA
REVIEWED BY :



(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility

PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-090

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,630E, 7,101,485N
GROUND ELEVATION (m) : 928
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 07 Sep 16
FINISH DATE : 07 Sep 16
FINAL DEPTH (m) : 36.4
DEPTH TO TOP OF ROCK (m) : 3.1
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION
32			
			32.32 - 32.35 m - Shear zone, parallel to foliation at 40°, fault gouge is crushed rock and fines and is stiff (S4).
33			
			Below 33.22 m - Bedrock becomes dark grey with fine, white veins.
34			
			33.91 - 33.93 m - Shear zone, fractures are parallel to foliation at 23° and < 1 mm apart, fault gouge is crushed rock and is very stiff (S5).
35			
			Below 34.90 m - Bedrock becomes very strong (R5).
			35.26 m - Near vertical, jagged joint.
36			
			35.77 and 36.05 m - Two joints of the same set at 35° and 28°, respectively.
			END OF BOREHOLE @ 36.4 m.
			Notes: 1. Borehole terminated at target depth. 2. No instrumentation installed. 3. No recovery recorded in overburden from 0 to 1.22 m. Core run count started at 1.22 m.
37			
38			
39			
40			

CORE RECOVERY % (20 40 60 80)

WEATHERING GRADE (1 2 3 4 5)

POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa)
STRENGTH GRADE (R) R1 R2 R3 R4 R5

FRACTURE FREQUENCY (FF/M) (20 40 60 80)

RQD % (20 40 60 80)

RMR (20 40 60 80)

DEPTH (m)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-091

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,536E, 7,101,485N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : N/A

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE : HTW
FLUID : Water and polymer
CASED TO (m) : 1.22

START DATE : 14 Sep 16
FINISH DATE : 15 Sep 16
FINAL DEPTH (m) : 50.2
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SYMBOL	LITHOLOGIC DESCRIPTION	INSTRUMENT DETAILS	SPT BLOWS PER 150mm
0				CASING - No recovery.		
1				GRAVEL Silty, some sand, trace clay, well graded, loose to compact, angular to subangular, equidimensional to flat, greyish brown, moist, heterogeneous, no cementation, no odour, faint oxidation, fines are low plasticity, slow dilatancy. [COLLUVIUM]		
2				Rock encountered at 1.80 m depth. Refer to rock log.		
3						
4						
5						
6						
7						
8						

Su - kPa: 40, 80, 120, 160
★ % FINES
● SPT (blows/300mm)
RECOVERY: 20, 40, 60, 80
MOISTURE CONTENT & SPT N
W_P% W% W_L%
20, 40, 60, 80

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (SOIL) EGP_SOIL.GDL BGC.GDT 6/13/17

DRILL HOLE # BH-BGC16-091

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,536E, 7,101,485N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 14 Sep 16
FINISH DATE : 15 Sep 16
FINAL DEPTH (m) : 50.2
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

0 to 1.80 m - See BH-BGC16-091 soil log.

Fair METASEDIMENTARY ROCK
Dark reddish grey, slightly to moderately weathered (W2.5), medium strong (R3), fine grained, foliated, 3 joint sets, the first set is parallel to foliation and dips at 8° to 36°, the second set is steeply dipping at 62° to 77°, and the third intermediate set dips at 35° to 50°.
[TYPE 2 BEDROCK]

Below 3.8 m - Increase in RQD. [TYPE 1 BEDROCK]

6.48 m - Iron staining observed on infilling of 1 - 5 mm wide joint at 45°.

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-091

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,536E, 7,101,485N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 14 Sep 16
FINISH DATE : 15 Sep 16
FINAL DEPTH (m) : 50.2
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

8
9
10
11
12
13
14
15
16

10.15 m - Water level measured prior to drilling activities on September 15, 2017.

11.16 m - Iron staining observed on fault gouge of 150 mm thick foliation at 30°. A shear zone was observed along similar foliations.

Below 12.57 m - Bedrock becomes slightly weathered (W2).

(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-091

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,536E, 7,101,485N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 14 Sep 16
FINISH DATE : 15 Sep 16
FINAL DEPTH (m) : 50.2
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

16 m

17.33 m - Bedrock is strongly foliated at 14°, very weak zone is 60 mm thick.

Below 17.58 m - Bedrock becomes faintly weathered (W1.5).

17 m

18 m

19 m

20 m

21 m

22 m

Below 22.25 m - Bedrock becomes dark grey, fresh (W1), medium strong to strong (R3.5)

22.78 m - Shear zone 40 mm thick observed parallel to foliaiton at 15°.

23 m

24 m

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

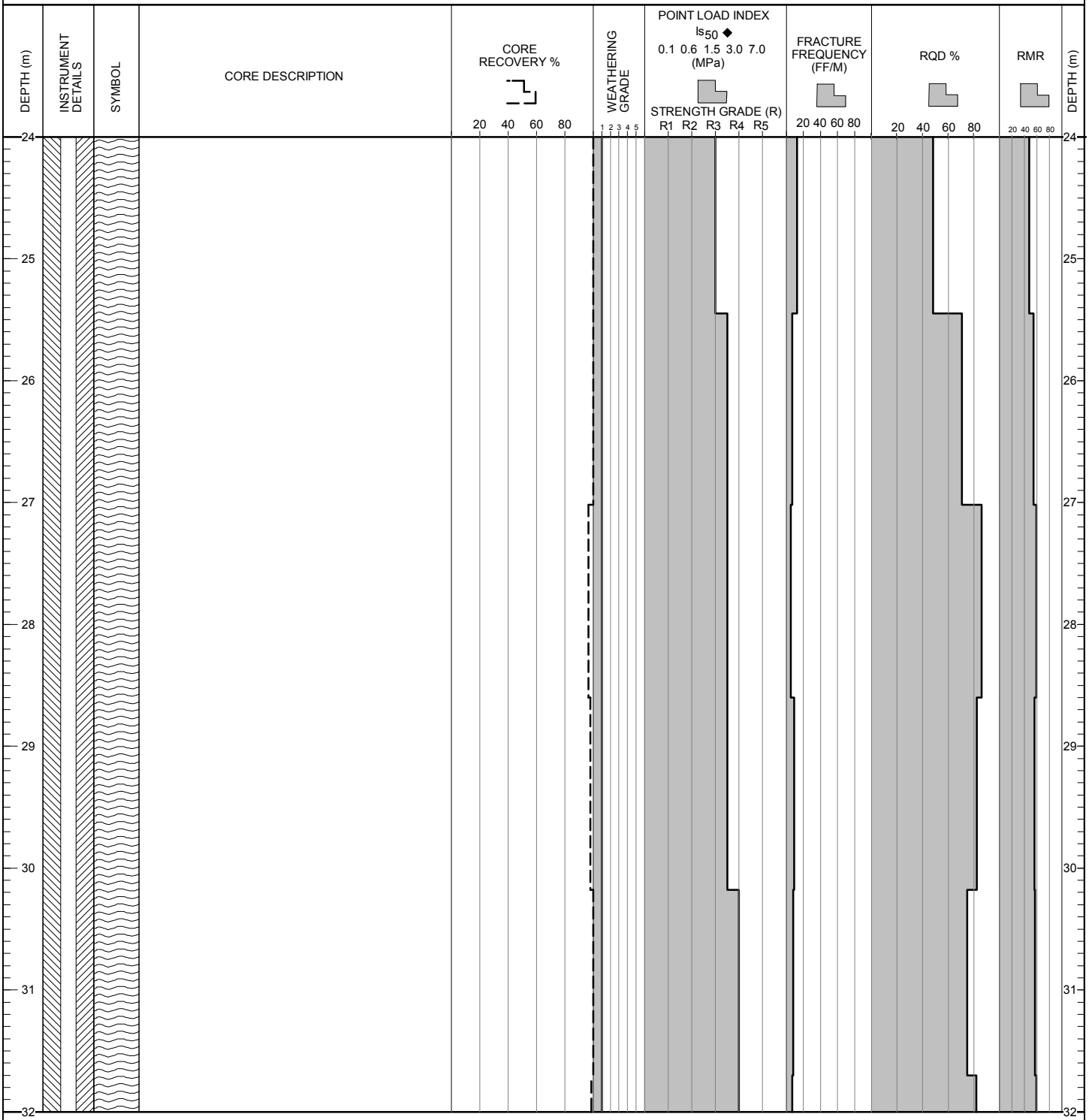
DRILL HOLE # BH-BGC16-091

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,536E, 7,101,485N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 14 Sep 16
FINISH DATE : 15 Sep 16
FINAL DEPTH (m) : 50.2
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : SHA
REVIEWED BY :



(CONTINUED ON NEXT PAGE)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation

PRINT DATE: 6/13/2017

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 6/13/17

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-091

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,536E, 7,101,485N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 14 Sep 16
FINISH DATE : 15 Sep 16
FINAL DEPTH (m) : 50.2
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	RQD % (20 40 60 80)	RMR (20 40 60 80)	DEPTH (m)
32										32
33										33
34										34
35										35
36			36.21 - 36.42 m - Sample UCS01: unconfined compressive strength, 29.5 Mpa.							36
37										37
38										38
39										39
40										40

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-091

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,536E, 7,101,485N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 14 Sep 16
FINISH DATE : 15 Sep 16
FINAL DEPTH (m) : 50.2
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m)	INSTRUMENT DETAILS	SYMBOL	CORE DESCRIPTION	CORE RECOVERY % (20 40 60 80)	WEATHERING GRADE (1 2 3 4 5)	POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5	FRACTURE FREQUENCY (FF/M) (20 40 60 80)	RQD % (20 40 60 80)	RMR (20 40 60 80)	DEPTH (m)
40			40.03 m - Jagged joint at 36°.							40
41										41
42										42
43										43
44										44
45										45
46										46
47										47
48										48

(CONTINUED ON NEXT PAGE)

PROJECT: Eagle Gold Project - Heap Leach Facility
PROJECT NO.: 0792-016

DRILL HOLE # BH-BGC16-091

LOCATION : ANN GULCH

CO-ORDINATES (m) : 459,536E, 7,101,485N
GROUND ELEVATION (m) : 911
SURVEY METHOD : Handheld GPS
DATUM : UTM NAD 83
PLUNGE (°) : -90
TREND (°) : n/a

DRILL DESIGNATION : KD 1000-03
DRILLING CONTRACTOR : Kluane Drilling
DRILL METHOD : Rotary Diamond
CORE SIZE : HTW
FLUID : Water and polymer
CASED TO (m): 1.22

START DATE : 14 Sep 16
FINISH DATE : 15 Sep 16
FINAL DEPTH (m) : 50.2
DEPTH TO TOP OF ROCK (m) : 1.8
LOGGED BY : SHA
REVIEWED BY :

DEPTH (m) | INSTRUMENT DETAILS | SYMBOL | CORE DESCRIPTION | CORE RECOVERY % (20 40 60 80) | WEATHERING GRADE (1 2 3 4 5) | POINT LOAD INDEX Is_{50} ◆ 0.1 0.6 1.5 3.0 7.0 (MPa) / STRENGTH GRADE (R) R1 R2 R3 R4 R5 | FRACTURE FREQUENCY (FF/M) (20 40 60 80) | RQD % (20 40 60 80) | RMR (20 40 60 80) | DEPTH (m)

48
49
50

END OF BOREHOLE @ 50.2 m.

Notes:
1. Borehole terminated at target depth.
2. Standpipe piezometer installed. Slotted portion of piezometer PVC is between 47.2 and 44.1 m.
3. Groundwater level observed at 10.15 m prior to installation.
4. No recovery recorded in overburden from 0 to 1.22 m. Core run count started at 1.22 m.

51
52
53
54
55
56

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: Victoria Gold Corporation
PRINT DATE: 6/13/2017

EGP (ROCK) EGP_ROCK.GDL BGC.GDT 6/13/17

APPENDIX E
BOREHOLE PHOTOS



BH-BGC16-086 – Box 1 to 3, 1.22 m to 9.91 m.



BH-BGC16-086 – Box 4 to 6, 9.91 m to 19.95 m.



BH-BGC16-086 – Box 7 to 9, 19.95 m to 30.23 m.



BH-BGC16-086 – Box 10, 30.23 m to 31.75 m.



BH-BGC16-087 – Box 1 to 3, 7.62 m to 17.87 m.



BH-BGC16-087 – Box 4 and 5, 17.87 m to 24.15 m.



BH-BGC16-087 – Box 6 to 8, 24.0 m to 33.36 m.



BH-BGC16-087 – Run 22, 16.0 to 17.42 m.



BH-BGC16-088 – Box 1 to 3, 4.57 m to 14.73 m.



BH-BGC16-088 – Box 4 to 6, 14.73 m to 23.97 m.



BH-BGC16-088 – Box 7 to 9, 23.97 m to 33.15 m.



BH-BGC16-088 – Box 10, 33.15 m to 35.05 m.

	
BH-BGC16-090 – Box 1 to 3, 1.65 m to 10.60 m.	BH-BGC16-090 – Box 4 to 6, 10.60 m to 20.88 m.
	
BH-BGC16-090 – Box 7 to 9, 20.88 m to 30.94 m.	BH-BGC16-090 – Box 10 and 11, 30.94 m to 36.42 m.



BH-BGC16-091 – Box 1 to 3, 1.22 m to 10.99 m.



BH-BGC16-091 – Box 4 to 6, 10.99 m to 20.30 m.



BH-BGC16-091 – Box 7 to 9, 20.30 m to 30.18 m.



BH-BGC16-091 – Box 10 to 12, 30.18 m to

	
BH-BGC16-091 - Box13 to 16, 39.86 m to 49.37 m.	BH-BGC16-091 – Run 2, 1.65 m to 2.29 m.
	
BH-BGC16-091 – Run 7, 5.59 m to 9.45 m.	BH-BGC16-091 – Run 16, 20.73 m to 22.25 m.



BH-BGC16-086 – Cut slope.



BH-BGC16-086 – Cut slope post-drilling.



BH-BGC16-086 – Cut slope close-up.



BH-BGC16-086 – Cut slope pre-drilling.

APPENDIX F
LAB TEST REPORT

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

FLEXIBLE WALL PERMEAMETER
ASTM D-5084-10 Method C

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2015-10-24
Report Date:	2015-10-25

Sample Information

Blended sample from the following test pits:
Samples used in CIU Tests 2, 4 & 6
TP-BGC16-187 G01 from 0.2-0.7m
TP-BGC16-188 G01 from 0.0-0.3m
TP-BGC16-190 G01 from 0.4-1.30m
TP-BGC16-192 G01 from 0.2-2.5m
TP-BGC16-202 G01, G02 & G03 from 1.15-4.0m

Testing Details

Compaction Effort	Standard Proctor
Permeant Used	De-aired water
Effective Stress (kPa)	150 kPa
Back Pressure (kPa)	650 kPa

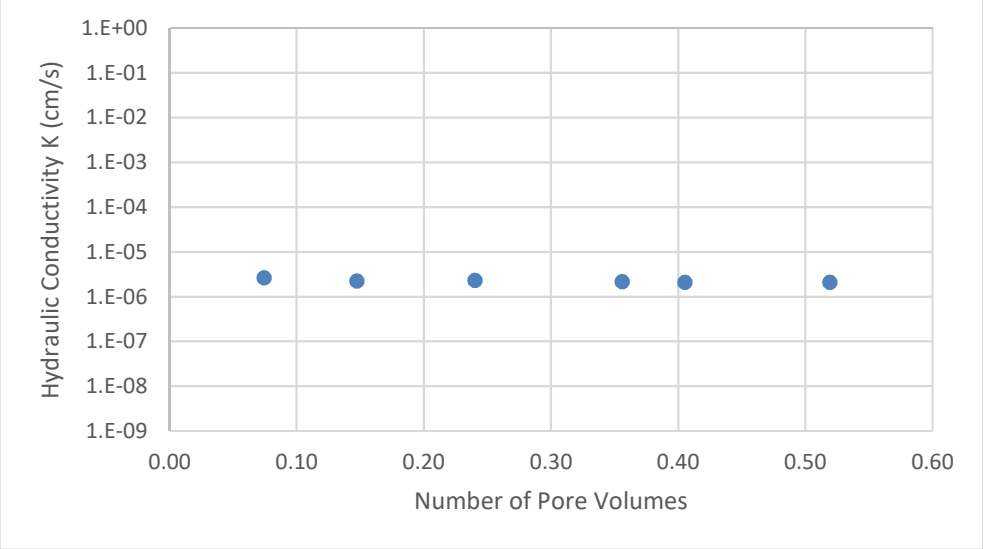
Sample Diameter (cm)	7.21
Sample Height (cm)	4.91
Bulk Density (g/cm^3)	2.07
Dry Density (g/cm^3)	1.90
Water Content (%)	9.1%
Porosity, n	0.30
Specific Gravity (Assumed)	2.70
Degree of Saturation Sr (%)	57.5

Index Properties (Final)

Bulk Density (g/cm^3)	2.16
Water Content (%)	14.8%
Degree of Saturation Sr (%)	91.6

Hydraulic Conductivty K (cm/s)

2.2E-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

FLEXIBLE WALL PERMEAMETER
ASTM D-5084-10 Method C

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Blended sample from the following test pits:

Samples used in CIU Tests 1, 3 & 5

TP-BGC16-185 G01 from 0.2-0.7m	TP-BGC16-198 G01 from 0.25-2.0m
TP-BGC16-186 G01 from 0.0-1.0m	TP-BGC16-199 G01 from 0.3-1.2m
TP-BGC16-186 G02 from 4.0-5.4m	TP-BGC16-200 G01 from 0.25-1.5m
TP-BGC16-189 G01 from 0.25-1.3m	TP-BGC16-201 G02 from 0.85-1.3m
TP-BGC16-193 G01 from 0.25-2.7m	

Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2015-10-25
Report Date:	2015-10-28

Testing Details

Compaction Effort	Standard Proctor
Permeant Used	De-aired water
Effective Stress (kPa)	150 kPa
Back Pressure (kPa)	650 kPa

Index Properties (Initial)

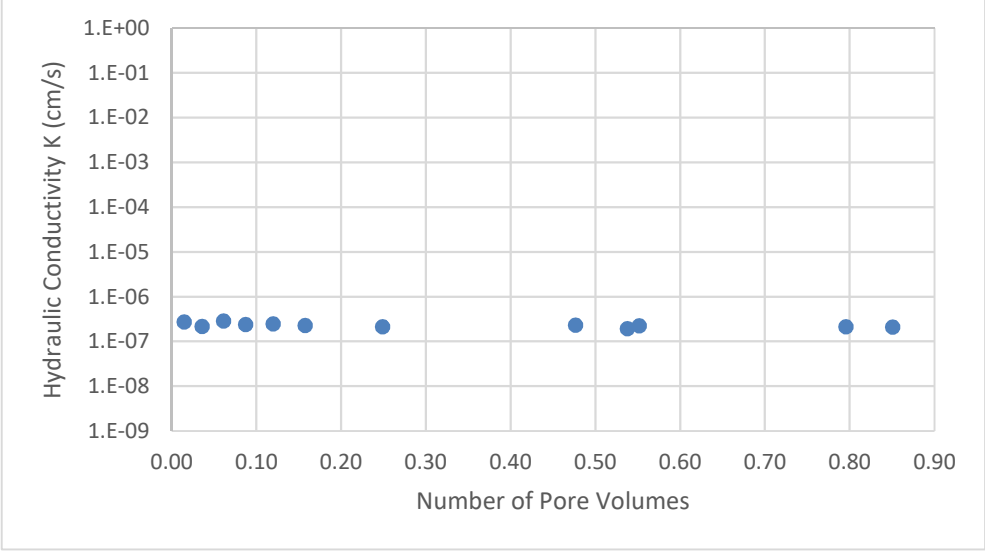
Sample Diameter (cm)	7.25
Sample Height (cm)	3.75
Bulk Density (g/cm^3)	2.21
Dry Density (g/cm^3)	2.00
Water Content (%)	10.5%
Porosity, n	0.26
Specific Gravity (Assumed)	2.70
Degree of Saturation Sr (%)	81.4

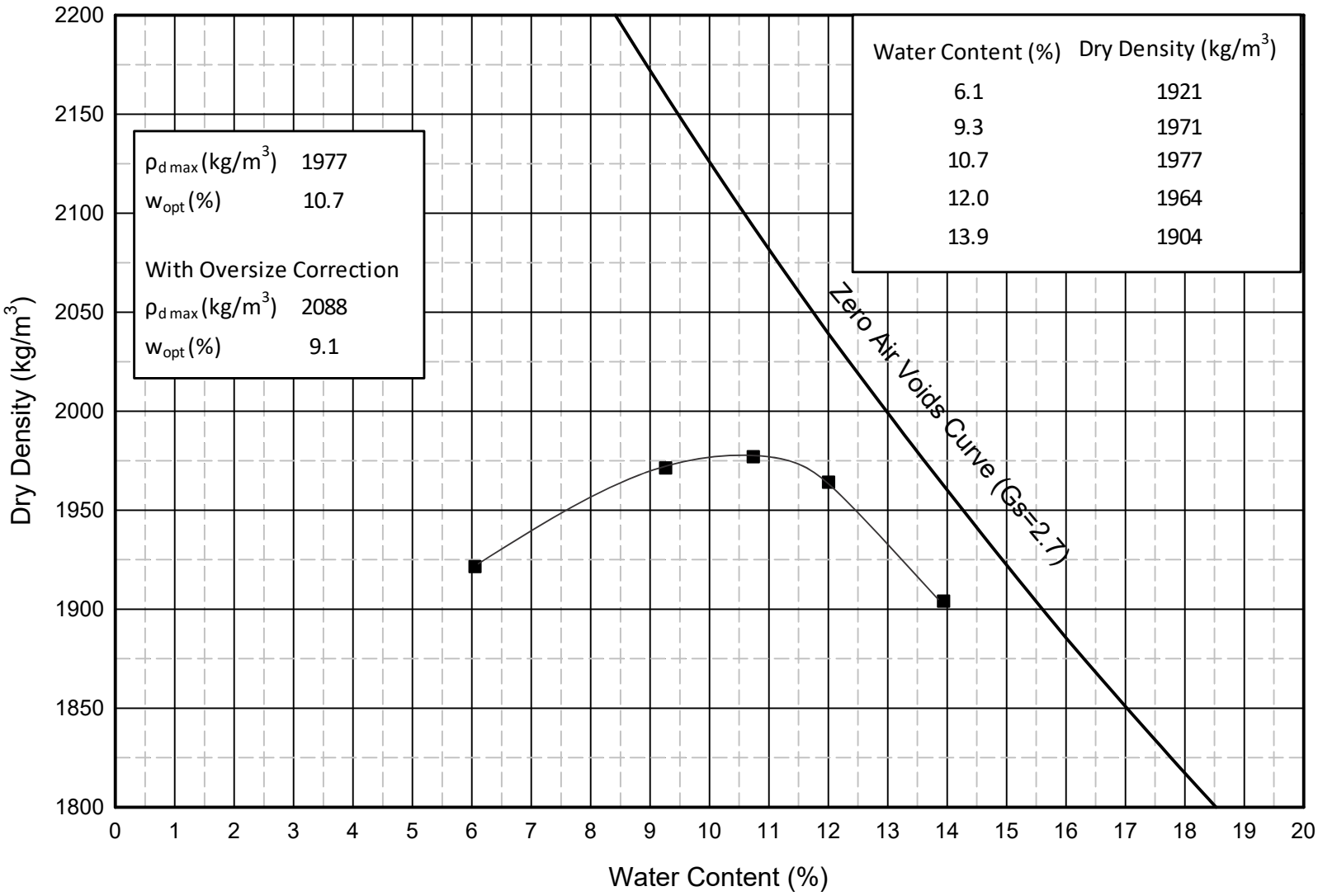
Index Properties (Final)

Bulk Density (g/cm^3)	2.22
Water Content (%)	11.6%
Degree of Saturation Sr (%)	87.8

Hydraulic Conductivty K (cm/s)

2.3E-07



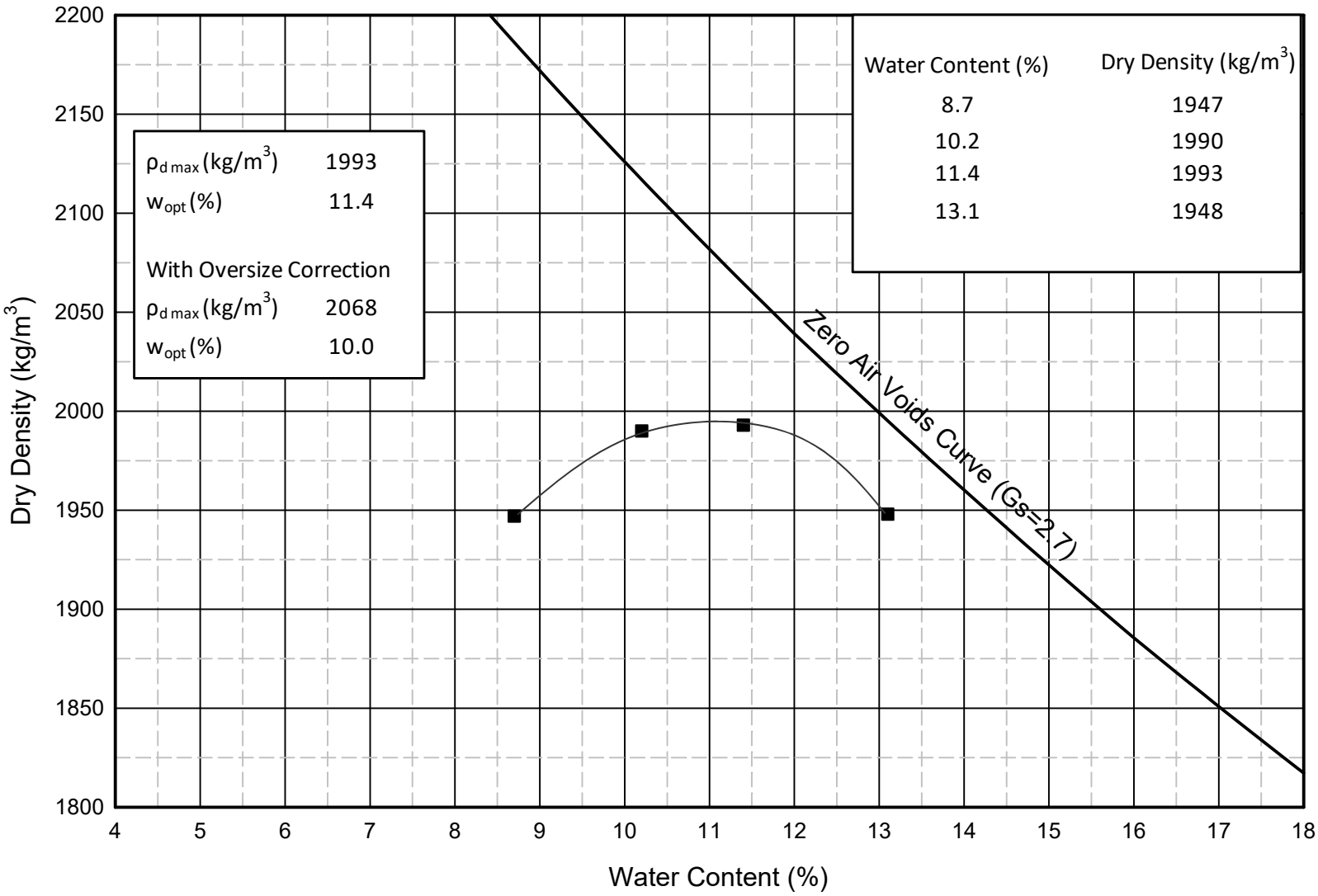


Tested by: DO
Reviewed by: SD

STANDARD PROCTOR DENSITY - ASTM D698

Blended Sample from - TP BGC16-187, 188, 190, 192 and 202
Sample used in CIU Tests 2, 4 & 6
BGC Project No.: 0792-016
EAGLE GOLD - VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY



Tested by: DO
Reviewed by: SD

STANDARD PROCTOR DENSITY - ASTM D698

Blended Sample from - TP BGC16-185, 186, 189, 193 and 198 to 201
Sample used in CIU Tests 1, 3 & 5
BGC Project No.: 0792-016
EAGLE GOLD - VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

GENERAL	
Date Test Completed	01-Nov-16
Type of Sample	Remoulded
Specimen Orientation	NA

INDEX PROPERTIES		
Diameter D	mm	72.9
Height H	mm	142.2
Water Content w	%	10.7
Bulk Density ρ_b	Mg/m^3	2.22
Dry Density ρ_d	Mg/m^3	2.00
Void Ratio e	-	0.35
Specific Gravity (assumed)	-	2.70
Degree of Saturation Sr	%	83.0
Liquid Limit	%	-
Plastic Limit	%	-
Plasticity Index	%	-

CONSOLIDATION STRESSES		STRESSES AT FAILURE	
$p'=(\sigma'_1+\sigma'_3)/2$ (kPa)	150	s_u (kPa)	153
		s_u/p'	1.02
		φ'_{max} (°)	42.8
		$\varphi'_{20\%}$ (°)	42.8

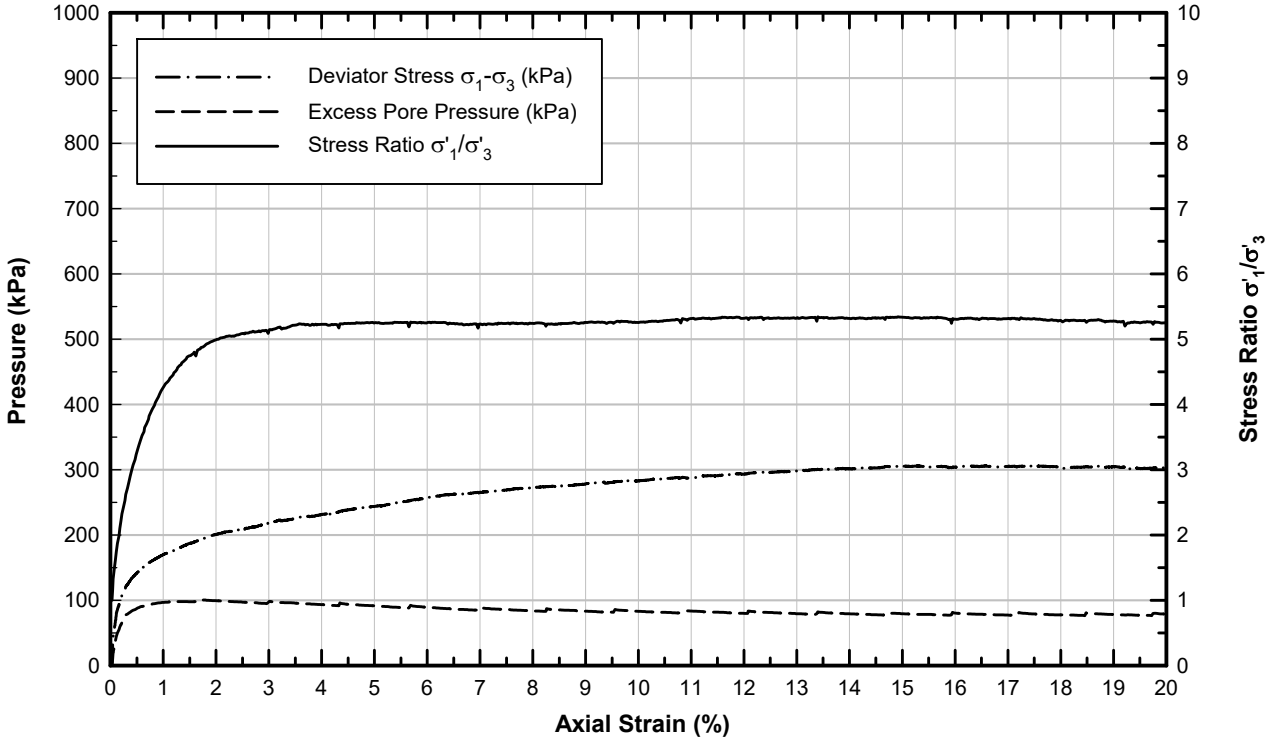
PORE PRESSURE COEFFICIENTS		SHEARING PARAMETERS	
B	0.98		
		Rate of Strain (%/hr)	1.0

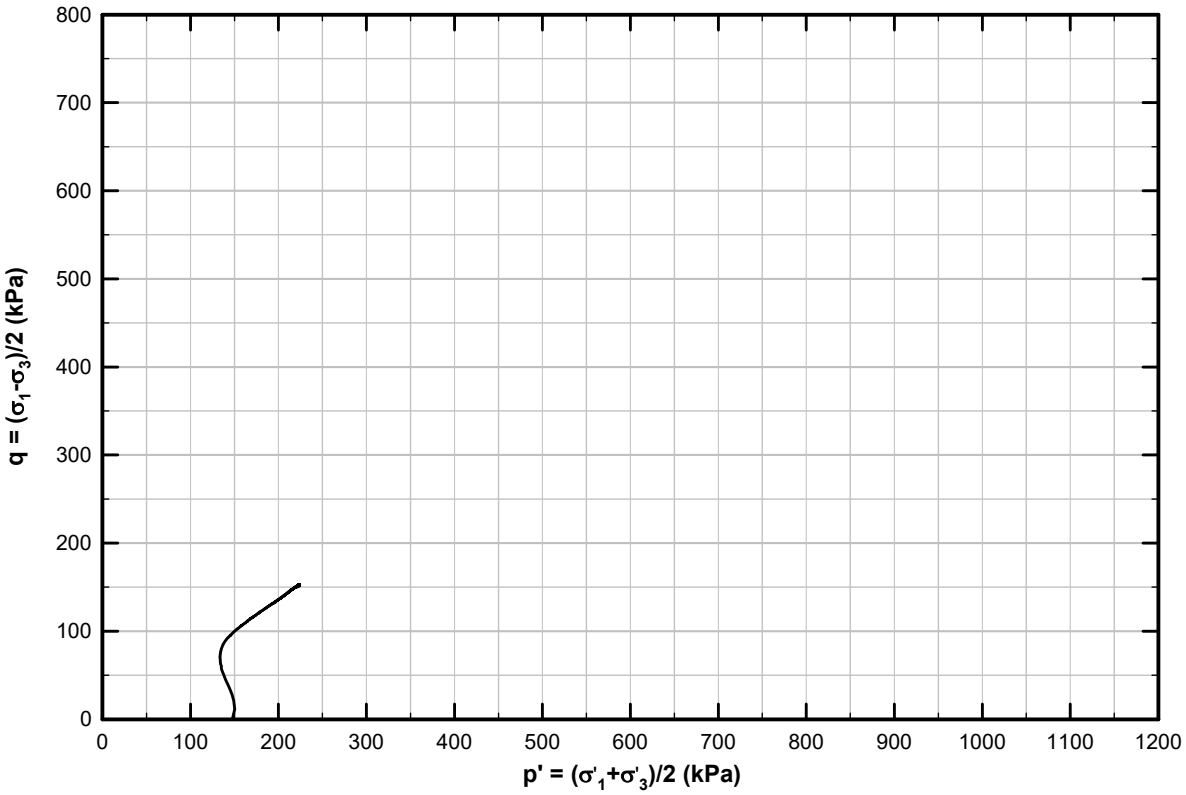
Tested by: MB
Reviewed by: SD

Note 1. Sample was reconstituted from the following samples:
TP-BGC16-185 G01 from 0.2-0.7m, TP-BGC16-186 G01 & G02 from 0.0-1.0m & 4.0-5.4m, TP-BGC16-189 G01 from 0.25-1.3m, TP-BGC16-193 G01 from 0.25-2.7m, TP-BGC16-198 G01 from 0.25-2.0m, TP-BGC16-199 G01 from 0.3-1.2m, TP-BGC16-200 G01 from 0.25-1.5m and TP-BGC16-201 G02 from 0.85-1.3m
Note 2. Sample was scalped on the 3/8" sieve and the mass removed was replaced by material between 3/8" sieve and the No. 4 sieve
Note 3. Sample was compacted to approximately 98% Standard Proctor Maximum Dry Density

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)
Test CIU 1
TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY





ISOTROPICALLY CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (CIU)

Test CIU 1

TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201

BGC Project No.: 0792-016

VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY



SAMPLE BEFORE TESTING



SAMPLE AFTER TESTING

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)
Test CIU 1
TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

GENERAL	
Date Test Completed	29-Oct-16
Type of Sample	Remoulded
Specimen Orientation	NA

INDEX PROPERTIES		
Diameter D	mm	72.4
Height H	mm	144.0
Water Content w	%	10.9
Bulk Density ρ_b	Mg/m^3	2.13
Dry Density ρ_d	Mg/m^3	1.92
Void Ratio e	-	0.41
Specific Gravity (assumed)	-	2.70
Degree of Saturation Sr	%	72.4
Liquid Limit	%	30.7
Plastic Limit	%	25.0
Plasticity Index	%	5.7

CONSOLIDATION STRESSES		STRESSES AT FAILURE	
$p'=(\sigma'_1+\sigma'_3)/2$ (kPa)	150	s_u (kPa)	109
		s_u/p'	0.73
		φ'_{max} (°)	43.6
		$\varphi'_{20\%}$ (°)	42.8

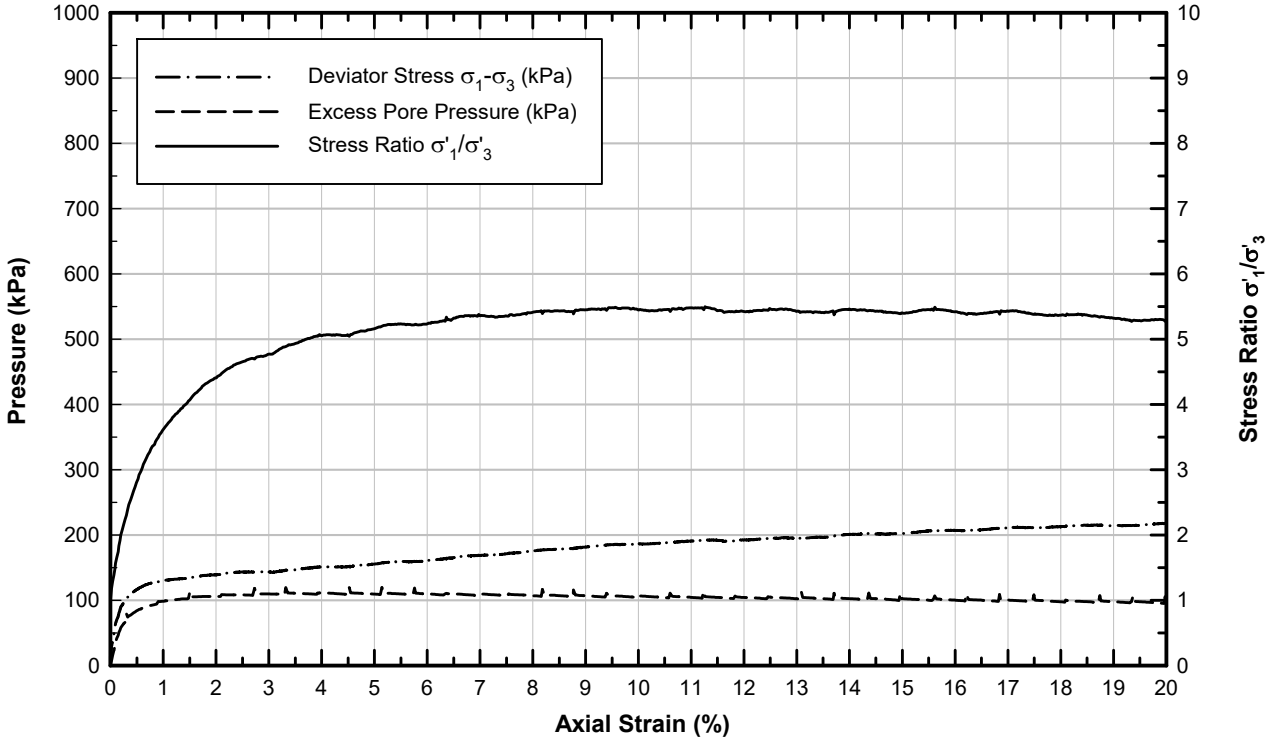
PORE PRESSURE COEFFICIENTS		SHEARING PARAMETERS	
B	0.98		
		Rate of Strain (%/hr)	1.0

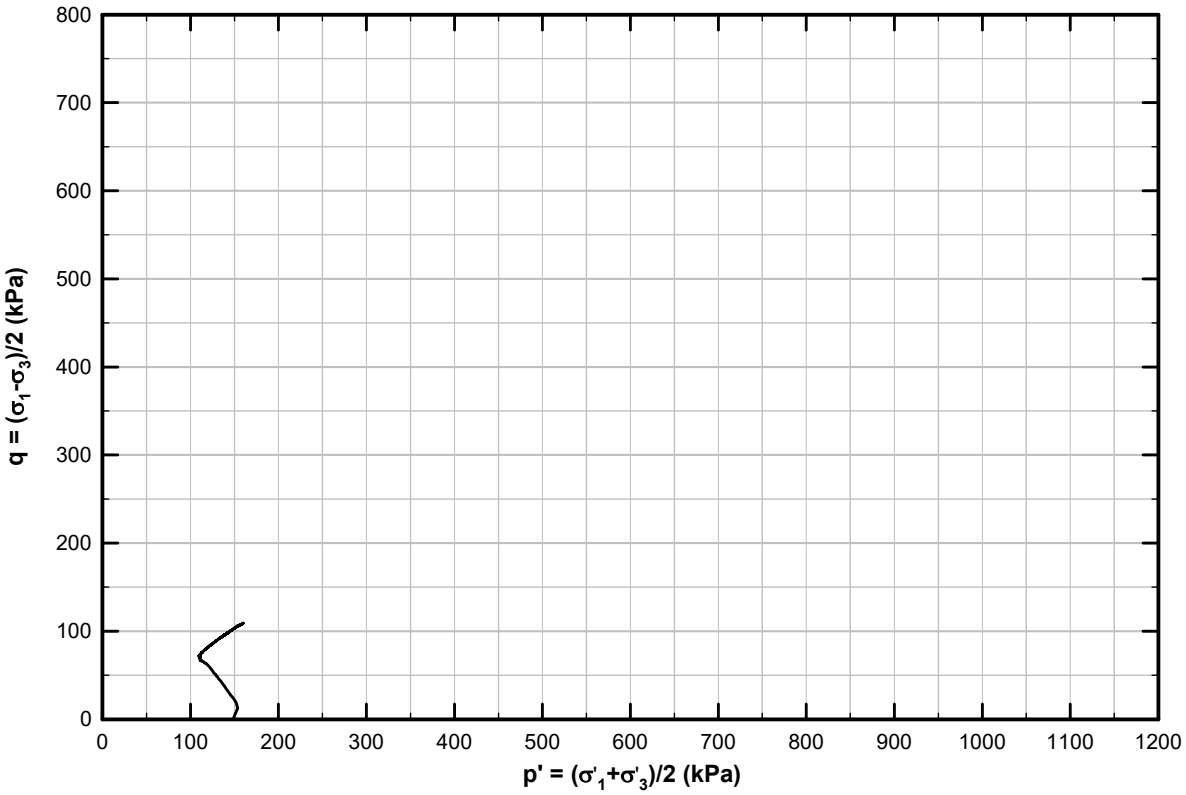
Tested by: MB
Reviewed by: SD

Note 1. Sample was reconstituted from the following samples:
TP-BGC16-187 G01 from 0.2-0.7m, TP-BGC16-188 G01 from 0.0-0.3m, TP-BGC16-190 G01 from 0.4-1.3m, TP-BGC16-192 G01 from 0.2-2.5m and TP-BGC16-202 G01, G02 and G03 from 0.25-1.3m
Note 2. Sample was scalped on the 3/8" sieve and the mass removed was replaced by material between 3/8" sieve and the No. 4 sieve
Note 3. Sample was compacted to approximately 98% Standard Proctor Maximum Dry Density

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)
Test CIU 2
TP-BGC16-187, 188, 190, 192 and 202
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY





ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 2
TP-BGC16-187, 188, 190, 192 and 202
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY



SAMPLE BEFORE TESTING



SAMPLE AFTER TESTING

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 2
TP-BGC16-187, 188, 190, 192 and 202
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

GENERAL	
Date Test Completed	01-Nov-16
Type of Sample	Remoulded
Specimen Orientation	NA

INDEX PROPERTIES		
Diameter D	mm	72.9
Height H	mm	141.6
Water Content w	%	11.1
Bulk Density ρ_b	Mg/m^3	2.23
Dry Density ρ_d	Mg/m^3	2.00
Void Ratio e	-	0.35
Specific Gravity (assumed)	-	2.70
Degree of Saturation Sr	%	86.2
Liquid Limit	%	-
Plastic Limit	%	-
Plasticity Index	%	-

CONSOLIDATION STRESSES		STRESSES AT FAILURE	
$p'=(\sigma'_1+\sigma'_3)/2$ (kPa)	300	s_u (kPa)	289
		s_u/p'	0.96
		φ'_{max} (°)	39.1
		$\varphi'_{20\%}$ (°)	38.3

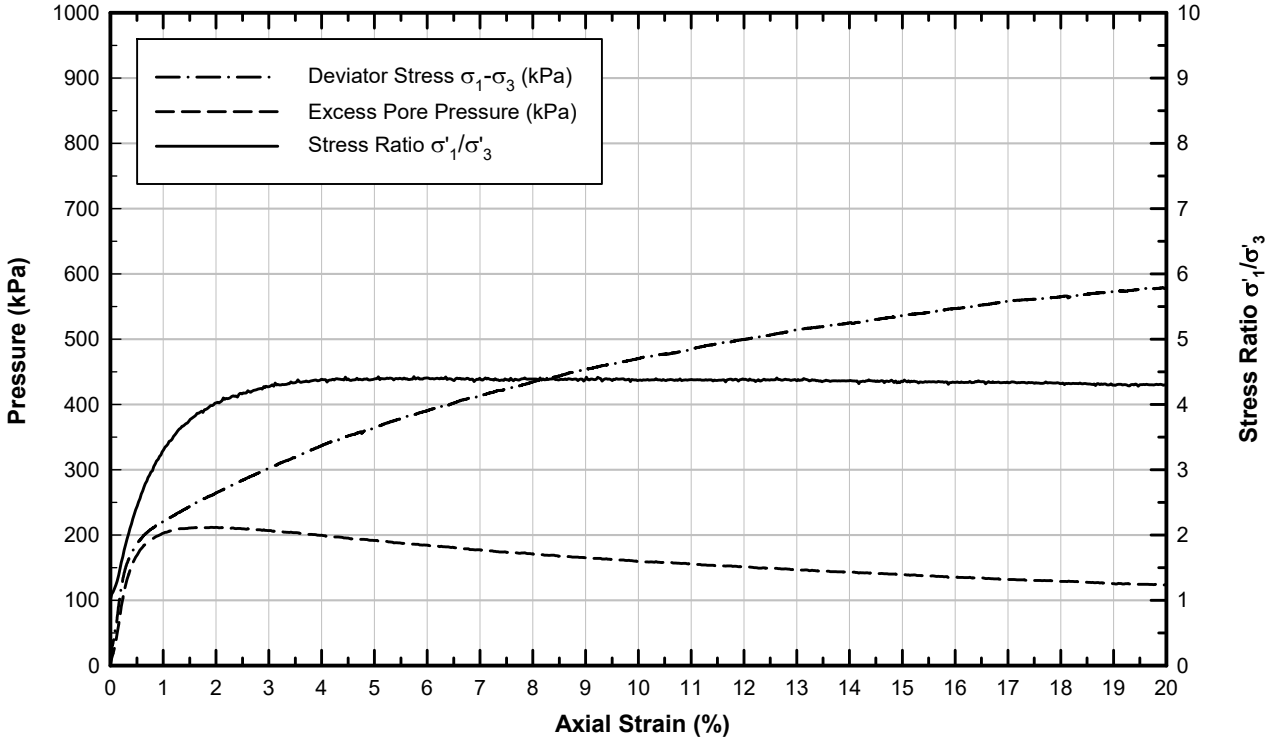
PORE PRESSURE COEFFICIENTS		SHEARING PARAMETERS	
B	0.98		
		Rate of Strain (%/hr)	1.0

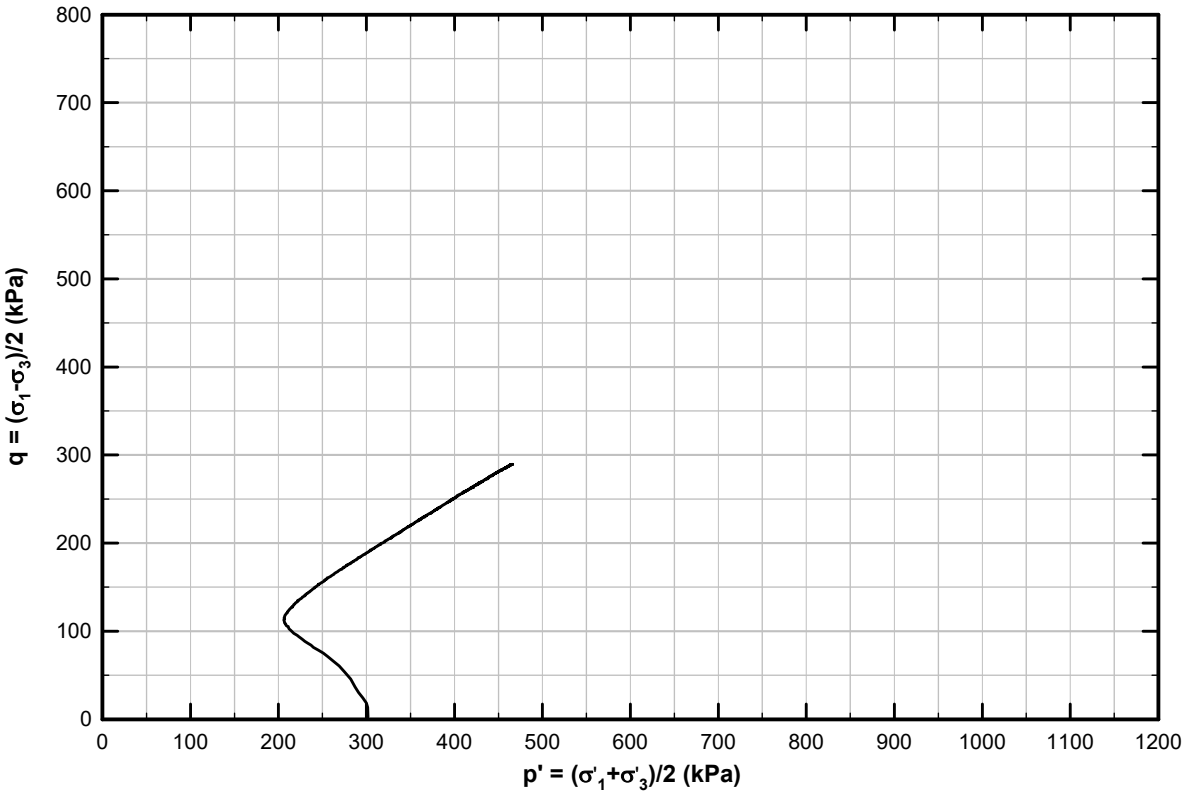
Tested by: MB
Reviewed by: SD

Note 1. Sample was reconstituted from the following samples:
TP-BGC16-185 G01 from 0.2-0.7m, TP-BGC16-186 G01 & G02 from 0.0-1.0m & 4.0-5.4m, TP-BGC16-189 G01 from 0.25-1.3m, TP-BGC16-193 G01 from 0.25-2.7m, TP-BGC16-198 G01 from 0.25-2.0m, TP-BGC16-199 G01 from 0.3-1.2m, TP-BGC16-200 G01 from 0.25-1.5m and TP-BGC16-201 G02 from 0.85-1.3m
Note 2. Sample was scalped on the 3/8" sieve and the mass removed was replaced by material between 3/8" sieve and the No. 4 sieve
Note 3. Sample was compacted to approximately 98% Standard Proctor Maximum Dry Density

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)
Test CIU 3
TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY





ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 3

TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201

BGC Project No.: 0792-016

VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY



SAMPLE BEFORE TESTING



SAMPLE AFTER TESTING

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 3

TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201

BGC Project No.: 0792-016

VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

GENERAL	
Date Test Completed	30-Oct-16
Type of Sample	Remoulded
Specimen Orientation	NA

INDEX PROPERTIES		
Diameter D	mm	72.5
Height H	mm	143.7
Water Content w	%	10.8
Bulk Density ρ_b	Mg/m^3	2.14
Dry Density ρ_d	Mg/m^3	1.93
Void Ratio e	-	0.40
Specific Gravity (assumed)	-	2.70
Degree of Saturation Sr	%	73.3
Liquid Limit	%	30.7
Plastic Limit	%	25.0
Plasticity Index	%	5.7

CONSOLIDATION STRESSES		STRESSES AT FAILURE	
$p'=(\sigma'_1+\sigma'_3)/2$ (kPa)	300	s_u (kPa)	179
		s_u/p'	0.60
		φ'_{max} (°)	40.5
		$\varphi'_{20\%}$ (°)	39.1

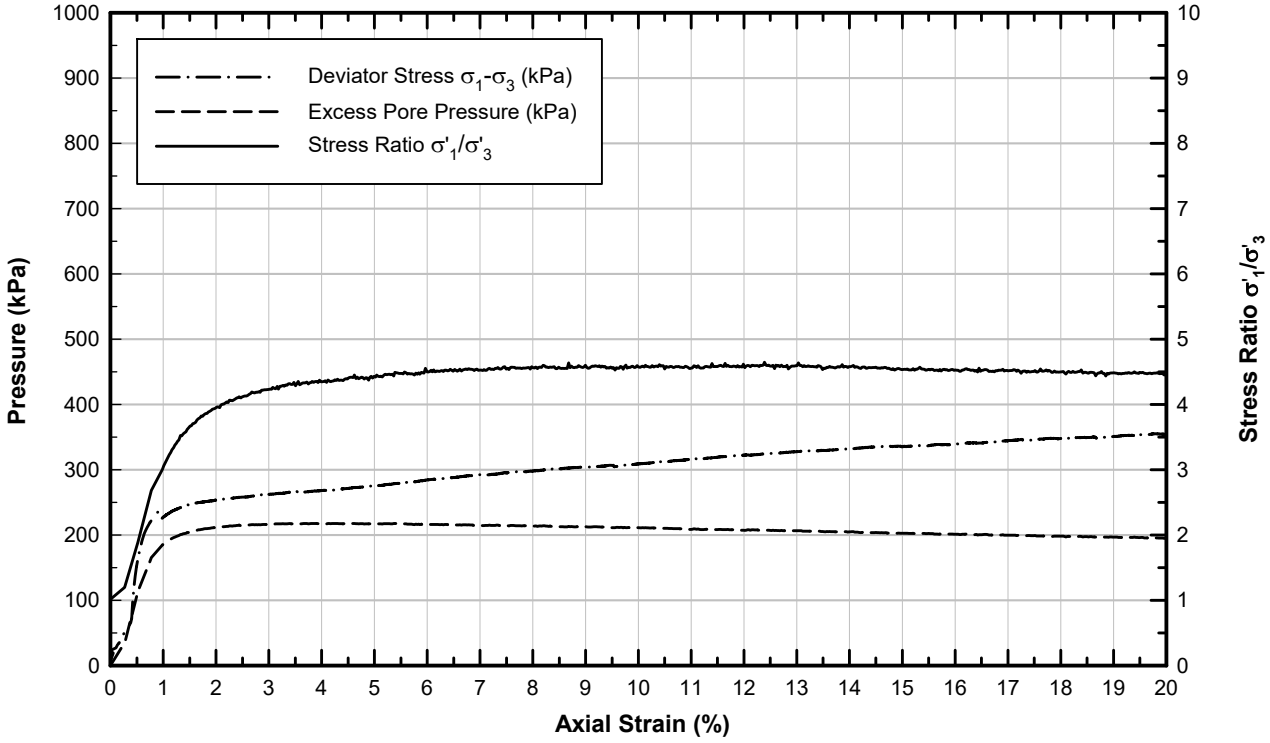
PORE PRESSURE COEFFICIENTS		SHEARING PARAMETERS	
B	0.98		
		Rate of Strain (%/hr)	1.0

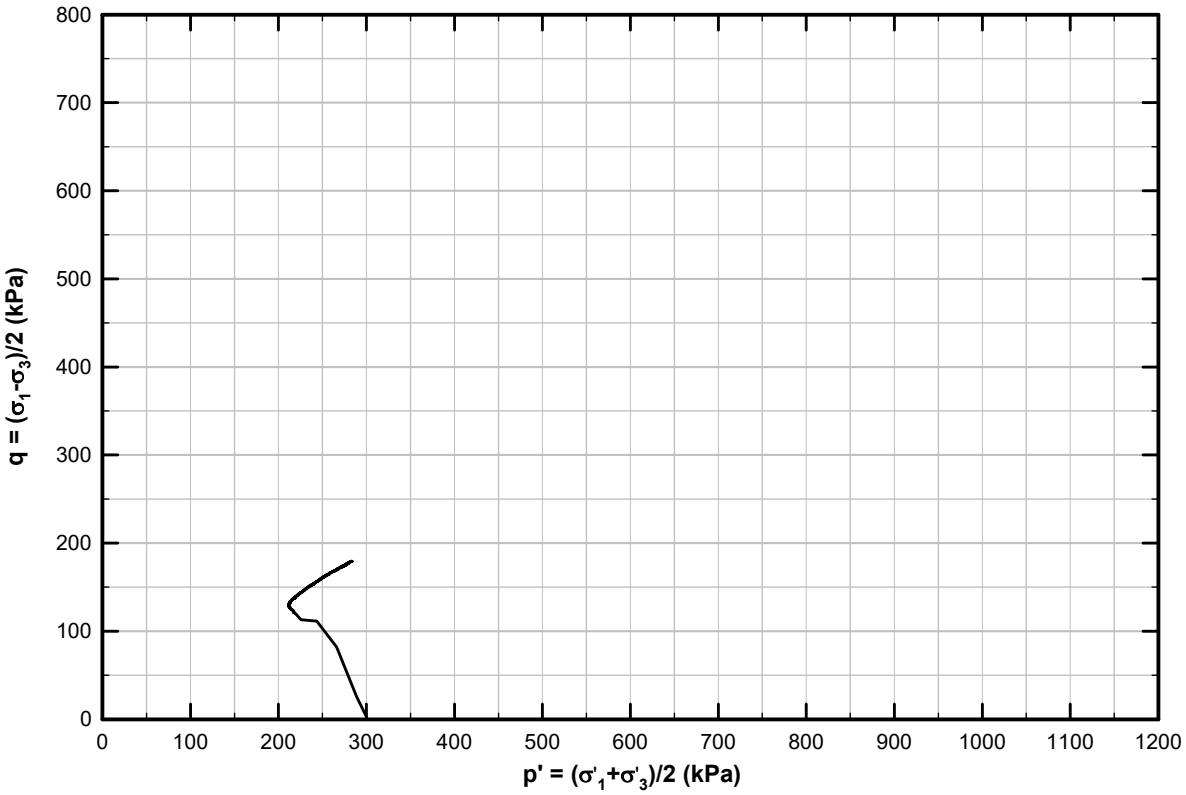
Tested by: MB
Reviewed by: SD

Note 1. Sample was reconstituted from the following samples:
TP-BGC16-187 G01 from 0.2-0.7m, TP-BGC16-188 G01 from 0.0-0.3m, TP-BGC16-190 G01 from 0.4-1.3m, TP-BGC16-192 G01 from 0.2-2.5m and TP-BGC16-202 G01, G02 and G03 from 0.25-1.3m
Note 2. Sample was scalped on the 3/8" sieve and the mass removed was replaced by material between 3/8" sieve and the No. 4 sieve
Note 3. Sample was compacted to approximately 98% Standard Proctor Maximum Dry Density

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)
Test CIU 4
TP-BGC16-187, 188, 190, 192 and 202
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY





ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 4
TP-BGC16-187, 188, 190, 192 and 202
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY



SAMPLE BEFORE TESTING



SAMPLE AFTER TESTING

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 4
TP-BGC16-187, 188, 190, 192 and 202
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

GENERAL	
Date Test Completed	28-Oct-16
Type of Sample	Remoulded
Specimen Orientation	NA

INDEX PROPERTIES		
Diameter D	mm	72.8
Height H	mm	142.5
Water Content w	%	11.0
Bulk Density ρ_b	Mg/m^3	2.22
Dry Density ρ_d	Mg/m^3	2.00
Void Ratio e	-	0.35
Specific Gravity (assumed)	-	2.70
Degree of Saturation Sr	%	84.5
Liquid Limit	%	-
Plastic Limit	%	-
Plasticity Index	%	-

CONSOLIDATION STRESSES		STRESSES AT FAILURE	
$p'=(\sigma'_1+\sigma'_3)/2$ (kPa)	600	s_u (kPa)	425
		s_u/p'	0.71
		φ'_{max} (°)	39.1
		$\varphi'_{20\%}$ (°)	38.3

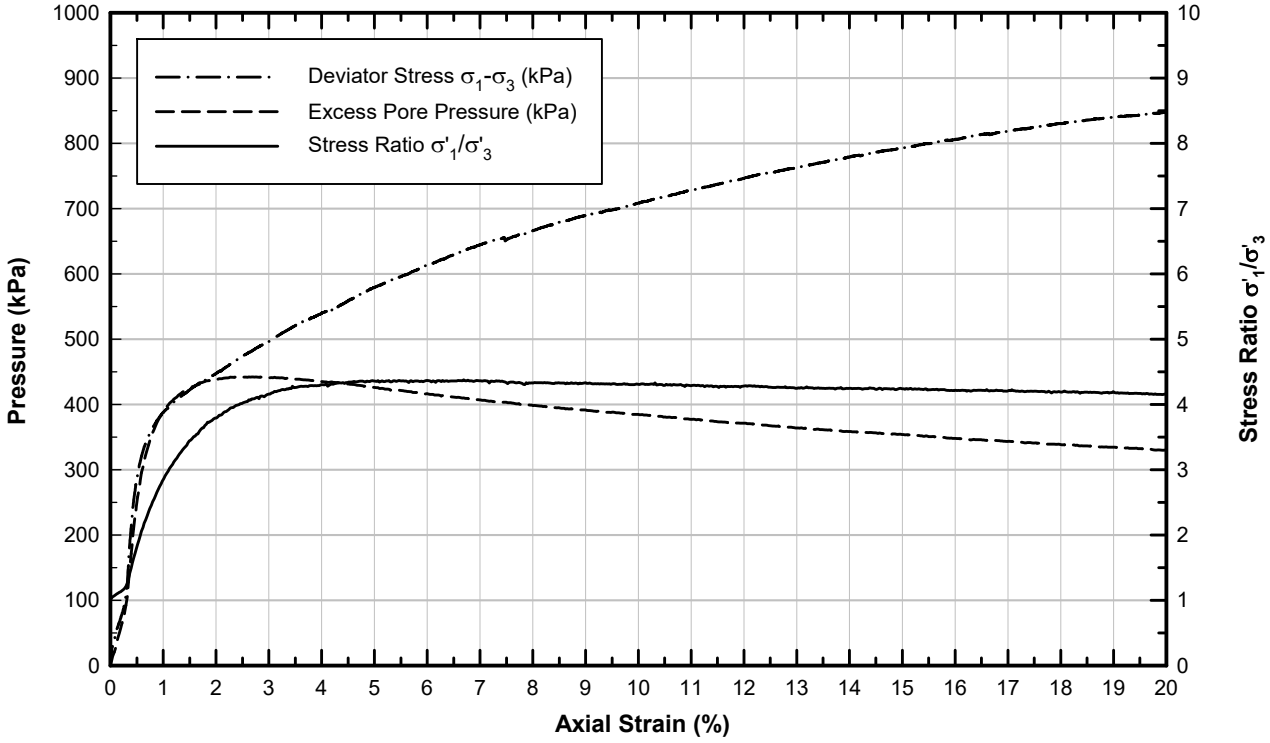
PORE PRESSURE COEFFICIENTS		SHEARING PARAMETERS	
B	0.99		
		Rate of Strain (%/hr)	1.0

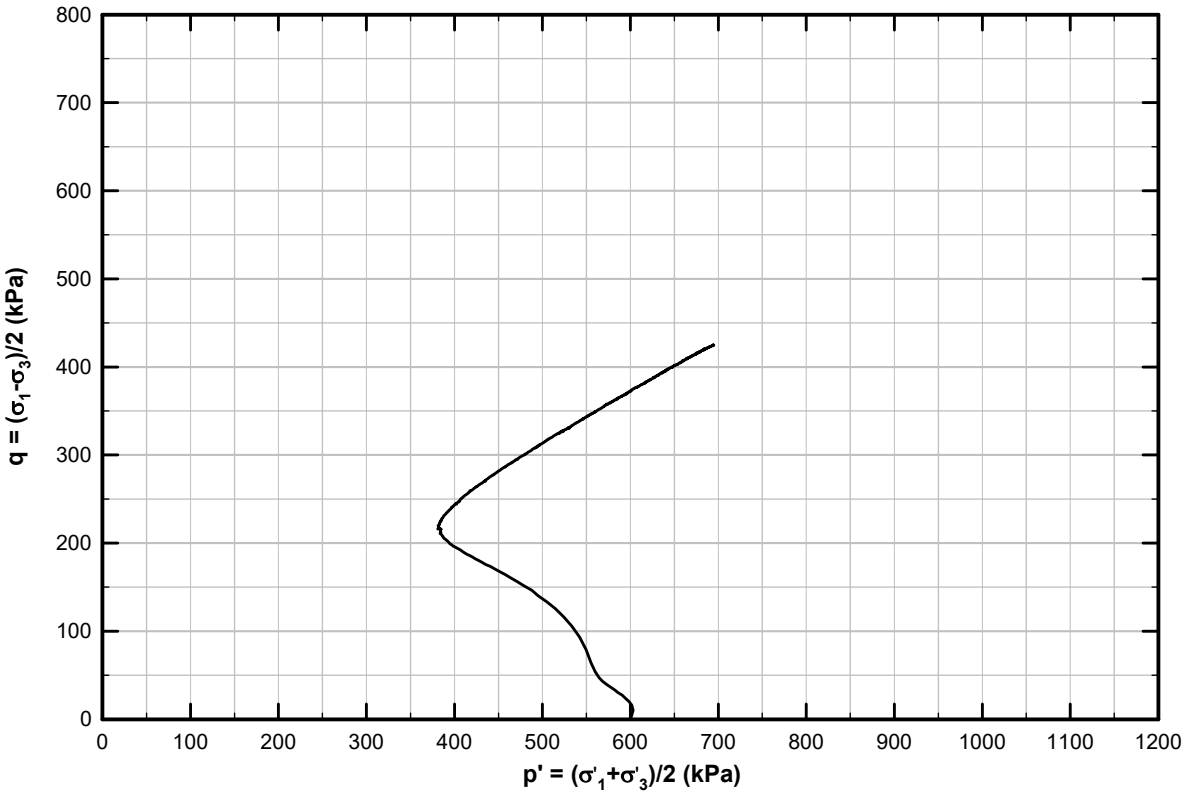
Tested by: MB
Reviewed by: SD

Note 1. Sample was reconstituted from the following samples:
TP-BGC16-185 G01 from 0.2-0.7m, TP-BGC16-186 G01 & G02 from 0.0-1.0m & 4.0-5.4m, TP-BGC16-189 G01 from 0.25-1.3m, TP-BGC16-193 G01 from 0.25-2.7m, TP-BGC16-198 G01 from 0.25-2.0m, TP-BGC16-199 G01 from 0.3-1.2m, TP-BGC16-200 G01 from 0.25-1.5m and TP-BGC16-201 G02 from 0.85-1.3m
Note 2. Sample was scalped on the 3/8" sieve and the mass removed was replaced by material between 3/8" sieve and the No. 4 sieve
Note 3. Sample was compacted to approximately 98% Standard Proctor Maximum Dry Density

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)
Test CIU 5
TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY





ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 5
TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY



SAMPLE BEFORE TESTING



SAMPLE AFTER TESTING

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 5
TP-BGC16-185, 186, 189, 193, 198, 199, 200 and 201
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

GENERAL	
Date Test Completed	26-Oct-16
Type of Sample	Remoulded
Specimen Orientation	NA

INDEX PROPERTIES		
Diameter D	mm	72.1
Height H	mm	142.5
Water Content w	%	11.0
Bulk Density ρ_b	Mg/m^3	2.12
Dry Density ρ_d	Mg/m^3	1.91
Void Ratio e	-	0.42
Specific Gravity (assumed)	-	2.70
Degree of Saturation Sr	%	71.5
Liquid Limit	%	30.7
Plastic Limit	%	25.0
Plasticity Index	%	5.7

CONSOLIDATION STRESSES		STRESSES AT FAILURE	
$p'=(\sigma'_1+\sigma'_3)/2$ (kPa)	600	s_u (kPa)	238
		s_u/p'	0.40
		φ'_{max} (°)	38.3
		$\varphi'_{20\%}$ (°)	36.9

PORE PRESSURE COEFFICIENTS		SHEARING PARAMETERS	
B	0.99		
		Rate of Strain (%/hr)	1.0

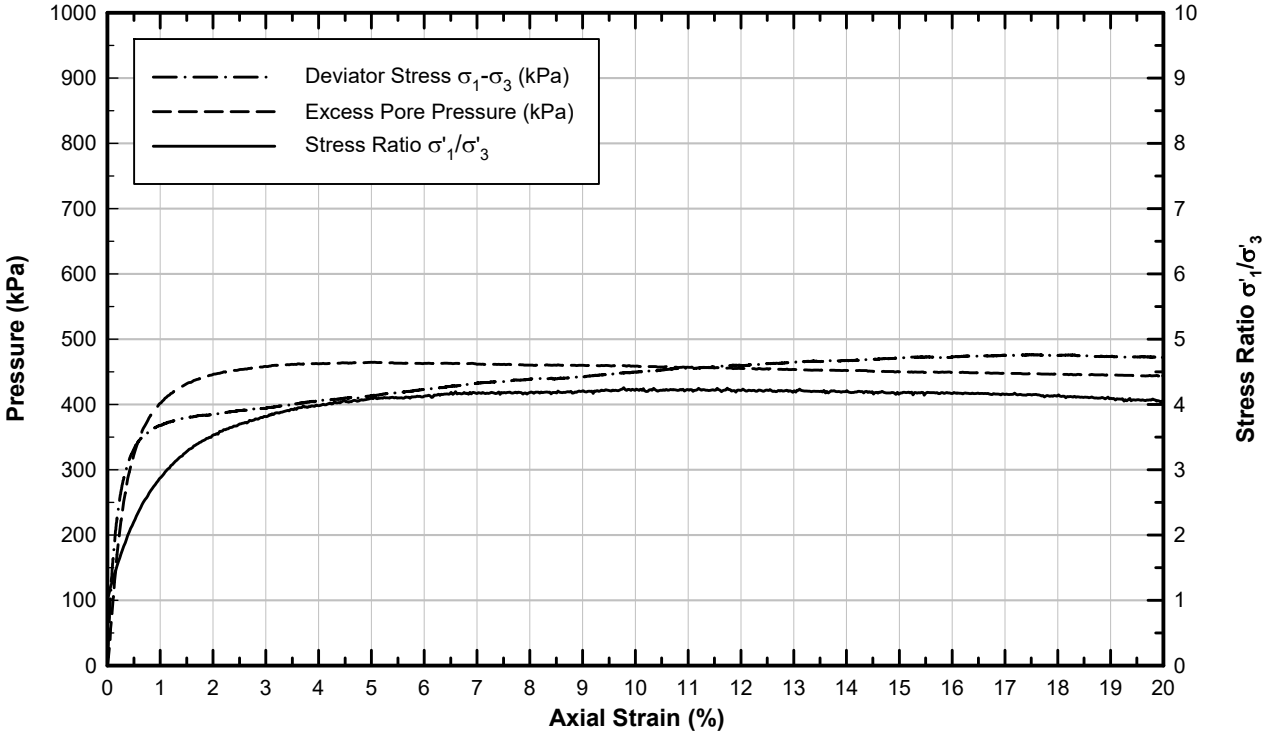
Tested by: MB
Reviewed by: SD

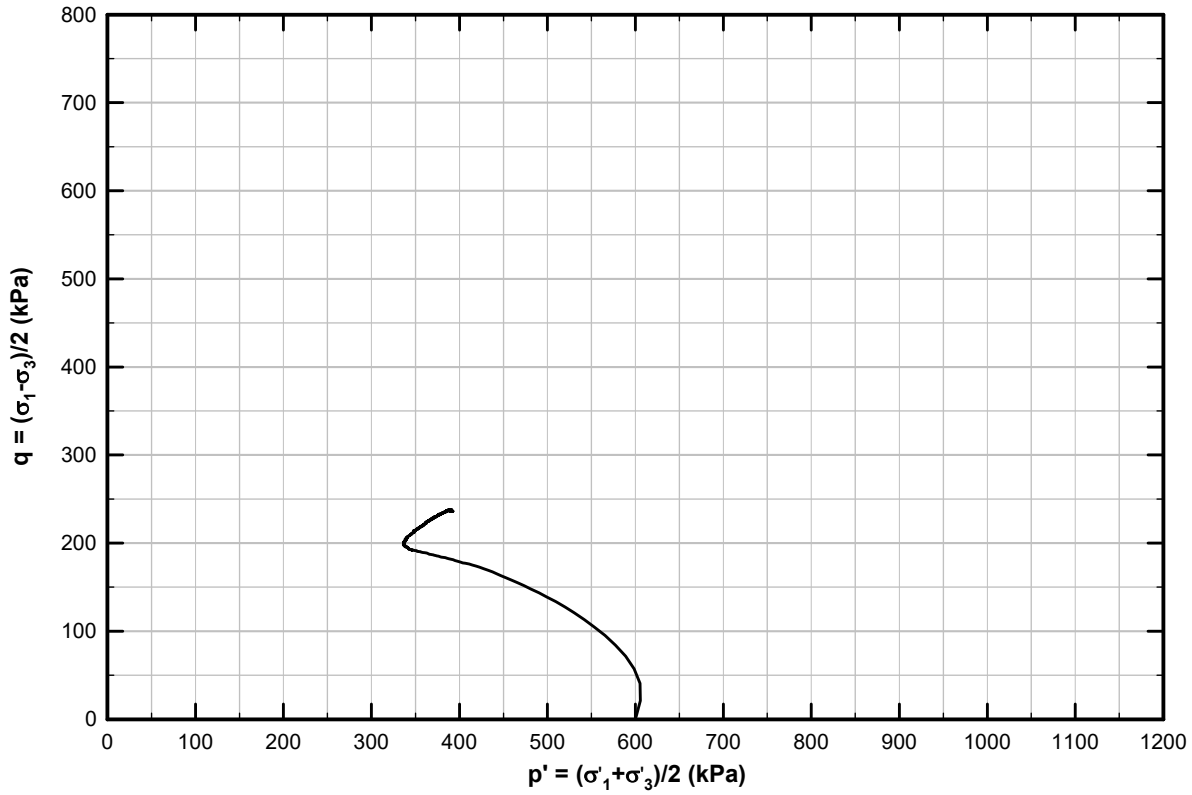
Note 1. Sample was reconstituted from the following samples:
TP-BGC16-187 G01 from 0.2-0.7m, TP-BGC16-188 G01 from 0.0-0.3m, TP-BGC16-190 G01 from 0.4-1.3m, TP-BGC16-192 G01 from 0.2-2.5m and TP-BGC16-202 G01, G02 and G03 from 0.25-1.3m
Note 2. Sample was scalped on the 3/8" sieve and the mass removed was replaced by material between 3/8" sieve and the No. 4 sieve
Note 3. Sample was compacted to approximately 98% Standard Proctor Maximum Dry Density

ISOTROPICALLY CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (CIU)

Test CIU 6
TP-BGC16-187, 188, 190, 192 and 202
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY





ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 6
TP-BGC16-187, 188, 190, 192 and 202
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY



SAMPLE BEFORE TESTING



SAMPLE AFTER TESTING

ISOTROPICALLY CONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION (CIU)

Test CIU 6
TP-BGC16-187, 188, 190, 192 and 202
BGC Project No.: 0792-016
VICTORIA GOLD CORP.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
515 Beaverbrook Court Fredericton, NB Canada E3B 1X6
Telephone (506) 460-8660 Fax (506) 460-8679

Project Memorandum

To:	**BGC Internal**	**Doc. No.:**	
Attention:	**Troy Meyer**	**cc:**	
From:	**David Oldford, Simon Dickinson**	**Date:**	**November 10, 2016**
Subject:	**Rock Core Testing for Eagle Gold**		
Project No.:	**0792016**		

1.0 INTRODUCTION

BGC Engineering Inc. (BGC) conducted laboratory testing to determine the unconfined compressive strength (UCS) and the point load strength index on rock core samples from the Eagle Gold Heap Leach Facility project. The rock core samples were collected from the following five (5) boreholes: BH-BGC16-086, 087, 088, 089 and 091 and ranged in diameters from 70.9 mm to 71.1 mm. The results of these tests are provided herein.

2.0 LABORATORY TESTING

2.1. Unconfined Compressive Strength (UCS)

A total of five (5) UCS tests were completed (one test per borehole) using an Accutek 250 Digital Compression Machine. All testing was performed using the latest editions of applicable American Society for Testing and Material (ASTM) Standards and recognized good practice. The following ASTM Standards were utilized:

- ASTM D7012 - Standard Test Method for Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures.
- ASTM 4543 - Standard Practices for Preparing Rock Core Specimens and Determining Dimensional and Shape Tolerances.

All samples were prepared and measured in accordance with ASTM D4543 for straightness, flatness, parallelism and perpendicularity. The following general procedure was used:

- The samples were first cut by diamond saw to prepare cylindrical samples having nearly parallel end faces.
- The end surfaces were ground to prepare samples to within the applicable tolerances.

2.2. Point Load

In addition to UCS testing, sixteen (16) point load tests were performed. Four (4) of the point load test samples were tested axially and twelve (12) samples were tested diametrically. The following ASTM Standards were utilized:

- ASTM D5731 - Standard Test Method for Determination of the Point Load Strength Index of Rock and Application to Rock Strength Classifications.

3.0 RESULTS

A summary of the UCS and point load test results are presented in Table 1 and 2, respectivley. Photographs taken before and after each test follow the summary tables.

Yours sincerely,

BGC ENGINEERING INC.
per:



David Oldford, P.Eng.
Geotechnical Engineer

Reviewed by:

Simon Dickinson, Ph.D., P.Eng.
Senior Geotechnical Engineer

DO/sd/bm

Table 1. Summary of UCS Test Results.

Sample ID	Depth (m)	Density (g/cm^3)	Diameter (mm)	Load (kN)	UCS (MPa)
BH-BGC16-086 (UCS01)	22.74 to 23.19	2.70	71.03	79.4	20.0 [1]
BH-BGC16-087 (UCS01)	33.38 to 33.70	2.65	71.06	68.8	17.3 [2]
BH-BGC16-088 (UCS01)	30.81 to 30.97	2.65	71.09	126.6	31.9 [3]
BH-BGC16-089 (UCS01)	21.10 to 21.32	2.67	70.87	248.4	63.0 [2]
BH-BGC16-091 (UCS01)	36.21 to 36.42	2.75	71.02	116.7	29.5 [1]

[1]Sample failed along a pre-exisintg plane of weakness parallel to its bedding/foliations.

[2]Sample failed along a pre-exisintg plane of weakness parallel to and perpendicular to its bedding/foliations.

[3]Sample failed along a pre-existing plane of weakness perpendicular to its bedding/foliations

Table 2. Summary of Point Load Test Results.

SAMPLE	DEPTH (m)	Test Type	Width (w), mm	Diameter (D), mm	Load (P), kN	D_e^2, mm^2	D_e, mm	I_s, Mpa	F	$I_{s(50)}$, Mpa	UCS (S_c), Mpa
BH-BGC16-086 PLT 01	19.7 to 19.8	d‖	-	70.91	3.30	5028.23	-	0.66	1.17	0.77	17
BH-BGC16-086 PLT 02	27.92 to 28.11	d‖	-	70.96	14.44	5035.32	-	2.87	1.17	3.36	76
BH-BGC16-086 PLT 03	12.79 to 12.9	d[1]	-	70.93	0.14	5031.06	-	0.03	1.17	0.03	1
BH-BGC16-086 PTL04	28.51 to 28.63	d	-	71.03	9.74	5045.26	-	1.93	1.17	2.26	51
BH-BGC16-087 PLT 01	9.85 to 9.92	a⊥[1]	63.02	70.92	4.24	5690.59	4469.38	0.74	1.20	0.90	20
BH-BGC16-087 PLT 02	23.73 to 23.78	a⊥[1]	61.37	70.90	5.18	5540.03	4351.13	0.94	1.20	1.12	25
BH-BGC16-087 PLT 03	34.45 to 34.56	d	-	71.03	2.12	5045.26	-	0.42	1.17	0.49	11
BH-BGC16-088 PLT 01	11.7 to 11.76	a⊥[1]	59.40	71.05	4.73	5376.27	4220.37	0.88	1.19	1.05	23
BH-BGC16-088 PTL 02	15.02 to 15.15	d‖	-	71.07	10.95	5050.94	-	2.17	1.17	2.54	58
BH-BGC16-088 PTL 03	27.82 to 27.91	d‖	-	71.10	2.58	5055.21	-	0.51	1.17	0.60	14
BH-BGC16-089 PLT 01	16.54 to 16.64	a⊥[1]	45.44	71.14	0.12	4117.96	3232.60	0.03	1.12	0.03	1
BH-BGC16-089 PLT 02	21.32 to 21.39	d‖	-	70.83	7.63	5016.89	-	1.52	1.17	1.78	40
BH-BGC16-089 PLT 03	31.78 to 31.88	d	-	71.00	0.39	5041.00	-	0.08	1.17	0.09	2
BH-BGC16-091 PLT 01	18.12 to 18.23	d‖	-	70.90	0.28	5026.81	-	0.06	1.17	0.06	1
BH-BGC16-091 PLT 02	5.49 to 5.55	d‖	-	70.85	6.92	5019.72	-	1.38	1.17	1.61	37
BH-BGC16-091 PLT 03	11.78 to 11.85	d	-	70.90	3.42	5026.81	-	0.68	1.17	0.80	18

d= diametrical
a= axial
b= block
i= irregular lump
⊥= perpendicular to plane of weakness
‖= parallel to plane fo weakness

[1] Fracture Surface only passed through one loading point



Photo 1. BH-BGC16-086, UCS01, before

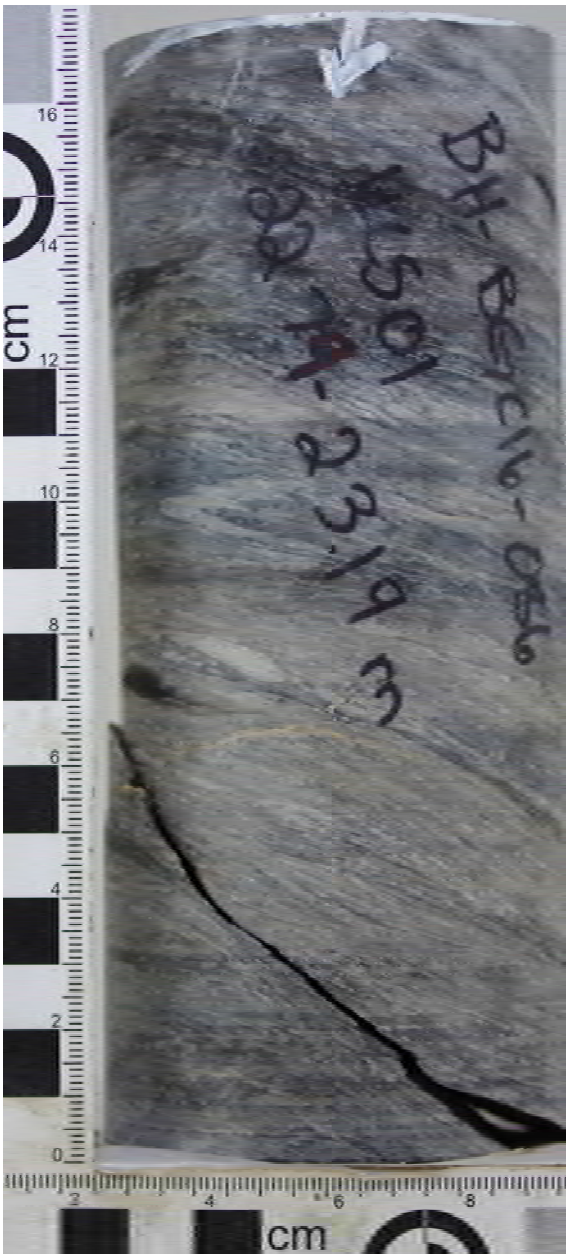


Photo 2. BH-BGC16-086, UCS01, after

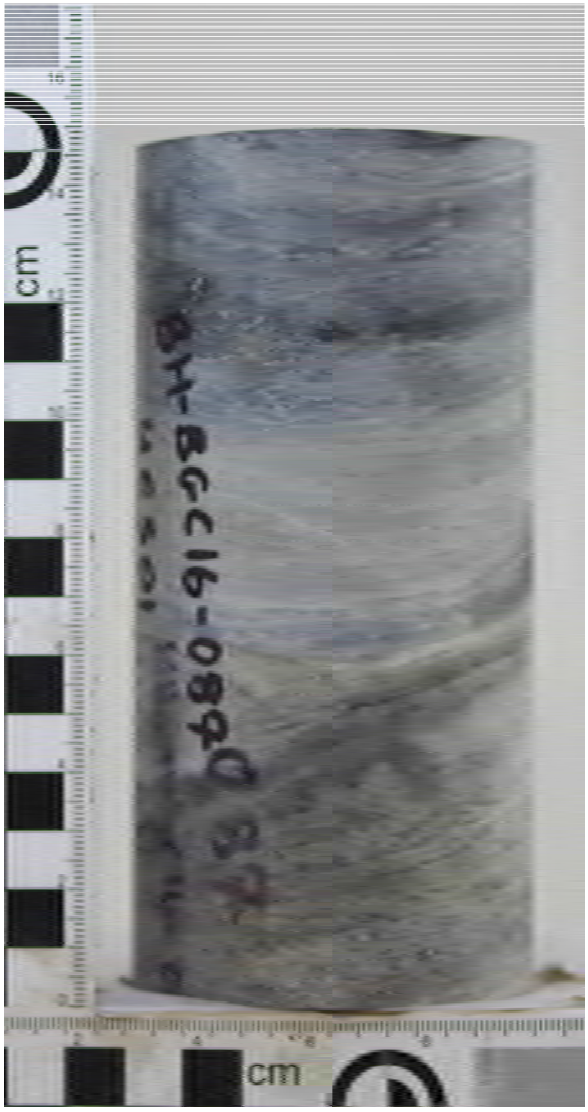


Photo 3. BH-BGC16-087, UCS01, before



Photo 4. BH-BGC16-087, UCS01, after

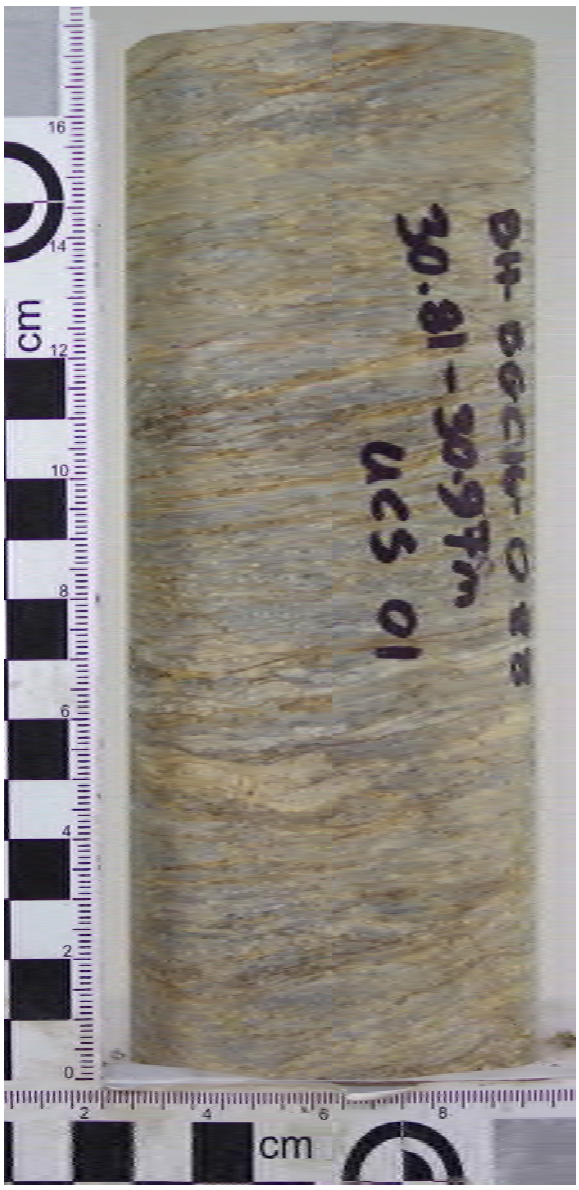


Photo 5. BH-BGC16-088, UCS01, before



Photo 6. BH-BGC16-088, UCS01, after



Photo 7. BH-BGC16-089, UCS01, before



Photo 8. BH-BGC16-089, UCS01, after



Photo 9. BH-BGC16-091, UCS01, before



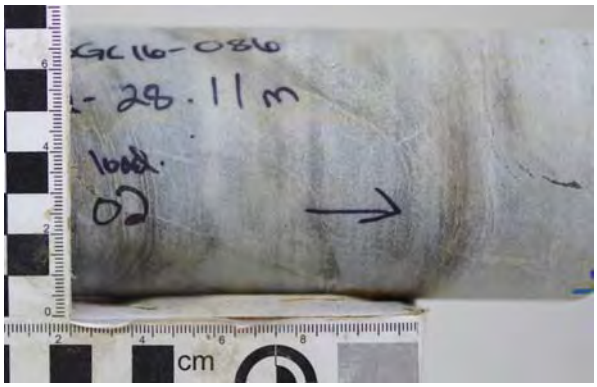
Photo 10. BH-BGC16-091, UCS01, after



Photo 11. BH-BGC16-086, PLT01, before



Photo 12. BH-BGC16-086, PLT01, after



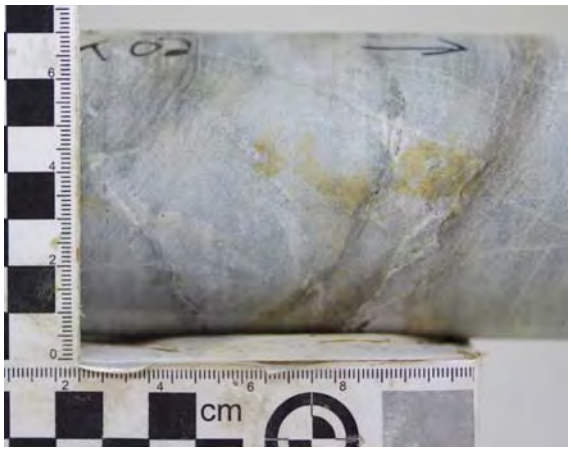


Photo 13 & 14. BH-BGC16-086, PLT02, before

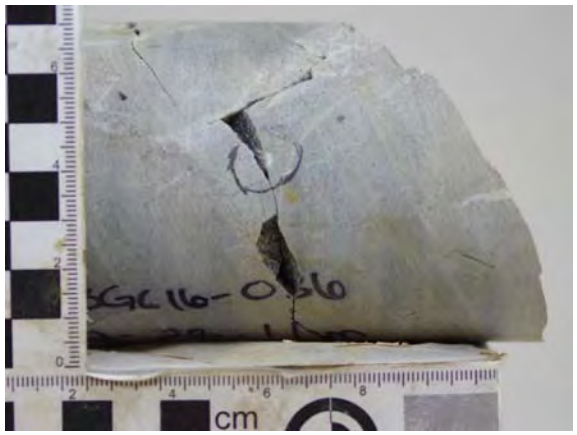




Photo 15 & 16. BH-BGC16-086, PLT02, after







Photo 17 & 18. BH-BGC16-086, PLT03, before



Photo 19 & 20. BH-BGC16-086, PLT03, after

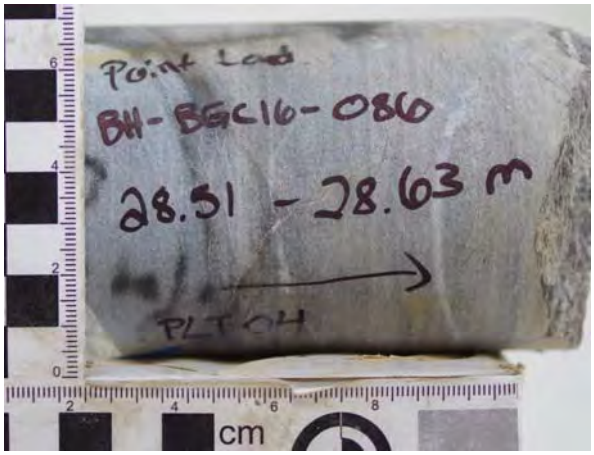


Photo 21. BH-BGC16-086, PLT04, before

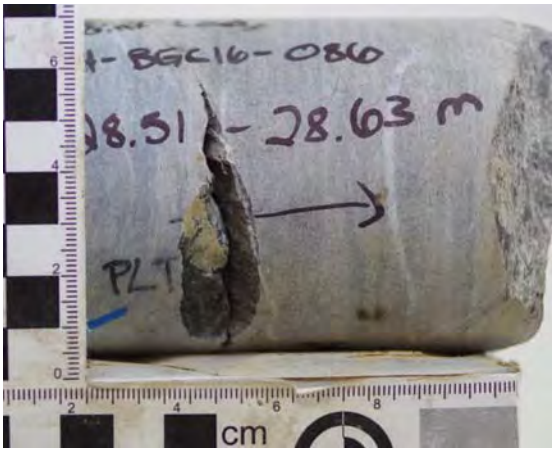


Photo 22. BH-BGC16-086, PLT04, after







Photo 23 & 24. BH-BGC16-087, PLT01, before

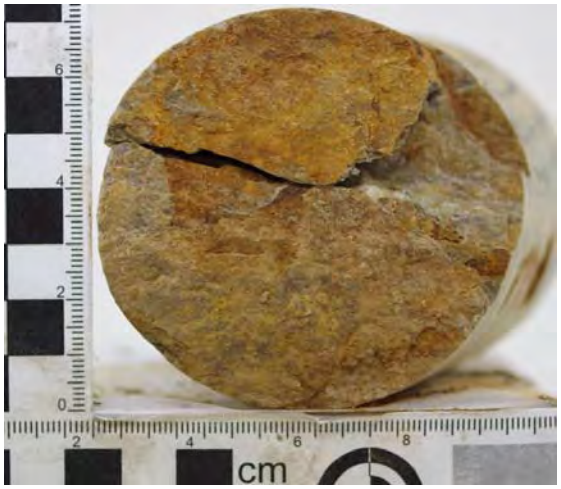


Photo 25 & 26. BH-BGC16-087, PLT01, after



Photo 27. BH-BGC16-087, PLT02, before

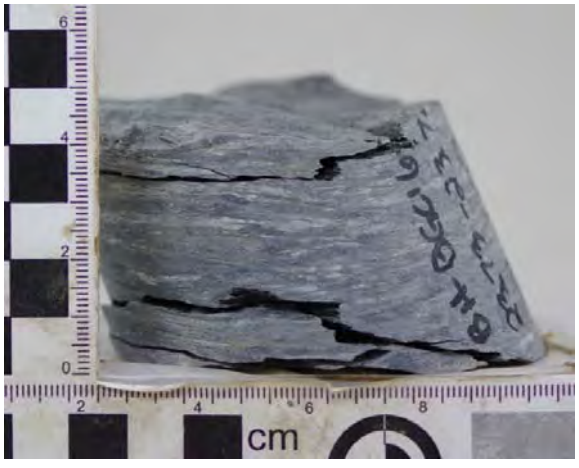
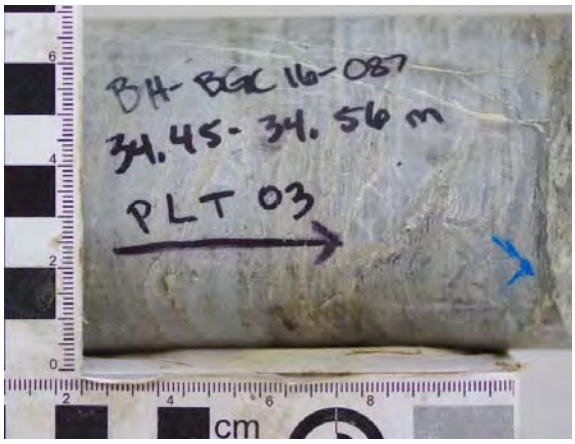


Photo 28. BH-BGC16-087, PLT02, after





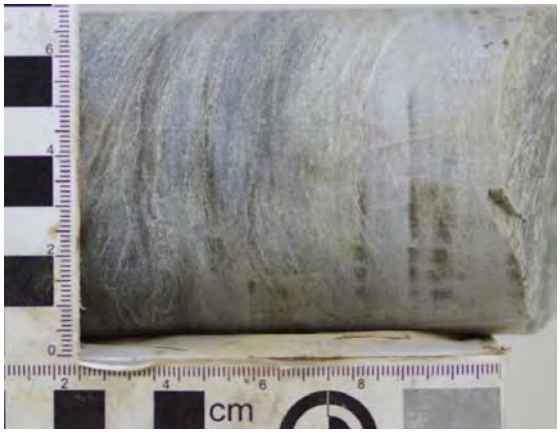




Photo 29 & 30. BH-BGC16-087, PLT03, before

Photo 31 & 32. BH-BGC16-087, PLT03, after





Photo 33. BH-BGC16-088, PLT01, before

Photo 34. BH-BGC16-088, PLT01, after



Photo 35. BH-BGC16-088, PLT02, before



Photo 36. BH-BGC16-088, PLT02, after



Photo 37. BH-BGC16-088, PLT03, before



Photo 38. BH-BGC16-088, PLT03, after



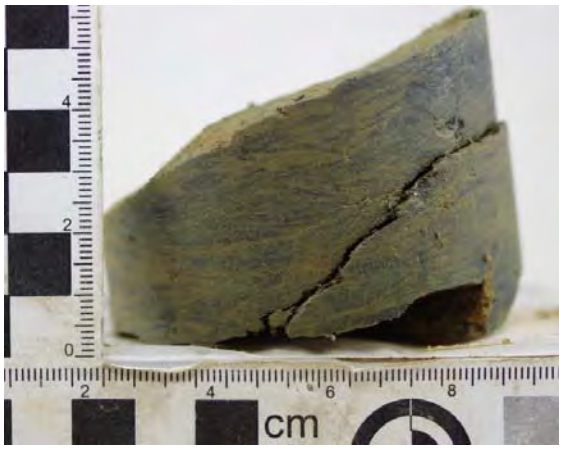
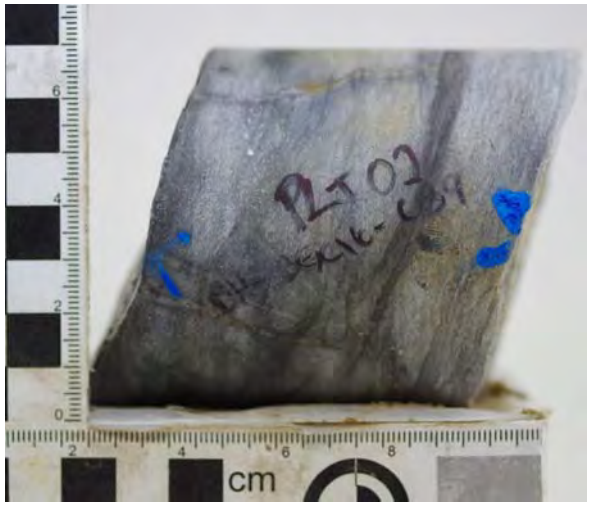






Photo 39 & 40. BH-BGC16-089, PLT01, before

Photo 41 & 42. BH-BGC16-089, PLT01, after





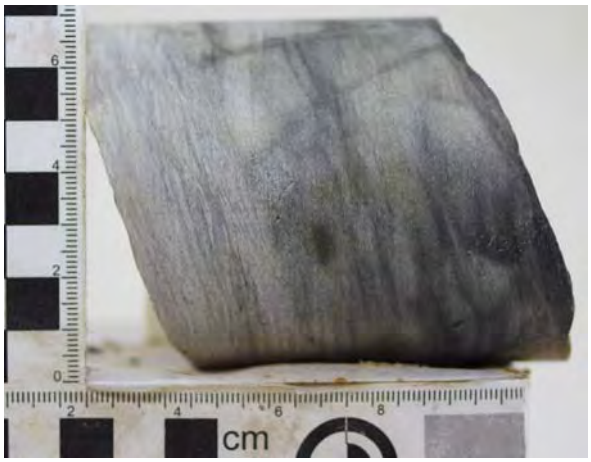


Photo 43 & 44. BH-BGC16-089, PLT02, before



Photo 45 & 46. BH-BGC16-089, PLT02, after









Photo 47 & 48. BH-BGC16-089, PLT03, before

Photo 49 & 50. BH-BGC16-089, PLT03, after



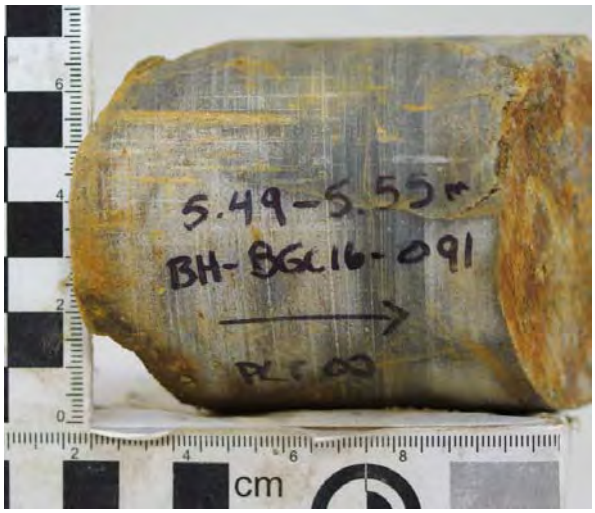




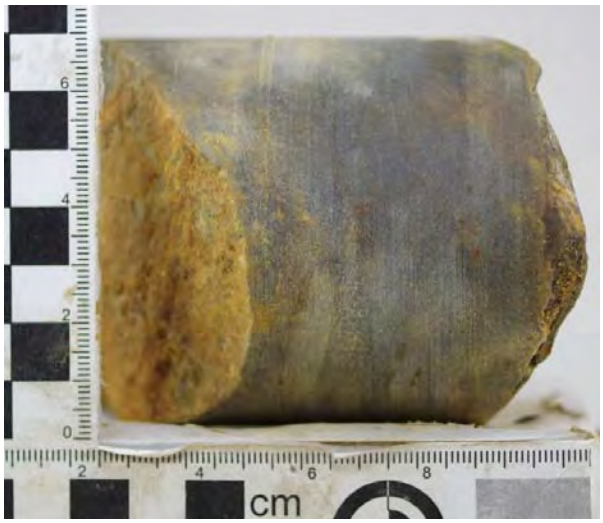


Photo 51 & 52. BH-BGC16-091, PLT01, before

Photo 53 & 54. BH-BGC16-091, PLT01, after







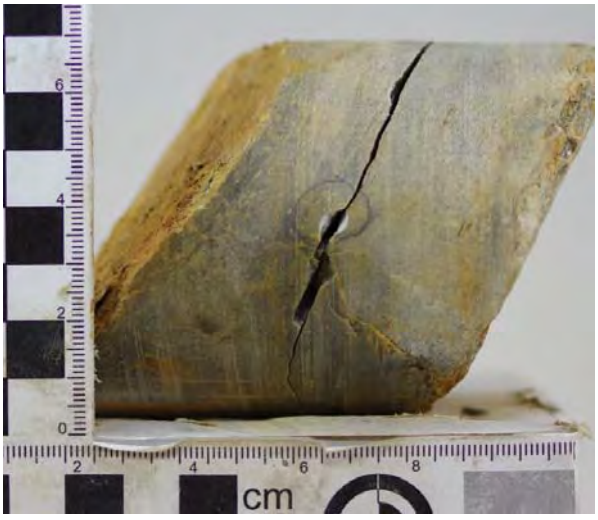


Photo 55 & 56. BH-BGC16-091, PLT02, before

Photo 57 & 58. BH-BGC16-091, PLT02, after



Photo 59 & 60. BH-BGC16-091, PLT03, before



Photo 61 & 62. BH-BGC16-091, PLT03, after

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

ATTERBERG LIMITS
ASTM D-4318 Method B

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D.Oldford
Reviewed By:	S.Dickinson
Test Date:	2016-10-14
Report Date:	2016-10-16

Sample Information

Blended sample from the following test pits:

Samples used in CIU Tests 2, 4 & 6

TP-BGC16-187 G01 from 0.2-0.7m
TP-BGC16-188 G01 from 0.0-0.3m
TP-BGC16-190 G01 from 0.4-1.3m
TP-BGC16-192 G01 from 0.2-2.5m
TP-BGC16-202 G01, G02, G03 from 1.15-4.0m

Preparation Method: Wet preparation ☐ Oven Dry ☐ Air Dry [x]

Liquid Limit

Sample Number	1	2	3	4
(A) No. of Blows	25	23		
(B) Tin ID	AL5	B11		
(C) Mass of Tin + Moist Soil, g	39.71	42.85		
(D) Mass of Tin + Dry Soil, g	35.04	37.51		
(E) Mass of Water, g = (C-D)	4.67	5.34		
(F) Mass of Tin, g	19.94	20.02		
(G) Mass of Dry Soil, g = (D-F)	15.10	17.49		
(H) Moisture Content, % = (E/G)	30.93	30.53		

TABLE 1 Factors for Obtaining Liquid Limit from Water Content and Number of Drops Causing Closure of Groove

N (Number of Drops)	k (Factor for Liquid Limit)
20	0.973
21	0.979
22	0.985
23	0.990
24	0.995
25	1.000
26	1.005
27	1.009
28	1.014
29	1.018
30	1.022

$$LL^n = k \cdot W^n$$

where:

LL^n = one point liquid limit for given trial, %,
W^n = water content for given trial, %, and
k = factor given in Table 1.

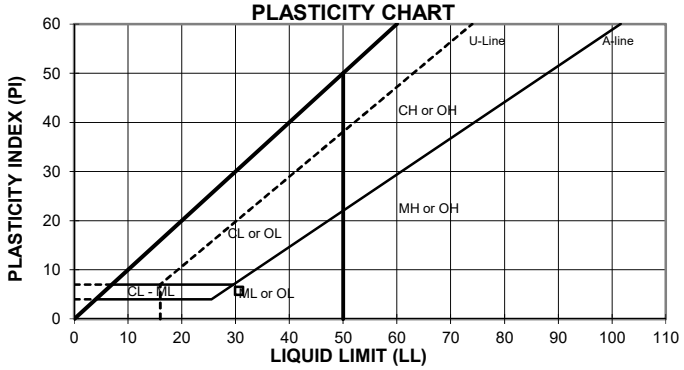
Plastic Limit

Sample Number	1	2	3	4
(I) Tin ID	AL25	B1		
(J) Mass of Tin + Moist Soil, g	26.46	25.12		
(K) Mass of Tin + Dry Soil, g	25.29	24.18		
(L) Mass of Water, g = (J-K)	1.17	0.94		
(M) Mass of Tin, g	20.72	20.32		
(N) Mass of Dry Soil, g = (K-M)	4.57	3.86		
(O) Moisture Content, % = (L/N)	25.60	24.35		
Average Moisture Content, %	24.98			

Visual Description

USCS Group Symbol (ASTM D2487)
ML

Liquid Limit (%): 30.7
Plastic Limit (%): 25.0
Plasticity Index (%) 5.7



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

ATTERBERG LIMITS
ASTM D-4318 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D.Oldford
Reviewed By:	S.Dickinson
Test Date:	2016-10-19
Report Date:	2016-10-20

Sample Information

Blended sample from the following test pits:

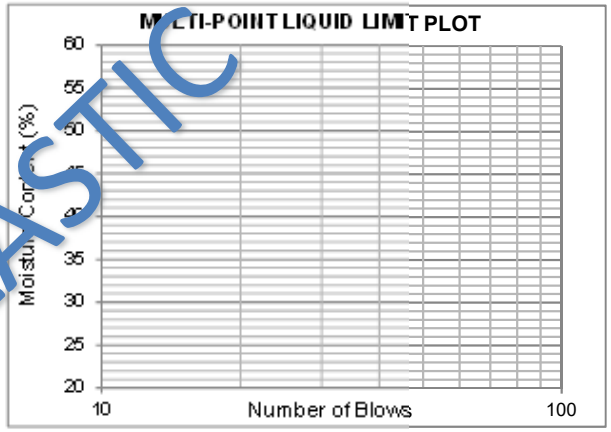
Samples used in CIU tests 1, 3 & 5

TP-BGC16-185 G01 from 0.2-0.7m	TP-BGC16-193 G01 from 0.25-2.7m
TP-BGC16-186 G01 from 0.0-1.0m	TP-BGC16-198 G01 from 0.25-2.0m
TP-BGC16-186 G02 from 4.0-5.4m	TP-BGC16-199 G01 from 0.3-1.2m
TP-BGC16-189 G01 from 0.25-1.3m	TP-BGC16-200 G01 from 0.25-1.5m
	TP-BGC16-201 G02 from 0.85-1.3m

Preparation Method: Wet preparation ☐ Oven Dry ☐ Air Dry [x]

Liquid Limit

Sample Number	1	2	3	4
(A) No. of Blows	-	-	-	-
(B) Tin ID	-	-	-	-
(C) Mass of Tin + Moist Soil, g	-	-	-	-
(D) Mass of Tin + Dry Soil, g	-	-	-	-
(E) Mass of Water, g = (C-D)	-	-	-	-
(F) Mass of Tin, g	-	-	-	-
(G) Mass of Dry Soil, g = (D-F)	-	-	-	-
(H) Moisture Content, % = (E/G)	-	-	-	-



Plastic Limit

Sample Number	1	2	3	4
(I) Tin ID	-	-	-	-
(J) Mass of Tin + Moist Soil, g	-	-	-	-
(K) Mass of Tin + Dry Soil, g	-	-	-	-
(L) Mass of Water, g = (J-K)	-	-	-	-
(M) Mass of Tin, g	-	-	-	-
(N) Mass of Dry Soil, g = (K-M)	-	-	-	-
(O) Moisture Content, % = (L/N)	-	-	-	-
Average Moisture Content, %	-			

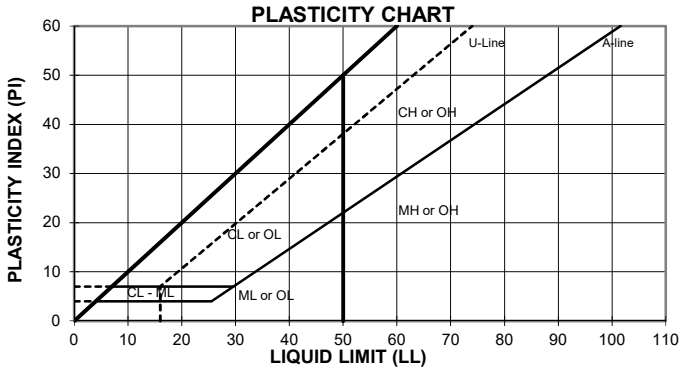
Visual Description

USCS Group Symbol (ASTM D2487)
ML

Liquid Limit (%): -

Plastic Limit (%): -

Plasticity Index (%) -



NON-PLASTIC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-422

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D.Oldford
Reviewed By:	S.Dickinson
Test Date:	2016-10-13
Report Date:	2016-10-14

Sample Information

Blended sample from the following test pits:

Samples used in CIU Tests 2, 4 & 6

TP-BGC16-187 G01 from 0.2-0.7m

TP-BGC16-188 G01 from 0.0-0.3m

TP-BGC16-190 G01 from 0.4-1.3m

TP-BGC16-192 G01 from 0.2-2.5m

TP-BGC16-202 G01, G02 & G03 from 1.15-4.0m

Preparation Method: Oven Dry [x] Air Dry [ ]

Laboratory Comments/Observations

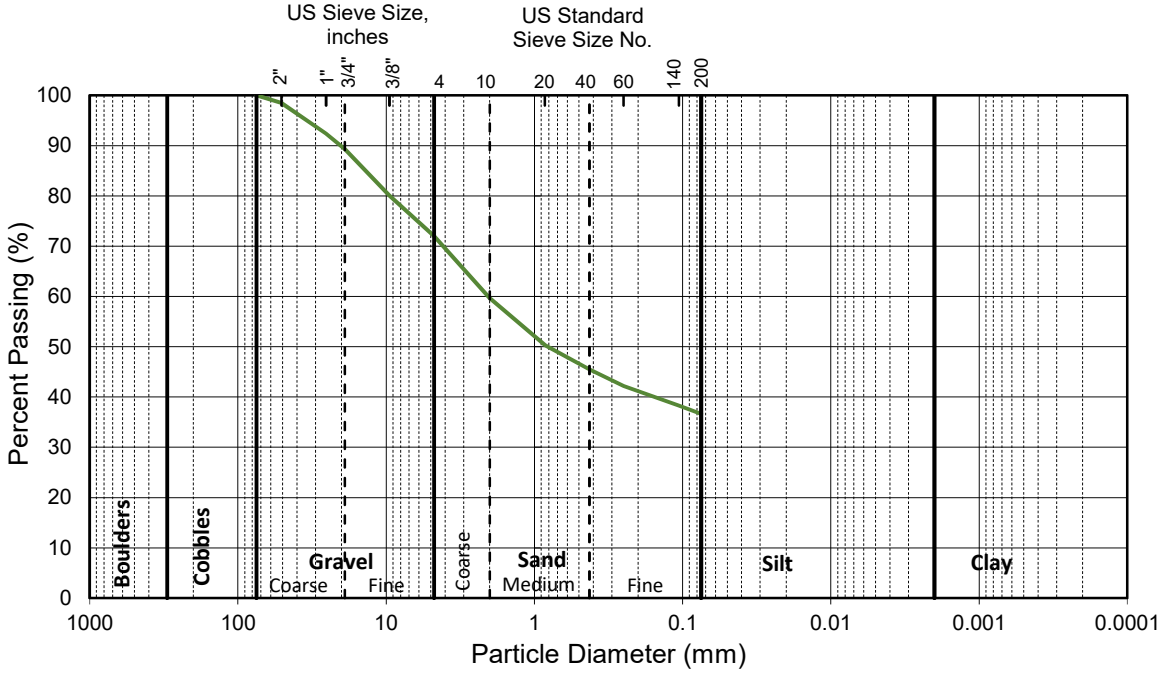
(mm)	% Pass	(mm)	% Pass
75.000	100.00	0.250	42.2
50.800	98.41	0.106	38.3
25.400	92.41	0.075	36.6
19.000	89.30		
9.500	80.04		
4.750	72.02		
2.000	59.71		
0.850	50.34		
0.425	45.47		

Gradation Summary

Gravel%	28.0
Sand%	35.4
Fines%	36.6
D60, mm:	2.0
D30, mm:	-
D10, mm:	-
Cc:	-
Cu:	-

Soil Classification as per USCS (ASTM D2487)

Silty SAND with gravel (SM)



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D.Oldford
Reviewed By:	S.Dickinson
Test Date:	2016-10-19
Report Date:	2016-10-20

Sample Information

Blended sample from the following test pits:

Samples used in CIU Tests 1, 3 & 5

TP-BGC16-185 G01 from 0.2-0.7m	TP-BGC16-198 G01 from 0.25-2.0m
TP-BGC16-186 G01 from 0.0-1.0m	TP-BGC16-199 G01 from 0.3-1.2m
TP-BGC16-186 G02 from 4.0-5.4m	TP-BGC16-200 G01 from 0.25-1.5m
TP-BGC16-189 G01 from 0.25-1.3m	TP-BGC16-201 G02 from 0.85-1.3m
TP-BGC16-193 G01 from 0.25-2.7m	

Preparation Method: Oven Dry [x] Air Dry [ ]

Laboratory Comments/Observations

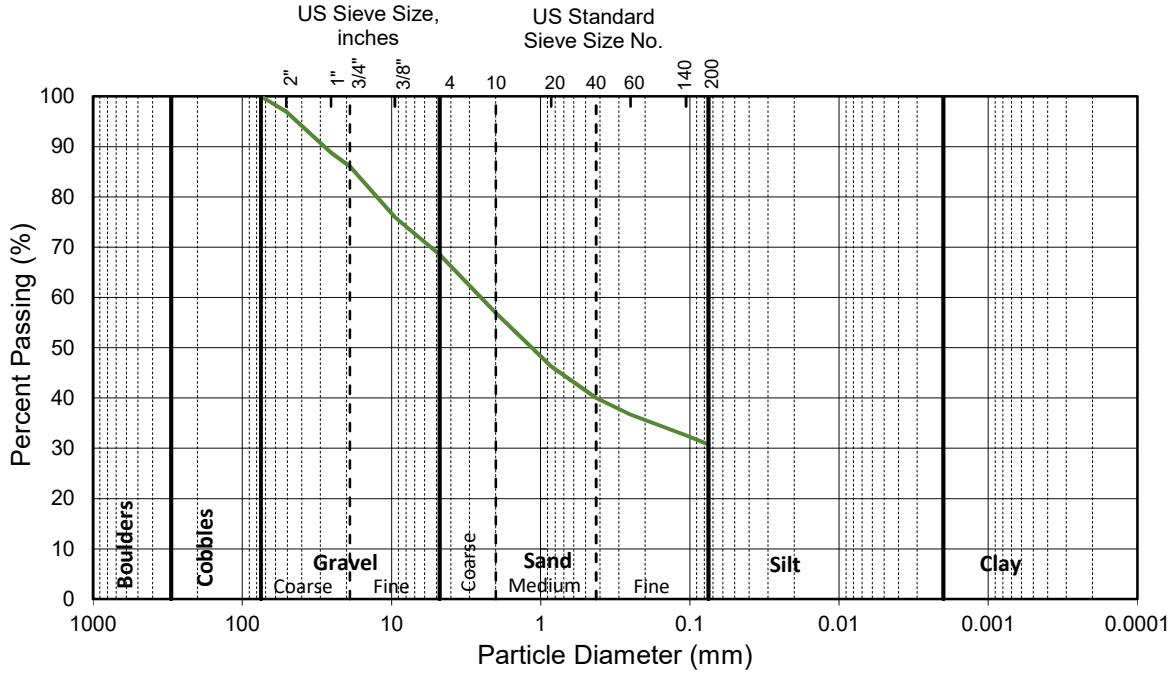
(mm)	% Pass	(mm)	% Pass
75.000	100.00	0.250	36.7
50.800	96.97	0.106	32.6
25.400	88.74	0.075	30.7
19.000	86.01		
9.500	75.99		
4.750	68.53		
2.000	56.97		
0.850	46.28		
0.425	40.04		

Gradation Summary

Gravel%	31.5
Sand%	37.8
Fines%	30.7
D60, mm:	2.6
D30, mm:	-
D10, mm:	-
Cc:	-
Cu:	-

Soil Classification as per USCS (ASTM D2487)

Silty SAND with gravel (SM)



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-182
Sample #:	G01
Depth:	2.0m to 2.5m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	DM
Mass of moist soil + pan (g)	4003.20
Mass of dry soil + pan (g)	3790.30
Mass of pan (g)	772.40
Mass of dry soil (g)	3017.90
Dry mass of washed soil (g)	2925.90
Mass lost in wash (g)	92.00
Water Content (%)	7.1

Summary Parameter

Coarser than Gravel%	23
Gravel%	65
Sand%	9
Fines%	3
D60, mm:	60.63
D30, mm:	21.76
D10, mm:	2.68
Cc:	2.91
Cu:	22.61

Laboratory Information

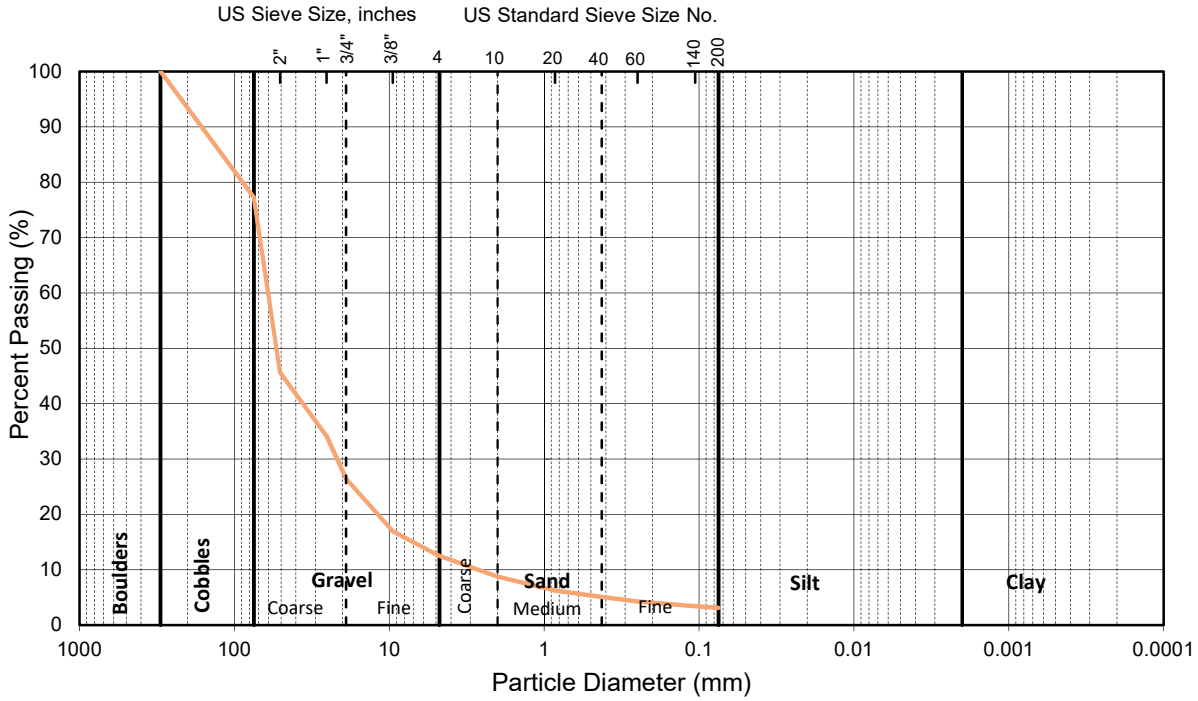
Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-05
Report Date:	2016-10-06

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300		0.00	0.00	100.00
3"	75.0	686.30	22.74	22.74	77.26
2"	50.8	954.00	31.61	54.35	45.65
1"	25.4	349.10	11.57	65.92	34.08
3/4"	19.0	230.80	7.65	73.57	26.43
3/8"	9.50	287.10	9.51	83.08	16.92
No. 4	4.75	132.90	4.40	87.48	12.52
10	2.00	114.80	3.80	91.29	8.71
20	0.85	73.90	2.45	93.74	6.26
40	0.425	35.60	1.18	94.92	5.08
60	0.25	24.80	0.82	95.74	4.26
140	0.106	25.80	0.85	96.59	3.41
200	0.075	8.90	0.29	96.89	3.11
Pan		2.10			
Tot Pan		94.10	3.12	100.01	-0.01

Classification of Soils as per USCS, ASTM designation D 2487-06

Well graded gravel (GP)



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-182
Sample #:	G02
Depth:	1.5m to 1.8m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	K2
Mass of moist soil + pan (g)	4540.80
Mass of dry soil + pan (g)	4208.00
Mass of pan (g)	930.00
Mass of dry soil (g)	3278.00
Dry mass of washed soil (g)	2313.80
Mass lost in wash (g)	964.20
Water Content (%)	10.2

Summary Parameter

Coarser than Gravel%	0
Gravel%	33
Sand%	36
Fines%	30
D60, mm:	2.79
D30, mm:	0.08
D10, mm:	-
Cc:	-
Cu:	-

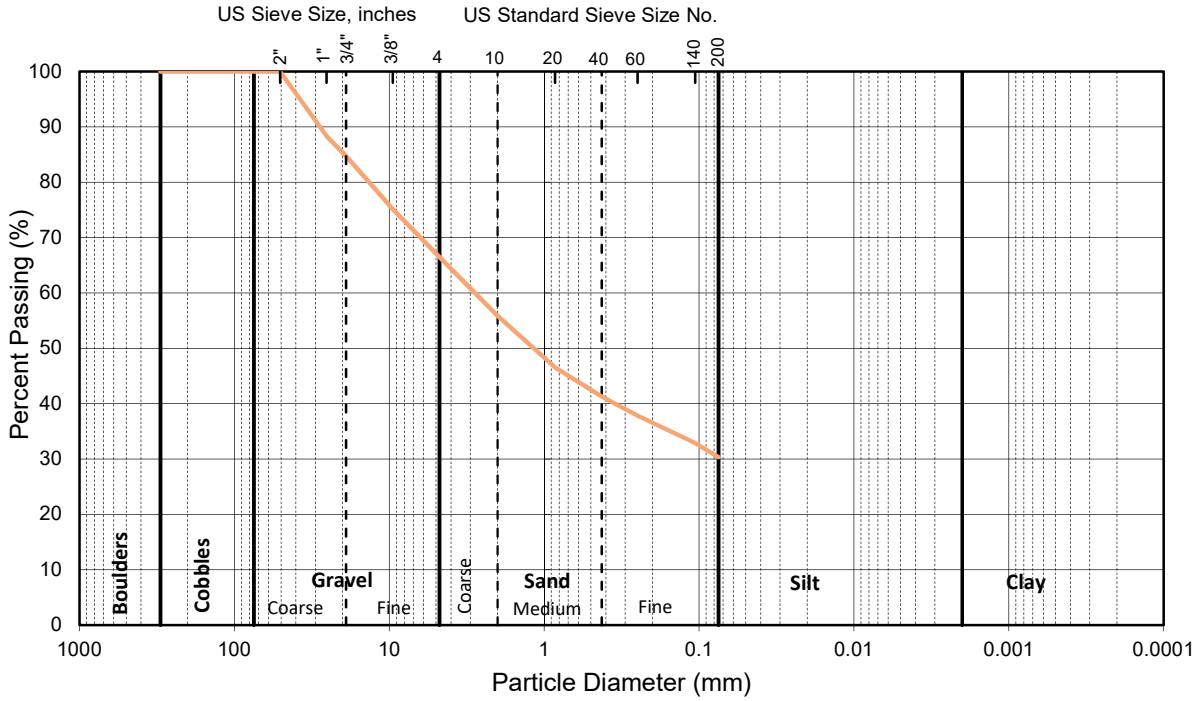
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-06
Report Date:	2016-10-07

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	0.00	0.00	0.00	100.00
1"	25.4	381.80	11.65	11.65	88.35
3/4"	19.0	117.70	3.59	15.24	84.76
3/8"	9.50	316.80	9.66	24.90	75.10
No. 4	4.75	280.60	8.56	33.46	66.54
10	2.00	348.80	10.64	44.10	55.90
20	0.85	306.20	9.34	53.44	46.56
40	0.425	173.90	5.31	58.75	41.25
60	0.25	111.50	3.40	62.15	37.85
140	0.106	163.20	4.98	67.13	32.87
200	0.075	83.40	2.54	69.67	30.33
Pan		30.10			
Tot Pan		994.30	30.33	100.01	-0.01

Classification of Soils as per USCS, ASTM designation D 2487-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-183
Sample #:	G01
Depth:	0.7m to 1.5m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	BT2
Mass of moist soil + pan (g)	4253.50
Mass of dry soil + pan (g)	3943.50
Mass of pan (g)	933.30
Mass of dry soil (g)	3010.20
Dry mass of washed soil (g)	2563.00
Mass lost in wash (g)	447.20
Water Content (%)	10.3

Summary Parameter

Coarser than Gravel%	0
Gravel%	51
Sand%	34
Fines%	15
D60, mm:	8.25
D30, mm:	1.13
D10, mm:	Assume 0.01
Cc:	15.48 -
Cu:	0.0825 -

Laboratory Information

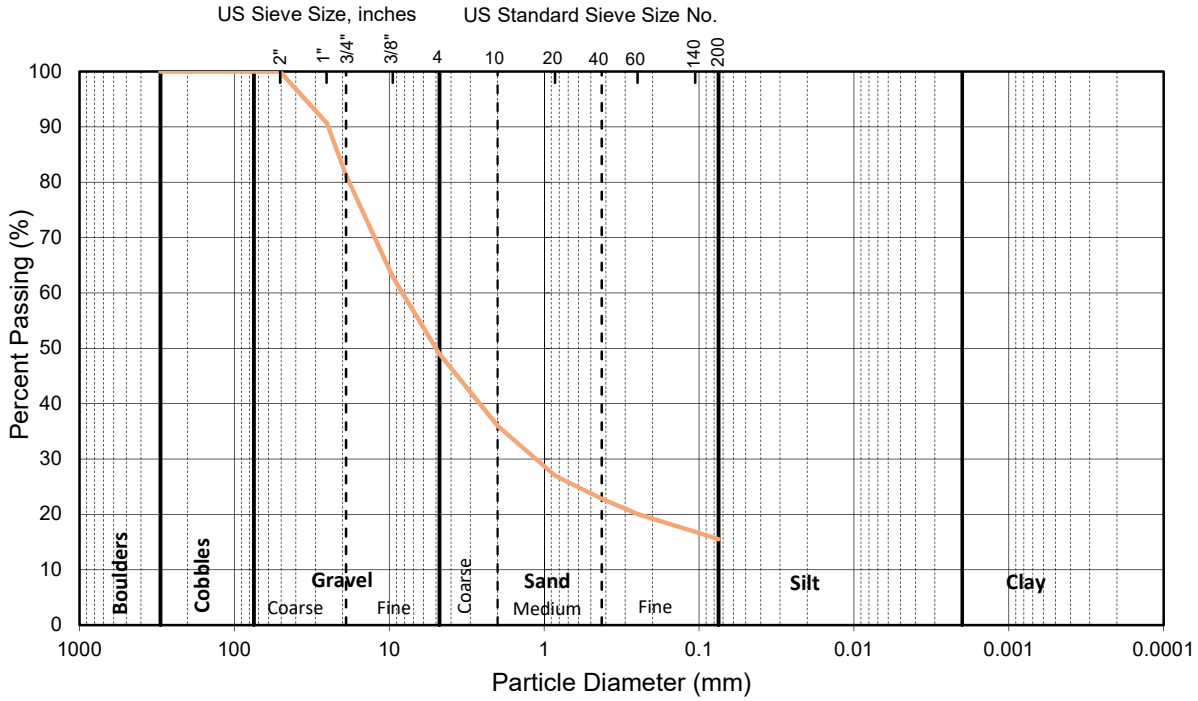
Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-05
Report Date:	2016-10-06

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	0.00	0.00	0.00	100.00
1"	25.4	279.00	9.27	9.27	90.73
3/4"	19.0	287.50	9.55	18.82	81.18
3/8"	9.50	552.80	18.36	37.18	62.82
No. 4	4.75	415.40	13.80	50.98	49.02
10	2.00	391.70	13.01	64.00	36.00
20	0.85	270.50	8.99	72.98	27.02
40	0.425	125.20	4.16	77.14	22.86
60	0.25	84.60	2.81	79.95	20.05
140	0.106	96.40	3.20	83.15	16.85
200	0.075	40.80	1.36	84.51	15.49
Pan		18.70			
Tot Pan		465.90	15.48	99.99	0.01

Classification of Soils as per USCS, ASTM designation D 2487-06

GM



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-183
Sample #:	G02
Depth:	1.5m to 1.8m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	DM
Mass of moist soil + pan (g)	2898.20
Mass of dry soil + pan (g)	2620.90
Mass of pan (g)	772.60
Mass of dry soil (g)	1848.30
Dry mass of washed soil (g)	1055.00
Mass lost in wash (g)	793.30
Water Content (%)	15.0

Summary Parameter

Coarser than Gravel%	0
Gravel%	25
Sand%	32
Fines%	43
D60, mm:	1.02
D30, mm:	-
D10, mm:	-
Cc:	-
Cu:	-

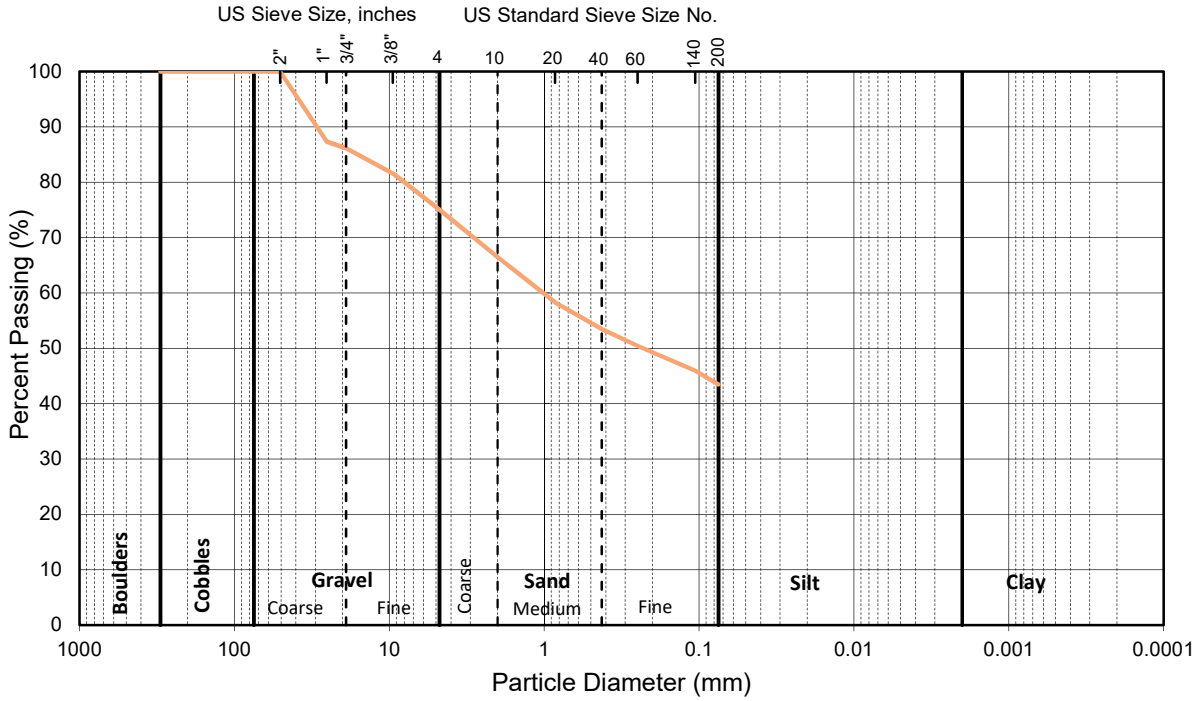
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-13
Report Date:	2016-10-14

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	0.00	0.00	0.00	100.00
1"	25.4	234.00	12.66	12.66	87.34
3/4"	19.0	22.10	1.20	13.86	86.14
3/8"	9.50	85.20	4.61	18.47	81.53
No. 4	4.75	120.40	6.51	24.98	75.02
10	2.00	158.20	8.56	33.54	66.46
20	0.85	151.40	8.19	41.73	58.27
40	0.425	88.30	4.78	46.51	53.49
60	0.25	56.40	3.05	49.56	50.44
140	0.106	82.90	4.49	54.04	45.96
200	0.075	45.70	2.47	56.52	43.48
Pan		10.30			
Tot Pan		803.60	43.48	99.99	0.01

Classification of Soils as per USCS, ASTM designation D 2487-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-184
Sample #:	G01
Depth:	0.15m to 0.35m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	BT1
Mass of moist soil + pan (g)	3832.20
Mass of dry soil + pan (g)	3488.70
Mass of pan (g)	783.70
Mass of dry soil (g)	2705.00
Dry mass of washed soil (g)	2271.10
Mass lost in wash (g)	433.90
Water Content (%)	12.7

Summary Parameter

Coarser than Gravel%	0
Gravel%	47
Sand%	35
Fines%	17
D60, mm:	7.84
D30, mm:	0.69
D10, mm:	Assume 0.02 -
Cc:	3.04 -
Cu:	392 -

Poorly graded

Laboratory Information

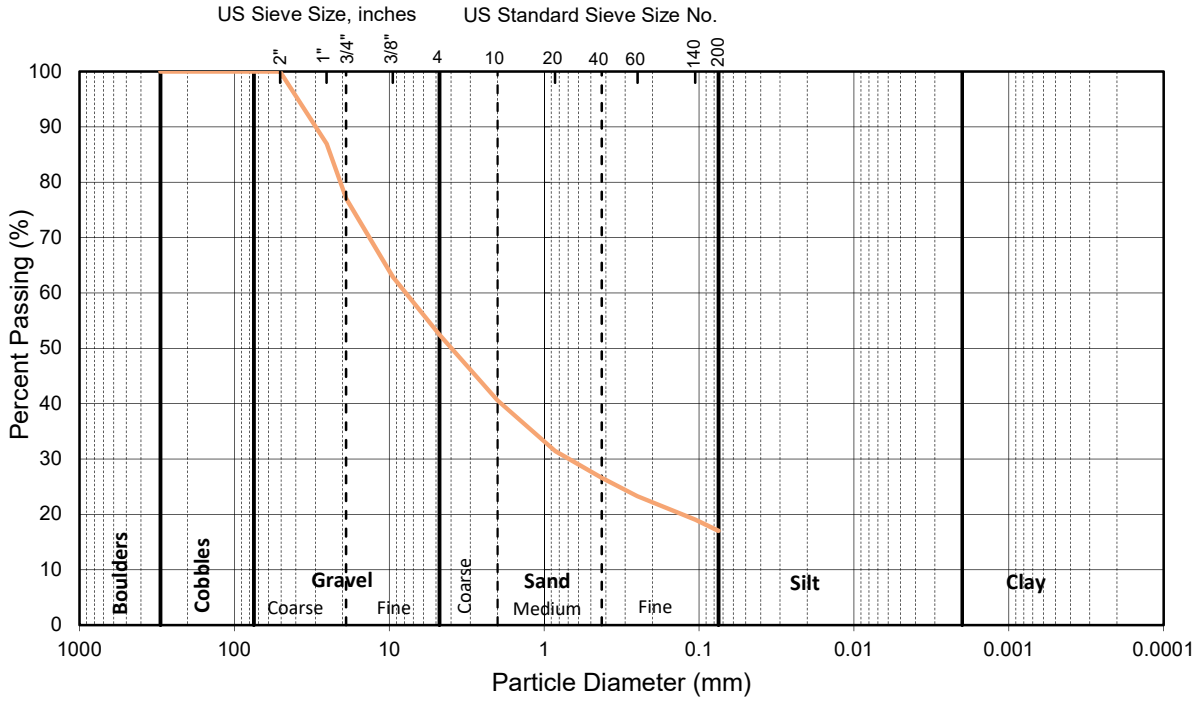
Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-05
Report Date:	2016-10-06

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	0.00	0.00	0.00	100.00
1"	25.4	352.60	13.04	13.04	86.96
3/4"	19.0	268.80	9.94	22.97	77.03
3/8"	9.50	383.10	14.16	37.13	62.87
No. 4	4.75	280.10	10.35	47.49	52.51
10	2.00	323.20	11.95	59.44	40.56
20	0.85	247.00	9.13	68.57	31.43
40	0.425	131.60	4.87	73.43	26.57
60	0.25	88.90	3.29	76.72	23.28
140	0.106	115.70	4.28	81.00	19.00
200	0.075	53.40	1.97	82.97	17.03
Pan		25.60			
Tot Pan		459.50	16.99	99.96	0.04

Classification of Soils as per USCS, ASTM designation D 2487-06

GM



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-187
Sample #:	G02
Depth:	0.7m to 1.4m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	BT3
Mass of moist soil + pan (g)	3726.70
Mass of dry soil + pan (g)	3342.80
Mass of pan (g)	782.10
Mass of dry soil (g)	2560.70
Dry mass of washed soil (g)	1744.30
Mass lost in wash (g)	816.40
Water Content (%)	15.0

Summary Parameter

Coarser than Gravel%	0
Gravel%	31
Sand%	36
Fines%	32
D60, mm:	2.51
D30, mm:	-
D10, mm:	-
Cc:	-
Cu:	-

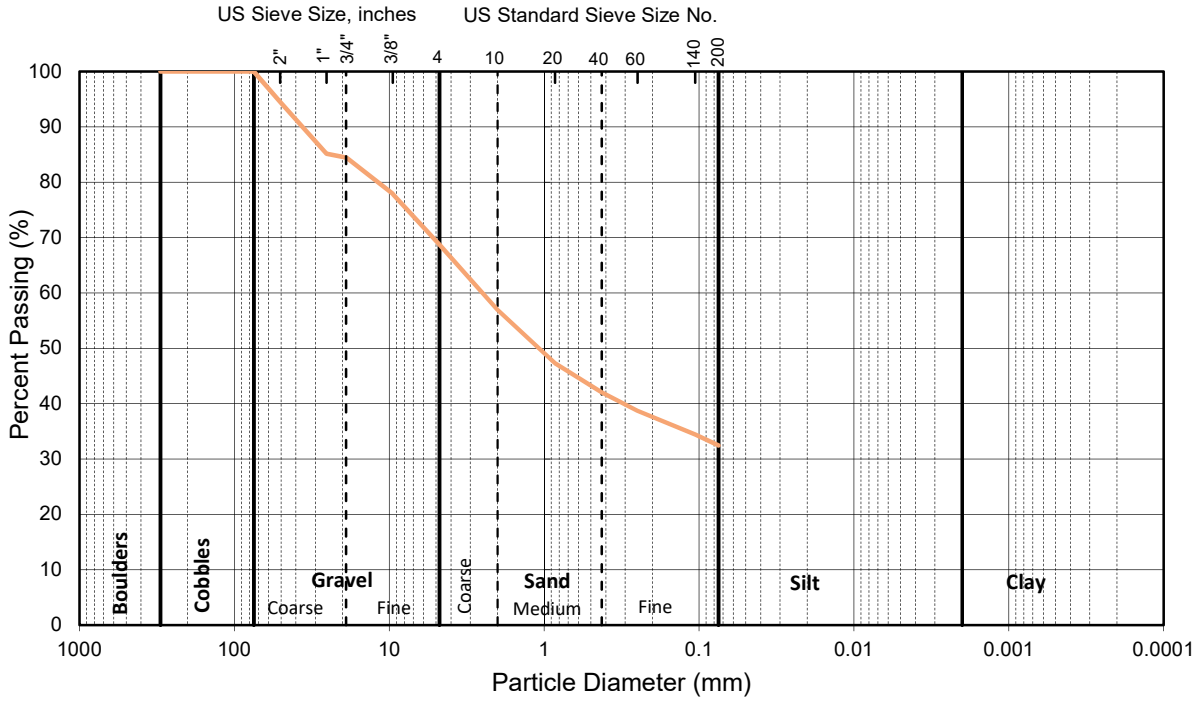
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-13
Report Date:	2016-10-14

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	141.00	5.51	5.51	94.49
1"	25.4	238.70	9.32	14.83	85.17
3/4"	19.0	19.00	0.74	15.57	84.43
3/8"	9.50	168.20	6.57	22.14	77.86
No. 4	4.75	232.70	9.09	31.23	68.77
10	2.00	303.80	11.86	43.09	56.91
20	0.85	246.50	9.63	52.72	47.28
40	0.425	135.10	5.28	57.99	42.01
60	0.25	83.60	3.26	61.26	38.74
140	0.106	110.70	4.32	65.58	34.42
200	0.075	50.70	1.98	67.56	32.44
Pan		16.50			
Tot Pan		832.90	32.53	100.09	-0.09

Classification of Soils as per USCS, ASTM designation D 2487-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-189
Sample #:	G02
Depth:	3.8m to 4.6m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	BT3
Mass of moist soil + pan (g)	5201.10
Mass of dry soil + pan (g)	4723.30
Mass of pan (g)	781.90
Mass of dry soil (g)	3941.40
Dry mass of washed soil (g)	2502.00
Mass lost in wash (g)	1439.40
Water Content (%)	12.1

Summary Parameter

Coarser than Gravel%	0
Gravel%	44
Sand%	19
Fines%	37
D60, mm:	6.65
D30, mm:	-
D10, mm:	-
Cc:	-
Cu:	-

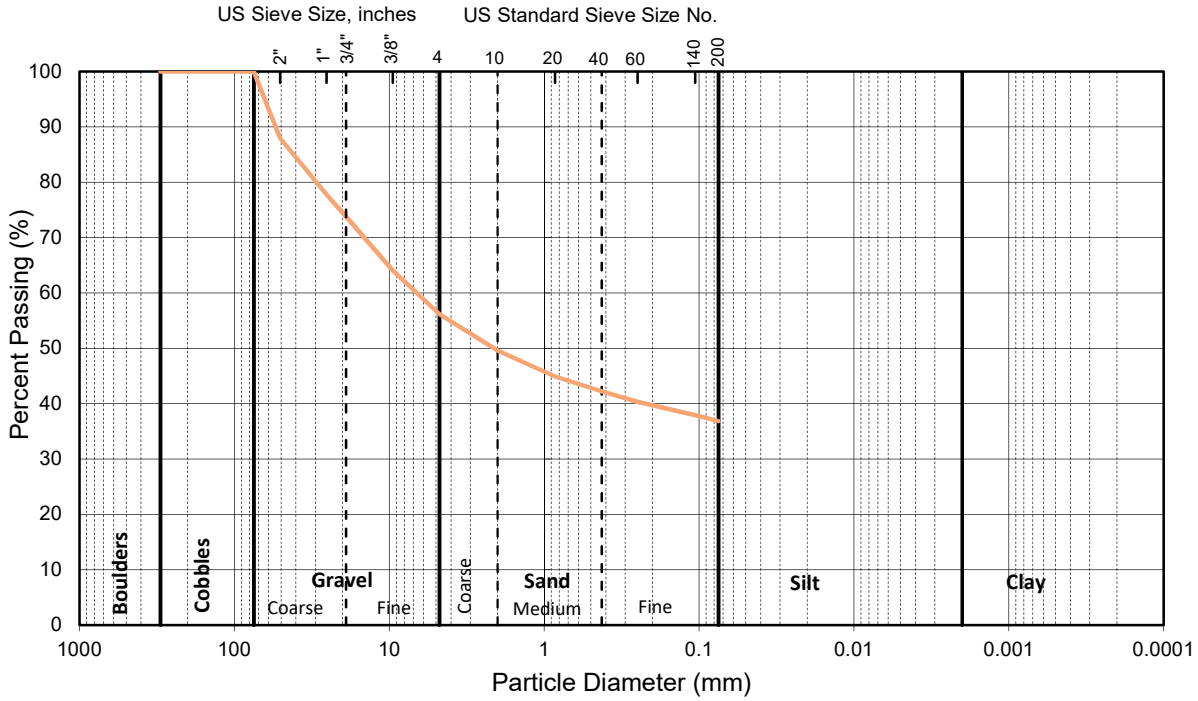
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-05
Report Date:	2016-10-06

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	472.70	11.99	11.99	88.01
1"	25.4	404.90	10.27	22.27	77.73
3/4"	19.0	155.70	3.95	26.22	73.78
3/8"	9.50	384.90	9.77	35.98	64.02
No. 4	4.75	308.20	7.82	43.80	56.20
10	2.00	260.10	6.60	50.40	49.60
20	0.85	184.20	4.67	55.07	44.93
40	0.425	107.20	2.72	57.79	42.21
60	0.25	72.90	1.85	59.64	40.36
140	0.106	96.80	2.46	62.10	37.90
200	0.075	42.20	1.07	63.17	36.83
Pan		11.70			
Tot Pan		1451.10	36.82	99.99	0.01

Classification of Soils as per USCS, ASTM designation D 2487-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-191
Sample #:	G01
Depth:	0.25m to 1.1m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	R1
Mass of moist soil + pan (g)	4095.10
Mass of dry soil + pan (g)	3902.50
Mass of pan (g)	765.70
Mass of dry soil (g)	3136.80
Dry mass of washed soil (g)	2954.80
Mass lost in wash (g)	182.00
Water Content (%)	6.1

Summary Parameter

Coarser than Gravel%	0
Gravel%	76
Sand%	17
Fines%	7
D60, mm:	36.36
D30, mm:	10.01
D10, mm:	0.31
Cc:	8.86
Cu:	116.84

Laboratory Information

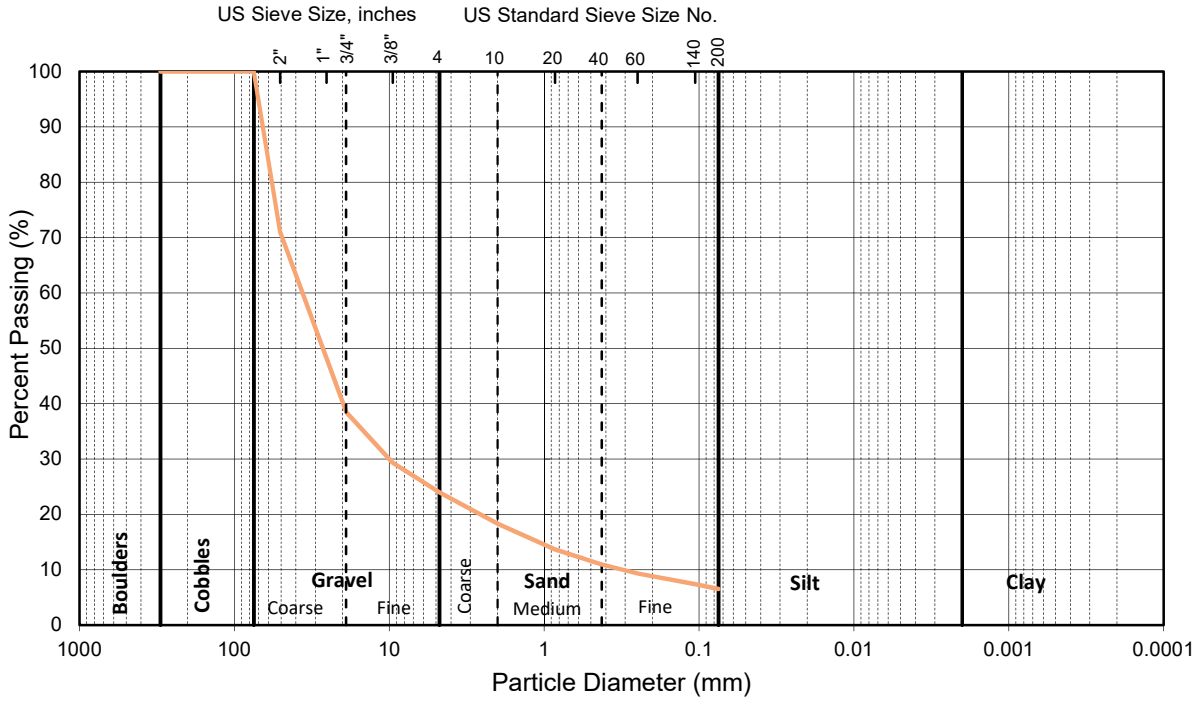
Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-05
Report Date:	2016-10-06

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	905.80	28.88	28.88	71.12
1"	25.4	723.20	23.06	51.93	48.07
3/4"	19.0	299.40	9.54	61.48	38.52
3/8"	9.50	289.20	9.22	70.70	29.30
No. 4	4.75	167.50	5.34	76.04	23.96
10	2.00	176.00	5.61	81.65	18.35
20	0.85	148.40	4.73	86.38	13.62
40	0.425	83.90	2.67	89.05	10.95
60	0.25	50.60	1.61	90.67	9.33
140	0.106	60.50	1.93	92.59	7.41
200	0.075	28.00	0.89	93.49	6.51
Pan		21.70			
Tot Pan		203.70	6.49	99.98	0.02

Classification of Soils as per USCS, ASTM designation D 2487-06

GP-GM



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-193
Sample #:	G02
Depth:	3.5m to 5.5m
Sample type:	Grab
Sampled by:	BGC
Laboratory Comments/Observations	

Testing Information

Pan ID	K7E1
Mass of moist soil + pan (g)	21330.60
Mass of dry soil + pan (g)	20713.60
Mass of pan (g)	1569.10
Mass of dry soil (g)	19144.50
Dry mass of washed soil (g)	18945.80
Mass lost in wash (g)	198.70
Water Content (%)	3.2

Summary Parameter

Coarser than Gravel%	5
Gravel%	92
Sand%	2
Fines%	1
D60, mm:	45.20
D30, mm:	30.05
D10, mm:	19.78
Cc:	1.01
Cu:	2.28

Laboratory Information

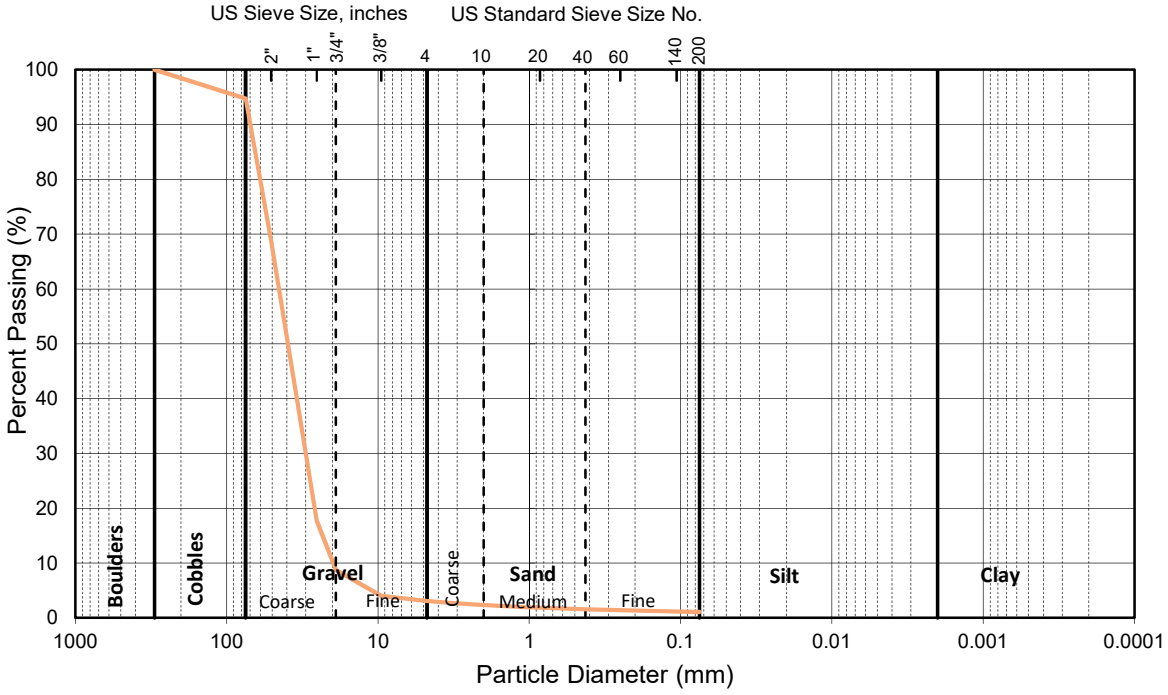
Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-05
Report Date:	2016-10-06

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300		0.00	0.00	100.00
3"	75.0	1009.30	5.27	5.27	94.73
2"	50.8	5007.50	26.16	31.43	68.57
1"	25.4	9746.10	50.91	82.34	17.66
3/4"	19.0	1704.70	8.90	91.24	8.76
3/8"	9.50	904.20	4.72	95.96	4.04
No. 4	4.75	185.40	0.97	96.93	3.07
10	2.00	137.80	0.72	97.65	2.35
20	0.85	91.90	0.48	98.13	1.87
40	0.425	55.30	0.29	98.42	1.58
60	0.25	39.20	0.20	98.63	1.37
140	0.106	46.00	0.24	98.87	1.13
200	0.075	13.50	0.07	98.94	1.06
Pan		2.00			
Tot Pan		200.70	1.05	99.98	0.02

Classification of Soils as per USCS, ASTM designation D 2487-06

Poorly graded GRAVEL (GP)



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-194
Sample #:	G01
Depth:	0.2m to 2.5m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	BT2
Mass of moist soil + pan (g)	5453.30
Mass of dry soil + pan (g)	5022.20
Mass of pan (g)	933.20
Mass of dry soil (g)	4089.00
Dry mass of washed soil (g)	2808.95
Mass lost in wash (g)	1280.05
Water Content (%)	10.5

Summary Parameter

Coarser than Gravel%	0
Gravel%	27
Sand%	41
Fines%	32
D60, mm:	2.06
D30, mm:	-
D10, mm:	-
Cc:	-
Cu:	-

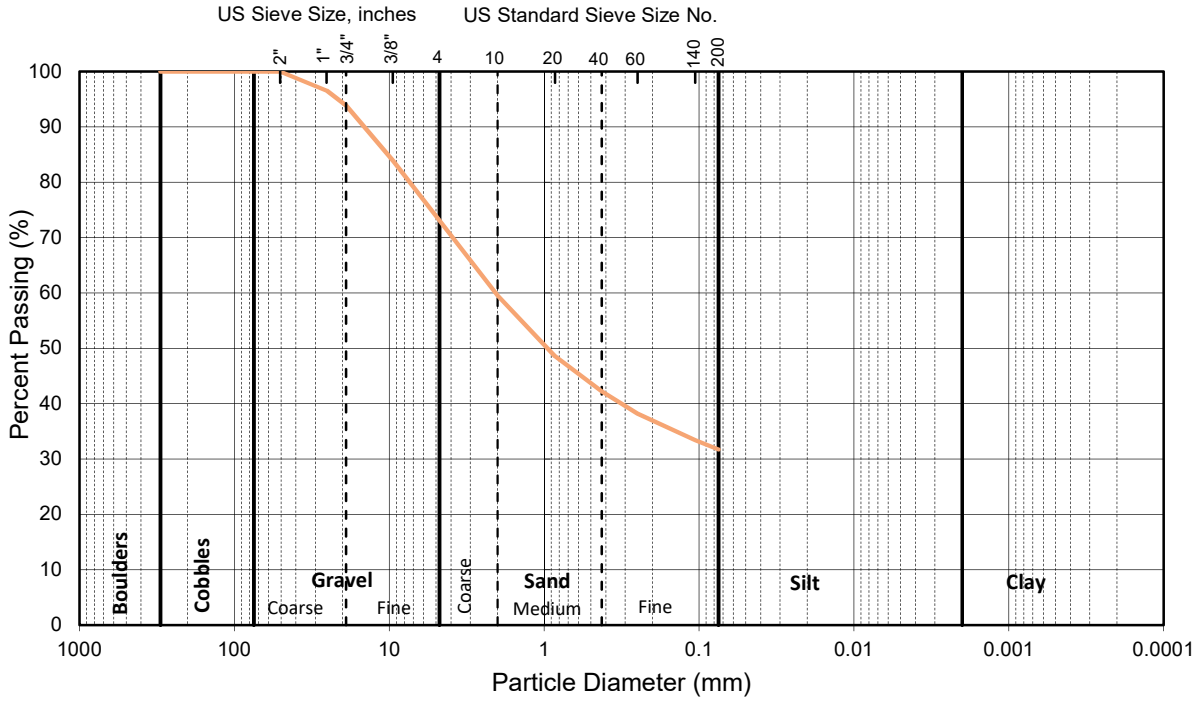
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-13
Report Date:	2016-10-14

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	0.00	0.00	0.00	100.00
1"	25.4	142.40	3.48	3.48	96.52
3/4"	19.0	111.10	2.72	6.20	93.80
3/8"	9.50	406.20	9.93	16.13	83.87
No. 4	4.75	439.90	10.76	26.89	73.11
10	2.00	554.10	13.55	40.44	59.56
20	0.85	450.50	11.02	51.46	48.54
40	0.425	258.20	6.31	57.77	42.23
60	0.25	163.10	3.99	61.76	38.24
140	0.106	197.70	4.83	66.60	33.40
200	0.075	68.60	1.68	68.28	31.72
Pan		18.00			
Tot Pan		1298.05	31.74	100.02	-0.02

Classification of Soils as per USCS, ASTM designation D 2487-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-195
Sample #:	G01
Depth:	0.2m to 1.5m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	K7
Mass of moist soil + pan (g)	5069.80
Mass of dry soil + pan (g)	4732.00
Mass of pan (g)	783.30
Mass of dry soil (g)	3948.70
Dry mass of washed soil (g)	2958.88
Mass lost in wash (g)	989.82
Water Content (%)	8.6

Summary Parameter

Coarser than Gravel%	0
Gravel%	40
Sand%	34
Fines%	25
D60, mm:	4.78
D30, mm:	0.18
D10, mm:	-
Cc:	-
Cu:	-

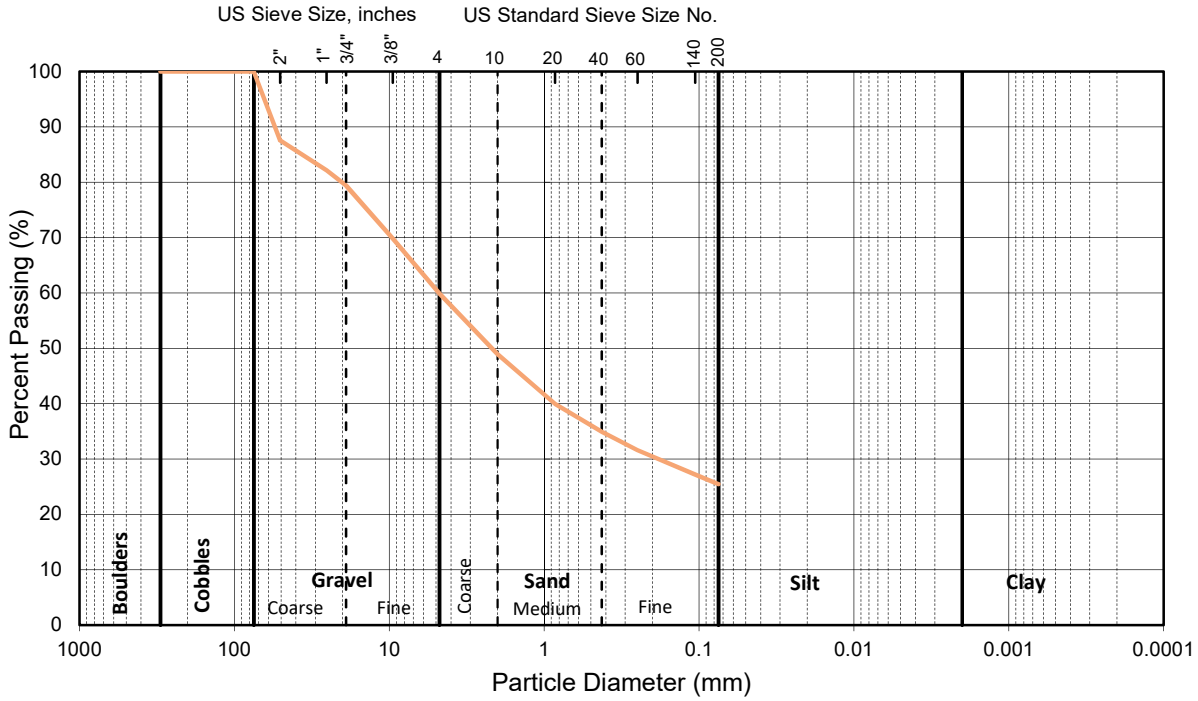
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-14
Report Date:	2016-10-17

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	490.90	12.43	12.43	87.57
1"	25.4	214.00	5.42	17.85	82.15
3/4"	19.0	110.30	2.79	20.64	79.36
3/8"	9.50	377.30	9.56	30.20	69.80
No. 4	4.75	390.70	9.89	40.09	59.91
10	2.00	431.20	10.92	51.01	48.99
20	0.85	356.10	9.02	60.03	39.97
40	0.425	199.60	5.05	65.09	34.91
60	0.25	129.70	3.28	68.37	31.63
140	0.106	176.80	4.48	72.85	27.15
200	0.075	66.70	1.69	74.54	25.46
Pan		16.10			
Tot Pan		1005.92	25.47	100.01	-0.01

Classification of Soils as per USCS, ASTM designation D 2487-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-196
Sample #:	G01
Depth:	0.0m to 1.75m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	KJ1
Mass of moist soil + pan (g)	5164.30
Mass of dry soil + pan (g)	4736.10
Mass of pan (g)	789.00
Mass of dry soil (g)	3947.10
Dry mass of washed soil (g)	2930.36
Mass lost in wash (g)	1016.74
Water Content (%)	10.8

Summary Parameter

Coarser than Gravel%	0
Gravel%	42
Sand%	32
Fines%	26
D60, mm:	5.35
D30, mm:	0.17
D10, mm:	-
Cc:	-
Cu:	-

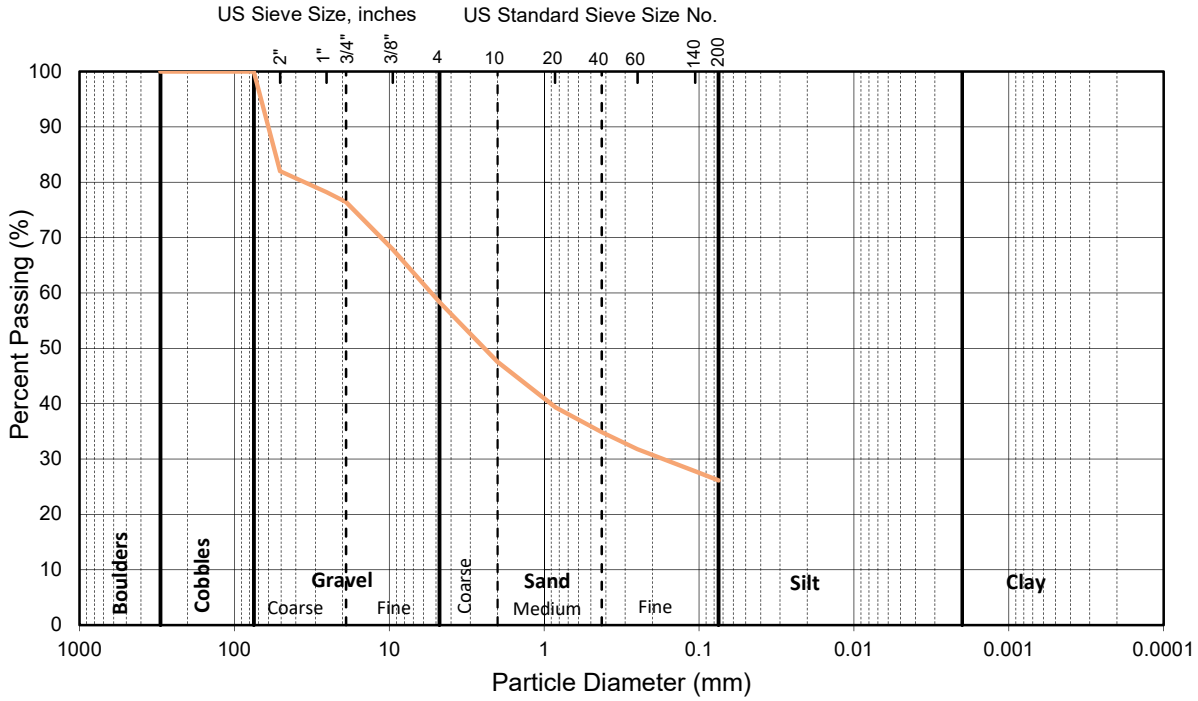
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-13
Report Date:	2016-10-14

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	709.00	17.96	17.96	82.04
1"	25.4	150.50	3.81	21.78	78.22
3/4"	19.0	72.30	1.83	23.61	76.39
3/8"	9.50	336.00	8.51	32.12	67.88
No. 4	4.75	375.20	9.51	41.63	58.37
10	2.00	425.40	10.78	52.40	47.60
20	0.85	324.60	8.22	60.63	39.37
40	0.425	179.20	4.54	65.17	34.83
60	0.25	119.90	3.04	68.20	31.80
140	0.106	159.80	4.05	72.25	27.75
200	0.075	64.00	1.62	73.87	26.13
Pan		16.00			
Tot Pan		1032.74	26.16	100.04	-0.04

Classification of Soils as per USCS, ASTM designation D 2487-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-197
Sample #:	G01
Depth:	0.15m to 1.5m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	R1
Mass of moist soil + pan (g)	4972.30
Mass of dry soil + pan (g)	4734.80
Mass of pan (g)	766.00
Mass of dry soil (g)	3968.80
Dry mass of washed soil (g)	3597.00
Mass lost in wash (g)	371.80
Water Content (%)	6.0

Summary Parameter

Coarser than Gravel%	0
Gravel%	75
Sand%	15
Fines%	10
D60, mm:	36.83
D30, mm:	7.77
D10, mm:	0.08
Cc:	19.34
Cu:	435.04

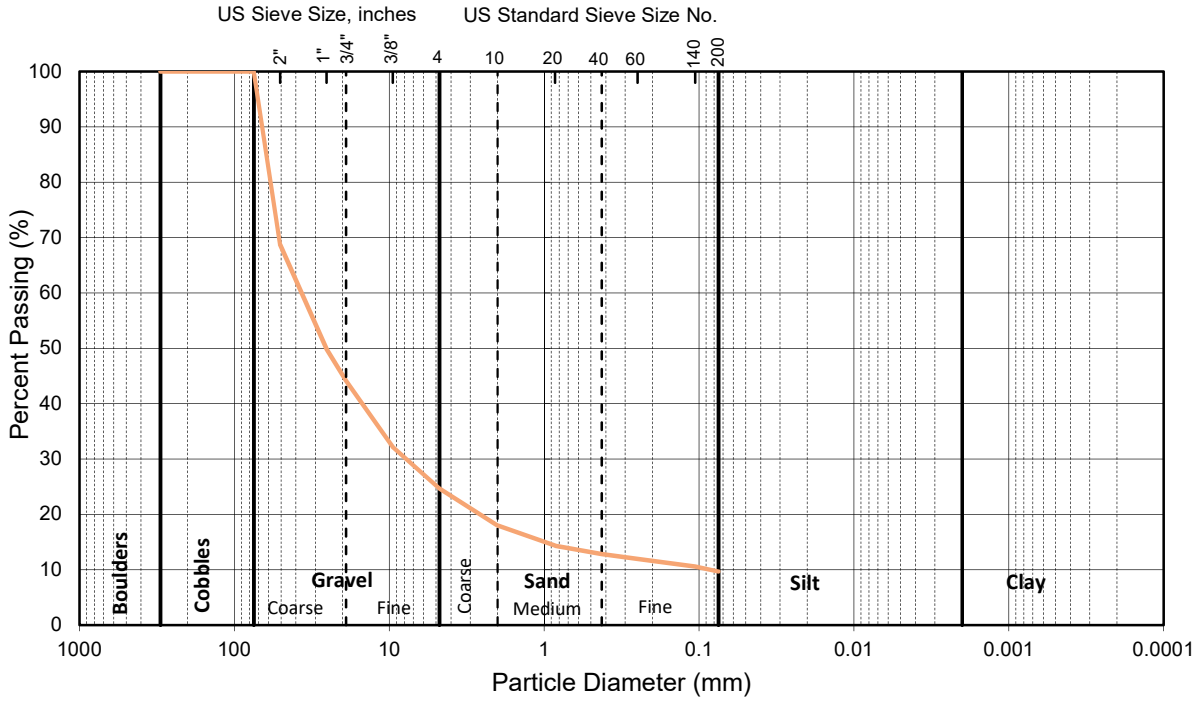
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-13
Report Date:	2016-10-14

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300		0.00	0.00	100.00
3"	75.0		0.00	0.00	100.00
2"	50.8	1238.50	31.21	31.21	68.79
1"	25.4	752.60	18.96	50.17	49.83
3/4"	19.0	227.60	5.73	55.90	44.10
3/8"	9.50	473.30	11.93	67.83	32.17
No. 4	4.75	296.30	7.47	75.29	24.71
10	2.00	267.50	6.74	82.03	17.97
20	0.85	144.30	3.64	85.67	14.33
40	0.425	58.10	1.46	87.13	12.87
60	0.25	34.70	0.87	88.01	11.99
140	0.106	55.90	1.41	89.42	10.58
200	0.075	35.60	0.90	90.31	9.69
Pan		12.20			
Tot Pan		384.00	9.68	99.99	0.01

Classification of Soils as per USCS, ASTM designation D 2487-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-198
Sample #:	G02
Depth:	2.0m to 5.0m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	E1
Mass of moist soil + pan (g)	4798.40
Mass of dry soil + pan (g)	4333.40
Mass of pan (g)	786.10
Mass of dry soil (g)	3547.30
Dry mass of washed soil (g)	2371.40
Mass lost in wash (g)	1175.90
Water Content (%)	13.1

Summary Parameter

Coarser than Gravel%	0
Gravel%	34
Sand%	32
Fines%	33
D60, mm:	2.82
D30, mm:	-
D10, mm:	-
Cc:	-
Cu:	-

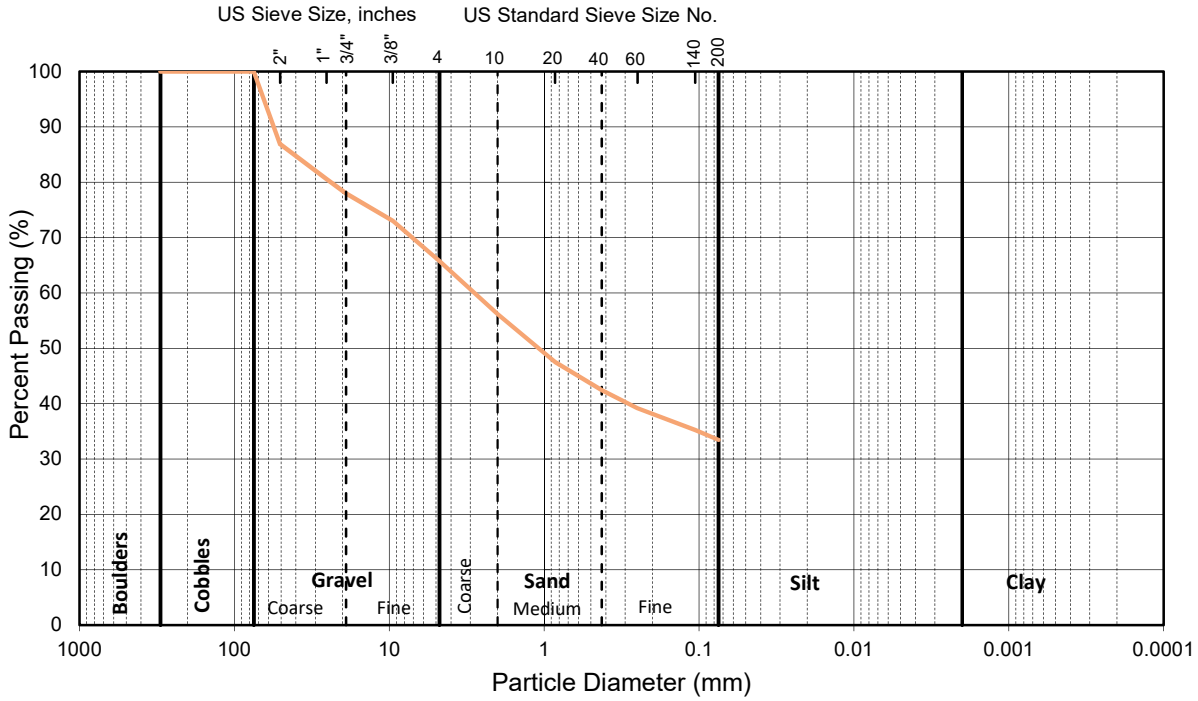
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-13
Report Date:	2016-10-14

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	466.30	13.15	13.15	86.85
1"	25.4	224.00	6.31	19.46	80.54
3/4"	19.0	91.60	2.58	22.04	77.96
3/8"	9.50	176.60	4.98	27.02	72.98
No. 4	4.75	254.60	7.18	34.20	65.80
10	2.00	341.20	9.62	43.82	56.18
20	0.85	307.30	8.66	52.48	47.52
40	0.425	180.80	5.10	57.58	42.42
60	0.25	113.60	3.20	60.78	39.22
140	0.106	142.20	4.01	64.79	35.21
200	0.075	62.00	1.75	66.54	33.46
Pan		13.00			
Tot Pan		1188.90	33.52	100.05	-0.05

Classification of Soils as per USCS, ASTM designation D 2487-06



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-199
Sample #:	G02
Depth:	1.2m to 2.5m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	K6
Mass of moist soil + pan (g)	4875.70
Mass of dry soil + pan (g)	4270.40
Mass of pan (g)	922.40
Mass of dry soil (g)	3348.00
Dry mass of washed soil (g)	2598.50
Mass lost in wash (g)	749.50
Water Content (%)	18.1

Summary Parameter

Coarser than Gravel%	0
Gravel%	43
Sand%	34
Fines%	23
D60, mm:	5.74
D30, mm:	0.34
D10, mm:	Assume 0.005
Cc:	4.03 -
Cu:	1148 -

Laboratory Information

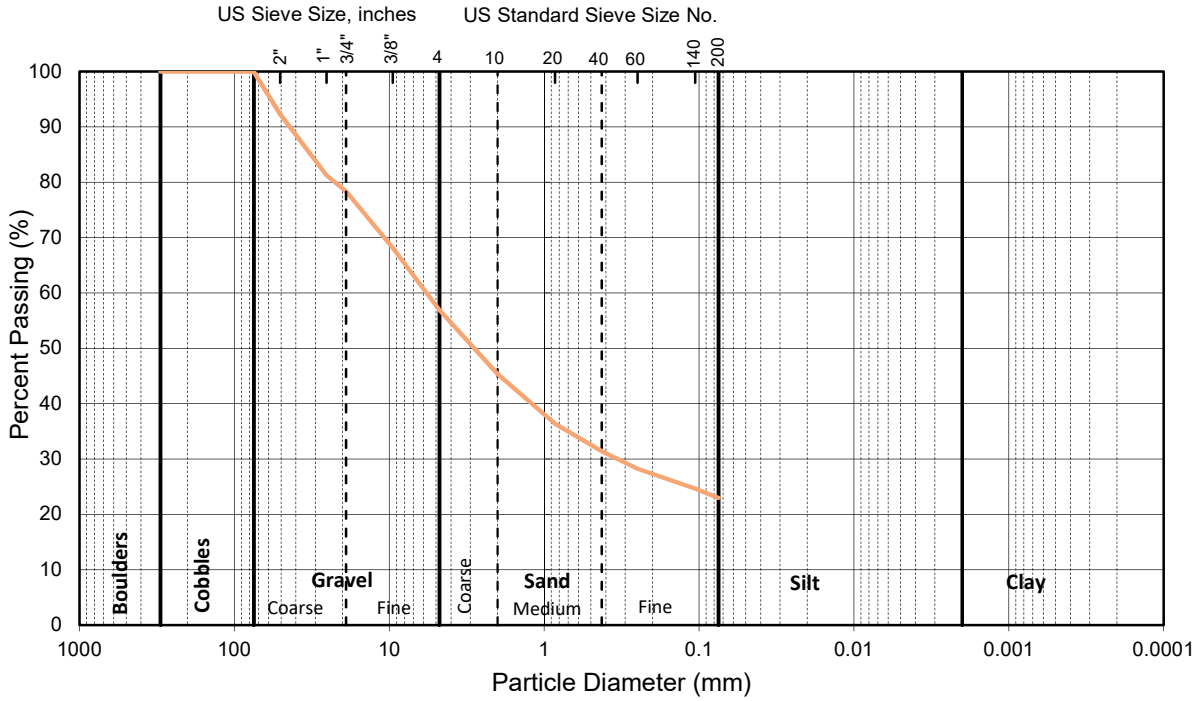
Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-06
Report Date:	2016-10-07

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	254.60	7.60	7.60	92.40
1"	25.4	374.90	11.20	18.80	81.20
3/4"	19.0	95.60	2.86	21.66	78.34
3/8"	9.50	342.70	10.24	31.89	68.11
No. 4	4.75	373.10	11.14	43.04	56.96
10	2.00	387.30	11.57	54.61	45.39
20	0.85	302.20	9.03	63.63	36.37
40	0.425	166.70	4.98	68.61	31.39
60	0.25	104.10	3.11	71.72	28.28
140	0.106	123.20	3.68	75.40	24.60
200	0.075	53.90	1.61	77.01	22.99
Pan		20.90			
Tot Pan		770.40	23.01	100.02	-0.02

Classification of Soils as per USCS, ASTM designation D 2487-06

GM, assuming fines are M



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-200
Sample #:	G02
Depth:	1.5m to 2.3m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	K3
Mass of moist soil + pan (g)	4838.50
Mass of dry soil + pan (g)	4529.80
Mass of pan (g)	783.10
Mass of dry soil (g)	3746.70
Dry mass of washed soil (g)	3486.80
Mass lost in wash (g)	259.90
Water Content (%)	8.2

Summary Parameter

Coarser than Gravel%	0
Gravel%	51
Sand%	42
Fines%	7
D60, mm:	11.51
D30, mm:	0.93
D10, mm:	0.14
Cc:	0.54
Cu:	83.15

Laboratory Information

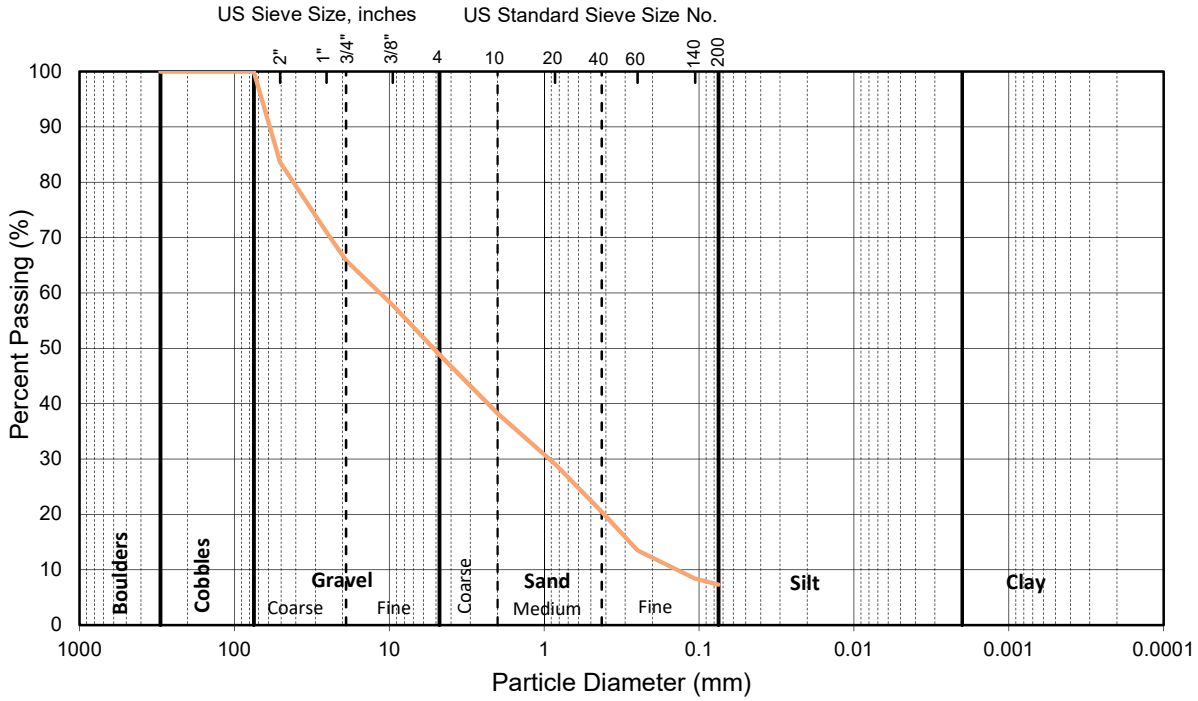
Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-06
Report Date:	2016-10-07

Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	612.50	16.35	16.35	83.65
1"	25.4	477.80	12.75	29.10	70.90
3/4"	19.0	190.10	5.07	34.17	65.83
3/8"	9.50	301.90	8.06	42.23	57.77
No. 4	4.75	331.40	8.85	51.08	48.92
10	2.00	399.50	10.66	61.74	38.26
20	0.85	344.90	9.21	70.95	29.05
40	0.425	320.70	8.56	79.50	20.50
60	0.25	260.20	6.94	86.45	13.55
140	0.106	193.10	5.15	91.60	8.40
200	0.075	40.80	1.09	92.69	7.31
Pan		13.30			
Tot Pan		273.20	7.29	99.98	0.02

Classification of Soils as per USCS, ASTM designation D 2487-06

GP-GM, assuming fines are M



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PARTICLE SIZE ANALYSIS
ASTM D-6913 Method A

Project Information

Project Name:	Eagle Gold
Project Number:	0792-016
Client Name:	Victoria Gold Corp.

Sample Information

Borehole/Test Pit:	TP-BGC16-201
Sample #:	G01
Depth:	0.2m to 0.85m
Sample type:	Grab
Sampled by:	BGC

Laboratory Comments/Observations

Testing Information

Pan ID	K5
Mass of moist soil + pan (g)	4915.80
Mass of dry soil + pan (g)	4476.30
Mass of pan (g)	773.50
Mass of dry soil (g)	3702.80
Dry mass of washed soil (g)	2863.30
Mass lost in wash (g)	839.50
Water Content (%)	11.9

Summary Parameter

Coarser than Gravel%	0
Gravel%	35
Sand%	42
Fines%	23
D60, mm:	3.48
D30, mm:	0.28
D10, mm:	-
Cc:	-
Cu:	-

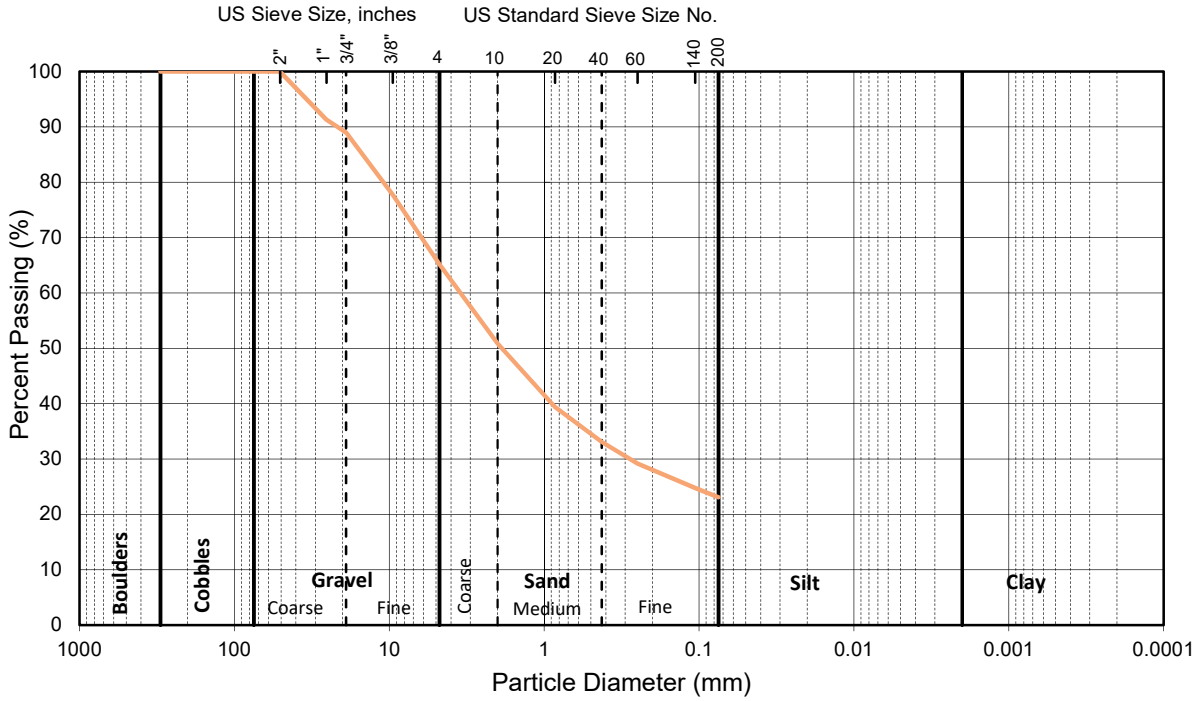
Laboratory Information

Lab Name:	BGC Fredericton
Tested By:	D. Oldford
Reviewed By:	S. Dickinson
Test Date:	2016-10-06
Report Date:	2016-10-07

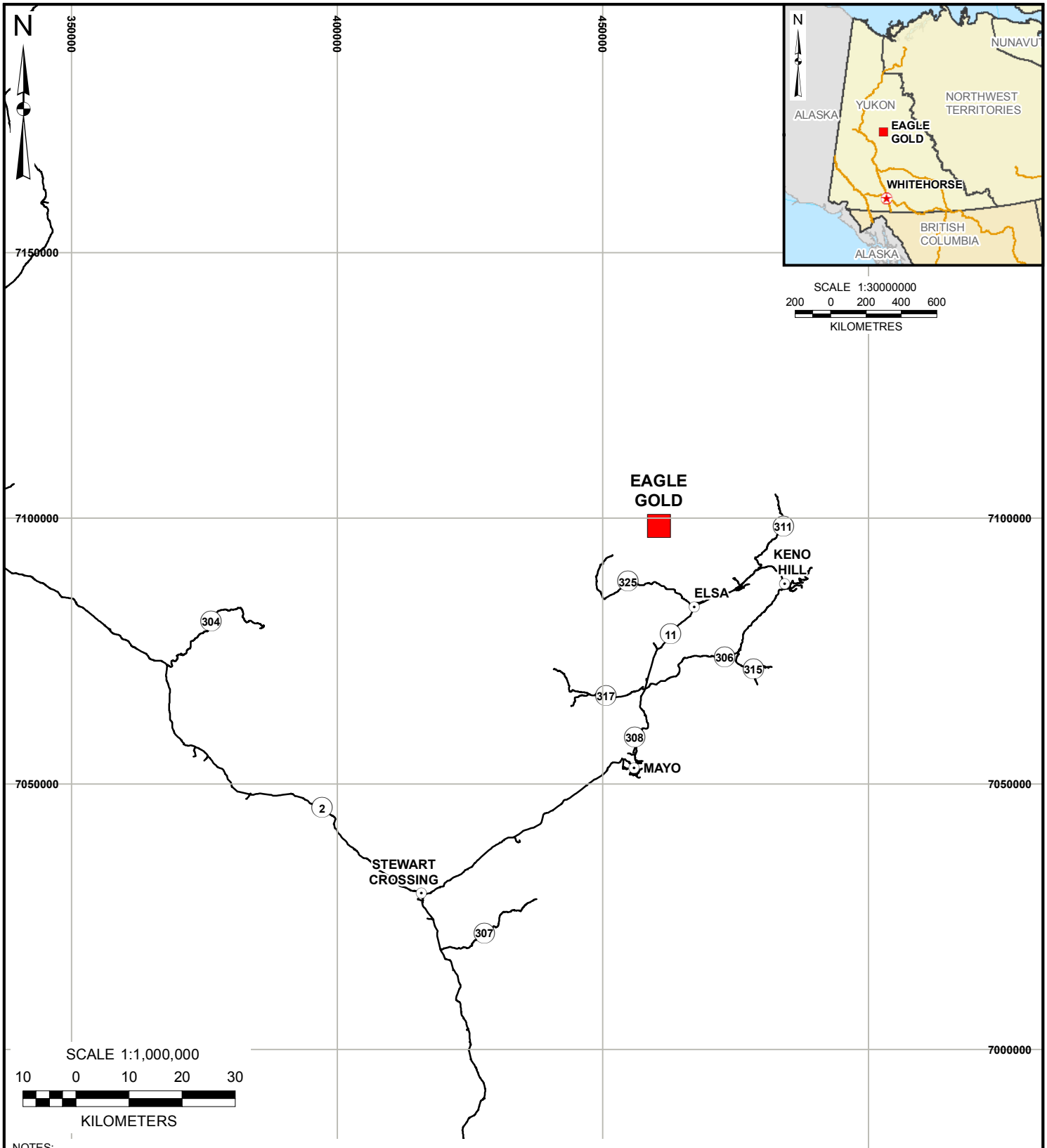
Preparation Method: Oven Dry [x] Air Dry [ ]

Screen	(mm)	Wt Ret	% Ret	Cum % Ret	% Pass
12"	300	0.00	0.00	0.00	100.00
3"	75.0	0.00	0.00	0.00	100.00
2"	50.8	0.00	0.00	0.00	100.00
1"	25.4	322.90	8.72	8.72	91.28
3/4"	19.0	86.60	2.34	11.06	88.94
3/8"	9.50	415.70	11.23	22.29	77.71
No. 4	4.75	464.20	12.54	34.82	65.18
10	2.00	530.60	14.33	49.15	50.85
20	0.85	426.00	11.50	60.66	39.34
40	0.425	232.10	6.27	66.93	33.07
60	0.25	144.20	3.89	70.82	29.18
140	0.106	165.30	4.46	75.28	24.72
200	0.075	59.80	1.61	76.90	23.10
Pan		17.10			
Tot Pan		856.60	23.13	100.03	-0.03

Classification of Soils as per USCS, ASTM designation D 2487-06



DRAWINGS



NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "EAGLE GOLD PROJECT: HEAP LEACH FACILITY GEOTECHNICAL INVESTIGATION", AND DATED JUNE 2017.
3. PROJECTION IS NAD 1983 UTM ZONE 8N.
4. UNLESS BGC AGREES OTHERWISE IN WRITING, THIS DRAWING SHALL NOT BE MODIFIED OR USED FOR ANY PURPOSE OTHER THAN THE PURPOSE FOR WHICH BGC GENERATED IT. BGC SHALL HAVE NO LIABILITY FOR ANY DAMAGES OR LOSS ARISING IN ANY WAY FROM ANY USE OR MODIFICATION OF THIS DOCUMENT NOT AUTHORIZED BY BGC. ANY USE OF OR RELIANCE UPON THIS DOCUMENT OR ITS CONTENT BY THIRD PARTIES SHALL BE AT SUCH THIRD PARTIES' SOLE RISK.

LEGEND
11 ROAD

DRAFT

SCALE:	AS SHOWN
DATE:	JUN 2017
DRAWN:	JVC
CHECKED:	ERM
APPROVED:	JWC

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
HEAP LEACH FACILITY GEOTECHNICAL INVESTIGATION

TITLE: GENERAL SITE LOCATION

PROJECT No.: 0792016-03

DWG No: 01

X:\Projects\0792 Victoria Gold\016\GIS\Production\Report\20170117_2016_Heap_Leach_Facility_Geotechnical_Investigation\01_General_Site_Location.mxd

N

FISHER GULCH

HAGGART CREEK

458500

459000

459500

460000

7101500

7101000

ANN-GULCH

PRIMARY HEAP LEACH PAD
(PHASE 1)

PLANT SITE AREA

LOWER DUBLIN
NORTH POND

EVENT PONDS

DUBLIN GULCH

1025
1000
975
925
950
1050
900
875

TP-BGC16-196
BH-BGC16-087
BH-BGC16-086
TP-BGC16-197
TP-BGC16-202
TP-BGC16-182
BH-BGC16-090
TP-BGC16-203
TP-BGC16-204
BH-BGC16-091
TP-BGC16-183
TP-BGC16-185
TP-BGC16-187
TP-BGC16-188
BH-BGC16-089
BH-BGC16-088
TP-BGC16-186
TP-BGC16-184
TP-BGC16-195
TP-BGC16-201
TP-BGC16-194
TP-BGC16-193
TP-BGC16-200
TP-BGC16-192
TP-BGC16-189
TP-BGC16-190
TP-BGC16-191
TP-BGC16-199
TP-BGC16-198

SCALE 1:5000

50 0 50 100 150 200

METRES

LEGEND

- BGC 2016 BOREHOLE
- BGC 2016 BOREHOLE WITH PIEZOMETER AND STANDPIPE
- BGC 2016 TEST PIT
- HISTORICAL BOREHOLES
- HEAP LEACH FACILITY
- PROPOSED INFRASTRUCTURE LAYOUT
- EXISTING ROAD
- STREAM

SOIL CLASSIFICATION BY USCS
BASED ON AREA MAPPING

- COBBLES AND BOULDERS
- GW - WELL GRADED GRAVEL
- GP - POORLY GRADED GRAVEL
- SW - WELL GRADED SAND
- SM - SILTY SAND

BOND 1998 SURFICIAL GEOLOGY

- ALLUVIAL FAN
- OTHER ALLUVIAL DEPOSITS
- COLLUVIUM APRON OR BLANKET
- GLACIOFLUVIAL TERRACE
- PLACER TAILINGS
- BEDROCK WITH COLLUVIUM VENEER
- TILL BLANKET

NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "EAGLE GOLD PROJECT: HEAP LEACH FACILITY GEOTECHNICAL INVESTIGATION", AND DATED JUNE 2017.
3. BASE TOPOGRAPHIC DATA BASED ON EXISTING GROUND 1 m CONTOUR RECEIVED FROM ALLNORTH MAY 10, 2016.
4. GEOLOGY SOURCE: BOND J.D., 1998. SURFICIAL GEOLOGY OF DUBLIN GULCH CENTRAL YUKON (106 D/4). GEOSCIENCE MAP 1998-6. INDIAN AND NORTHERN AFFAIRS CANADA, EXPLORATION AND GEOLOGICAL SERVICES DIVISION, YUKON BRANCH.
5. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM ALLNORTH OCTOBER 19, 2016.
6. SOIL CLASSIFICATION BY USCS BASED ON AREA MAPPING FROM 2011 GEOTECHNICAL INVESTIGATION FOR MINE SITE INFRASTRUCTURE FOUNDATION REPORT.
7. PROJECTION IS NAD 1983 UTM ZONE 8N.
8. UNLESS BGC AGREES OTHERWISE IN WRITING, THIS DRAWING SHALL NOT BE MODIFIED OR USED FOR ANY PURPOSE OTHER THAN THE PURPOSE FOR WHICH BGC GENERATED IT. BGC SHALL HAVE NO LIABILITY FOR ANY DAMAGES OR LOSS ARISING IN ANY WAY FROM ANY USE OR MODIFICATION OF THIS DOCUMENT NOT AUTHORIZED BY BGC. ANY USE OF OR RELIANCE UPON THIS DOCUMENT OR ITS CONTENT BY THIRD PARTIES SHALL BE AT SUCH THIRD PARTIES' SOLE RISK.

DRAFT

SCALE:	1:5,000
DATE:	JUN 2017
DRAWN:	IL
CHECKED:	ERM
APPROVED:	

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

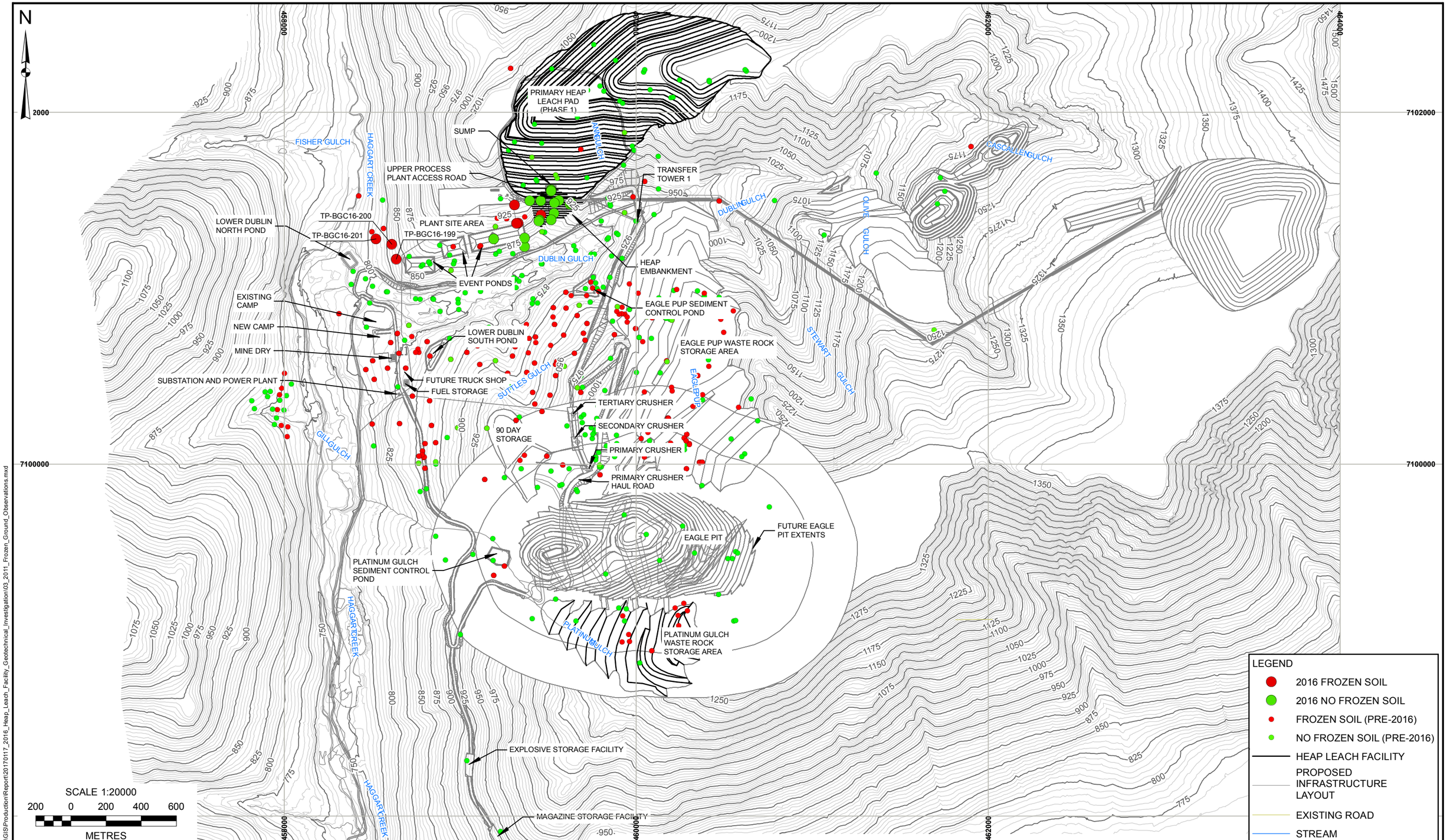
PROJECT: EAGLE GOLD PROJECT
HEAP LEACH FACILITY GEOTECHNICAL INVESTIGATION

TITLE: SURFICIAL GEOLOGY

PROJECT No.: 0792016-03

DWG No: 02

X:\Projects\0792 Victoria Gold\016\GIS\Production\Report\20170117_2016_Heap_Leach_Facility_Geotechnical_Investigation\02_Surficial_Geology.mxd



NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "EAGLE GOLD PROJECT: HEAP LEACH FACILITY GEOTECHNICAL INVESTIGATION", AND DATED JUNE 2017.
3. BASE TOPOGRAPHIC DATA BASED ON EXISTING GROUND 1 m CONTOUR RECEIVED FROM ALLNORTH MAY 10, 2016.
4. PROPOSED INFRASTRUCTURE LAYOUT RECEIVED FROM ALLNORTH OCTOBER 19, 2016.
5. PROJECTION IS NAD 1983 UTM ZONE 8N.
6. UNLESS BGC AGREES OTHERWISE IN WRITING, THIS DRAWING SHALL NOT BE MODIFIED OR USED FOR ANY PURPOSE OTHER THAN THE PURPOSE FOR WHICH BGC GENERATED IT. BGC SHALL HAVE NO LIABILITY FOR ANY DAMAGES OR LOSS ARISING IN ANY WAY FROM ANY USE OR MODIFICATION OF THIS DOCUMENT NOT AUTHORIZED BY BGC. ANY USE OF OR RELIANCE UPON THIS DOCUMENT OR ITS CONTENT BY THIRD PARTIES SHALL BE AT SUCH THIRD PARTIES' SOLE RISK.
7. LAYOUT OF THE HEAP LEACH FACILITY (HLF) PROVIDED BY DOWL CONSULTING FIRM.

DRAFT

SCALE:	1:20,000
DATE:	JUN 2017
DRAWN:	IL
CHECKED:	ERM
APPROVED:	

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CLIENT: VICTORIA GOLD CORPORATION

PROJECT: EAGLE GOLD PROJECT
HEAP LEACH FACILITY GEOTECHNICAL INVESTIGATION

TITLE: FROZEN GROUND OBSERVATIONS

PROJECT No.: 0792016-03

DWG No: 03

X:\Projects\0792 Victoria Gold\016\GIS\Production\Report\20170117_2016_Heap_Leach_Facility_Geotechnical_Investigation\03_2011_Frozen_Ground_Observations.mxd

APPENDIX A-4
VARIOUS LABORATORY REPORTS, GOLDER, 2012

June 4, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of grain size distribution (pre and post) and consolidation and hydraulic conductivity testing on samples "BGC-GD-01 (50mm)" and "BGC-GD-01 (38mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

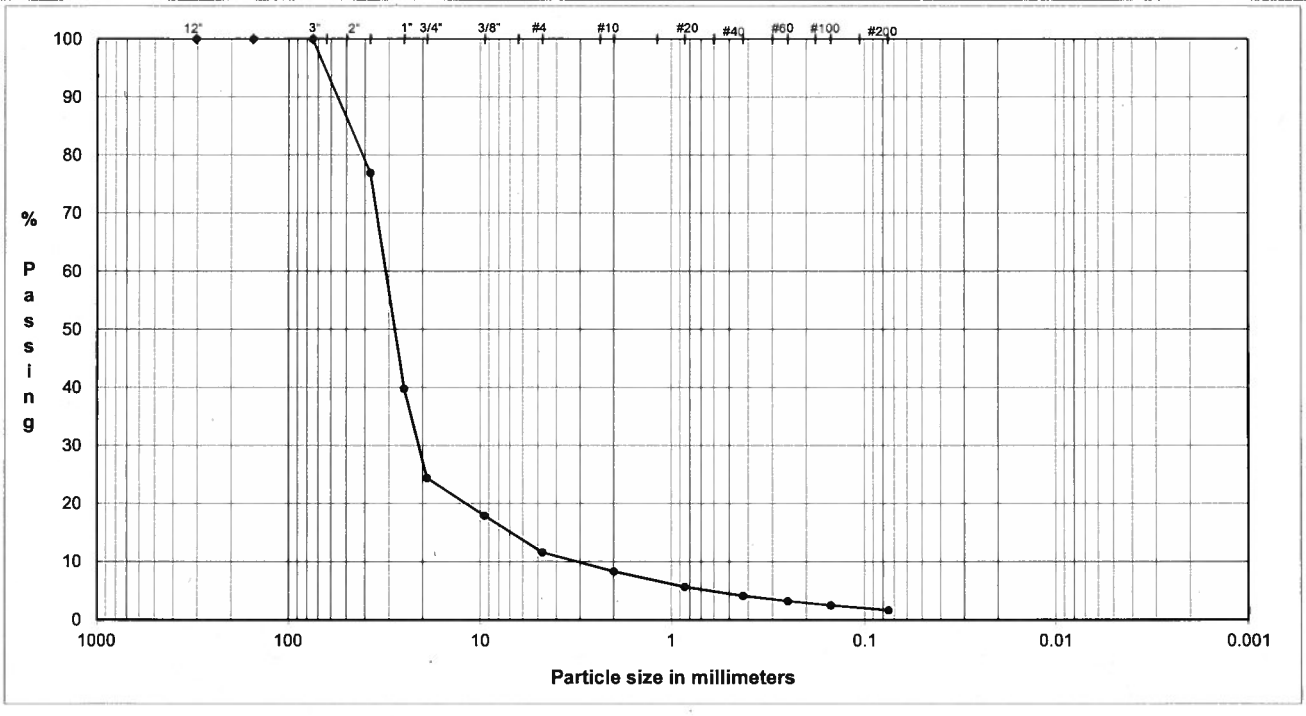
ATTACHMENTS

March-12 | 11-1415-0013.2000

PRE-PERM PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Tetra Tech/Aggregate/Yukon**
SAMPLE ID: **BGC-GD-01 (50mm)** Depth (ft) --
TYPE: **Pail (Composite)**

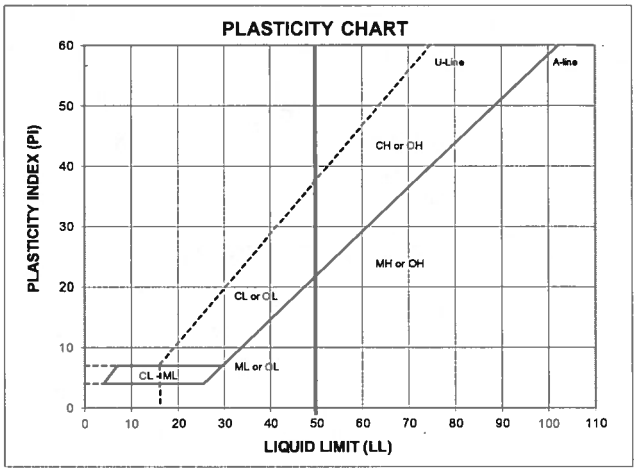


	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

PRE-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
6.0"	154.2	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.00**
1.5"	37.5	**76.9**		
1.0"	25.0	**39.8**		
0.75"	19.0	**24.4**	Coarse Gravel	**75.60**
0.375"	9.5	**17.9**		
#4	4.8	**11.6**	Fine Gravel	**12.79**
#10	2.0	**8.3**	Coarse Sand	**3.31**
#20	0.9	**5.6**		
#40	0.4	**4.1**	Medium Sand	**4.18**
#60	0.3	**3.2**		
#100	0.2	**2.5**		
#200	0.1	**1.6**	Fine Sand	**2.49**
			Fines	**1.62**



ATTERBERG LIMITS

M_c	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate

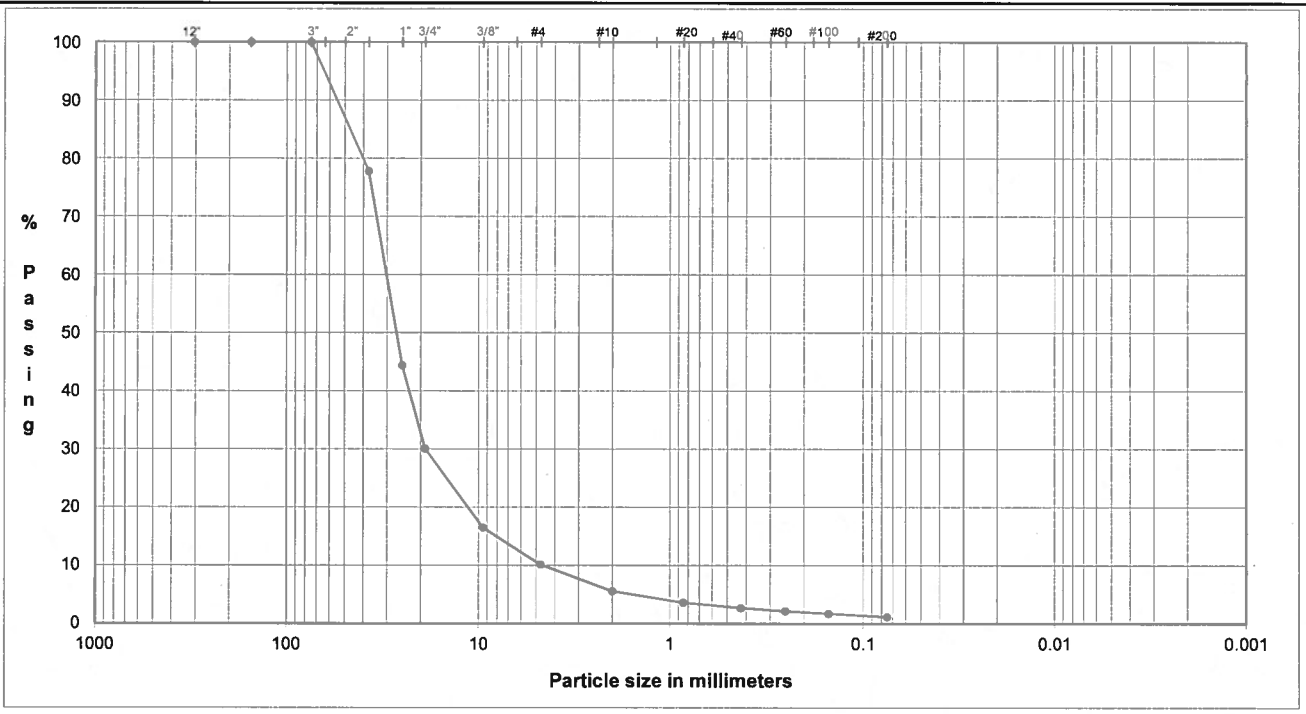
USCS: GP

TECH	JAM
DATE	3/7/12
REVIEW	PRH

March-12 11-1415-0013.2000

POST-PERM PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS
ASTM D421, D422, D4318

PROJECT NAME: **Tetra Tech/Aggregate/Yukon**
SAMPLE ID: **BGC-GD-01 (50mm)** Depth (ft) --
TYPE: **Pail (Composite)**

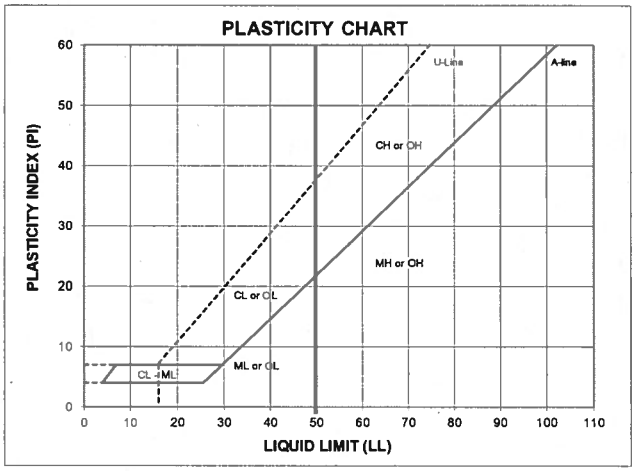


	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

POST-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0	Cobbles	0.00
1.5"	37.5	77.8		
1.0"	25.0	44.4		
0.75"	19.0	30.1	Coarse Gravel	69.93
0.375"	9.5	16.5		
#4	4.8	10.1	Fine Gravel	19.95
#10	2.0	5.5	Coarse Sand	4.57
#20	0.9	3.6		
#40	0.4	2.7	Medium Sand	2.89
#60	0.3	2.1		
#100	0.2	1.7		
#200	0.1	1.1	Fine Sand	1.52
			Fines	1.14



ATTERBERG LIMITS

M_c	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate

USCS: GP

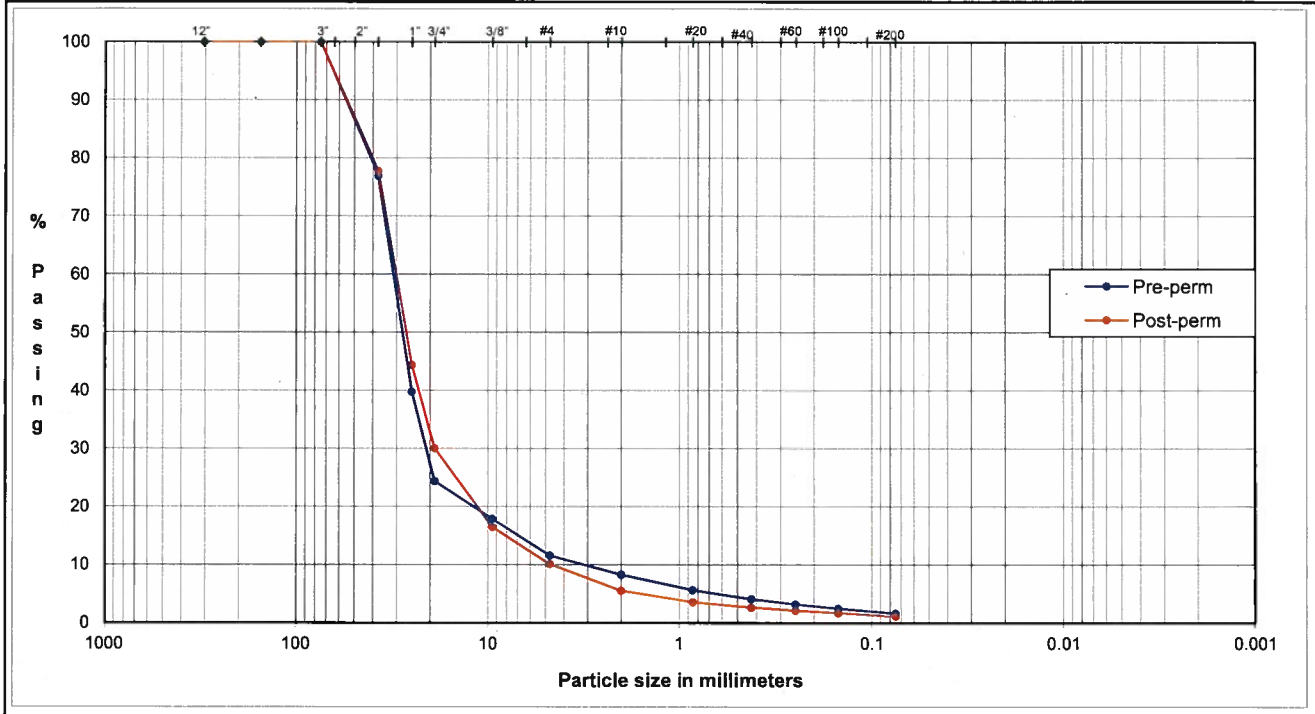
TECH JAM
DATE 3/12/2012
REVIEW PRH

March-12 | 11-1415-0013.2000

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Tetra Tech/Aggregate/Yukon**
SAMPLE ID: **BGC-GD-01 (50mm)** Depth (ft) --
TYPE: **Pail (Composite)**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

PRE-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
6.0"	154.2	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.00**
1.5"	37.5	**76.9**		
1.0"	25.0	**39.8**		
0.75"	19.0	**24.4**	Coarse Gravel	**75.60**
0.375"	9.5	**17.9**		
#4	4.8	**11.6**	Fine Gravel	**12.79**
#10	2.0	**8.3**	Coarse Sand	**3.31**
#20	0.9	**5.6**		
#40	0.4	**4.1**	Medium Sand	**4.18**
#60	0.3	**3.2**		
#100	0.2	**2.5**		
#200	0.1	**1.6**	Fine Sand	**2.49**
			Fines	**1.62**

POST-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
6.0"	154.2	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.00**
1.5"	37.5	**77.8**		
1.0"	25.0	**44.4**		
0.75"	19.0	**30.1**	Coarse Gravel	**69.93**
0.375"	9.5	**16.5**		
#4	4.8	**10.1**	Fine Gravel	**19.95**
#10	2.0	**5.5**	Coarse Sand	**4.57**
#20	0.9	**3.6**		
#40	0.4	**2.7**	Medium Sand	**2.89**
#60	0.3	**2.1**		
#100	0.2	**1.7**		
#200	0.1	**1.1**	Fine Sand	**1.52**
			Fines	**1.14**

ATTERBERG LIMITS

M_c	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate

USCS: GP

TECH	JAM
DATE	3/7/12
REVIEW	PRH

TETRA TECH/AGGREGATE/YUKON
11-1415-0013.2000
TABLE 1
RIGID-WALL COMPRESSION
CONSTANT-HEAD PERMEABILITY
10-INCH DIAMETER CELL

Project Title:	Tetra Tech/Aggregate/Yukor	**Boring:**	--
Project Number:	11-1415-0013.2000	**Sample:**	BGC-GD-01 (50mm)
Dates Tested:	3/8/2012 **To:** 3/10/2012	**Depth (ft):**	--

Sample Setup

Initial Sample Height, in	11.067
Mold Diameter, in	10.00
Sample Area, in^2	78.54
Wet Sample Weight, g	21,384.3
Wet Sample Weight, lb	47.15
Dry Sample Weight, g	21,286.0
Dry Sample Weight, lb	46.94

Initial Sample:
Moisture Determinatior

Tare	FEE
Wet Weight and Tare, g	431.30
Dry Weight and Tare, g	429.87
Tare Weight, g	120.37
Moisture Content, %	0.5

Initial Sample Density and Void Rati

Specific Gravity[1]	2.70
Initial Sample Volume, ft^3	0.503
Initial Wet Density, lb/ft^3	93.7
Initial Dry Density, lb/ft^3	93.3
Initial Void Ratic	0.81

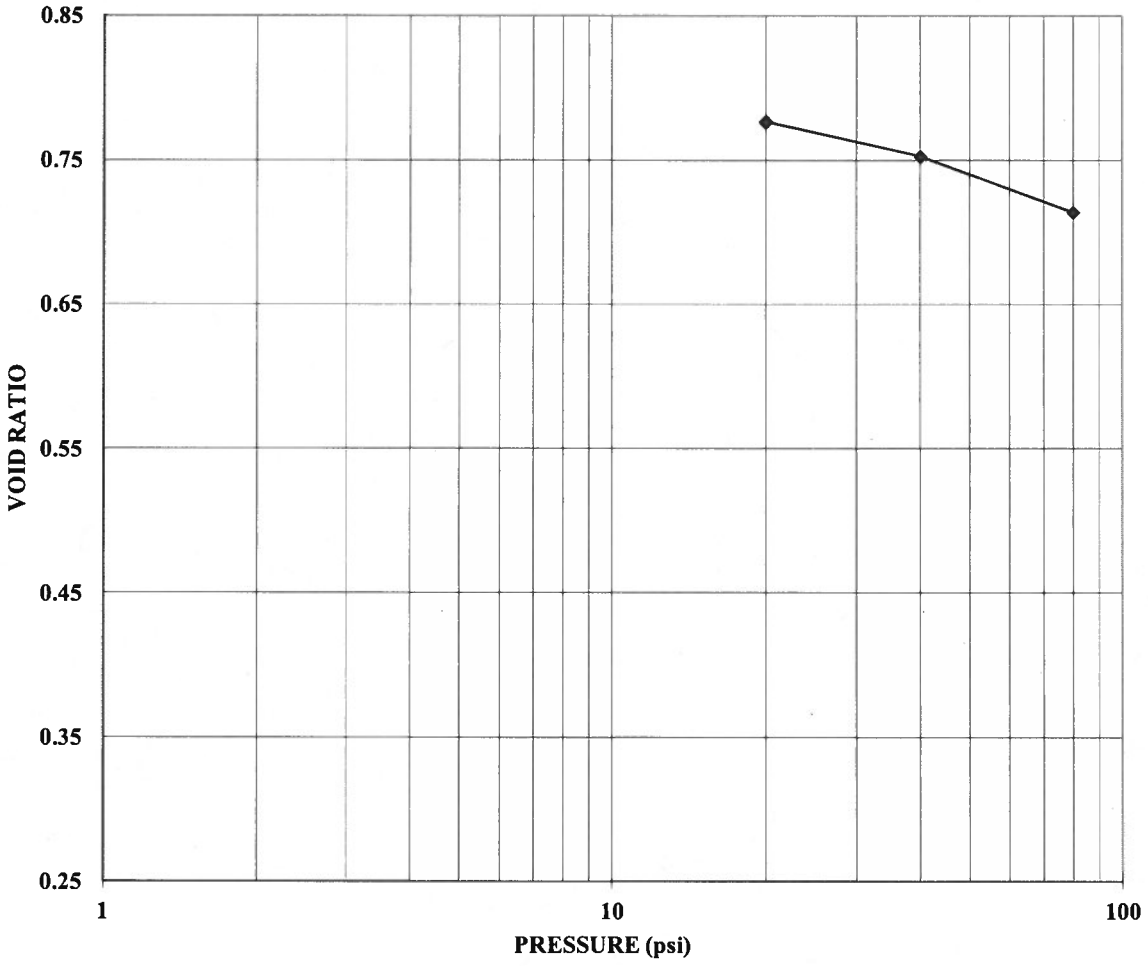
Final Sample Density and Void Rati

Final Sample Height, in	10.505
Final Sample Volume, ft^3	0.477
Final Dry Density, lb/ft^3	98.3
Final Void Ratio	0.71

Load (psi)	Height (in)	Dry Density (pcf)	Void Ratio	Flow Rate (ml/sec)	Gradient	Permeability (cm/sec)	Porosity
20	10.888	94.8	0.78	116.84	0.02	1.1E+01	0.44
40	10.741	96.1	0.75	101.04	0.02	9.7E+00	0.43
80	10.505	98.3	0.71	169.74	0.03	9.2E+00	0.42

NOTES: [1]Specific Gravity = Assumed Valu

ONE-DIMENSIONAL CONSOLIDATION



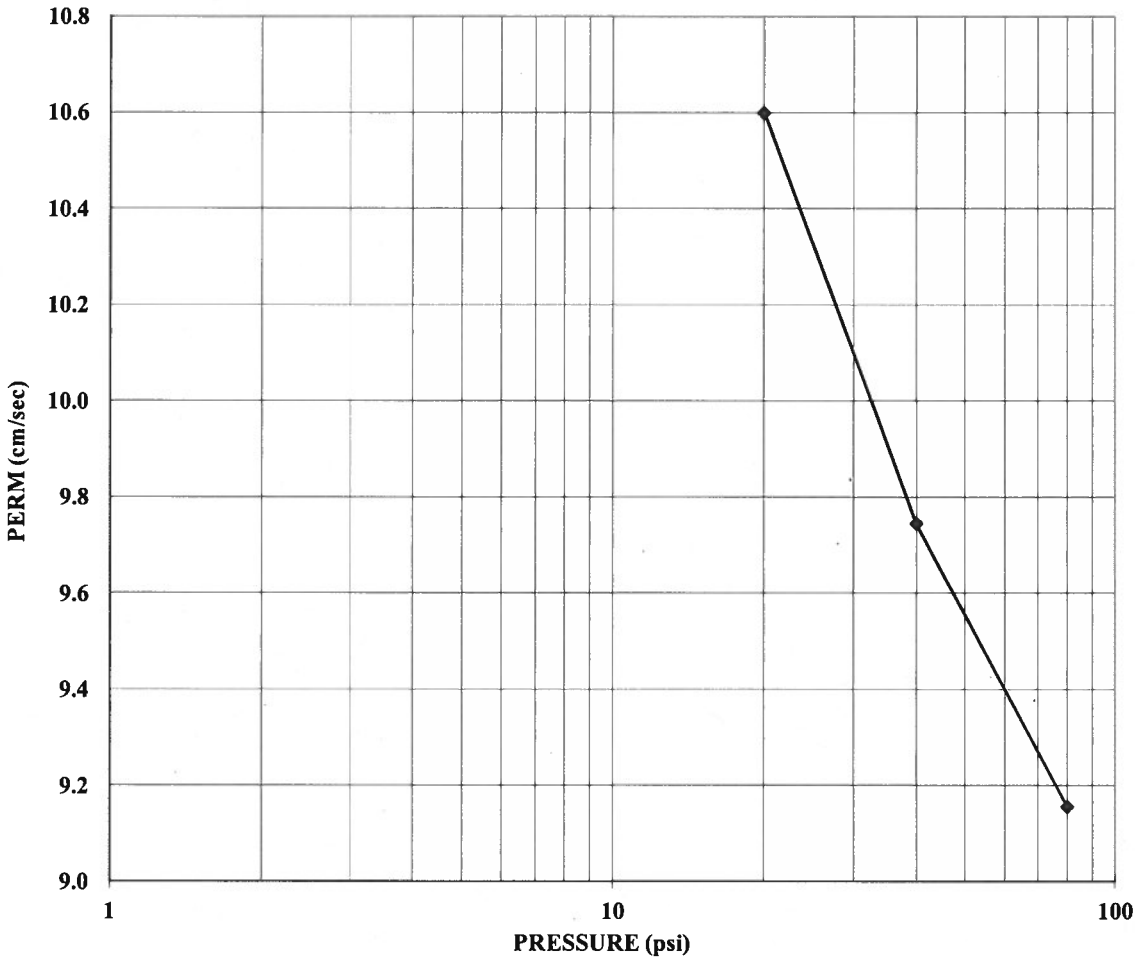
SAMPLE #:	**BGC-GD-01 (50mm)**
DESCRIPTION:	**Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate (GP)**

DATE	3/10/2012
TECH	JAM
REVIEW	PRH

Tetra Tech/Aggregate/Yukon
11-1415-0013.2000

GOLDER ASSOCIATES INC.
LAKEWOOD, COLORADO

ONE-DIMENSIONAL CONSOLIDATION



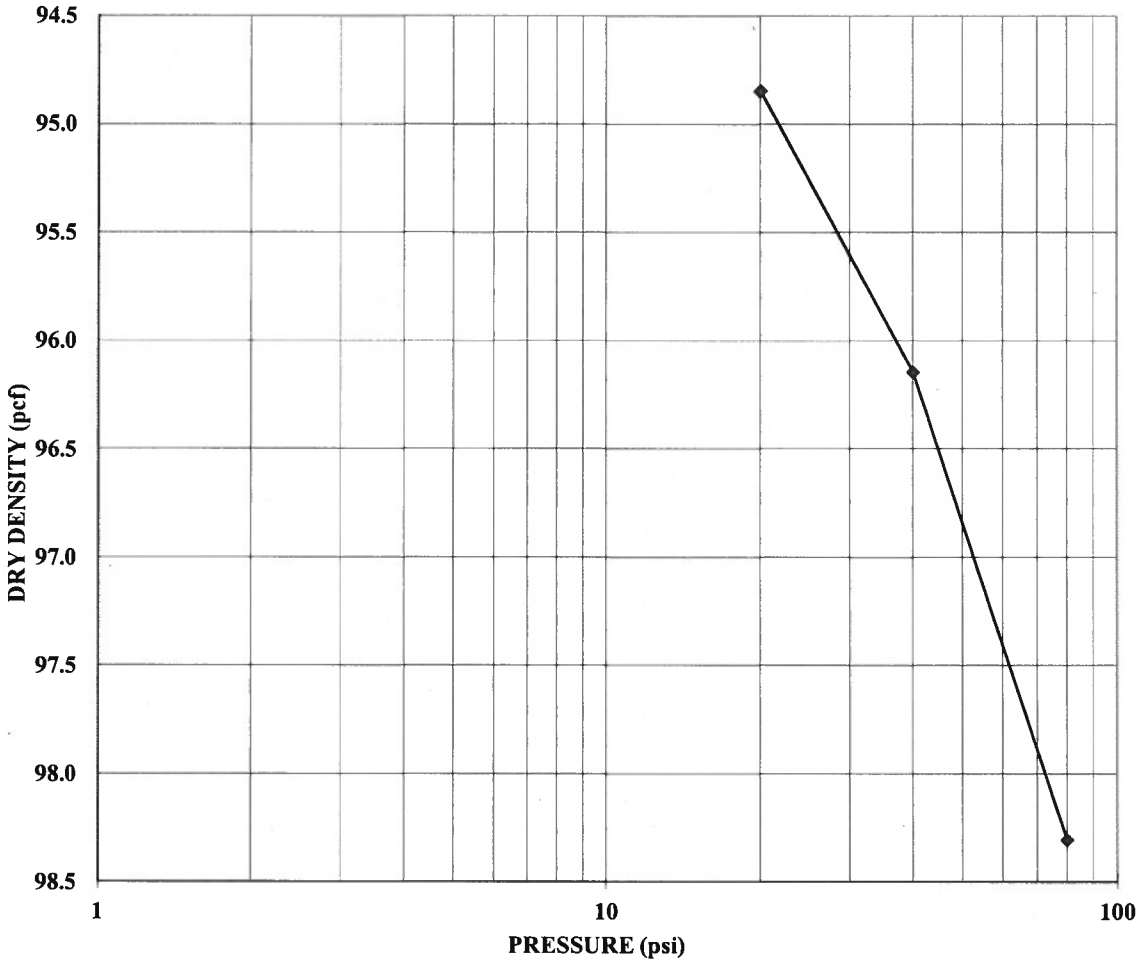
SAMPLE #:	**BGC-GD-01 (50mm)**
DESCRIPTION:	**Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate (GP)**

DATE	3/10/2012
TECH	JAM
REVIEW	PRH

Tetra Tech/Aggregate/Yukon
11-1415-0013.2000

GOLDER ASSOCIATES INC.
LAKEWOOD, COLORADO

ONE-DIMENSIONAL CONSOLIDATION



SAMPLE #:	**BGC-GD-01 (50mm)**
DESCRIPTION:	**Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate (GP)**

DATE	3/10/2012
TECH	JAM
REVIEW	PRH

Tetra Tech/Aggregate/Yukon
11-1415-0013.2000

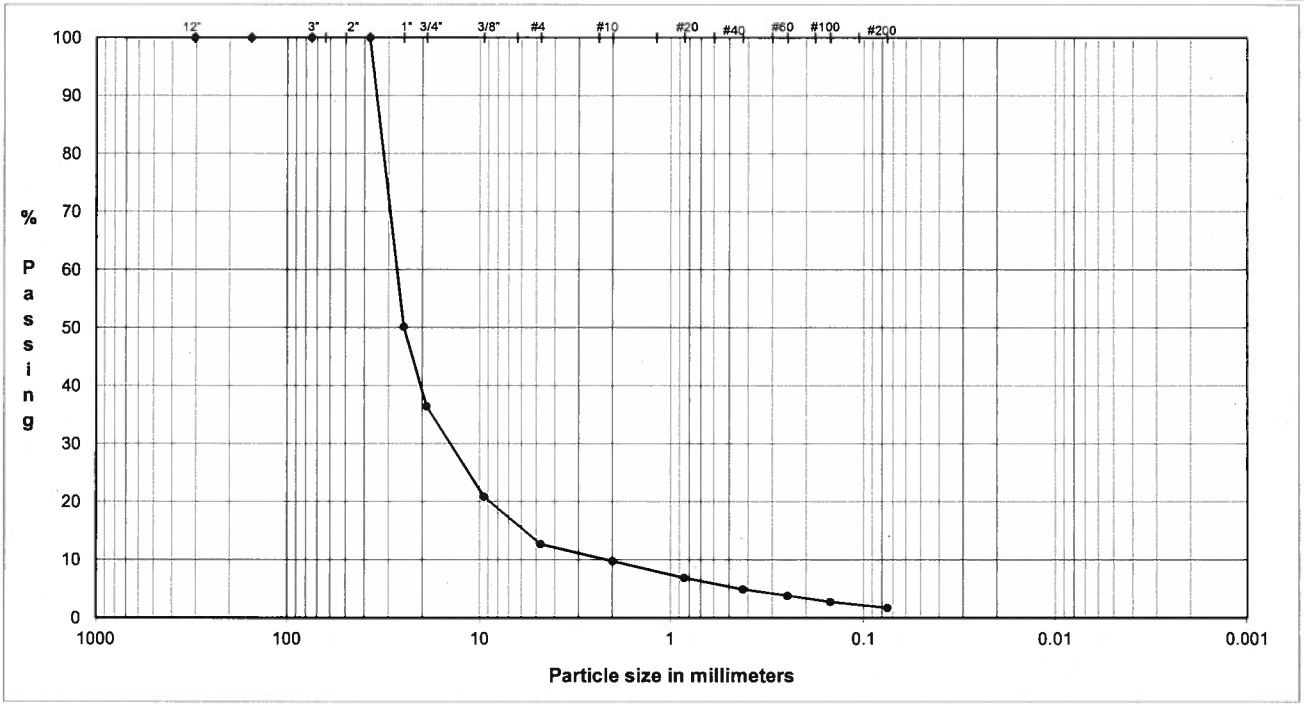
GOLDER ASSOCIATES INC.
LAKEWOOD, COLORADO

May-12 | 11-1415-0013/2000

PRE-PERM PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Tetra Tech/Aggregate/Yukon**
SAMPLE ID: **BGC-GD-01 (38mm)** Depth (ft) --
TYPE: **Pails**

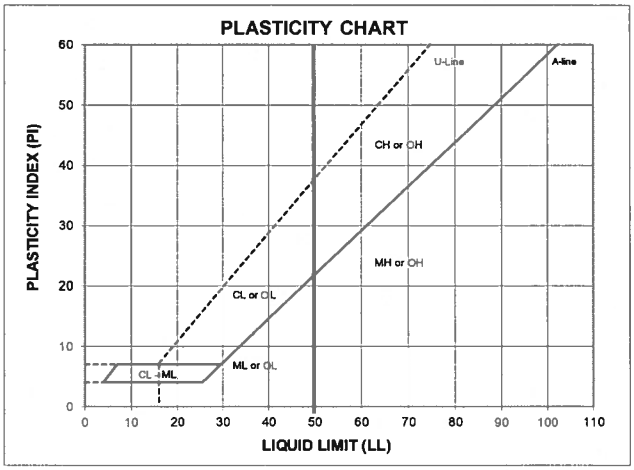


	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

PRE-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
6.0"	154.2	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.00**
1.5"	37.5	**100.0**		
1.0"	25.0	**50.1**		
0.75"	19.0	**36.4**	Coarse Gravel	**63.60**
0.375"	9.5	**20.9**		
#4	4.8	**12.7**	Fine Gravel	**23.72**
#10	2.0	**9.8**	Coarse Sand	**2.92**
#20	0.9	**6.9**		
#40	0.4	**4.9**	Medium Sand	**4.85**
#60	0.3	**3.8**		
#100	0.2	**2.8**		
#200	0.1	**1.7**	Fine Sand	**3.20**
			Fines	**1.71**



ATTERBERG LIMITS

M_c	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate

USCS: GP

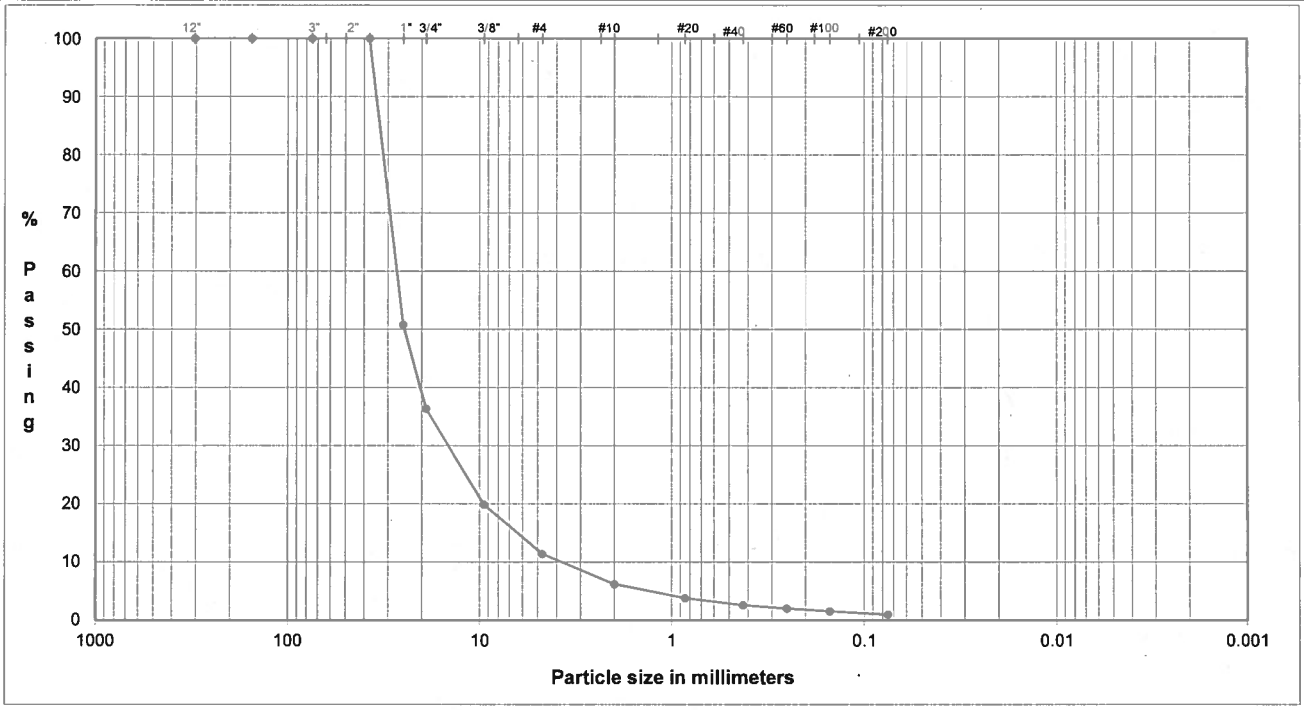
TECH	JAM
DATE	5/18/12
REVIEW	PRH

May-12 | 11-1415-0013/2000

POST-PERM PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Tetra Tech/Aggregate/Yukon**
SAMPLE ID: **BGC-GD-01 (38mm)** Depth (ft) --
TYPE: **Pails**

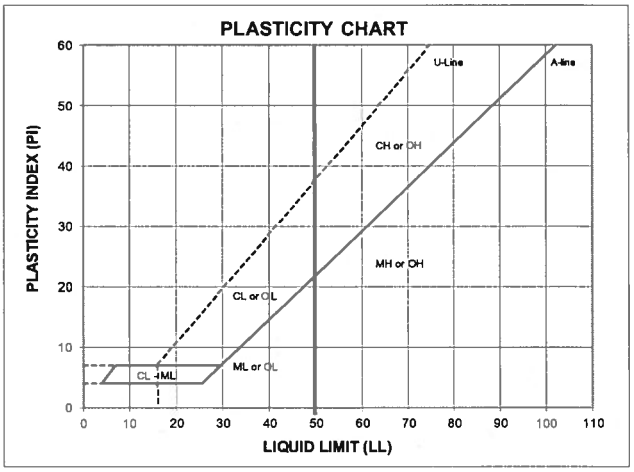


	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

POST-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
6.0"	154.2	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.00**
1.5"	37.5	**100.0**		
1.0"	25.0	**50.8**		
0.75"	19.0	**36.4**	Coarse Gravel	**63.64**
0.375"	9.5	**19.9**		
#4	4.8	**11.4**	Fine Gravel	**24.97**
#10	2.0	**6.2**	Coarse Sand	**5.19**
#20	0.9	**3.8**		
#40	0.4	**2.6**	Medium Sand	**3.60**
#60	0.3	**2.0**		
#100	0.2	**1.5**		
#200	0.1	**1.0**	Fine Sand	**1.61**
			Fines	**0.99**



ATTERBERG LIMITS

M_c	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate

USCS: GP

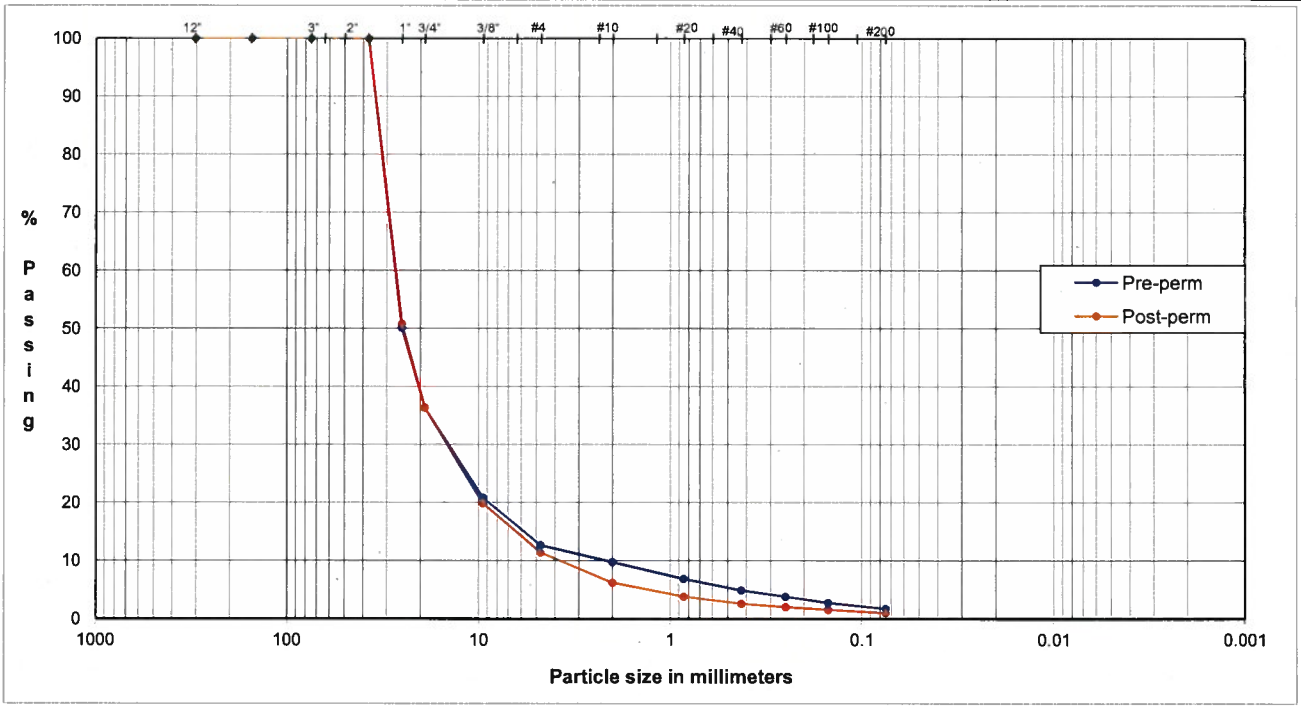
TECH JAM
DATE 5/22/2012
REVIEW PRH

May-12 11-1415-0013/2000

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Tetra Tech/Aggregate/Yukon**
SAMPLE ID: **BGC-GD-01 (38mm)** Depth (ft) --
TYPE: **Pails**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

PRE-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0	Cobbles	0.00
1.5"	37.5	100.0		
1.0"	25.0	50.1		
0.75"	19.0	36.4	Coarse Gravel	63.60
0.375"	9.5	20.9		
#4	4.8	12.7	Fine Gravel	23.72
#10	2.0	9.8	Coarse Sand	2.92
#20	0.9	6.9		
#40	0.4	4.9	Medium Sand	4.85
#60	0.3	3.8		
#100	0.2	2.8		
#200	0.1	1.7	Fine Sand	3.20
			Fines	1.71

POST-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
6.0"	154.2	100.0		
3.0"	75.0	100.0	Cobbles	0.00
1.5"	37.5	100.0		
1.0"	25.0	50.8		
0.75"	19.0	36.4	Coarse Gravel	63.64
0.375"	9.5	19.9		
#4	4.8	11.4	Fine Gravel	24.97
#10	2.0	6.2	Coarse Sand	5.19
#20	0.9	3.8		
#40	0.4	2.6	Medium Sand	3.60
#60	0.3	2.0		
#100	0.2	1.5		
#200	0.1	1.0	Fine Sand	1.61
			Fines	0.99

ATTERBERG LIMITS

M,	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate

USCS: GP

TECH	JAM
DATE	5/18/12
REVIEW	PRH

TETRA TECH/AGGREGATE/YUKON
11-1415-0013.2000
TABLE 1
RIGID-WALL COMPRESSION
CONSTANT-HEAD PERMEABILITY
10-INCH DIAMETER CELL

Project Title:	Tetra Tech/Aggregate/Yukor	**Boring:**	--
Project Number:	11-1415-0013/2000	**Sample:**	BGC-GD-01 (38mm)
Dates Tested:	5/18/2012 **To:** 5/21/2012	**Depth (ft):**	--

Sample Setup

Initial Sample Height, ir	12.045
Mold Diameter, in	10.00
Sample Area, in^2	78.54
Wet Sample Weight, g	22,542.6
Wet Sample Weight, lb	49.71
Dry Sample Weight, g	22,438.9
Dry Sample Weight, lb	49.48

Initial Sample:
Moisture Determination

Tare	ROB-1
Wet Weight and Tare, g	431.30
Dry Weight and Tare, g	429.87
Tare Weight, g	120.37
Moisture Content, %	0.5

Initial Sample Density and Void Ratio

Specific Gravity[1]	2.70
Initial Sample Volume, ft^3	0.547
Initial Wet Density, lb/ft^3	90.8
Initial Dry Density, lb/ft^3	90.4
Initial Void Ratio	0.86

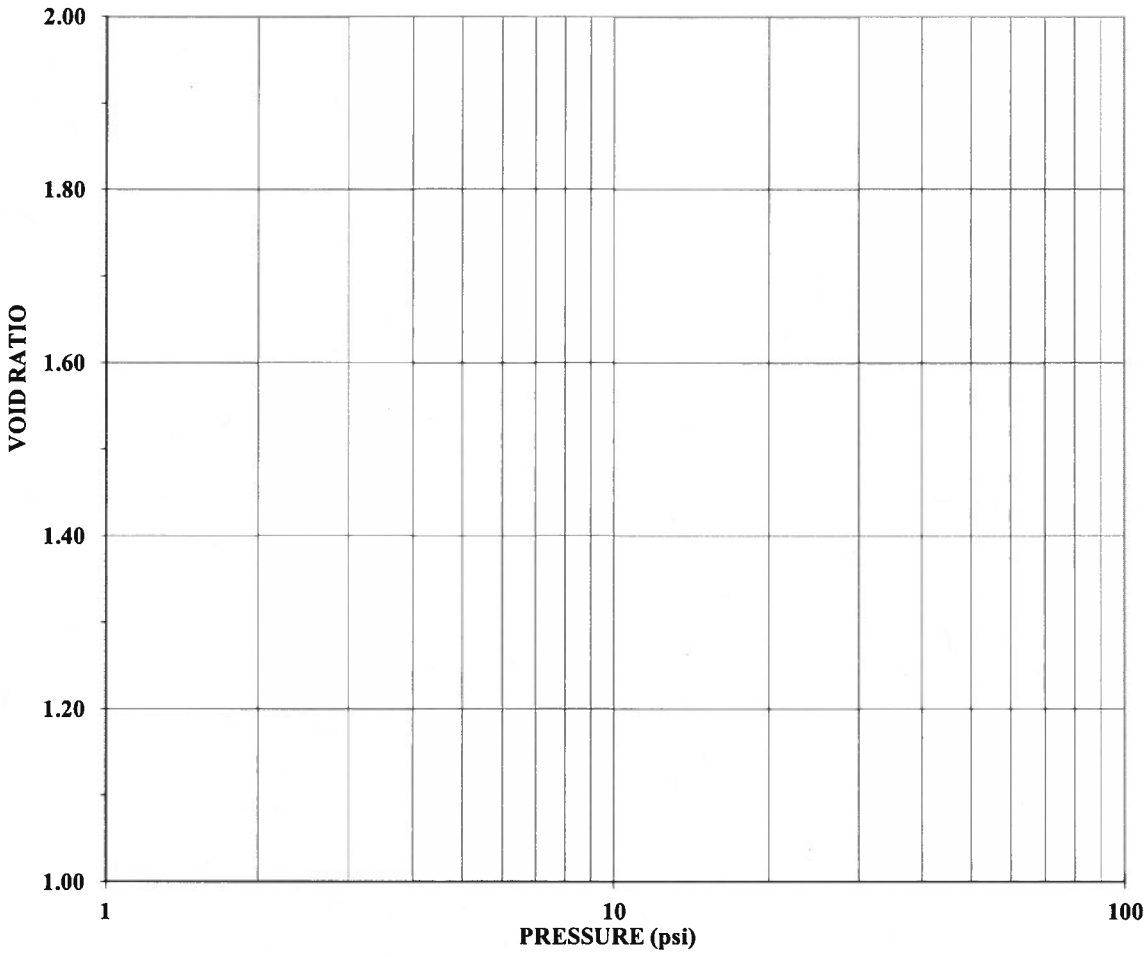
Final Sample Density and Void Ratio

Final Sample Height, ir	11.185
Final Sample Volume, ft^3	0.508
Final Dry Density, lb/ft^3	97.3
Final Void Ratio	0.73

Load (psi)	Height (in)	Dry Density (pcf)	Void Ratio	Flow Rate (ml/sec)	Gradient	Permeability (cm/sec)	Porosity
20	11.663	93.3	0.81	202.53	0.02	1.8E+01	0.45
40	11.624	93.7	0.80	218.80	0.05	8.5E+00	0.44
80	11.185	97.3	0.73	123.92	0.07	3.4E+00	0.42

NOTES: [1]Specific Gravity = Assumed Valu

ONE-DIMENSIONAL CONSOLIDATION



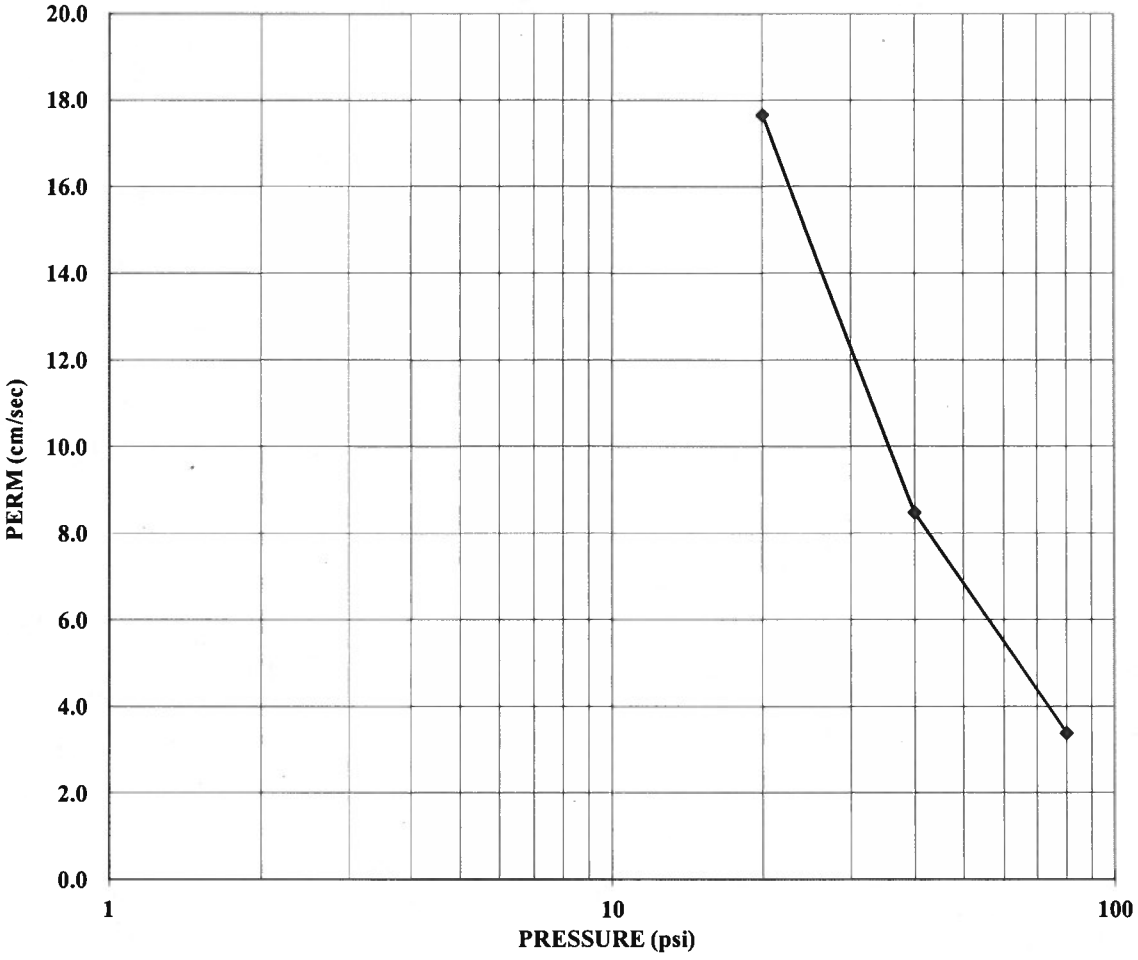
SAMPLE #:	**BGC-GD-01 (38mm)**
DESCRIPTION:	**Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate (GP)**

DATE	5/21/2012
TECH	JAM
REVIEW	PRH

Tetra Tech/Aggregate/Yukon
11-1415-0013/2000

GOLDER ASSOCIATES INC.
LAKEWOOD, COLORADO

ONE-DIMENSIONAL CONSOLIDATION



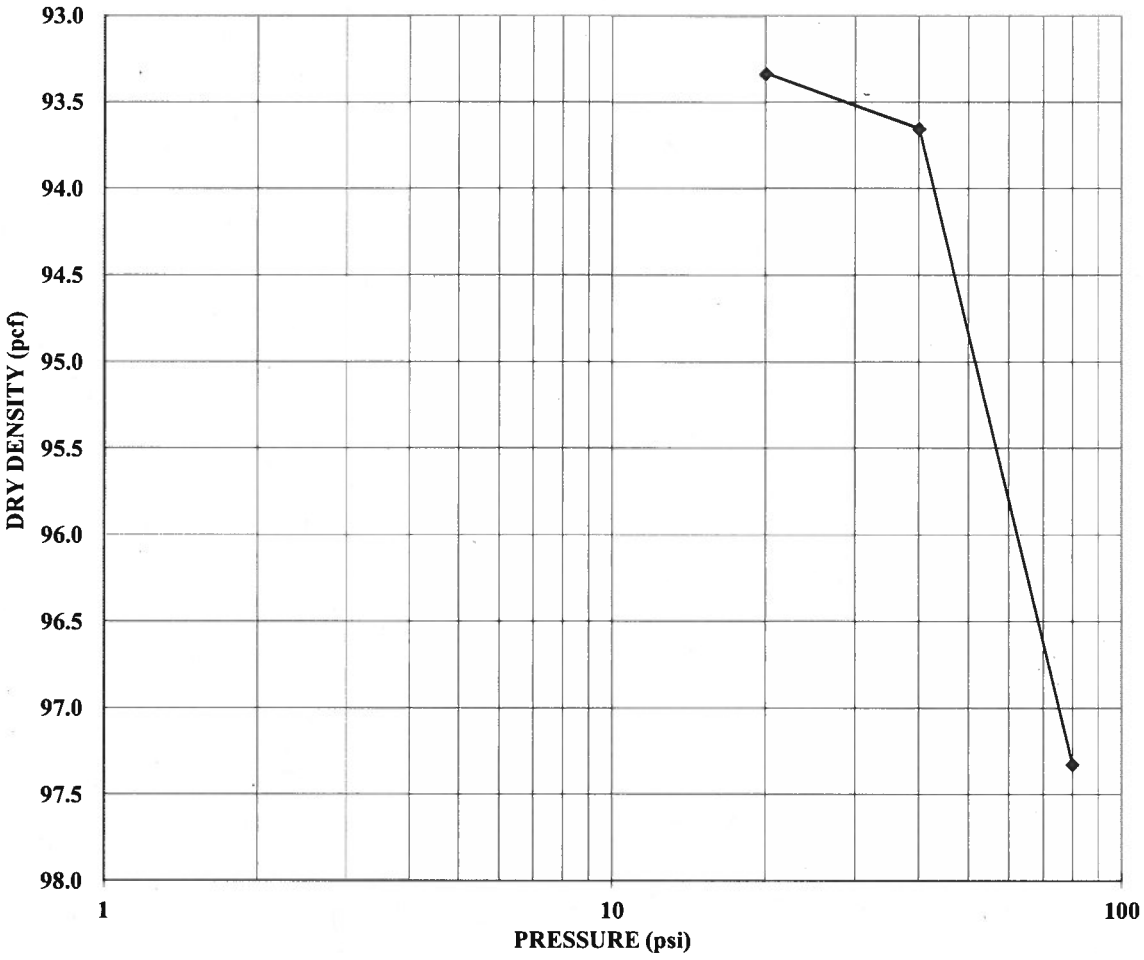
SAMPLE #:	**BGC-GD-01 (38mm)**
DESCRIPTION:	**Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate (GP)**

DATE	5/21/2012
TECH	JAM
REVIEW	PRH

Tetra Tech/Aggregate/Yukon
11-1415-0013/2000

GOLDER ASSOCIATES INC.
LAKEWOOD, COLORADO

ONE-DIMENSIONAL CONSOLIDATION



SAMPLE #:	**BGC-GD-01 (38mm)**
DESCRIPTION:	**Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate (GP)**

DATE	5/21/2012
TECH	JAM
REVIEW	PRH

Tetra Tech/Aggregate/Yukon
11-1415-0013/2000

GOLDER ASSOCIATES INC.
LAKEWOOD, COLORADO

Golder Associates

June 16, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner load testing on sample "BGC-GD-01 (50mm)". All pending laboratory tests results wi ll be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER: 11-1415-0013/2000
JOB NAME: Tetra Tech/Aggregate/Yukon
DATE TESTED: 05/11/12

UNDERLINER: Section 2 Silt
OVERLINER BGC-GD-01 (50mm)

Clay Liner

Initial Moisture Content

Tare:	JW-18
Wet Weight & Tare, g:	583.7
Dry Weight & Tare, g:	524.38
Tare Weight, g:	128.53
Moisture, %:	**15.0**

Final Moisture Content

Tare:	Bowl 3
Wet Weight & Tare, g:	924.74
Dry Weight & Tare, g:	824.41
Tare Weight, g:	138.66
Moisture, %:	**14.6**

Overliner

Initial Moisture Content

Tare:	OG-1
Wet Weight & Tare, g:	670.82
Dry Weight & Tare, g:	669.24
Tare Weight, g:	129.35
Moisture, %:	**0.3**

Final Moisture Content

Tare:	J11
Wet Weight & Tare, g:	689.95
Dry Weight & Tare, g:	687.98
Tare Weight, g:	82.28
Moisture, %:	**0.3**

Initial Height Determination (Inches)

	Clay Liner	Overliner
1.	4.000	3.337
2.	4.000	3.338
3.	4.000	3.339
4.	4.000	3.339
5.	4.000	3.337
6.	4.000	3.338
Average	4.000	3.338
Cell Height	--	16.250
Sample Height	4.000	8.851

Density	**Clay liner**		**Overliner**	
Wet Weight:	13,791.7	g	21441.10	g
Dry Weight:	11,994.3	g	21378.54	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	4.000	in	8.851	in
Final Height:	4.000	in	7.178	in
Initial Volume:	0.262	ft^3	0.58	ft^3
Final Volume:	0.262	ft^3	0.47	ft^3
Initial Wet Density:	116.2	pcf	81.7	pcf
Final Wet Density:	116.2	pcf	100.7	pcf
Initial Dry Density:	101.1	pcf	81.4	pcf
Final Dry Density:	101.1	pcf	100.4	pcf

General Test Notes:

Consolidate @ 640 psi for 48 hours.

Post-Test: No visual puncturing of geomembrane. No penetrations observed during the vaccuum test. Approximately 20 notable dimples on surface of geomembrane.

Liner Thickness (in)

1.	0.060	
2.	0.061	
3.	0.063	
4.	0.061	
5.	0.063	
6.	0.061	
Average	0.062	(in)
	61.50	(mls)

Remold Instructions

Minimun 12" thickness for -2" material. 95% compaction of optimum density. +/- 2% of optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech/Aggregate/Yukon

JOB NUMBER: 11-1415-0013/2000

DATE: 5/11/2012

Underliner (Bedding) Source: Section 2 Silt

Underliner Classification: --

Atterberg Limits: --

Maximum Dry Density (pcf): 1726 corrected

Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (50mm)

Overliner Classification: GP

Atterberg Limits: --

Dry Density (pcf): 81.4

Geosynthetic Manufacturer/Supplier: Agru America LLDPE Microspike (60-mil)

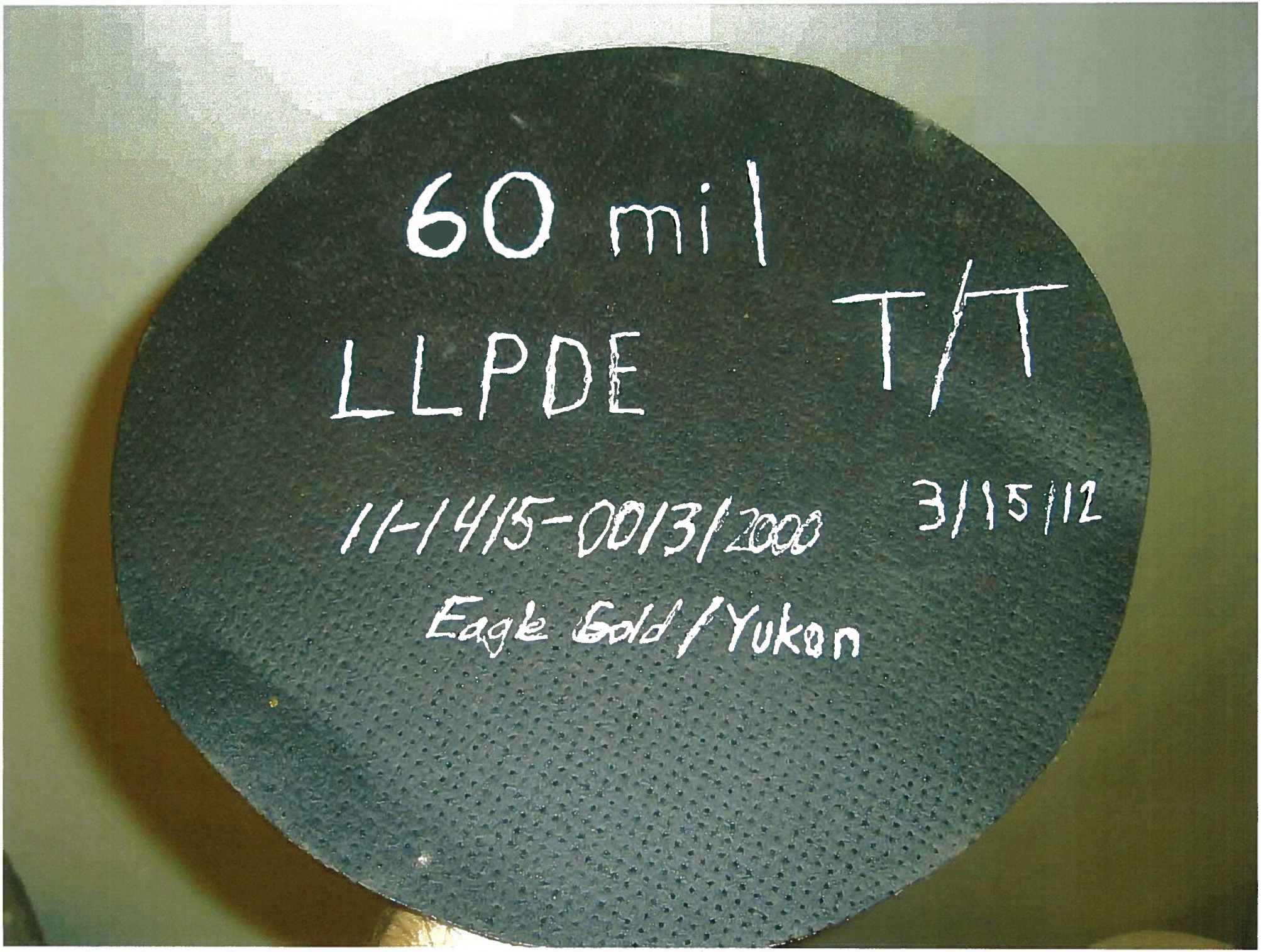
Liner Type	Ave. Liner Thickness (mls)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
LLDPE Microspike 60	61.50	48	93.9	15.2	640	1.673	Pass	Pass

General Test Notes: Test was conducted using a 12" diameter cell. The 60 mil microspike texture/texture HDPE liner was placed on top of 4.0 inches of underliner soil, then covered with approximately 8.8 inches of overliner material. Approximately 12 rocks were hand placed with points downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of 20 hours. The load was maintained for 48 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, the liner was inspected and tested for punctures both visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG

Liner observations: No visual puncturing of geomembrane. No penetrations observed during the vaccuum test. Approximately 20 notable dimples on surface of geomembrane.

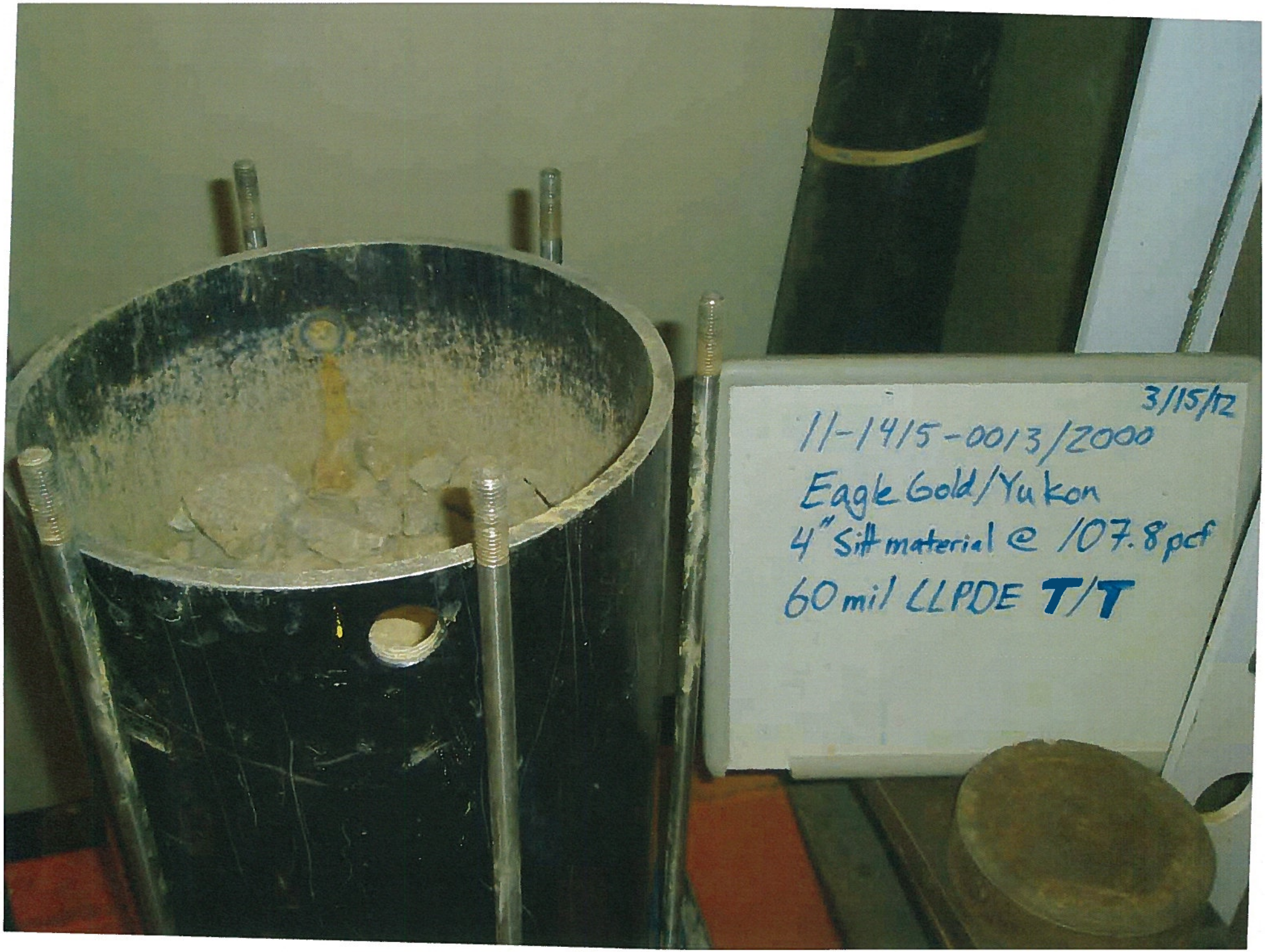
Underliner was remolded to 93.9% of maximum dry density at approximately optimum moisture. Overliner was loosely placed and slightly tamped.

Date:	5/11/12
Tech:	JAM
Review:	MB


60 mil
LLPDE
T/T
11-1415-00131/2000
3/15/12
Eagle Gold / Yukon


60 mil
LLPDE
T/T
11-1415-0013/2000
3/15/12
Eagle Gold / Yukon

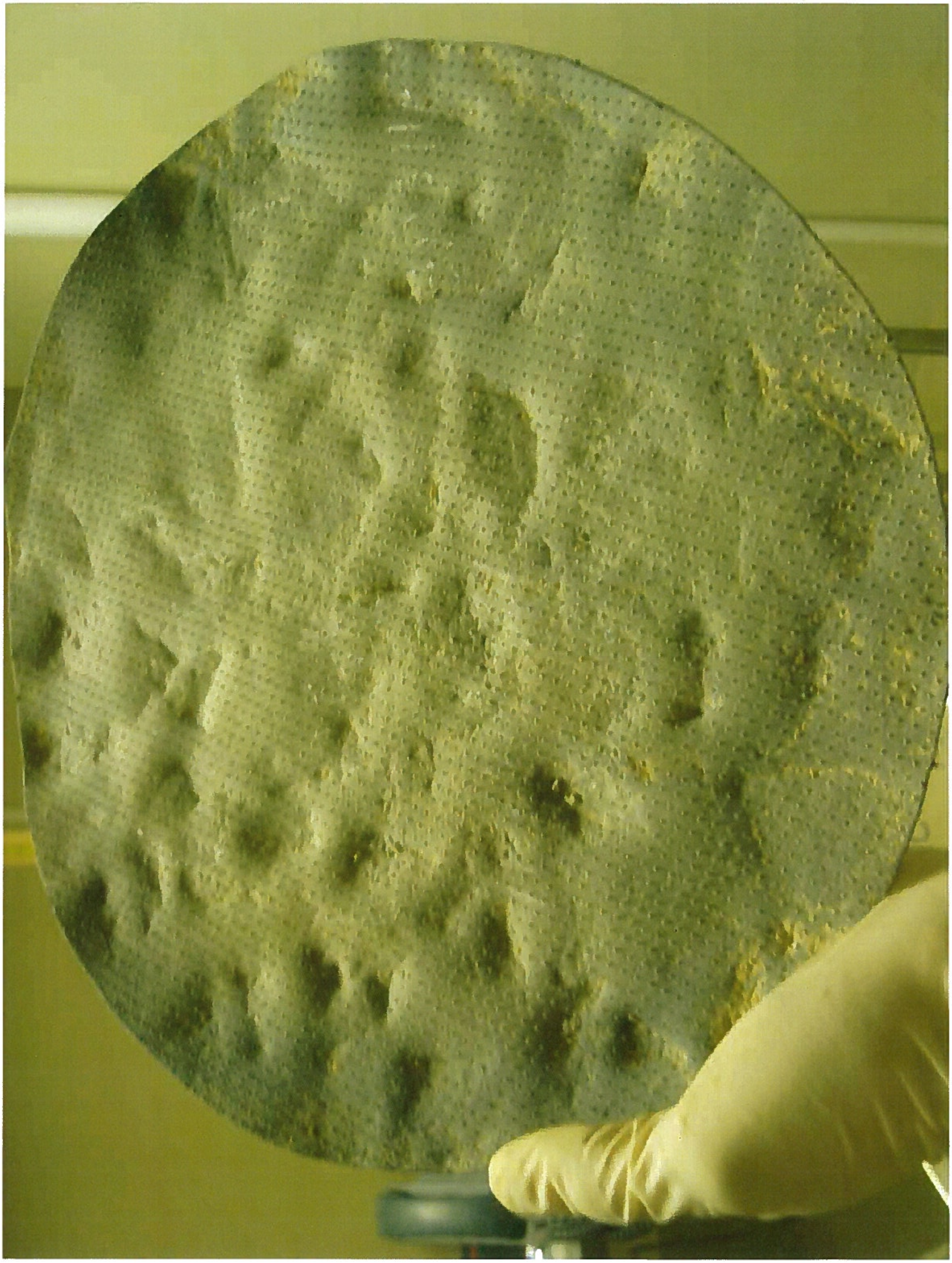

60 mil
LLPDE
T/T
11-1415-00131/2000
3/15/12
Eagle Gold / Yukon


3/15/12
11-1415-0013/2000
Eagle Gold/Yukon
4" Silt material @ 107.8 pcf
60 mil LLPDE T/T











11-1413-0013/12000
Eagle Gold/Yukon
4" Silt material @ 107.8 pcf
60 mil LLDPE T/T
Complete Set-up
POST-TEST
3/18/12

June 22, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner load testing on Agru Americas 80mil microspike liner sample and "BGC-GD-01 (38mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER:	11-1415-0013/2000	UNDERLINER:	Silt
JOB NAME:	Tetra Tech/Aggregate/Yukon	OVERLINER	BGC-GD-01 (38mm)
DATE TESTED:	06/16/12		

Clay Liner

Initial Moisture Content

Tare:	KD-35
Wet Weight & Tare, g:	463.28
Dry Weight & Tare, g:	419.63
Tare Weight, g:	125.86
Moisture, %:	**14.9**

Final Moisture Content

Tare:	SCI
Wet Weight & Tare, g:	591.98
Dry Weight & Tare, g:	535.27
Tare Weight, g:	123.48
Moisture, %:	**13.8**

Overliner

Initial Moisture Content

Tare:	C3PO
Wet Weight & Tare, g:	692.31
Dry Weight & Tare, g:	690.83
Tare Weight, g:	128.65
Moisture, %:	**0.3**

Final Moisture Content

Tare:	TDM-2
Wet Weight & Tare, g:	748.00
Dry Weight & Tare, g:	746.03
Tare Weight, g:	128.28
Moisture, %:	**0.3**

Initial Height Determination (Inches)

	Clay Liner	Overliner
1.	4.000	2.698
2.	4.000	2.691
3.	4.000	2.694
4.	4.000	2.697
5.	4.000	2.703
6.	4.000	2.698
Average	4.000	2.697
Cell Height	--	16.250
Sample Height	4.000	9.470

Density

	Clay liner		Overliner	
Wet Weight:	14,125.50	g	24699.60	g
Dry Weight:	12,298.17	g	24634.75	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	4.000	in	9.470	in
Final Height:	4.000	in	7.001	in
Initial Volume:	0.262	ft^3	0.62	ft^3
Final Volume:	0.262	ft^3	0.46	ft^3
Initial Wet Density:	119.0	pcf	87.9	pcf
Final Wet Density:	119.0	pcf	118.9	pcf
Initial Dry Density:	103.6	pcf	87.7	pcf
Final Dry Density:	103.6	pcf	118.6	pcf

General Test Notes:

Consolidate @ 640 psi for 48 hours

Post-Test: No visual puncturing of geomembrane. No penetrations observed during the vacuum test.

Approximately 20 notable, rounded dimples on the surface of the membrane.

Liner Thickness (in)

1.	0.085	
2.	0.081	
3.	0.081	
4.	0.086	
5.	0.085	
6.	0.082	
Average	0.083	(in)
	83.33	(mls)

Remold Instructions

Compact subgrade to 95% & +/- 2% of the Standard Proctor density at optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech/Aggregate/Yukon

JOB NUMBER: 11-1415-0013/2000

DATE: 6/16/2012

Underliner (Bedding) Source: Silt

Underliner Classification: --

Atterberg Limits: --

Maximum Dry Density (pcf): 107.8

Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (38mm)

Overliner Classification: GP

Atterberg Limits: --

Dry Density (pcf): 87.7

Geosynthetic Manufacturer/Supplier: Agru America (80 mil LLPDE T/T)

Liner Type	Ave. Liner Thickness (mls)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
LLDPE Microspike 80 mil	83.33	50	96.1	14.9	640	2.469	PASS	PASS

General Test Notes: Test was conducted using a 12" diameter cell. The 80 mil texture/texture LLDPE liner was placed on top of moistened GCL which was placed on top of 4.0 inches of underliner soil, then covered with approximately 9.5 inches of overliner material. Approximately 12 rocks were hand placed with points downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used t apply a load of 640 psi to the sample over a period of 14 hours. The load was maintained for 50 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, the liner was inspected and tested for punctures both visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG.

Liner observations: No punctures were present, but numerous rounded dimples.

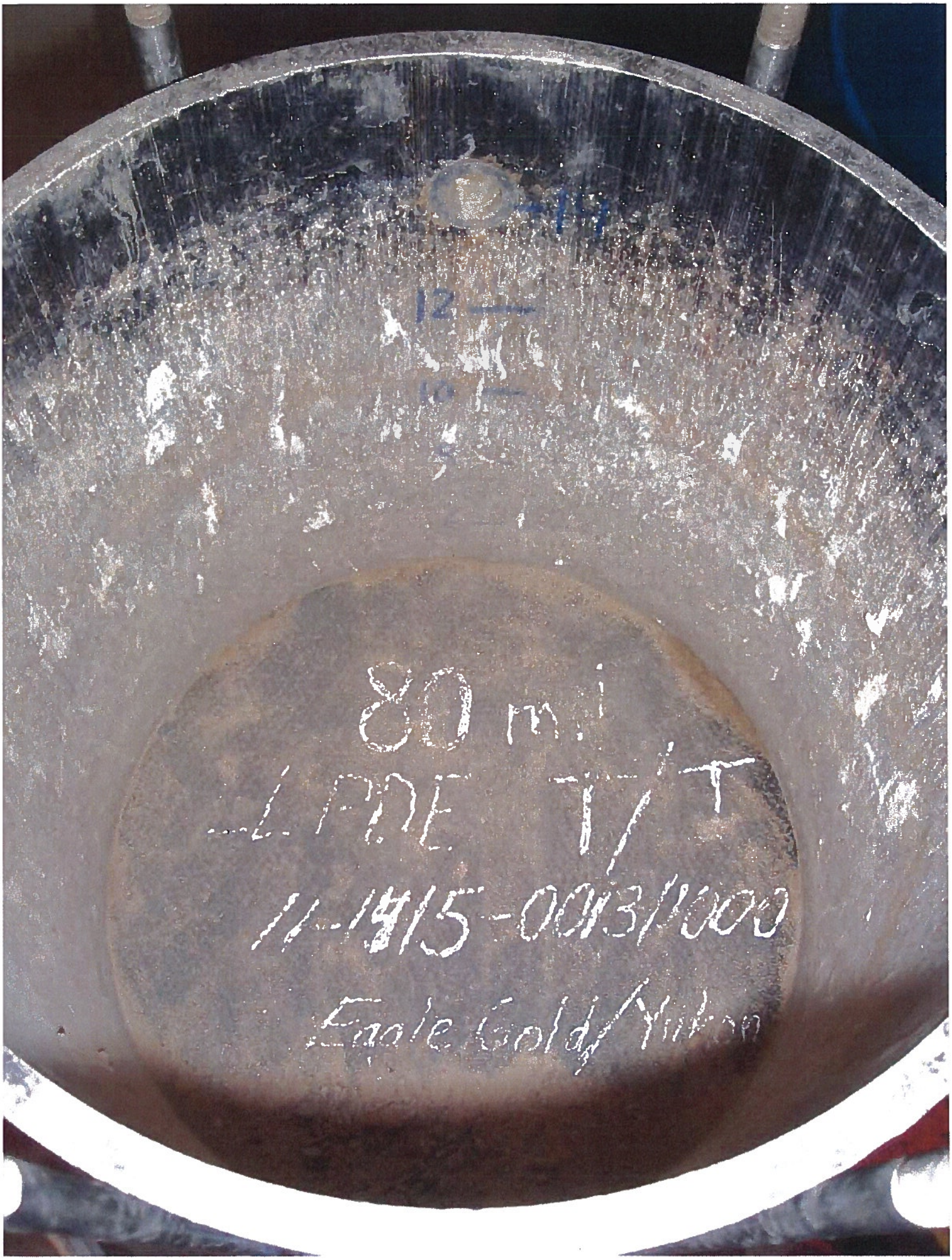
Underliner was remolded to 96.1% of maximum dry density at approximately optimum moisture. Overliner was loosely placed and slightly tamped.

Date: 6/16/12

Tech: JAM

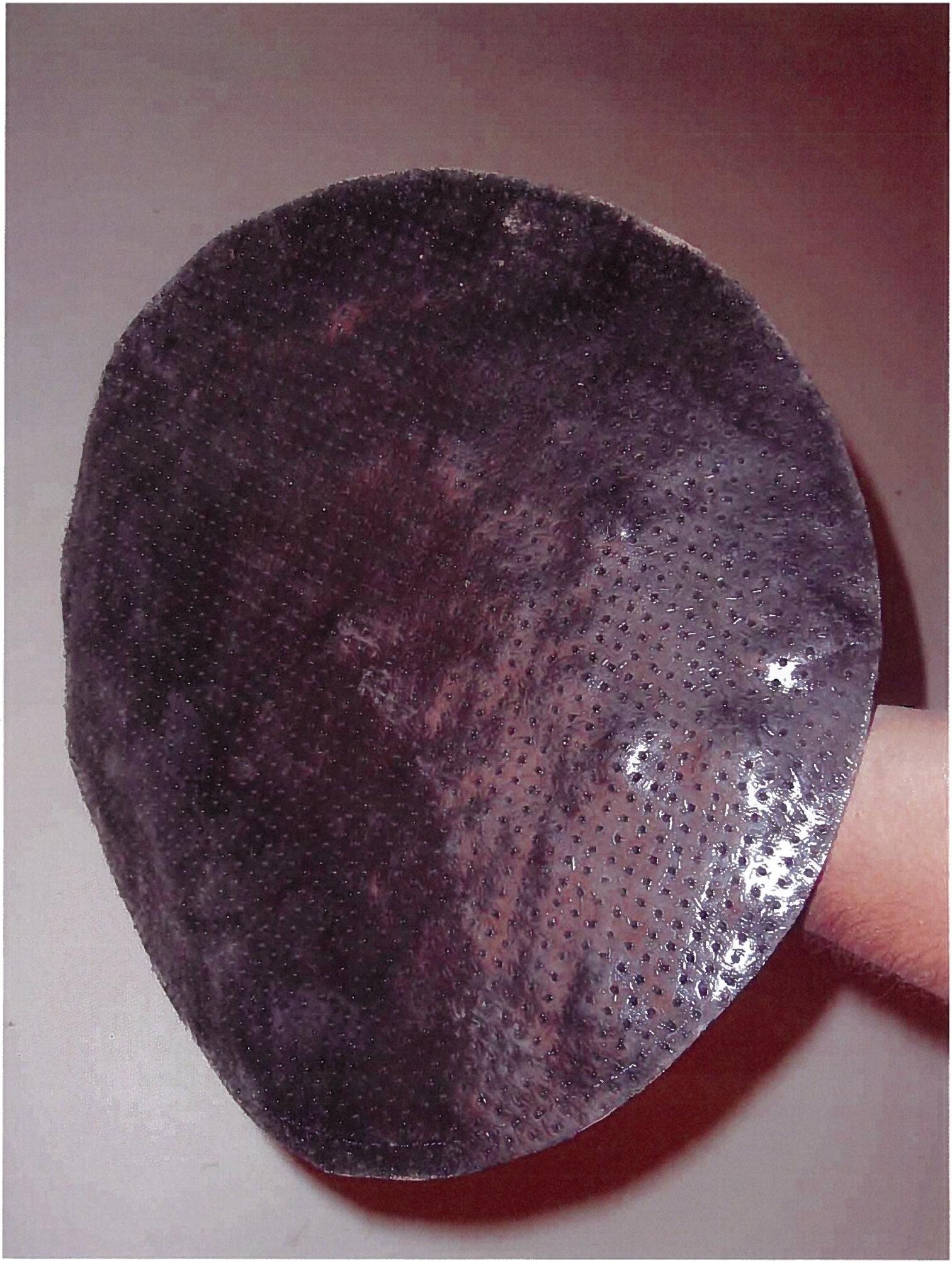
Review: MB




80 m.i
LINE T/T
11-1915-0013/1000
Eagle Gold Yukon


80 m.l
LPDE T/T
11-1415-0013/1000
Eagle Gold/Yukon
6/16/12


80 mi
LPDE T/T
11-1415-0013/1000
Eagle Gold/Yukon
6/16/12








11-1415-0013/2000
6/21/12
Eagle Gold / Yukon
4" Silt @ 107.8 pcf
80 mil LLPDE T/T
TEST COMPLETE

June 26, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner load testing on Agru Americas 80mil microspike liner sample and "BGC-GD-01 (50mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER:	11-1415-0013/2000	UNDERLINER:	Section 2 Silt
JOB NAME:	Tetra Tech/Aggregate/Yukon	OVERLINER	BGC-GD-01 (50mm)
DATE TESTED:	06/21/12		

Clay Liner		**Overliner**	
Initial Moisture Content		**Initial Moisture Content**	
Tare:	SCI	Tare:	KD-35
Wet Weight & Tare, g:	591.98	Wet Weight & Tare, g:	712.90
Dry Weight & Tare, g:	535.27	Dry Weight & Tare, g:	710.81
Tare Weight, g:	123.48	Tare Weight, g:	125.83
Moisture, %:	**13.8**	Moisture, %:	**0.4**
Final Moisture Content		**Final Moisture Content**	
Tare:	EOTO	Tare:	FEE
Wet Weight & Tare, g:	615.14	Wet Weight & Tare, g:	947.87
Dry Weight & Tare, g:	555.36	Dry Weight & Tare, g:	944.49
Tare Weight, g:	122.15	Tare Weight, g:	120.41
Moisture, %:	**13.8**	Moisture, %:	**0.4**

Initial Height Determination (Inches)

	Clay Liner	Overliner
1.	4.030	2.313
2.	4.038	2.073
3.	4.010	2.033
4.	4.120	2.163
5.	3.970	2.413
6.	4.010	2.503
Average	4.030	2.250
Cell Height	--	16.250
Sample Height	4.030	9.889

Density	**Clay liner**		**Overliner**	
Wet Weight:	14,125.50	g	26704.40	g
Dry Weight:	12,415.67	g	26609.33	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	4.030	in	9.889	in
Final Height:	4.022	in	8.326	in
Initial Volume:	0.264	ft^3	0.65	ft^3
Final Volume:	0.263	ft^3	0.54	ft^3
Initial Wet Density:	118.2	pcf	91.0	pcf
Final Wet Density:	118.4	pcf	108.1	pcf
Initial Dry Density:	103.9	pcf	90.7	pcf
Final Dry Density:	104.1	pcf	107.7	pcf

General Test Notes:

Consolidate @ 640 psi for 48 hours.

Post-Test: No visual puncture of geomembrane. No penetrations observed during the vacuum test.

Approximately 10 notable, rounded dimples on the surface of the membrane.

Liner Thickness (in)

1.	0.081	
2.	0.081	
3.	0.083	
4.	0.078	
5.	0.080	
6.	0.083	
Average	0.081	(in)
	81.00	(mls)

Remold Instructions

Compact subgrade to 95% & +/- 2% of the Standard Proctor density at optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech/Aggregate/Yukon

JOB NUMBER: 11-1415-0013/2000

DATE: 6/21/2012

Underliner (Bedding) Source: Section 2 Silt

Underliner Classification: -- Atterberg Limits: --

Maximum Dry Density (pcf): 107.8 Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (50mm)

Overliner Classification: GP Atterberg Limits: --

Dry Density (pcf): 90.7

Geosynthetic Manufacturer/Supplier: Agru America LLDPE Microspike (80mil)

Liner Type	Ave. Liner Thickness (mls)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
LLDPE Microspike 80	81.00	70	96.4	13.8	640	2.373	PASS	PASS

General Test Notes: Test was conducted using a 12" diameter cell. The 80 mil texture/texture LLDPE microspike liner was placed on top of moistened GCL which was placed on top of 4.0 inches of underliner soil, then covered with approximately 9.75 inches of overliner material. Approximately 12 rocks were hand placed with points downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of 89 hours. The load was maintained for 70 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, the liner was inspected and tested for punctures both visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG.

Liner observations: No punctures were present but numerous dimples and scratches.

Underliner was remolded to 95% of maximum dry density at approximately optimum moisture. Overliner was loosely placed and slightly tamped.

Date: 6/21/12

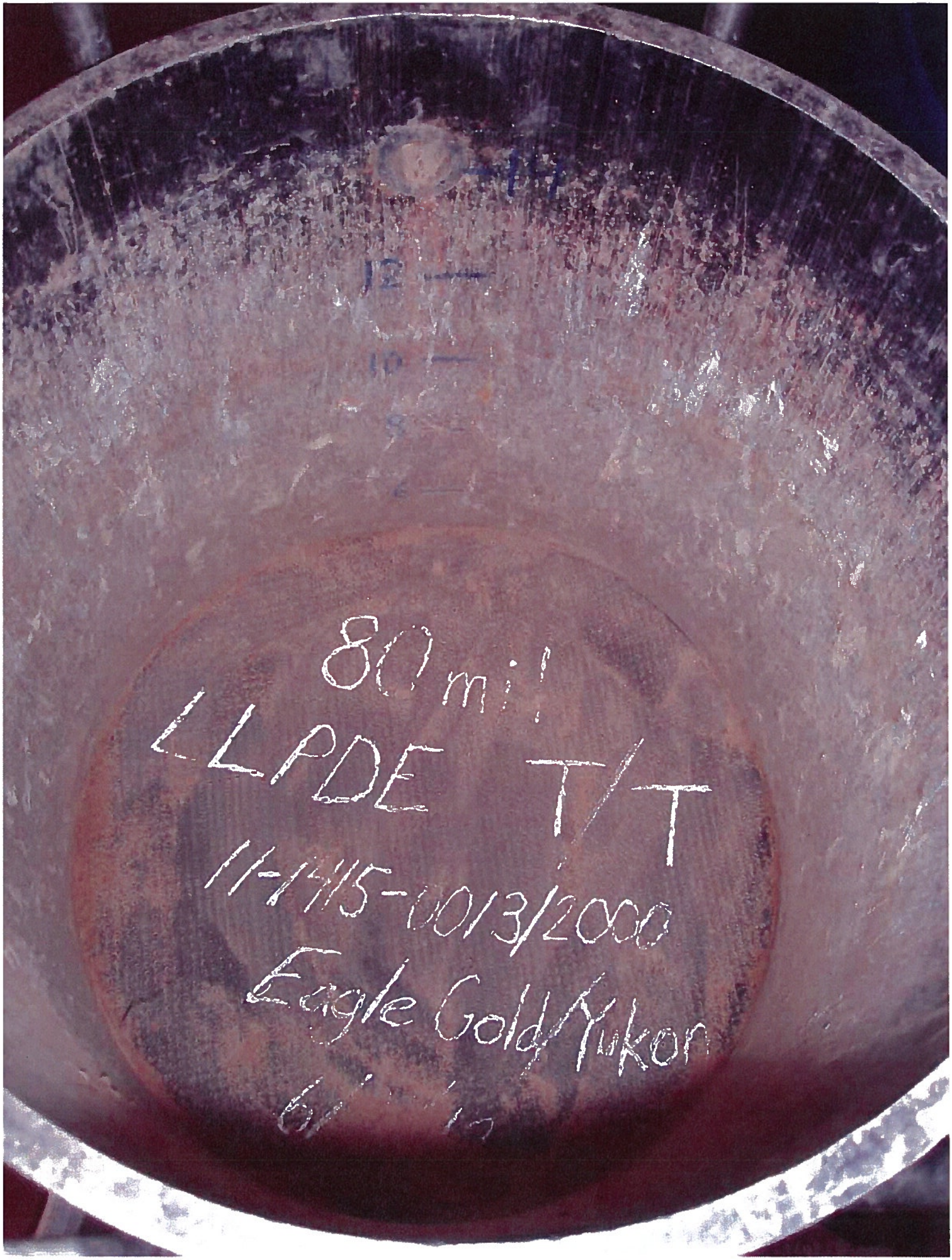
Tech: JAM

Review: MB


80 mil
LLPDE T/T
11-1415-00013/2000
Eagle Gold/Yukon






80 mil
LLPDE T/T
11-1115-10/13/2000
Eagle Gold/Yukon






80 mil
LLPDE T/T
11-1415-0013/2000
Eagle Gold/Yukon
6/21/12


80 mil
LLPDE T/T
11-1415-0013/2000
Eagle Gold/Yukon
6/21/12






11-1415-0013/2000
6/25/12
Eagle Gold / Yukon
4 @ 107.8pcf
50mil LLPDE T/T
TEST COMPLETE

Golder Associates

July 13, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner load testing on Agru Americas 60mil microspike liner sample, GCL, and "BGC-GD-01 (38mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS


60 mil
LLPDE T/T
11-1415-0013/2000
Eagle Gold/Yukon
6/25/12








60mil
LLPDE T/T
11/415-0013/2000
Eagle Gold/Yukon
6/25/12


11-1415-0013/2000 6/25/12
Eagle Gold / Yukon
4 Silt @ 107.8pcf
0mil LLPDE T/T
mplete Setup

Golder Associates

July 30, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on a sample submitted from the Golder Office in Burnaby, British Columbia, Canada. The sample was tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of Liner System A liner load testing on sample "BGC-GD-01 (50mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER: 11-1415-0013/2000
JOB NAME: Tetra Tech/Aggregate/Yukon
DATE TESTED: 07/10/12

UNDERLINER: Silt
OVERLINER: BGC-GD-01 (50mm)

Clay Liner

Initial Moisture Content

Tare:	Z-42
Wet Weight & Tare, g:	382.80
Dry Weight & Tare, g:	361.18
Tare Weight, g:	208.02
Moisture, %:	**14.1**

Final Moisture Content

Tare:	PGC
Wet Weight & Tare, g:	532.00
Dry Weight & Tare, g:	487.73
Tare Weight, g:	127.19
Moisture, %:	**12.3**

Overliner

Initial Moisture Content

Tare:	EM-88
Wet Weight & Tare, g:	702.55
Dry Weight & Tare, g:	700.54
Tare Weight, g:	126.39
Moisture, %:	**0.4**

Final Moisture Content

Tare:	A-7X
Wet Weight & Tare, g:	833.18
Dry Weight & Tare, g:	830.49
Tare Weight, g:	125.19
Moisture, %:	**0.4**

Initial Height Determination (Inches)

	Clay Liner	Overliner
1.	3.945	1.817
2.	3.984	1.883
3.	3.866	1.827
4.	3.945	1.707
5.	4.063	1.657
6.	4.142	1.697
Average	3.991	1.765
Cell Height	--	16.250
Sample Height	3.991	10.013

Density

	Clay liner		Overliner	
Wet Weight:	13,882.2	g	25750.30	g
Dry Weight:	12,165.0	g	25660.47	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	3.991	in	10.013	in
Final Height:	3.932	in	7.453	in
Initial Volume:	0.261	ft^3	0.66	ft^3
Final Volume:	0.257	ft^3	0.49	ft^3
Initial Wet Density:	117.3	pcf	86.7	pcf
Final Wet Density:	119.0	pcf	116.5	pcf
Initial Dry Density:	102.8	pcf	86.4	pcf
Final Dry Density:	104.3	pcf	116.1	pcf

General Test Notes:

Consolidate @ 640 psi for a minimum of 48 hours

Post-Test: No visual or vacuum-tested punctures present in either "Top" or "Bottom" 80 mil microspike texture/texture LLDPE liner. "Top" liner had approximately 10 notable dimples while the "Bottom" liner had approximately 1 notable dimple.

TOP LINER Visual puncture inspection: PASS Vacuum Test: PASS

BOTTOM LINER Visual puncture inspection: PASS Vacuum Test: PASS

Liner Thickness (in)

	Top	Bottom	Geonet	
1.	0.083	0.08	0.335	
2.	0.081	0.083	0.33	
3.	0.079	0.08	0.328	
4.	0.080	0.081	0.305	
5.	0.079	0.080	0.324	
6.	0.081	0.081	0.297	
Average	0.081	0.081	0.320	(in)
	80.50	80.83	319.83	(mls)

Remold Instructions

Approximately 10" thickness for overliner material. Compaction to 95% of standard Proctor maximum dry density and +/- 2% of standard Proctor optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech/Aggregate/Yukon

JOB NUMBER: 11-1415-0013/2000

DATE: 7/10/2012

Underliner (Bedding) Source: Silt

Underliner Classification: --

Atterberg Limits: --

Maximum Dry Density (pcf): 107.8

Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (50mm)

Overliner Classification: GP

Atterberg Limits: --

Dry Density (pcf): 86.4

Geosynthetic Manufacturer/Supplier: Agru America LLDPE Microspike (80-mil)

Geosynthetic Manufacturer/Supplier: Agru America LLDPE Microspike (80-mil)

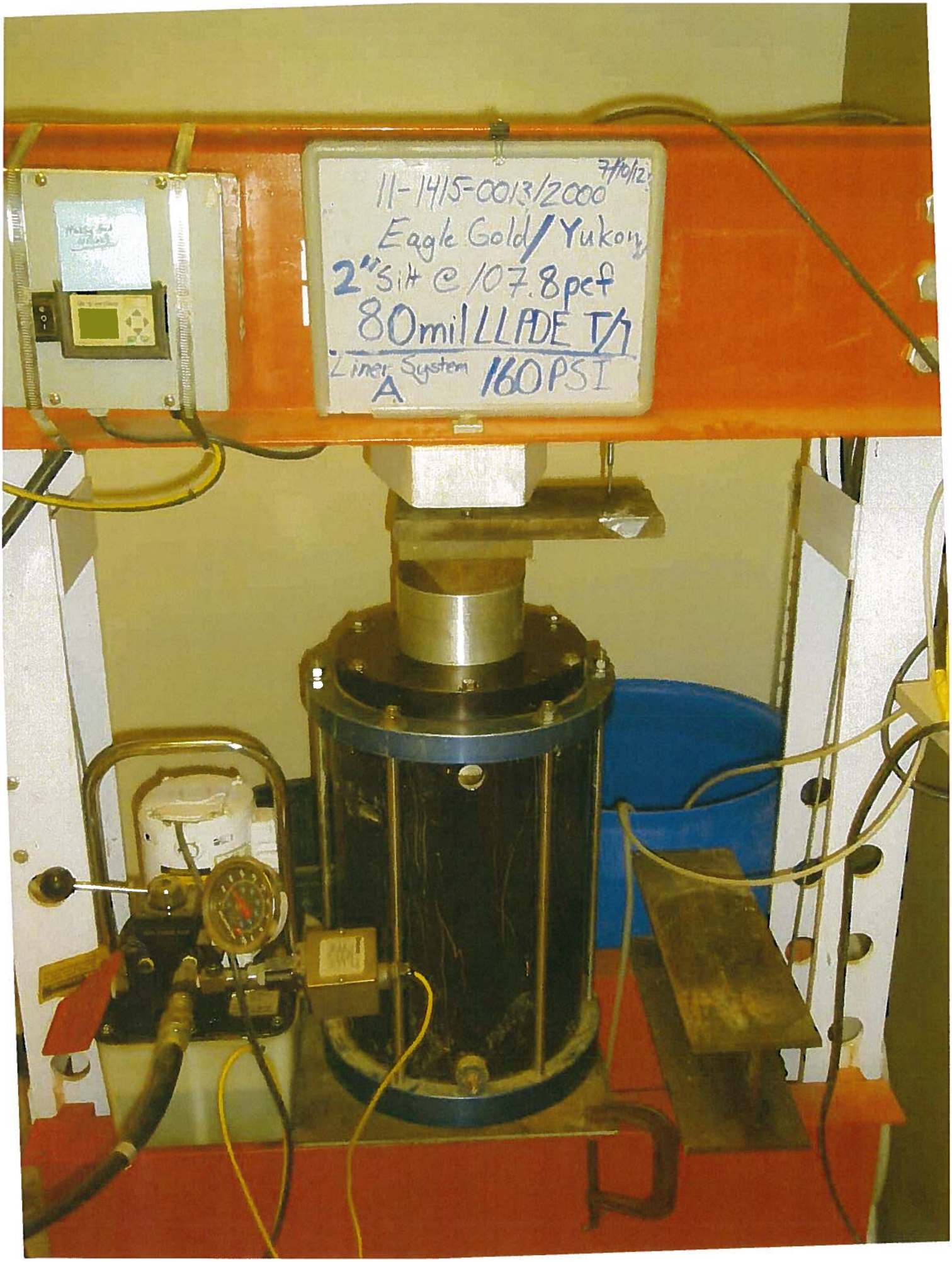
Liner Type	Ave. Liner Thickness (mls)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
(Top) LLDPE Microspike 80	80.50	52	95.3	14.1	640	2.56	PASS	PASS
Tendrain 770-2 Double-sided	319.83	52	95.3	14.1	640	2.56	PASS	--
(Bottom) LLDPE Microspike 80	80.83	52	95.3	14.1	640	2.56	PASS	PASS

General Test Notes: Test was conducted using a 12" diameter cell. GCL was placed on top of approximately 4 inches of the underliner material then overlaid by 80 mil microspike texture/texture LLDPE liner then followed by Geonet drain material. A second layer of 80 mil microspike texture/texture LLDPE liner was then placed on top of the Geonet and then overlain by approximately 10 inches of overliner material. Approximately 18 rocks were hand placed pointing downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of 71 hours and maintained for 52 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, both liners were inspected and tested for punctures visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG.

Liner observations: No visual puncturing of either geomembrane or Geonet. No leaks were observed during the vacuum test. Approximately 10 notable dimples were present on the surface of the "Top" LLDPE liner. The "Bottom" LLDPE liner had only 1 notable dimple. GCL and geonet have only indentations that mimic the dimples from overlying geosynthetic materials.

Underliner was remolded to 95.3% of standard Proctor maximum dry density and -1.1% of standard Proctor optimum moisture content. Overliner was loosely placed and slightly tampec

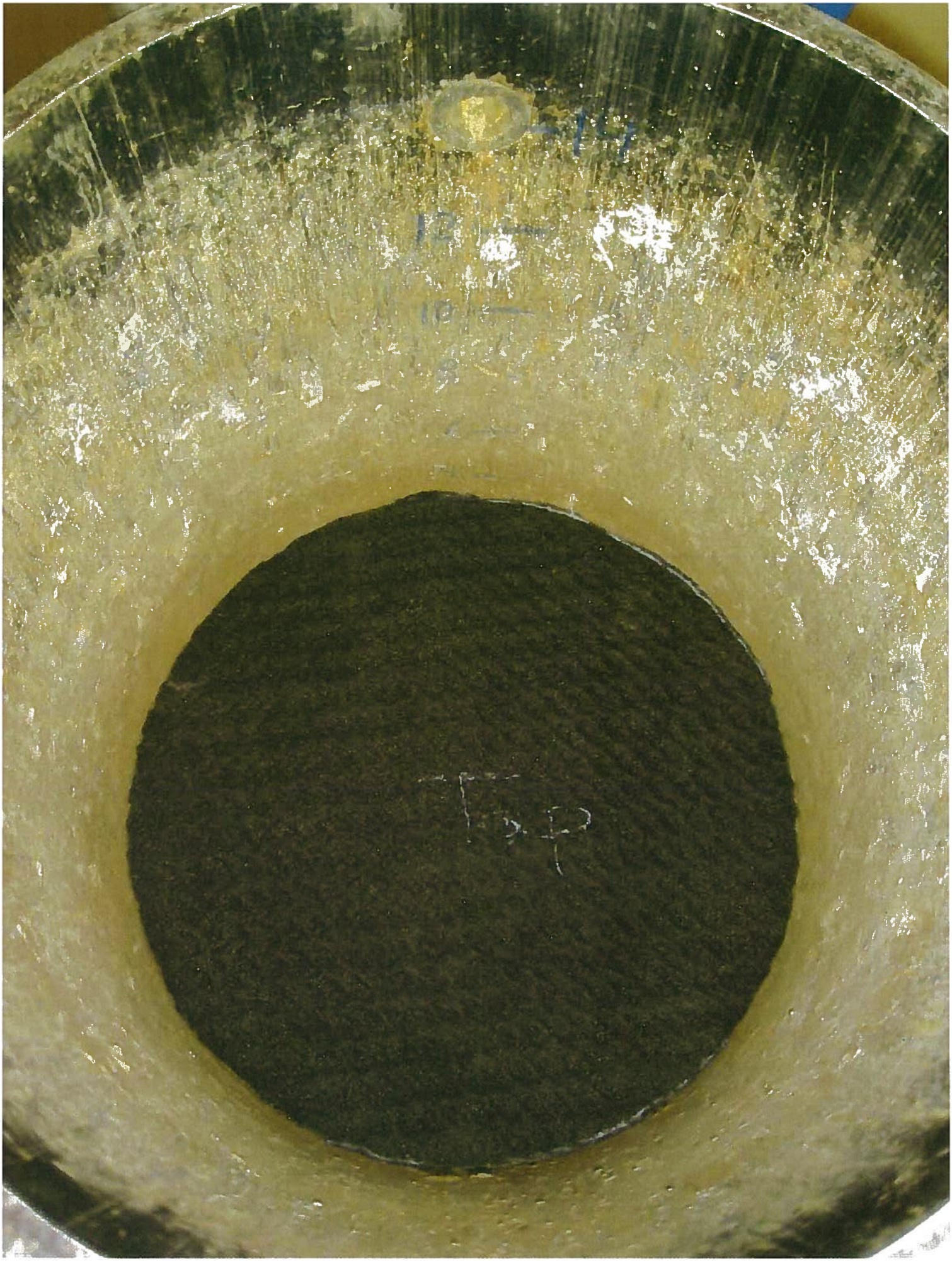
Date:	7/10/12
Tech:	JAM
Review:	MB

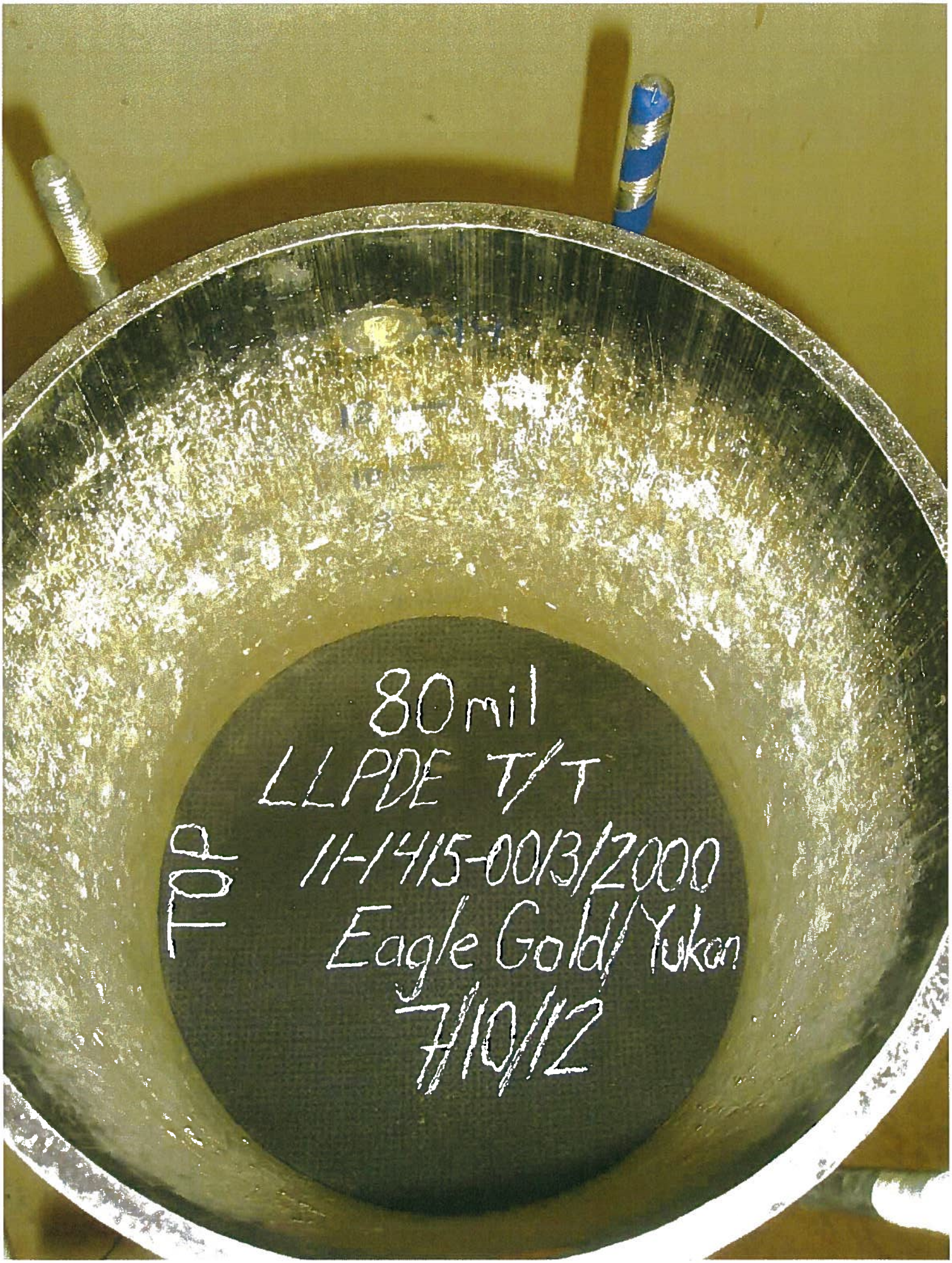

7/10/12
11-1415-0013/2000
Eagle Gold / Yukon
2" Silt @ 107.8 pcf
80 mil LLDPE T/T
Liner System A
160 PSI




12
10
8


80 mil
LLPDE T/T
11-1415-0013/2000
Eagle Gold/Yukon
7/10/12
BOTTOM

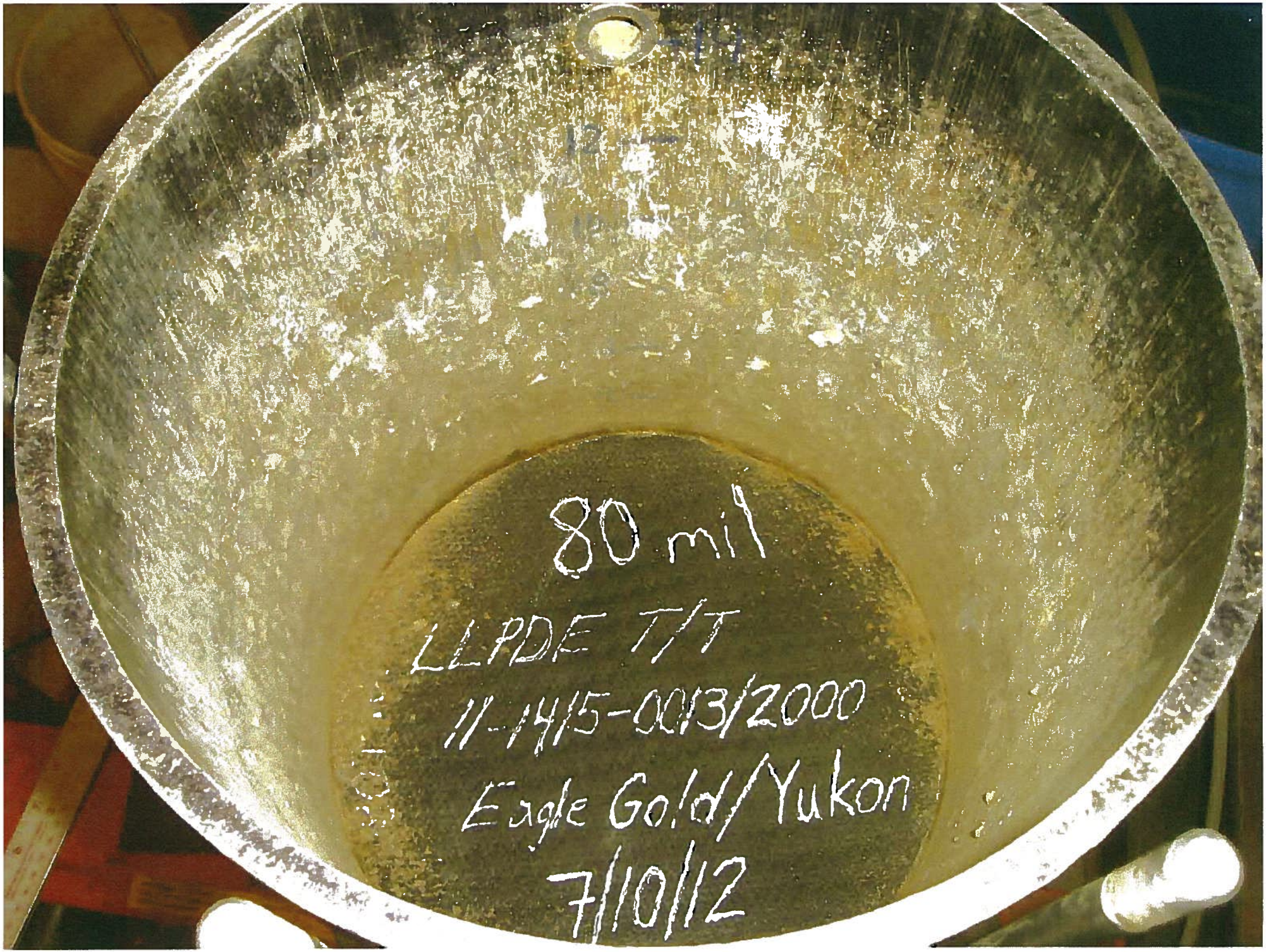


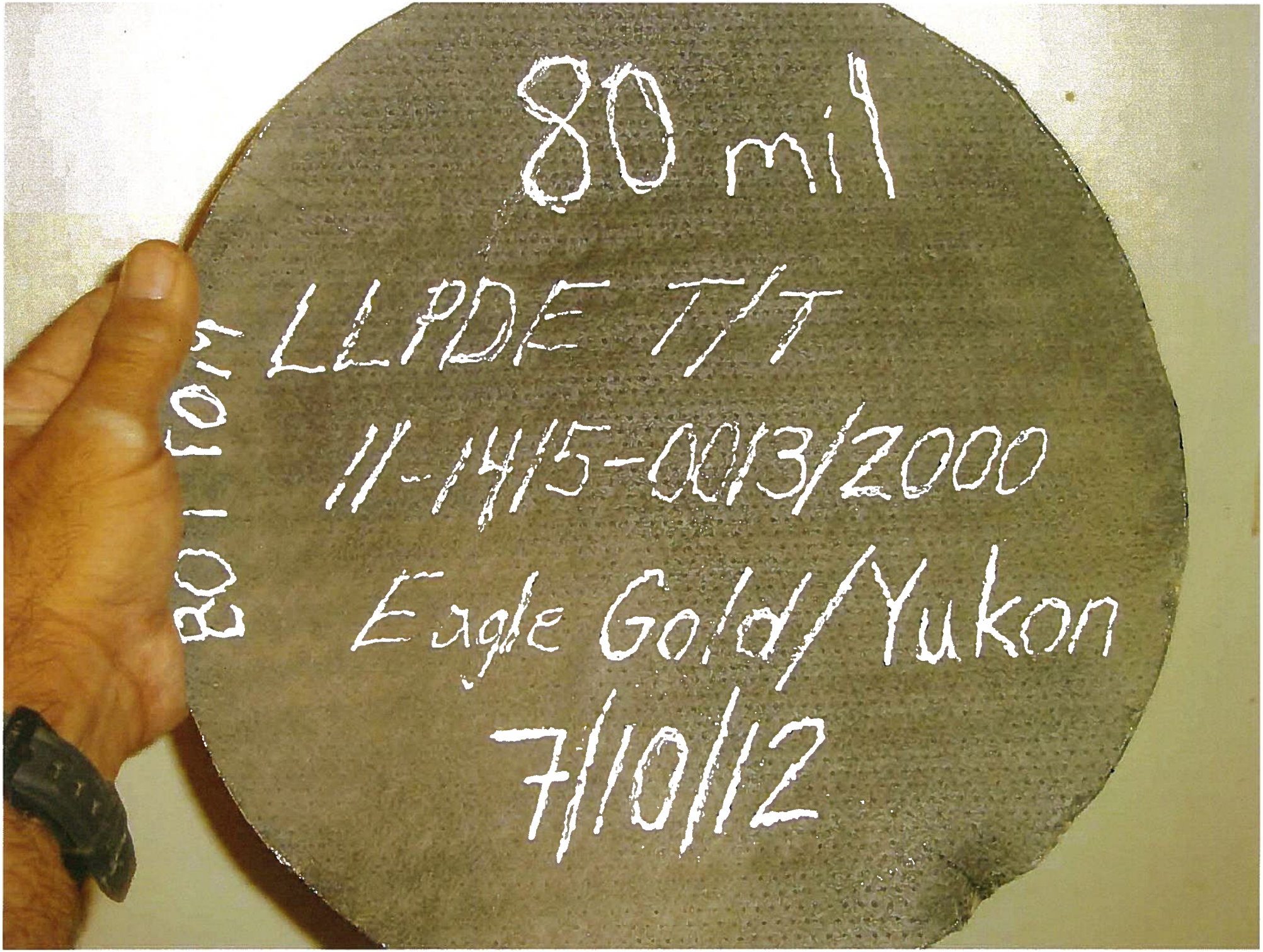

80 mil
LLPDE T/T
11-1415-0013/2000
Eagle Gold/Yukon
7/10/12
Top



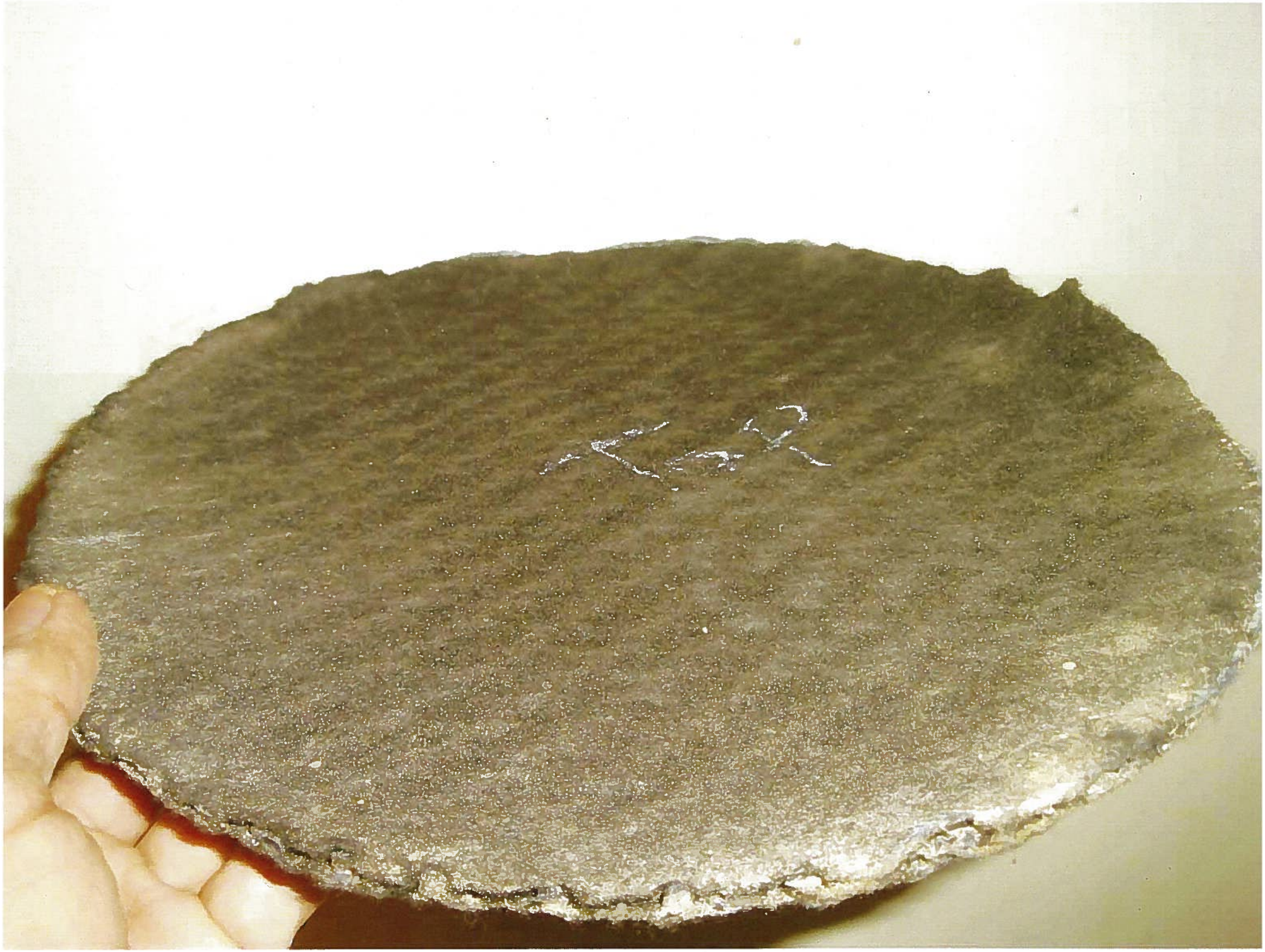

12

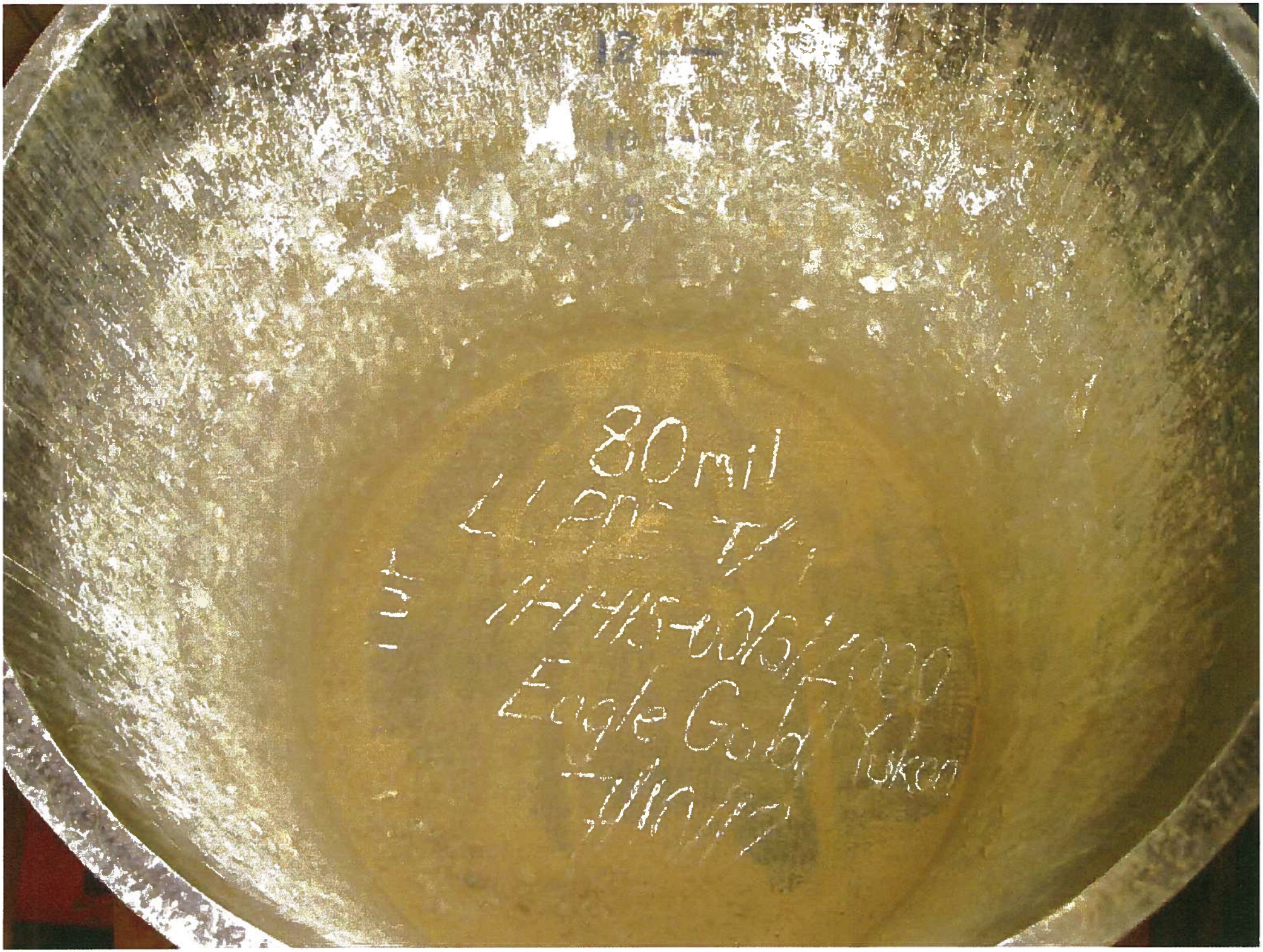



80 mil
LLPDE T/T
11-1415-0013/2000
Eagle Gold/Yukon
7/10/12


80 mil
LLPDE T/T
11-1415-0013/2000
Eagle Gold/Yukon
7/10/12
80 mil

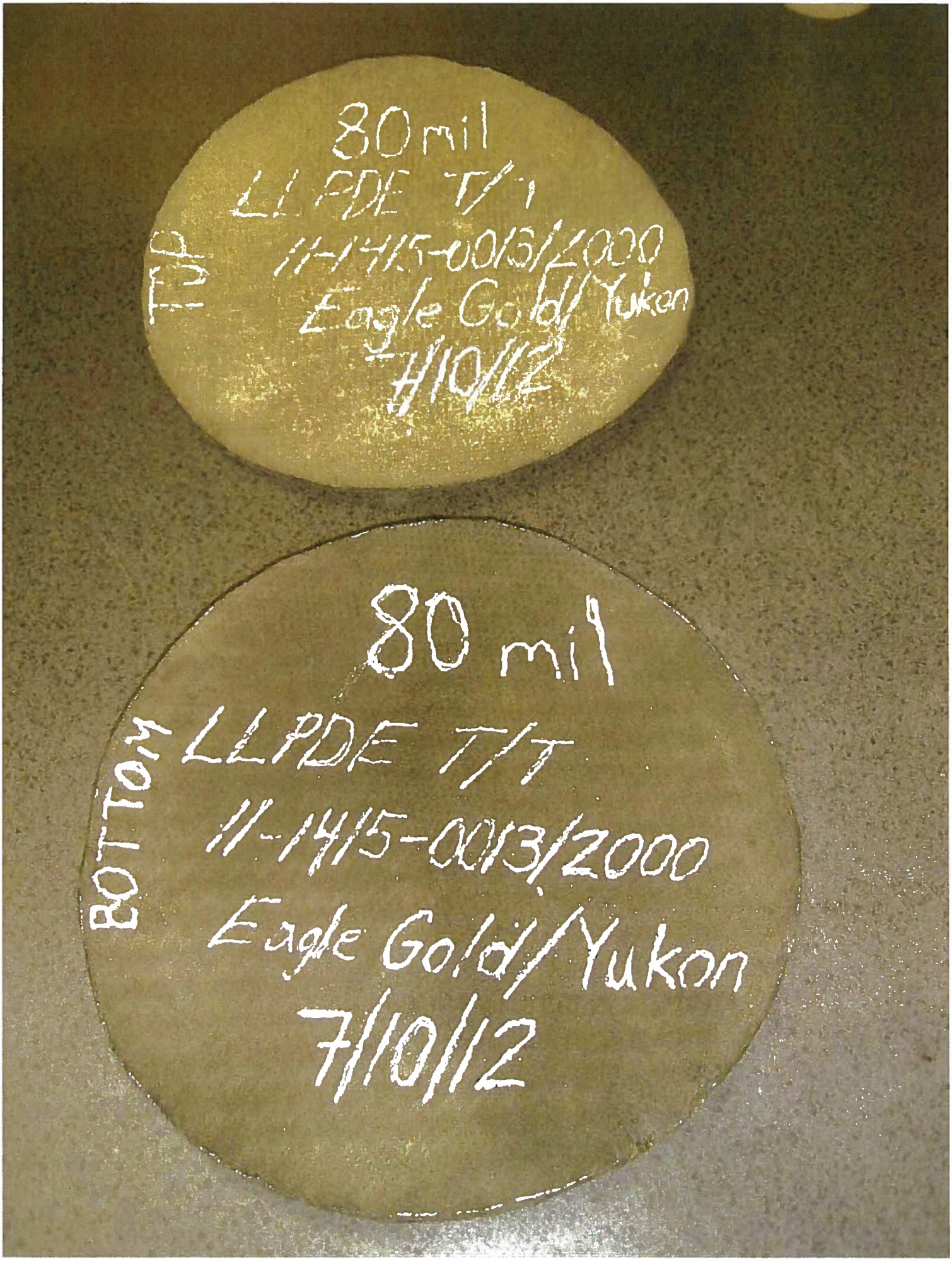





80mil
Eagle Gold Yukon






80 mil
LLPDE T/T
11-1415-0013/2000
Eagle Gold/Yukon
7/10/12
TOP
80 mil
LLPDE T/T
11-1415-0013/2000
Eagle Gold/Yukon
7/10/12
BOTTOM

July 31, 2012

Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on a sample submitted from the Golder Office in Burnaby, British Columbia, Canada. The sample was tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of Liner System C liner load testing on sample "BGC-GD-01 (50mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER:	11-1415-0013/2000	UNDERLINER:	Silt
JOB NAME:	Tetra Tech/Aggregate/Yukon	OVERLINER	BGC-GD-01 (50mm)
DATE TESTED:	07/17/12		

Clay Liner

Initial Moisture Content

Tare:	EOTO
Wet Weight & Tare, g:	450.29
Dry Weight & Tare, g:	409.72
Tare Weight, g:	122.16
Moisture, %:	**14.1**

Final Moisture Content

Tare:	AC
Wet Weight & Tare, g:	560.73
Dry Weight & Tare, g:	506.69
Tare Weight, g:	96.47
Moisture, %:	**13.2**

Overliner

Initial Moisture Content

Tare:	AC/DC
Wet Weight & Tare, g:	738.34
Dry Weight & Tare, g:	735.62
Tare Weight, g:	112.08
Moisture, %:	**0.4**

Final Moisture Content

Tare:	W-H
Wet Weight & Tare, g:	805.51
Dry Weight & Tare, g:	802.62
Tare Weight, g:	95.80
Moisture, %:	**0.4**

Initial Height Determination (Inches)

	Underliner	Overliner
1.	3.100	3.007
2.	3.140	2.981
3.	2.982	2.901
4.	2.982	2.866
5.	2.982	2.883
6.	3.140	2.971
Average	3.054	2.935
Cell Height	--	16.250
Sample Height	3.054	10.231

Density	**Underliner**		**Overliner**	
Wet Weight:	10,493.8	g	25028.20	g
Dry Weight:	9,196.3	g	24919.50	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	3.054	in	10.231	in
Final Height:	2.972	in	8.245	in
Initial Volume:	0.200	ft^3	0.67	ft^3
Final Volume:	0.195	ft^3	0.54	ft^3
Initial Wet Density:	115.8	pcf	82.5	pcf
Final Wet Density:	119.0	pcf	102.3	pcf
Initial Dry Density:	101.5	pcf	82.1	pcf
Final Dry Density:	104.3	pcf	101.9	pcf

General Test Notes:

Consolidate @ 640 psi for 48 hours. Approximately 3" of subgrade.

20 rocks positioned above PVC membrane prior to overliner addition.

PVC LINER: Visual puncture inspection: PASS Vacuum Test: FAIL

Two small perforations within membrane-noted with white circles in photos.

Liner Thickness (in)

1.	0.030	
2.	0.030	
3.	0.030	
4.	0.030	
5.	0.030	
6.	0.030	
Average	0.030	(in)
	30.00	(mls)

Remold Instructions

Approximately 12" thickness for overliner material. Compaction to 95% of standard Proctor maximum dry density. +/- 2% of standard Proctor optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech/Aggregate/Yukon

JOB NUMBER: 11-1415-0013/2000

DATE: 7/17/2012

Underliner (Bedding) Source: Silt

Underliner Classification: -- Atterberg Limits: --

Maximum Dry Density (pcf): 107.8 Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (50mm)

Overliner Classification: GP Atterberg Limits: --

Dry Density (pcf): 82.1

Geosynthetic Manufacturer/Supplier: Nan Ya Plastics Corporation, America 0.75 mm PVC

Liner Type	Ave. Liner Thickness (mils)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
0.75mm PVC	30.0	65	94.1	14.1	640	1.986	PASS	FAIL

General Test Notes: Test was conducted using a 12" diameter cell. Smooth 0.75mm PVC was placed on top of approximately 3.0 inches of silt then overlain by approximatley 10.2 inches of overliner material. Approximately 20 rocks were hand placed pointing downward on the liner prior to placement of the remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of 70 hours and maintained for 65 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, the PVC liner was inspected and tested for punctures visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG.

Liner observations: No visual puncturing of PVC liner. Two leaks were observed during the vacuum test. Approximately 40 notable dimples were present on the surface of the PVC liner.

Underliner was remolded to 94.1% of standard Proctor maximum dry density and -1.1% of standard Proctor optimum moisture content. Overliner was loosely placed and slightly tamped

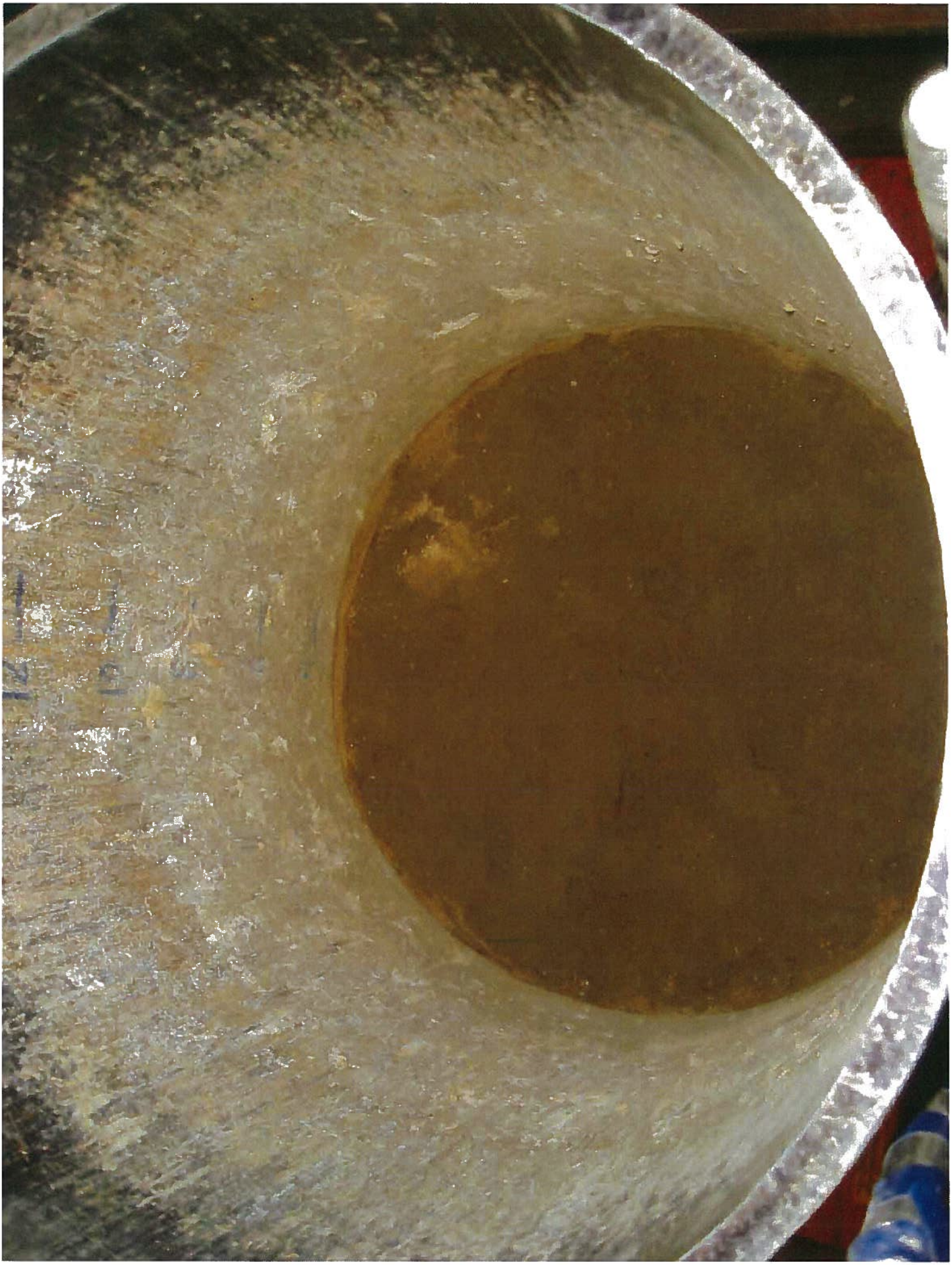
Date:	7/17/12
Tech:	JAM
Review:	MB


11-1415-0013/2000
Eagle Gold / Yukon
3" Silt @ 107.8 pcf
0.75 mm PVC
Liner System TEST COMPLETE




0.75mm PVC
11-1415-0013/2000
Eagle Gold/Yukon
50mm Gravel






075mm PVC
11-1415-0013/2000
Eagle Gold / Yukon
50mm Gravel




0.75mm PVC
11-1415-0013/2000
Eagle Gold/Yukon
50mm Gravel




0.75mm PVC
11-4/5-0013/2000
Gold/Yukon
50mm Gravel

August 22, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner load testing on Liner System A sample "BGC-GD-01 (38mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER: 11-1415-0013/2000
JOB NAME: Tetra Tech/Aggregate/Yukon
DATE TESTED: 08/08/12

UNDERLINER: Silt
OVERLINER: BGC-GD-01 (38mm)

Clay Liner

Initial Moisture Content

Tare:	K-5
Wet Weight & Tare, g:	136.14
Dry Weight & Tare, g:	123.05
Tare Weight, g:	21.82
Moisture, %:	**12.9**

Final Moisture Content

Tare:	N-8
Wet Weight & Tare, g:	224.47
Dry Weight & Tare, g:	200.59
Tare Weight, g:	26.77
Moisture, %:	**13.7**

Overliner

Initial Moisture Content

Tare:	JW-18
Wet Weight & Tare, g:	540.22
Dry Weight & Tare, g:	537.71
Tare Weight, g:	128.52
Moisture, %:	**0.6**

Final Moisture Content

Tare:	GURU
Wet Weight & Tare, g:	719.76
Dry Weight & Tare, g:	716.74
Tare Weight, g:	125.76
Moisture, %:	**0.5**

Initial Height Determination (Inches)

	Underliner	Overliner
1.	2.746	5.433
2.	2.707	5.433
3.	2.746	5.512
4.	2.707	5.512
5.	2.667	5.433
6.	2.825	5.590
Average	2.733	5.486
Cell Height	--	16.250
Sample Height	2.733	7.574

Density	**Underliner**		**Overliner**	
Wet Weight:	9,412.0	g	21355.00	g
Dry Weight:	8,334.3	g	21224.81	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	2.733	in	7.574	in
Final Height:	2.634	in	6.098	in
Initial Volume:	0.179	ft^3	0.50	ft^3
Final Volume:	0.172	ft^3	0.40	ft^3
Initial Wet Density:	116.1	pcf	95.0	pcf
Final Wet Density:	120.5	pcf	118.1	pcf
Initial Dry Density:	102.8	pcf	94.5	pcf
Final Dry Density:	106.7	pcf	117.3	pcf

General Test Notes:

Consolidate @ 640psi for 48hrs.

Post-Test: No visual or vacuum-tested punctures present in either "Top" or "Bottom" 60 mil microspike texture/texture LLDPE liner. "Top" liner had approximately 15 notable dimples, geocomposite had 7 dimples, while the "Bottom" liner had approximately 5 notable dimples.

17 rocks positioned with edges or points against top LLDPE liner.

TOP LINER Visual puncture inspection: PASS Vacuum Test: PASS

GCL and GEOCOMPOSITE No damage, only indentations.

BOTTOM LINER Visual puncture inspection: PASS Vacuum Test: PASS

Liner Thickness (in)

	Top	Bottom	Geonet	
1.	0.060	0.060	0.346	
2.	0.061	0.060	0.344	
3.	0.061	0.060	0.331	
4.	0.061	0.060	0.337	
5.	0.060	0.060	0.331	
6.	0.060	0.060	0.335	
Average	0.061	0.060	0.337	(in)
	60.50	60.08	337.33	(mils)

Remold Instructions

Approximately 7.5" thickness for overliner material. Compaction to 95% of standard Proctor maximum dry density and +/- 2% of standard Proctor optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech/Aggregate/Yukon

JOB NUMBER: 11-1415-0013/2000

DATE: 8/8/2012

Underliner (Bedding) Source: Silt

Underliner Classification: --

Atterberg Limits: --

Maximum Dry Density (pcf): 107.8

Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (38mm)

Overliner Classification: GP

Atterberg Limits: --

Dry Density (pcf): 94.5

Geosynthetic Manufacturer/Supplier: Agru America LLDPE Microspike (60-mil)

Geocomposite Manufacturer/Supplier: SYNTEC

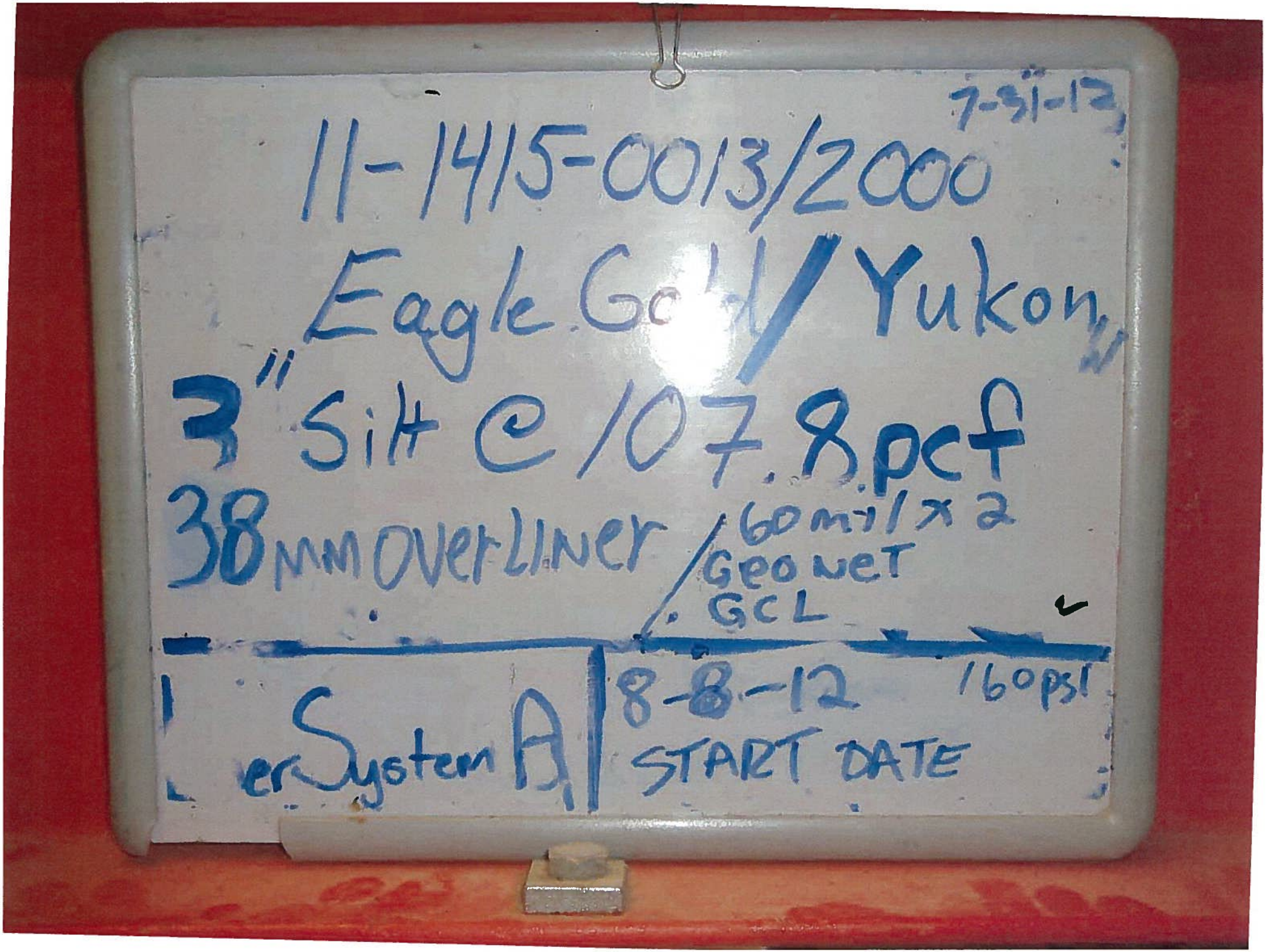
Liner Type	Ave. Liner Thickness (mils)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
(Top) LLDPE Microspike 60	60.5	48	95.4	12.9	640	1.575	PASS	PASS
Tendrain 770-2 Double-sided	337.3	48	95.4	12.9	640	1.575	PASS	--
(Bottom) LLDPE Microspike 60	60.1	48	95.4	12.9	640	1.575	PASS	PASS
GCL	0.3	48	95.4	12.9	640	1.575	PASS	--

General Test Notes: Test was conducted using a 12" diameter cell. GCL was placed on top of approximately 2.7 inches of underliner soil. 60 mil microspike texture/texture LLDPE liner was placed on top of the GCL, followed by GEONET drain material, a second layer of 60 mil microspike texture/texture LLDPE liner and approximately 7.5 inches of overliner material. Approximately 17 rocks were hand placed pointing downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of 17 hours. The load was maintained for 48 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, both liners were inspected and tested for punctures visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG

Liner observations: No visual puncturing of either geomembrane or Geonet. No leaks were observe during the vacuum test. Approximately 15 notable dimples were present on the surface of the "Top" LLDP liner. The "Bottom" LLDPE liner had only 5 notable dimples. GCL and geonet (7 dimples) have only indentations that mimic the dimples from overlying geosynthetic materials.

Underliner was remolded to 95.4% of standard Proctor maximum dry density at -2.3% of standard Proctor optimum moisture. Overliner was loosely placed and slightly tampe

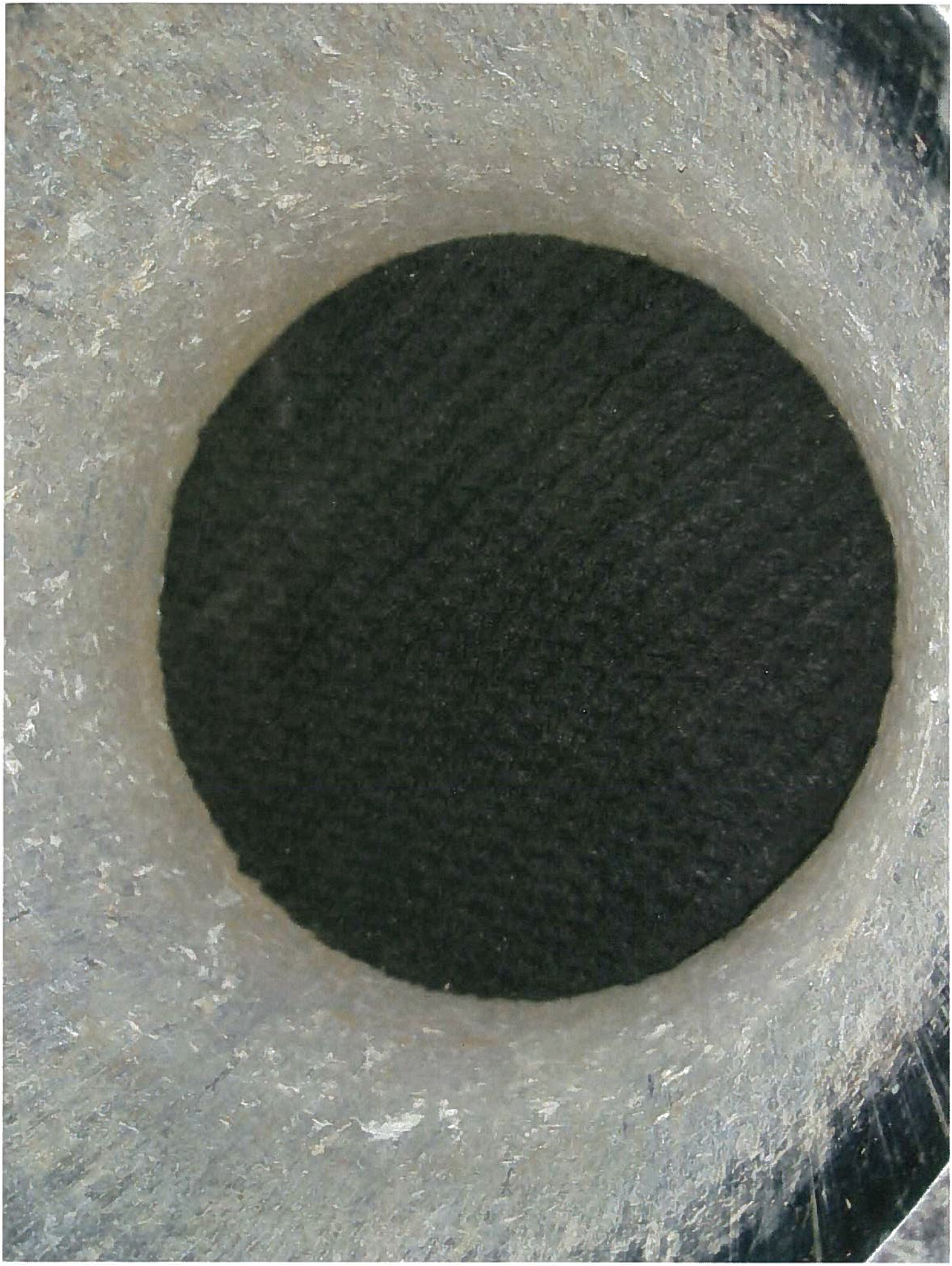
Date:	8/8/12
Tech:	JAM
Review:	MB

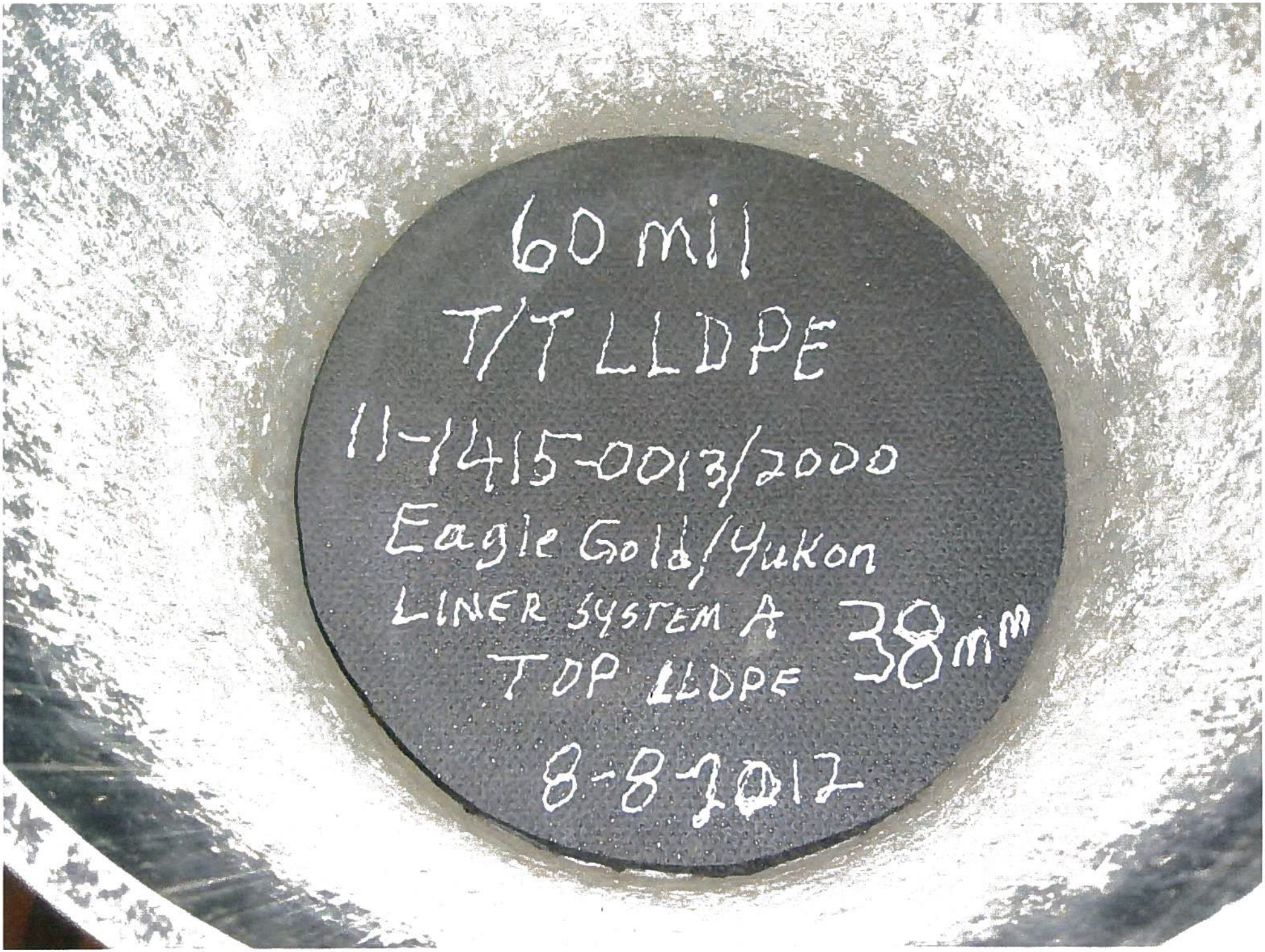

7-31-12
11-1415-0013/2000
Eagle Golf / Yukon
3" Silt @ 107.8 pcf
38 mm Overliner
60 mil x 2
GeoNet
GCL
8-8-12
160 psi
START DATE






60 mil
T/T LLDPE
11-1415-0013/2000
Eagle Gold / Yukon
Liner system A 38 mm
Bottom LLDPE
8-8-2012

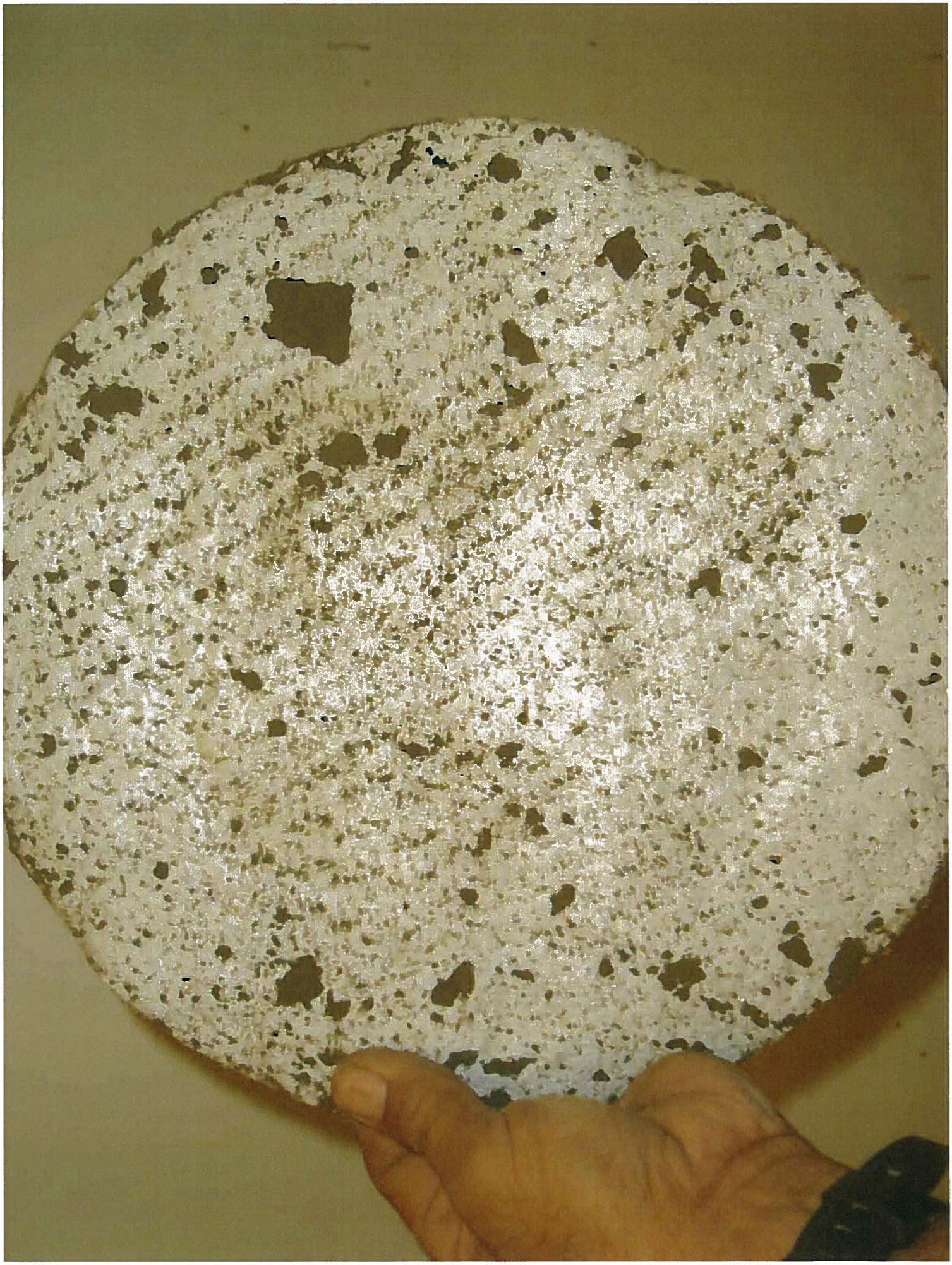



60 mil
T/T LLDPE
11-1415-0013/2000
Eagle Gold/Yukon
LINER SYSTEM A
TOP LLDPE
38mm
8-8-2017

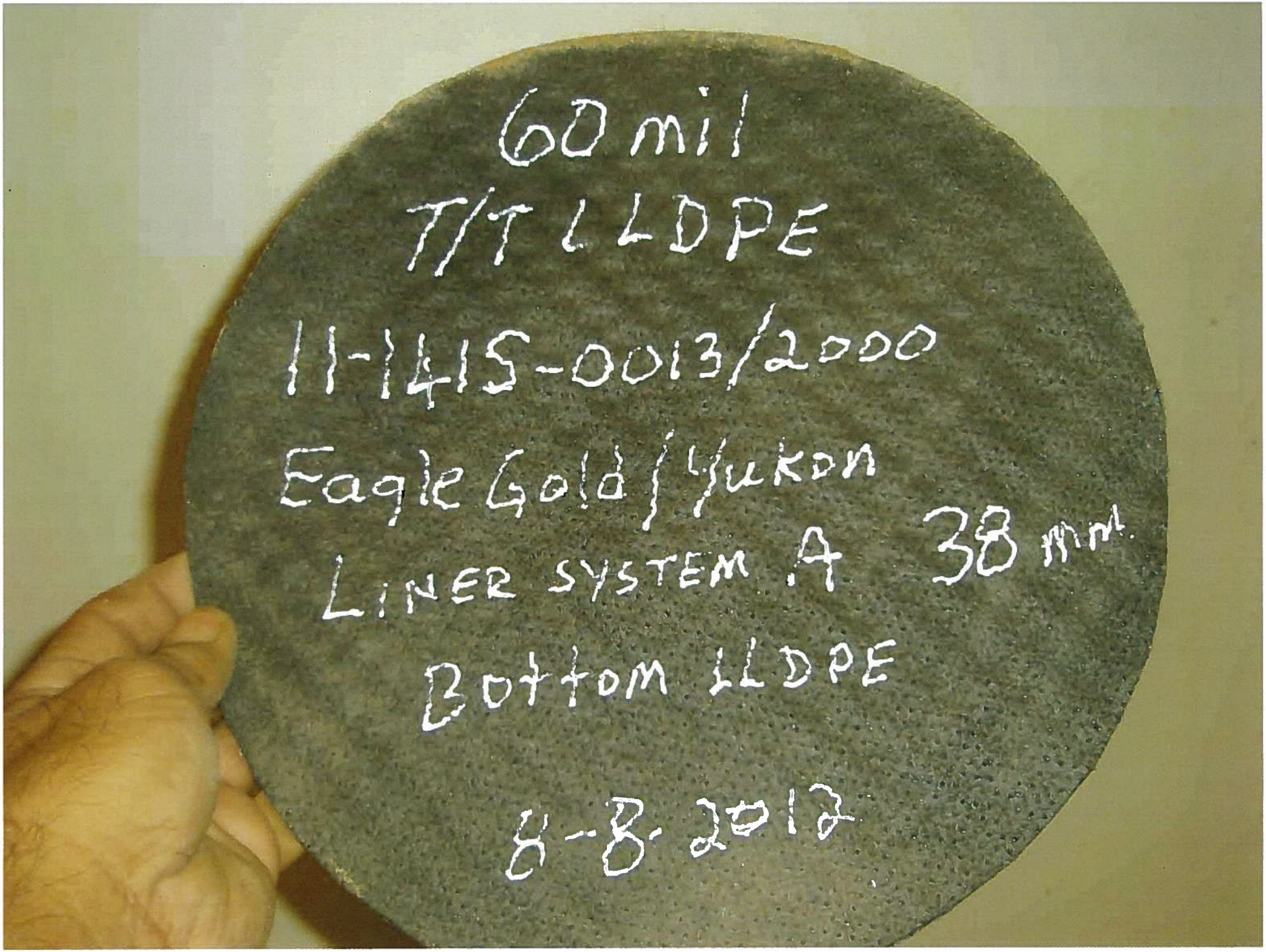


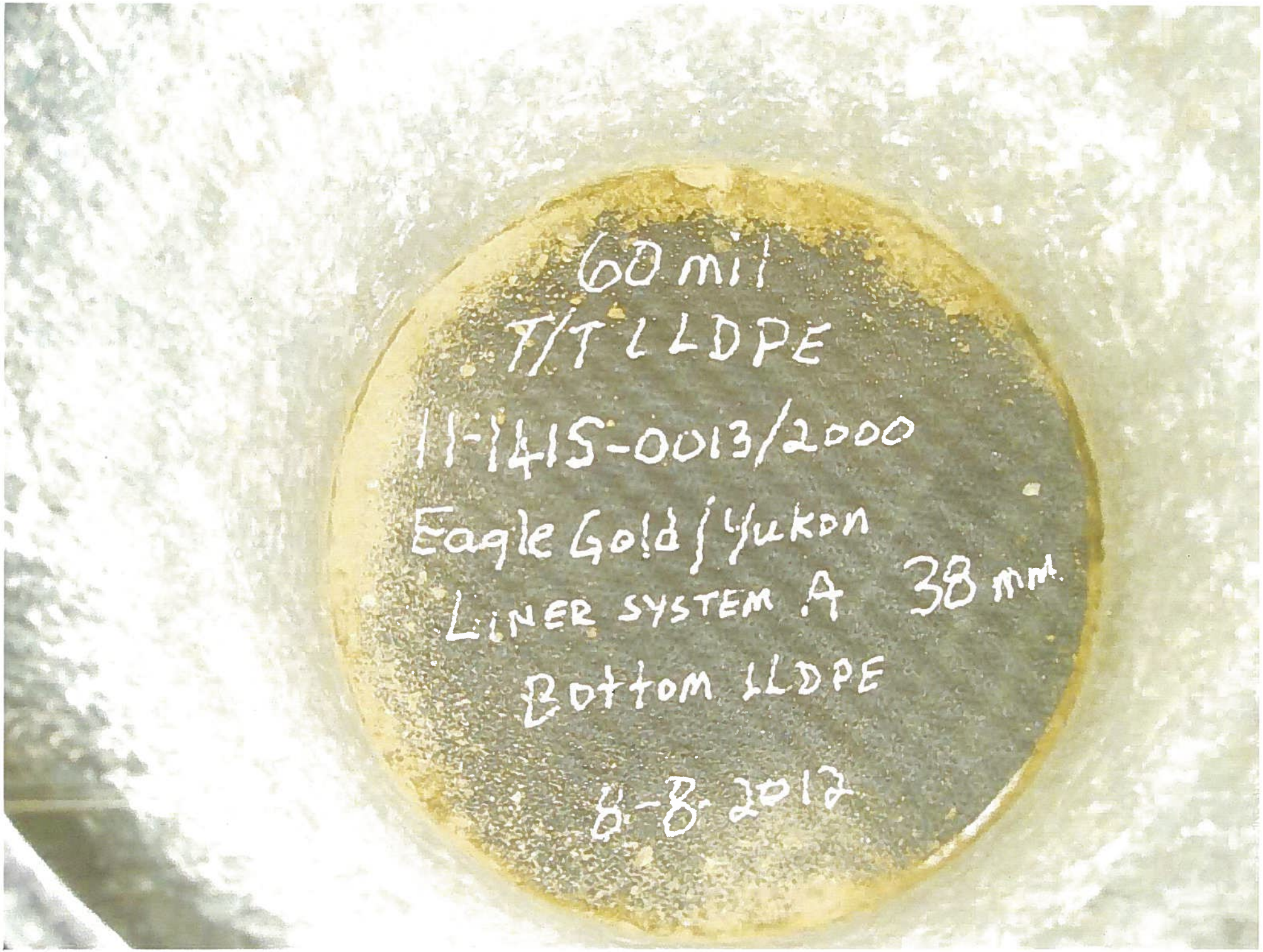


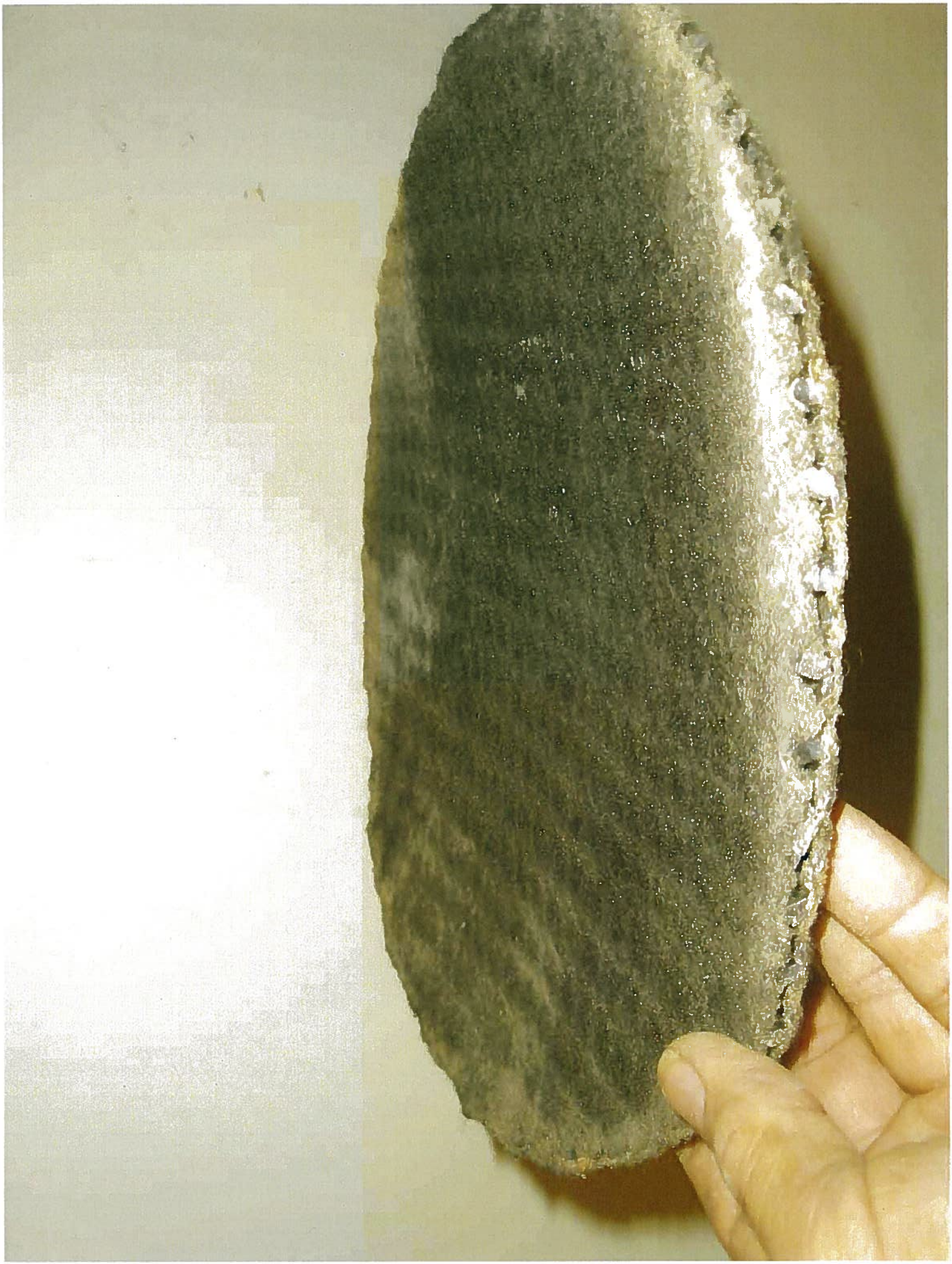


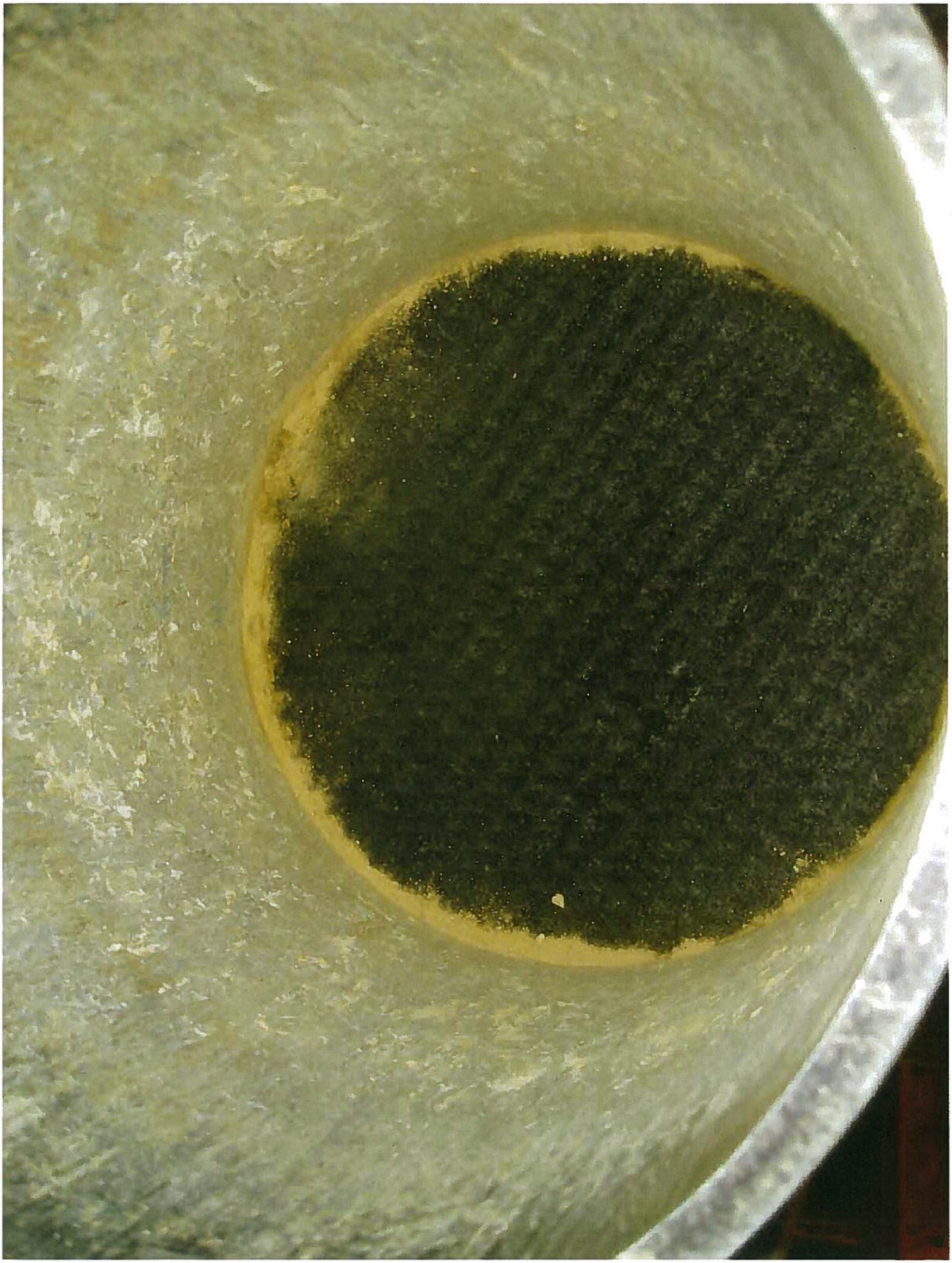



60 mil
HDPE
11-145-0013/2000
Eagle Gold Yukon
Liner System A
Bottom Liner
4-8-2012
30 mm


60 mil
T/T LLDPE
11-1415-0013/2000
Eagle Gold / Yukon
Liner system A 38 mm.
Bottom LLDPE
8-8-2012


60 mil
T/T LLDPE
11-1415-0013/2000
Eagle Gold / Yukon
Liner system A 38 mm.
Bottom LLDPE
6-8-2012







August 22, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner load testing on "Liner System B sample "BCD-01 (25mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER:	11-1415-0013/2000	UNDERLINER:	Silt
JOB NAME:	Tetra Tech/Aggregate/Yukon	OVERLINER	25mm (60mil) Liner System B
DATE TESTED:	07/24/12		

Clay Liner		**Overliner**	
Initial Moisture Content		**Initial Moisture Content**	
Tare:	PGC	Tare:	STS9
Wet Weight & Tare, g:	572.01	Wet Weight & Tare, g:	675.24
Dry Weight & Tare, g:	510.09	Dry Weight & Tare, g:	673.73
Tare Weight, g:	127.18	Tare Weight, g:	125.73
Moisture, %:	**16.2**	Moisture, %:	**0.3**
Final Moisture Content		**Final Moisture Content**	
Tare:	R2D2	Tare:	EOTO
Wet Weight & Tare, g:	565.98	Wet Weight & Tare, g:	802.03
Dry Weight & Tare, g:	512.60	Dry Weight & Tare, g:	799.47
Tare Weight, g:	126.65	Tare Weight, g:	122.15
Moisture, %:	**13.8**	Moisture, %:	**0.4**

Initial Height Determination (Inches)		
	Underliner	Overliner
1.	3.06	2.011
2.	2.94	2.110
3.	2.90	2.311
4.	2.94	2.429
5.	3.14	2.339
6.	3.14	2.141
Average	3.022	2.224
Cell Height	--	16.250
Sample Height	3.022	10.679

Density	**Underliner**		**Overliner**	
Wet Weight:	10,461.3	g	26131.70	g
Dry Weight:	9,005.1	g	26059.89	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	3.022	in	10.679	in
Final Height:	2.870	in	8.892	in
Initial Volume:	0.198	ft^3	0.70	ft^3
Final Volume:	0.188	ft^3	0.58	ft^3
Initial Wet Density:	116.7	pcf	82.5	pcf
Final Wet Density:	122.9	pcf	99.1	pcf
Initial Dry Density:	100.5	pcf	82.3	pcf
Final Dry Density:	105.8	pcf	98.8	pcf

General Test Notes:

test completed. All membranes used saved. Vacuum test on membranes show some dimples but no holes.

Liner Thickness (in)		
1.	0.061	
2.	0.061	
3.	0.059	
4.	0.060	
5.	0.060	
6.	0.061	
Average	0.060	(in)
	60.33	(mils)

Remold Instructions

Approximately 10" thickness for overliner material. Compaction to 95% of standard Proctor maximum dry density. +/- 2% of standard Proctor optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech/Aggregate/Yukon

JOB NUMBER: 11-1415-0013/2000

DATE: 7/17/2012

Underliner (Bedding) Source: Silt

Underliner Classification: --

Atterberg Limits: --

Maximum Dry Density (pcf): 107.5

Optimum Moisture: 15.2

Overliner Material Source: 25mm (60mil) Liner System B

Overliner Classification: GP

Atterberg Limits: --

Dry Density (pcf): 82.3

Geosynthetic Manufacturer/Supplier: Agru America (60 mil LLPDE T/T)

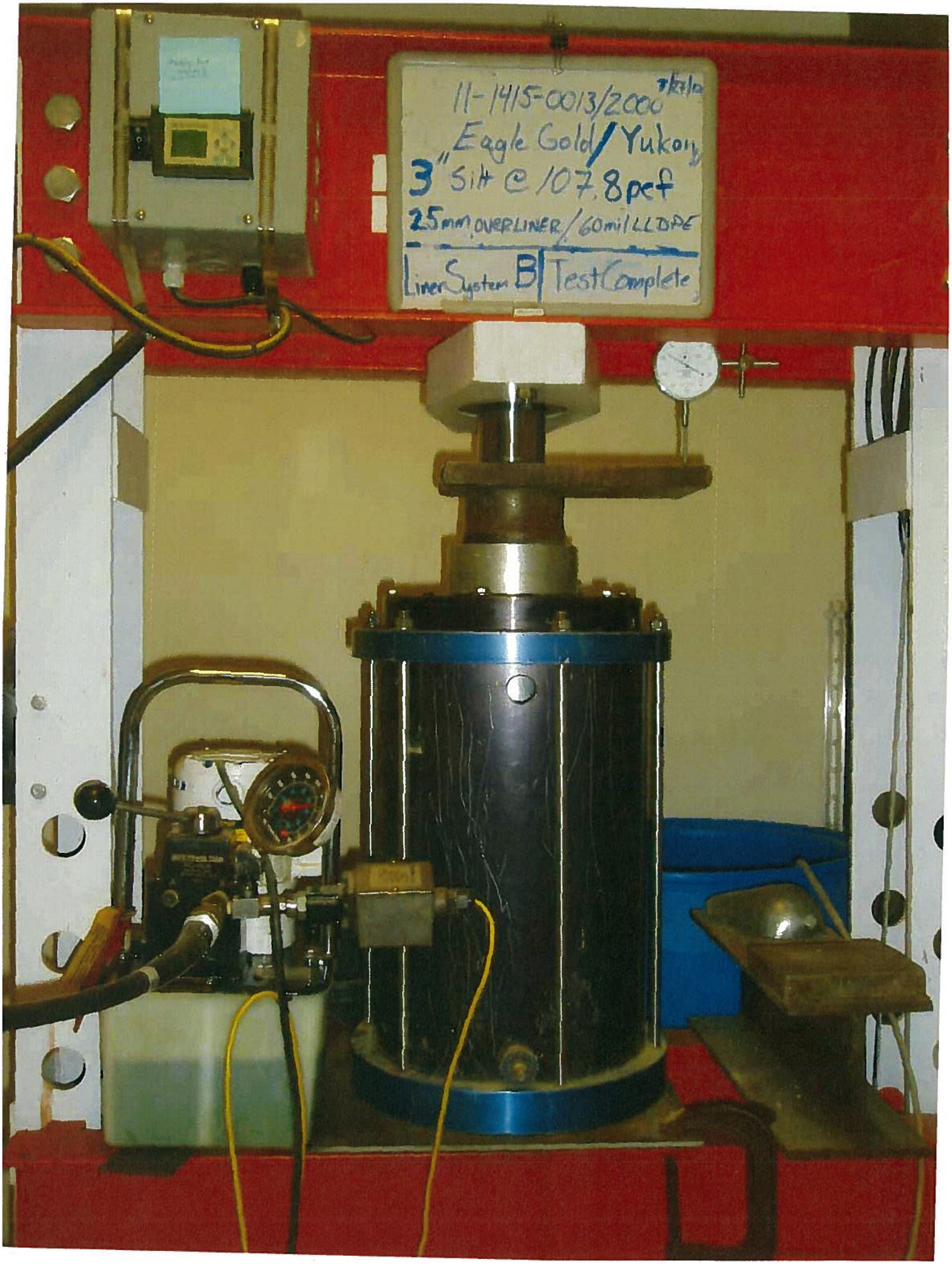
Liner Type	Ave. Liner Thickness (mils)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
LLDPE Microspike 80 mil	60.3	48	93.2	16.2	640	0.152	Pass	Pass
GCL	0.27	48	--	--	640	--	Pass	Pass

General Test Notes: Test was conducted using a 12" diameter cell. The 60 mil texture/texture LLDPE liner was placed on top of moistened GCL which was placed on top of approximately 3.0 inches of underliner soil, then covered with approximately 10.75 inches of overliner material. Approximately 12 rocks were hand placed with points downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of 3 hours. The load was maintained for 48 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, the liner was inspected and tested for punctures both visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG.

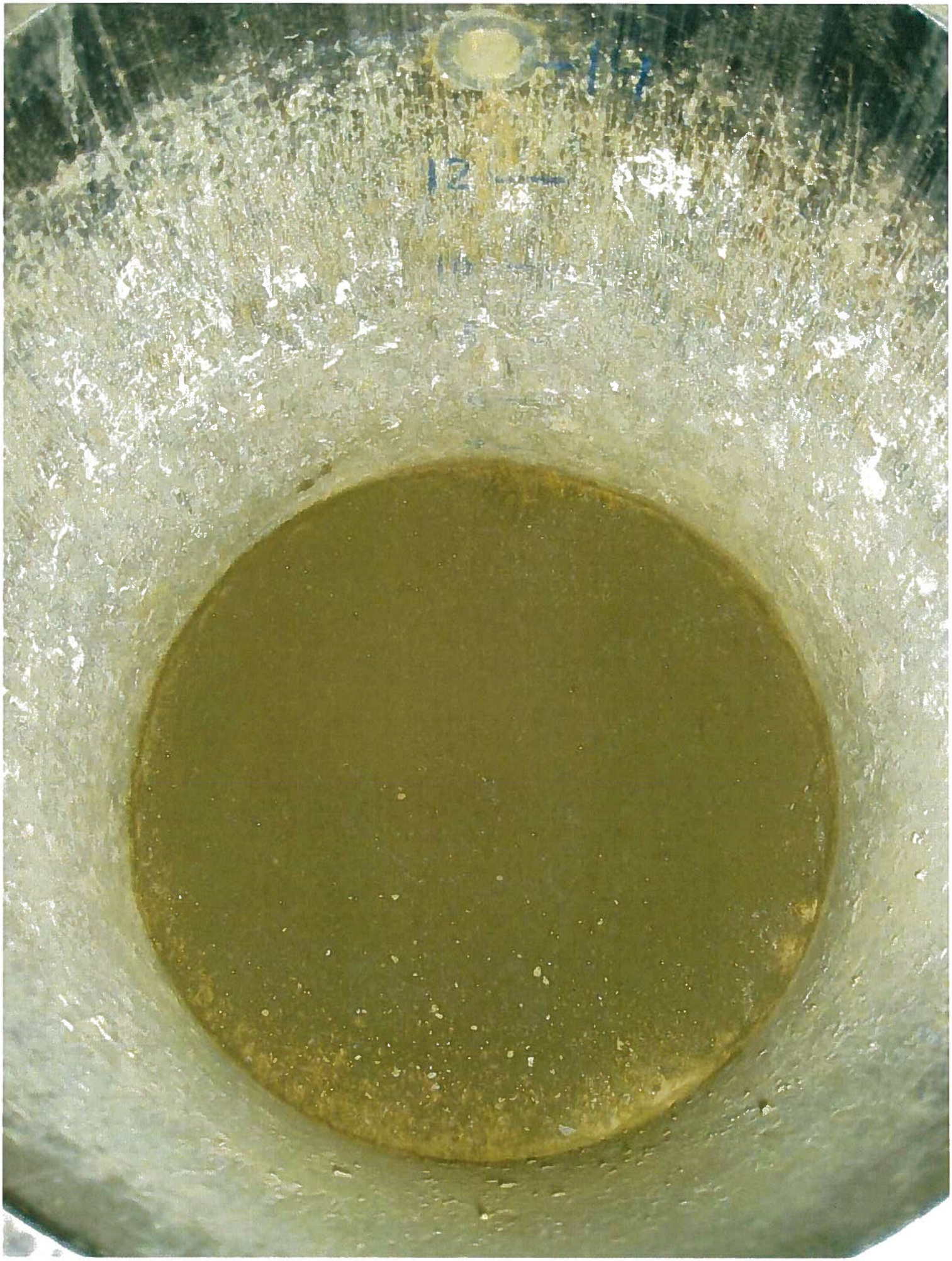
Liner observations: No punctures were present but numerous dimples (approximately 38) and scratches. There was no apparent damage to the underlying GCL, only depressions which mimicked th overlying geomembrane dimples.

Underliner was remolded to 93.2% of standard Proctor maximum dry density at +1.0% of optimum moisture. Overliner was loosely placed and slightly tamped.

Date:	7/24/12
Tech:	JAM
Review:	MB


11-1415-0013/2000
Eagle Gold / Yukon
3" Silt @ 107.8 pcf
25mm OVERLINER / 60mil LLDPE
Liner System B | Test Complete

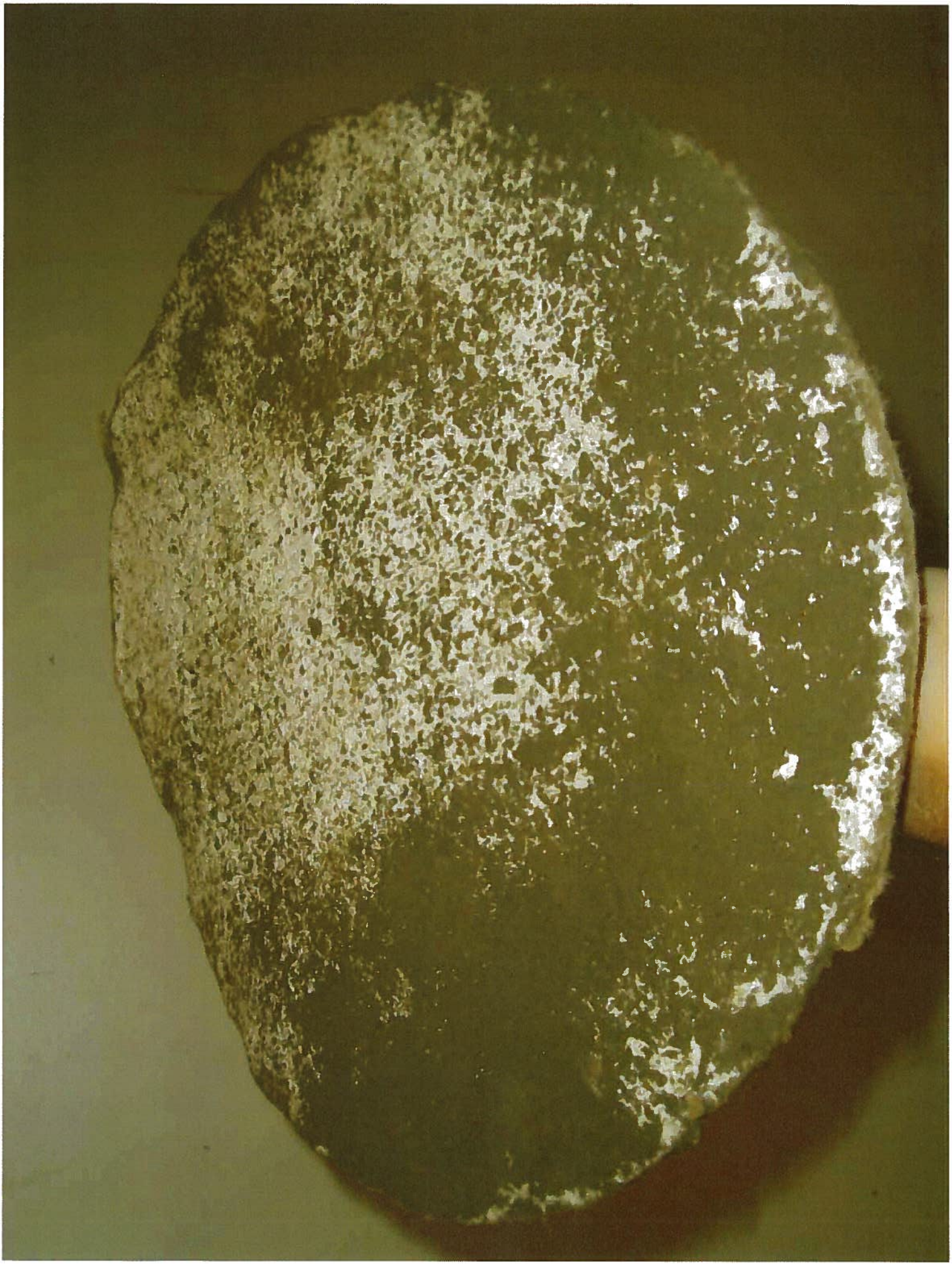


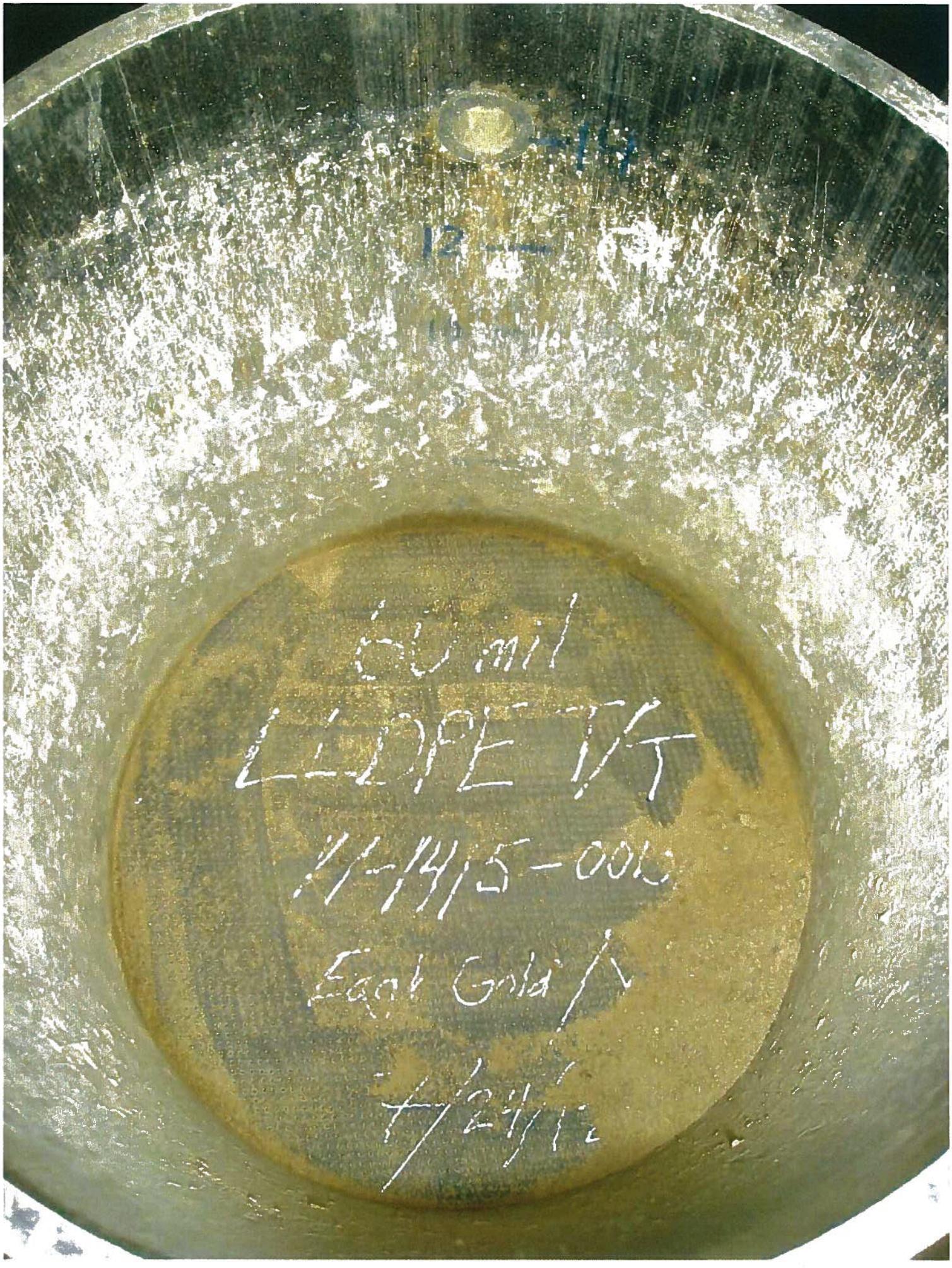




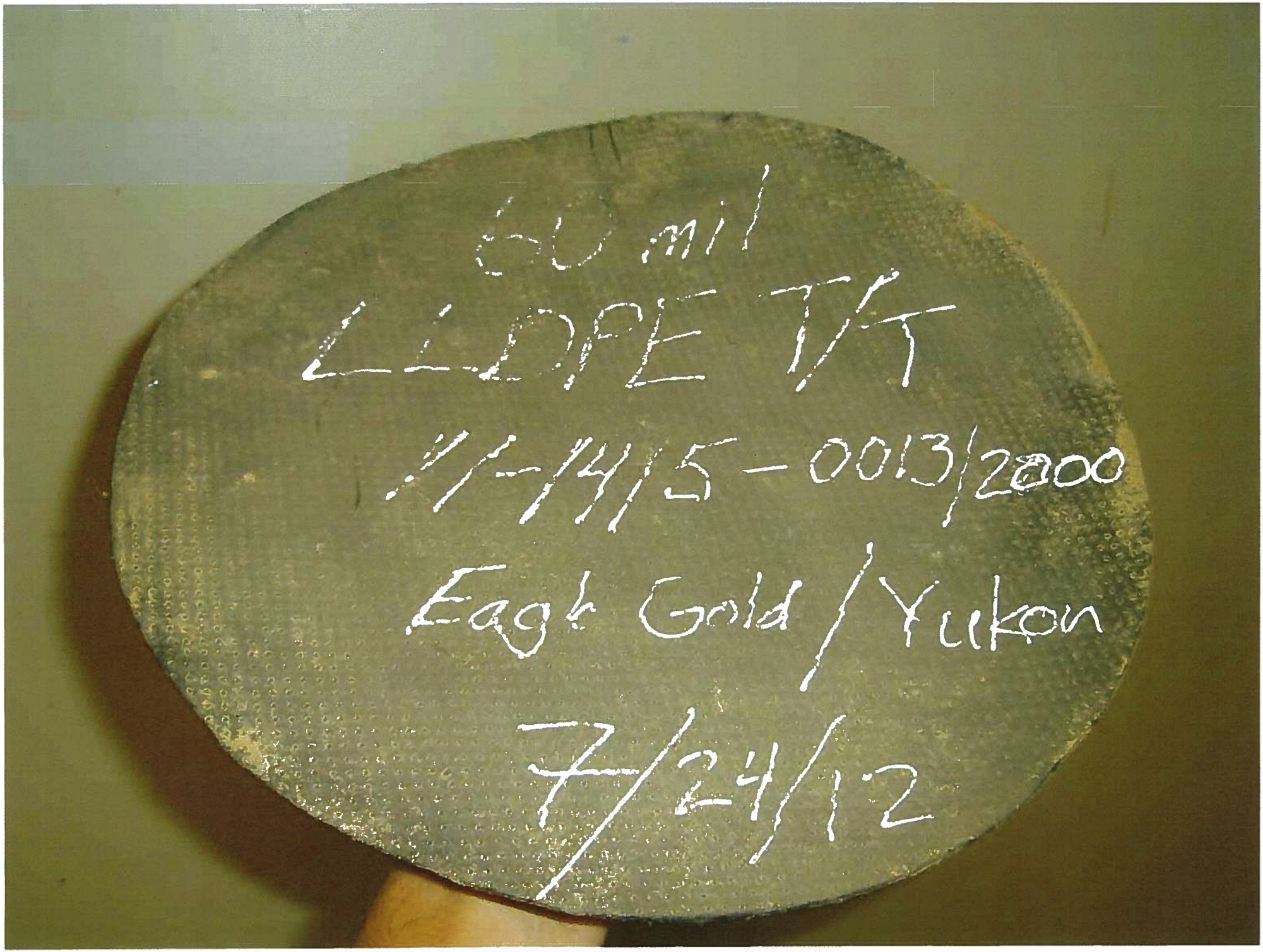


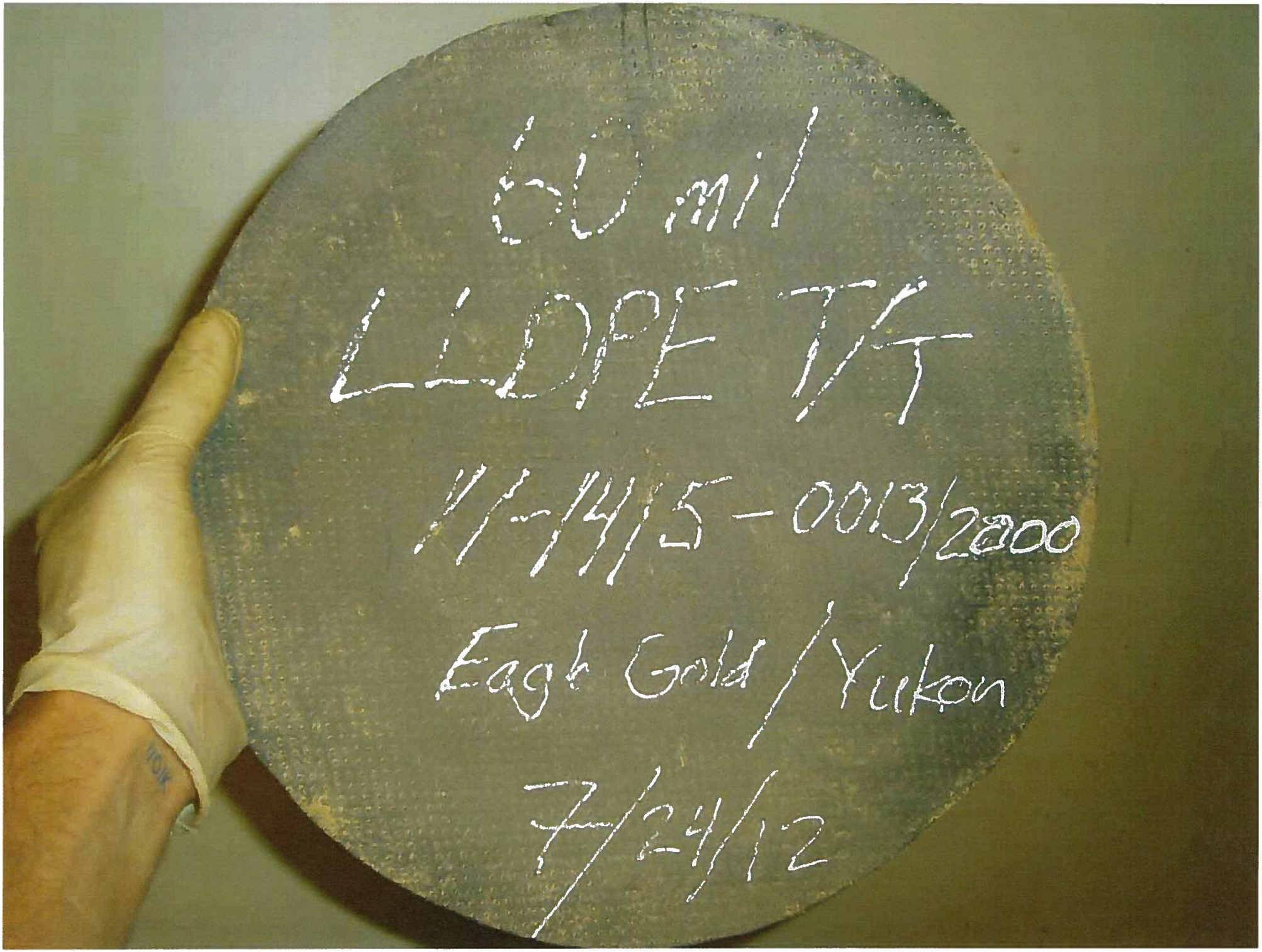


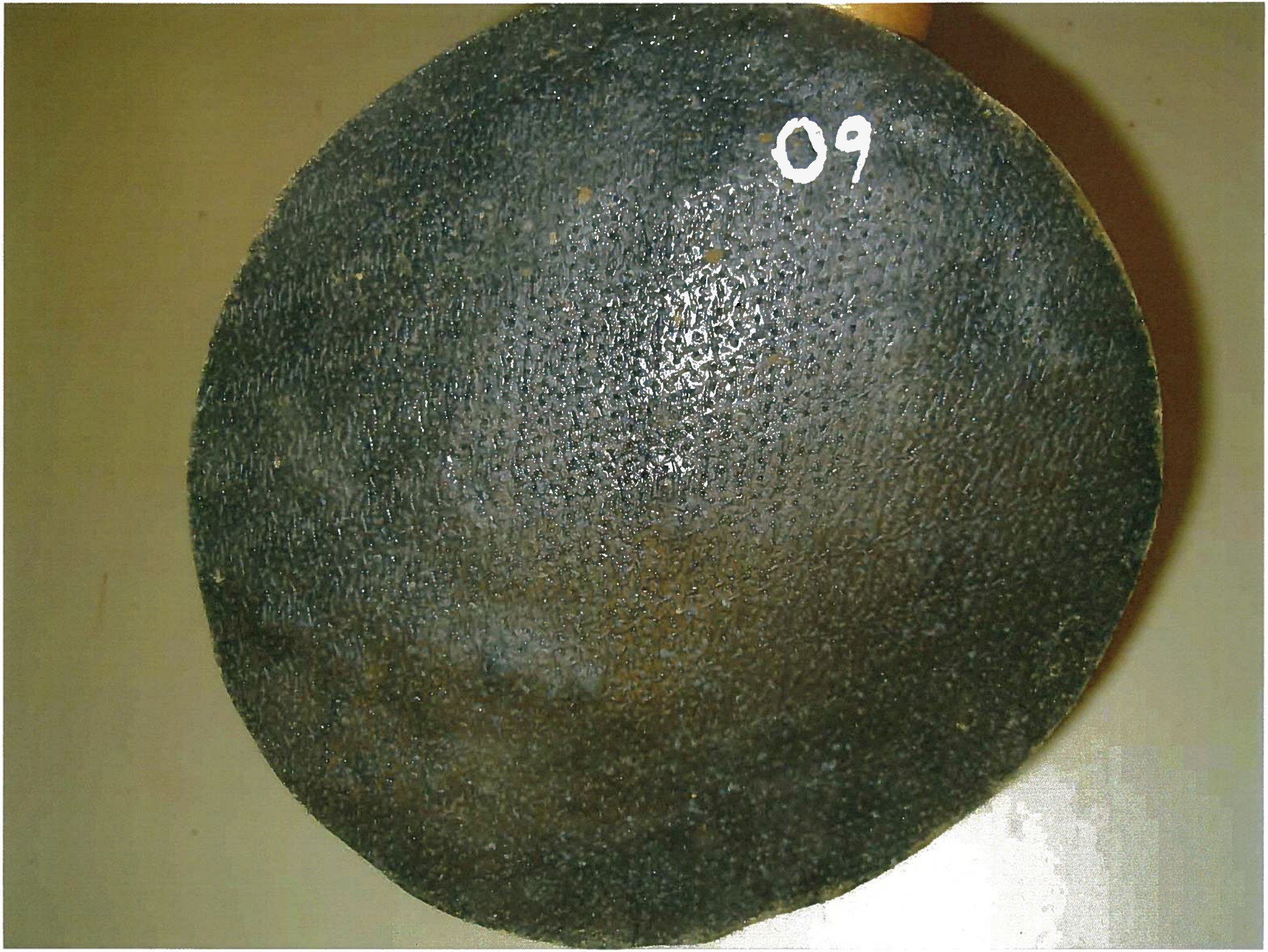



60 mil
LLDPE T/T
11-1415-006
Eagle Gold
7/24/12




60 mil
LLDPE T/T
11-14/5-0013/2000
Eagle Gold / Yukon
7/24/12


60 mil
LLDPE T/T
11-14/5-0013/2000
Eagle Gold / Yukon
7/24/12


09

August 22, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner load testing Liner System C sample "BGC-01 (38mm)", and consolidation/permeability testing on sample "BGC-01 (25mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER:	11-1415-0013/2000	UNDERLINER:	Silt
JOB NAME:	Tetra Tech/Aggregate/Yukon	OVERLINER	BGC-GD-01 (38mm)
DATE TESTED:	07/31/12		

Clay Liner

Initial Moisture Content

Tare:	S-7
Wet Weight & Tare, g:	154.67
Dry Weight & Tare, g:	138.17
Tare Weight, g:	27.58
Moisture, %:	**14.9**

Final Moisture Content

Tare:	T-4
Wet Weight & Tare, g:	159.44
Dry Weight & Tare, g:	144.95
Tare Weight, g:	27.25
Moisture, %:	**12.3**

Overliner

Initial Moisture Content

Tare:	M53
Wet Weight & Tare, g:	642.24
Dry Weight & Tare, g:	640.06
Tare Weight, g:	94.97
Moisture, %:	**0.4**

Final Moisture Content

Tare:	M53
Wet Weight & Tare, g:	689.89
Dry Weight & Tare, g:	687.04
Tare Weight, g:	94.89
Moisture, %:	**0.5**

Initial Height Determination (Inches)

	Underliner	Overliner
1.	3.088	3.750
2.	3.085	4.000
3.	3.079	3.750
4.	3.085	4.000
5.	3.092	3.750
6.	3.091	3.830
Average	3.087	3.847
Cell Height	--	16.250
Sample Height	3.087	9.240

Density	**Underliner**		**Overliner**	
Wet Weight:	10,512.0	g	24420.80	g
Dry Weight:	9,147.2	g	24323.52	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	3.087	in	9.240	in
Final Height:	2.969	in	8.134	in
Initial Volume:	0.202	ft^3	0.60	ft^3
Final Volume:	0.194	ft^3	0.53	ft^3
Initial Wet Density:	114.8	pcf	89.1	pcf
Final Wet Density:	119.3	pcf	101.2	pcf
Initial Dry Density:	99.9	pcf	88.7	pcf
Final Dry Density:	103.9	pcf	100.8	pcf

General Test Notes:

Consolidate @ 640 psi for 48 hours

20 rocks positioned above PVC membrane prior to overliner addition.

PVC membrane visual inspection showed 19 indentations where rocks were positioned prior to applying load. Vacuum test of PVC membrane showed zero punctures.

Liner Thickness (in)

1.	0.075	
2.	0.077	
3.	0.078	
4.	0.076	
5.	0.076	
6.	0.078	
Average	0.077	(in)
	76.67	(mils)

Remold Instructions

Approximately 9" thickness for overliner material. Compaction to 95% of standard Proctor maximum dry density and +/- 2% of standard Proctor optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech/Aggregate/Yukon

JOB NUMBER: 11-1415-0013/2000

DATE: 7/31/2012

Underliner (Bedding) Source: Silt

Underliner Classification: --

Atterberg Limits: --

Maximum Dry Density (pcf): 107.8

Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (38mm)

Overliner Classification: GP

Atterberg Limits: --

Dry Density (pcf): 88.7

Geosynthetic Manufacturer/Supplier: Nan Ya Plastics Corporation, America 0.75 mm PVC

Liner Type	Ave. Liner Thickness (mils)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
0.75mm PVC	76.7	48	92.7	14.9	640	1.226	Pass	Pass

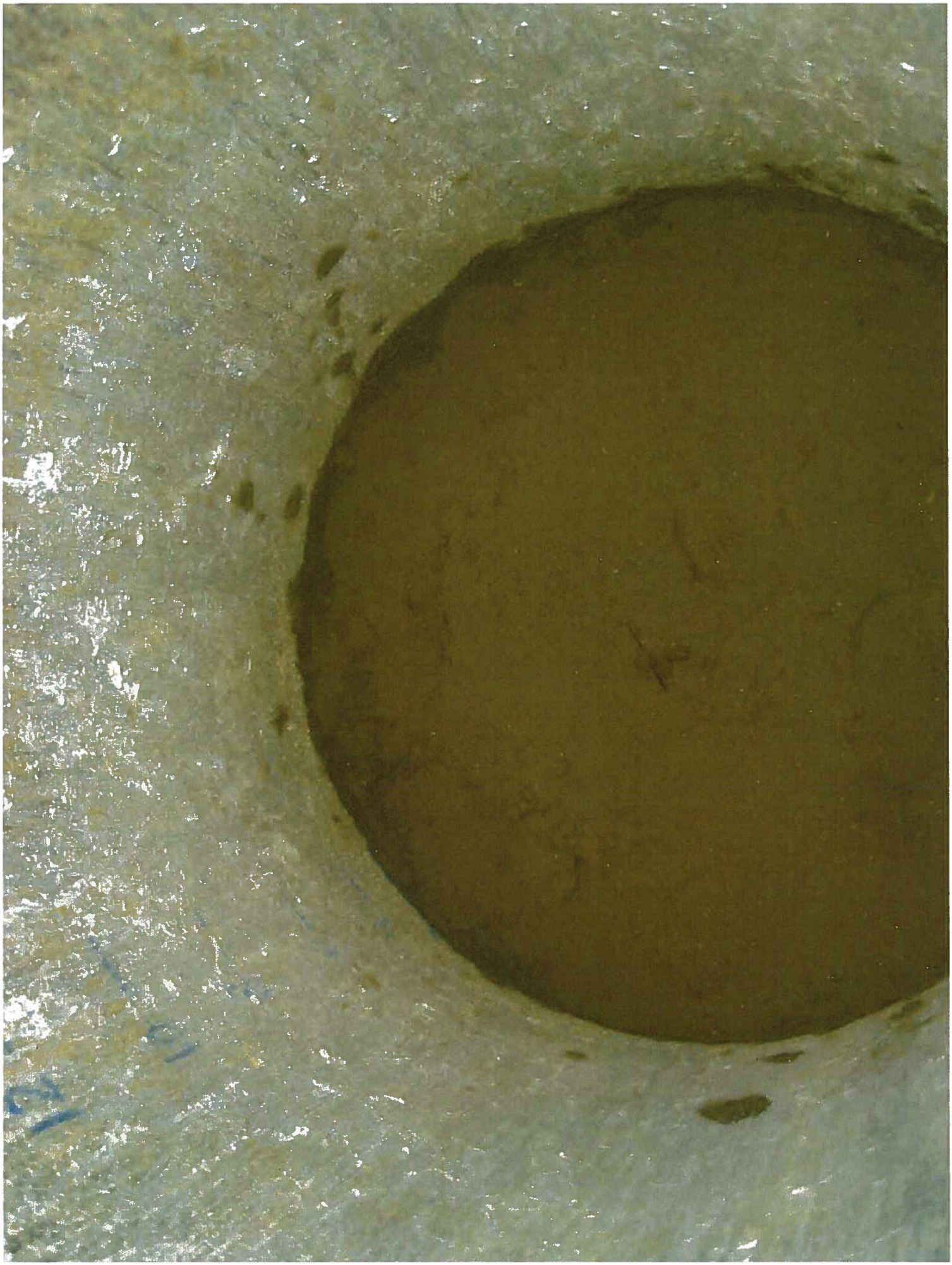
General Test Notes: Test was conducted using a 12" diameter cell. Smooth 0.75mm PVC was placed on top of approximately 3.0 inches of underliner then overlain by approximatley 9.25 inches of overliner materia Approximately 20 rocks were hand placed pointing downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of 1.5 hours. The load was maintained for 48 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, the PVC liner was inspected and tested for punctures visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG

Liner observations: No visual puncturing of PVC liner. No penetrations observed during the vacuum test. Approximately 19 notable dimples were present on the surface of the PVC liner.

Underliner was remolded to 92.7% of standard Proctor maximum dry density at -0.3% of standard Proctor optimum moisture. Overliner was loosely placed and slightly tamped

Date:	7/31/12
Tech:	ACE
Review:	MB

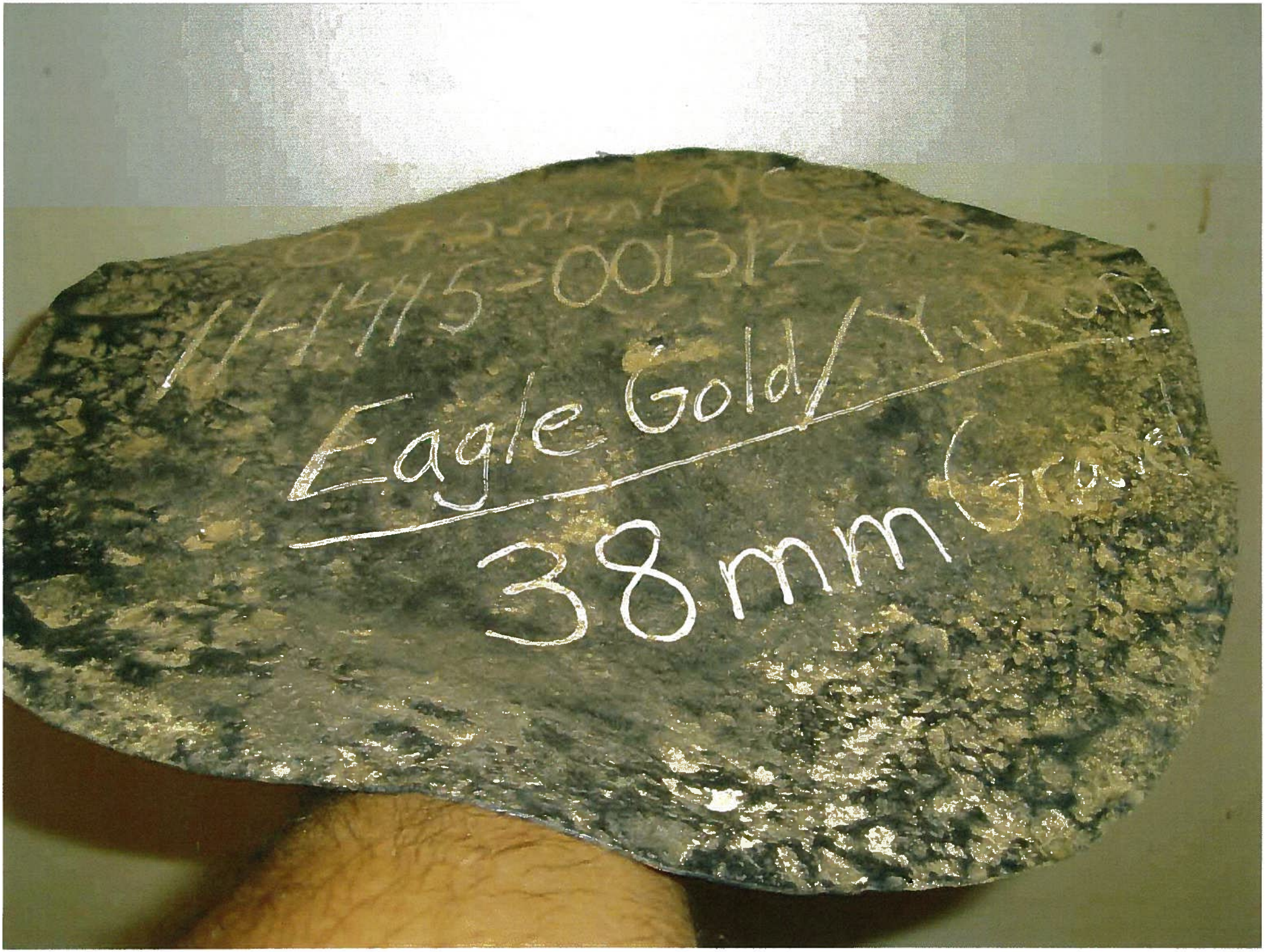

7-31-12
11-1415-0013/2000
Eagle Gold / Yukon
3" Slit @ 107.8 pcf
38mm Over Liner / 0.75mm PVC
Liner System C
START
7-31-12




0.75mm PVC
11-1415-0013/2000
Eagle Gold/Yukon
38mm Gravel




0.75mm PVC
11-1415-0013/2003
Eagle Gold/Yukon
38mm Gravel


11-1415-001312
Eagle Gold/
38mm

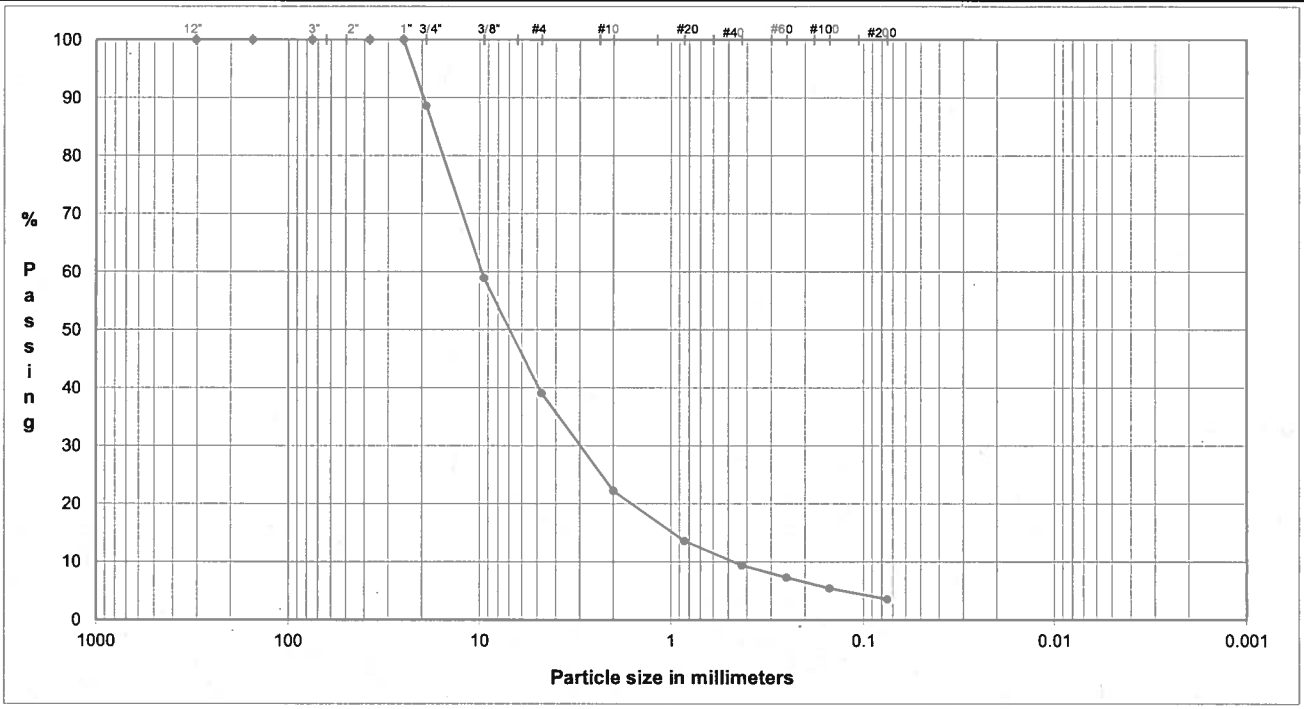


August-12 | 11-1415-0013.2000

PRE-PERM PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Tetra Tech/Aggregate/Yukon**
SAMPLE ID: **BGC-GD-01 (25mm)** Depth (ft) --
TYPE: **Pail**

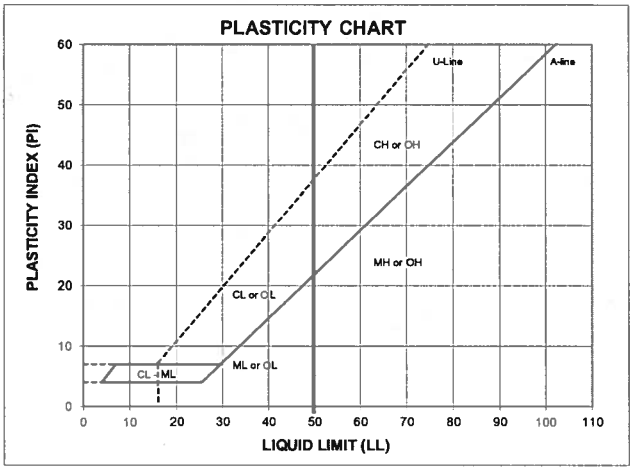


COBBLES	Coarse GRAVEL	Fine GRAVEL	Coarse SAND	Medium SAND	Fine SAND	Silt or Clay FINES

PRE-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
6.0"	154.2	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.00**
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**88.6**	Coarse Gravel	**11.39**
0.375"	9.5	**58.9**		
#4	4.8	**39.1**	Fine Gravel	**49.54**
#10	2.0	**22.2**	Coarse Sand	**16.85**
#20	0.9	**13.6**		
#40	0.4	**9.4**	Medium Sand	**12.84**
#60	0.3	**7.3**		
#100	0.2	**5.4**		
#200	0.1	**3.6**	Fine Sand	**5.82**
			Fines	**3.57**



ATTERBERG LIMITS

M_c	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate

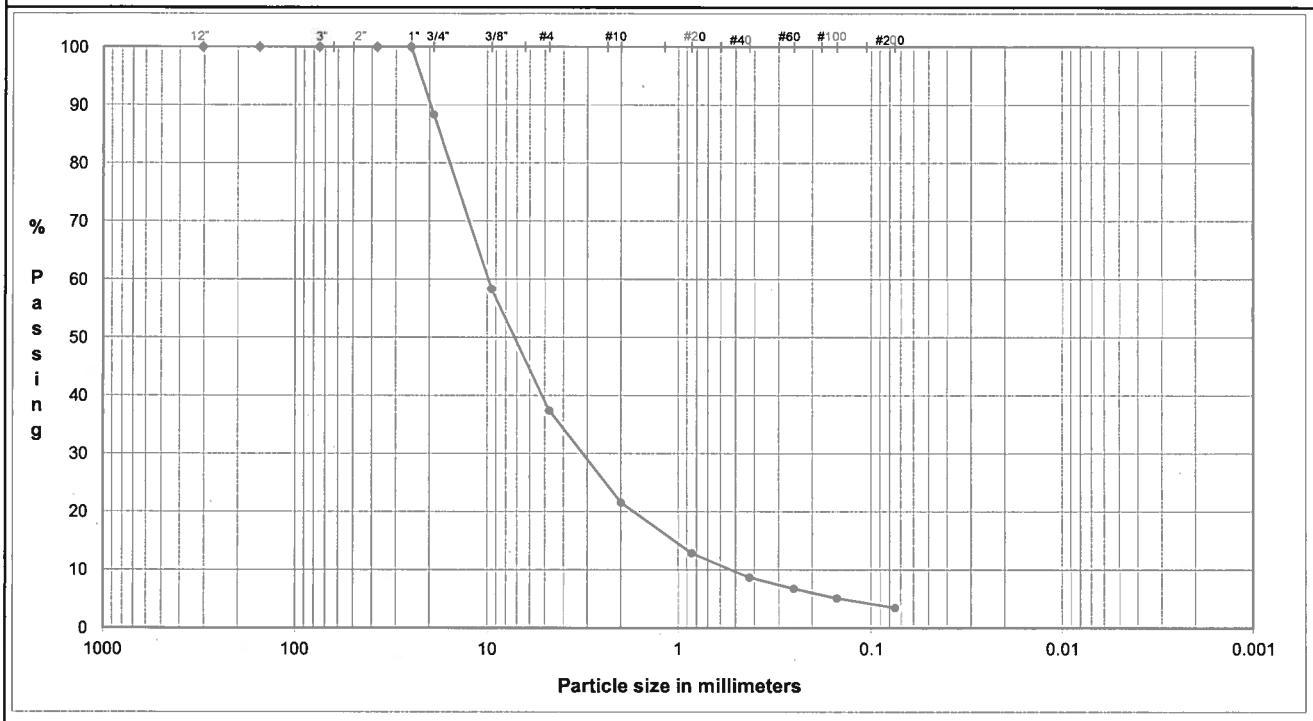
USCS: --

TECH	Ace/PH
DATE	8/6/12
REVIEW	PRH

August-12 | 11-1415-0013.2000

POST-PERM PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS
ASTM D421, D422, D4318

PROJECT NAME: **Tetra Tech/Aggregate/Yukon**
SAMPLE ID: **BGC-GD-01 (25mm)** Depth (ft) --
TYPE: **Pail**

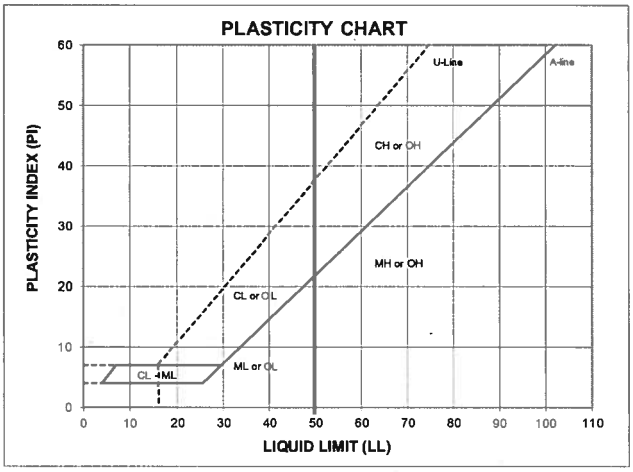


	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

POST-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
6.0"	154.2	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.00**
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**88.3**	Coarse Gravel	**11.67**
0.375"	9.5	**58.3**		
#4	4.8	**37.4**	Fine Gravel	**50.92**
#10	2.0	**21.6**	Coarse Sand	**15.85**
#20	0.9	**12.9**		
#40	0.4	**8.7**	Medium Sand	**12.88**
#60	0.3	**6.8**		
#100	0.2	**5.1**		
#200	0.1	**3.5**	Fine Sand	**5.22**
			Fines	**3.46**



ATTERBERG LIMITS

M_c	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate

USCS: --

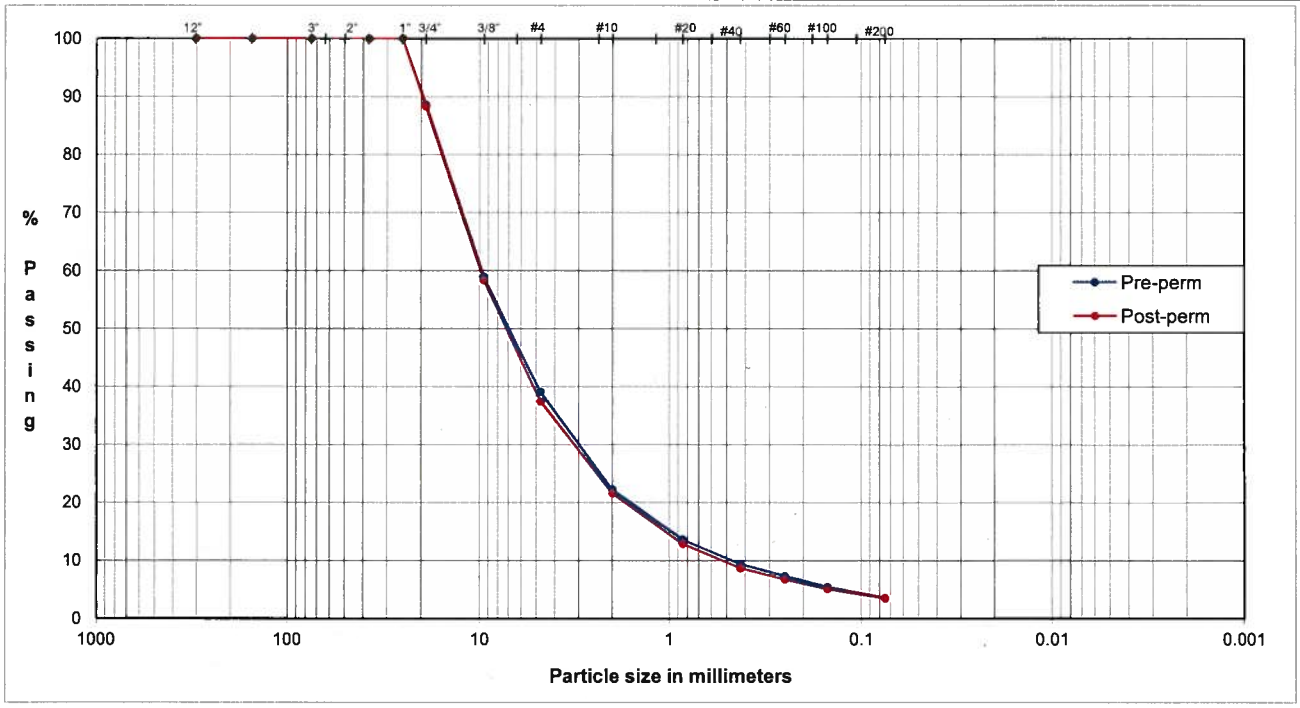
TECH	ACE/PRH
DATE	8/10/2012
REVIEW	PRH

August-12 11-1415-0013.2000

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: **Tetra Tech/Aggregate/Yukon**
SAMPLE ID: **BGC-GD-01 (25mm)** Depth (ft) --
TYPE: **Pail**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

PRE-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
6.0"	154.2	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.00**
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**88.6**	Coarse Gravel	**11.39**
0.375"	9.5	**58.9**		
#4	4.8	**39.1**	Fine Gravel	**49.54**
#10	2.0	**22.2**	Coarse Sand	**16.85**
#20	0.9	**13.6**		
#40	0.4	**9.4**	Medium Sand	**12.84**
#60	0.3	**7.3**		
#100	0.2	**5.4**		
#200	0.1	**3.6**	Fine Sand	**5.82**
			Fines	**3.57**

POST-PERM

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
6.0"	154.2	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.00**
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**88.3**	Coarse Gravel	**11.67**
0.375"	9.5	**58.3**		
#4	4.8	**37.4**	Fine Gravel	**50.92**
#10	2.0	**21.6**	Coarse Sand	**15.85**
#20	0.9	**12.9**		
#40	0.4	**8.7**	Medium Sand	**12.88**
#60	0.3	**6.8**		
#100	0.2	**5.1**		
#200	0.1	**3.5**	Fine Sand	**5.22**
			Fines	**3.46**

ATTERBERG LIMITS

M_c	LL	PL	PI	SG
--	--	--	--	--

DESCRIPTION: Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate

USCS: --

TECH	Ace/PH
DATE	8/6/12
REVIEW	PRH

TETRA TECH/AGGREGATE/YUKON
11-1415-0013.2000
TABLE 1
RIGID-WALL COMPRESSION
CONSTANT-HEAD PERMEABILITY
10-INCH DIAMETER CELL

Project Title:	Tetra Tech/Aggregate/Yukor	**Boring:**	--
Project Number:	11-1415-0013.2000	**Sample:**	BGC-GD-01 (25mm)
Dates Tested:	8/6/2012 **To:** 8/8/2012	**Depth (ft):**	--

Sample Setup

Initial Sample Height, in	9.932
Mold Diameter, in	10.00
Sample Area, in^2	78.54
Wet Sample Weight, g	21,873.6
Wet Sample Weight, lb	48.23
Dry Sample Weight, g	21,792.7
Dry Sample Weight, lb	48.05

Initial Sample:
Moisture Determinatior

Tare	M32
Wet Weight and Tare, g	651.17
Dry Weight and Tare, g	649.11
Tare Weight, g	93.98
Moisture Content, %	0.4

Initial Sample Density and Void Ratio

Specific Gravity[1]	2.70
Initial Sample Volume, ft^3	0.451
Initial Wet Density, lb/ft^3	106.8
Initial Dry Density, lb/ft^3	106.4
Initial Void Ratio	0.58

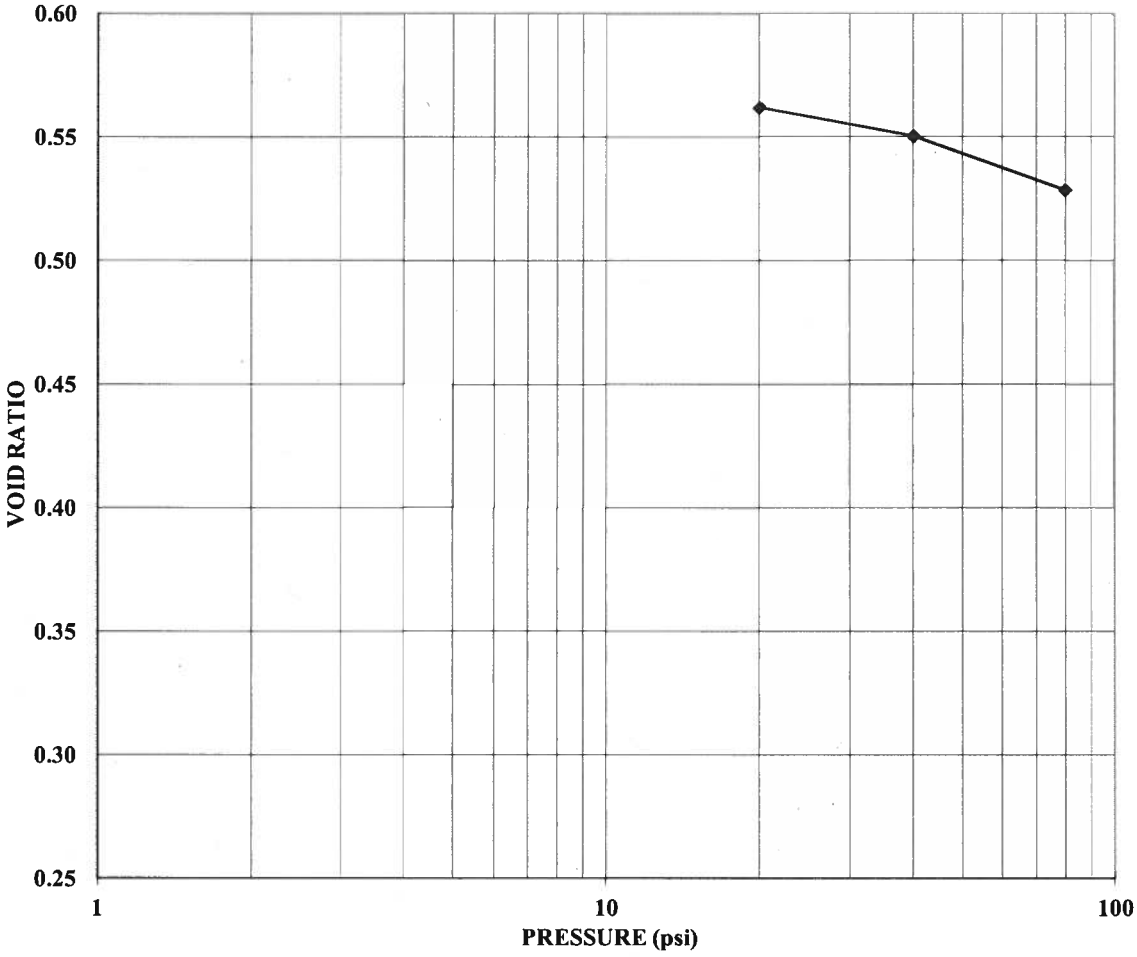
Final Sample Density and Void Ratio

Final Sample Height, in	9.590
Final Sample Volume, ft^3	0.436
Final Dry Density, lb/ft^3	110.2
Final Void Ratio	0.53

Load (psi)	Height (in)	Dry Density (pcf)	Void Ratio	Flow Rate (ml/sec)	Gradient	Permeability (cm/sec)	Porosity
20	9.800	107.9	0.56	95.18	0.08	2.4E+00	0.36
40	9.728	108.7	0.55	64.19	0.06	2.3E+00	0.35
80	9.590	110.2	0.53	54.04	0.05	2.2E+00	0.35

NOTES: [1]Specific Gravity = Assumed Value

ONE-DIMENSIONAL CONSOLIDATION



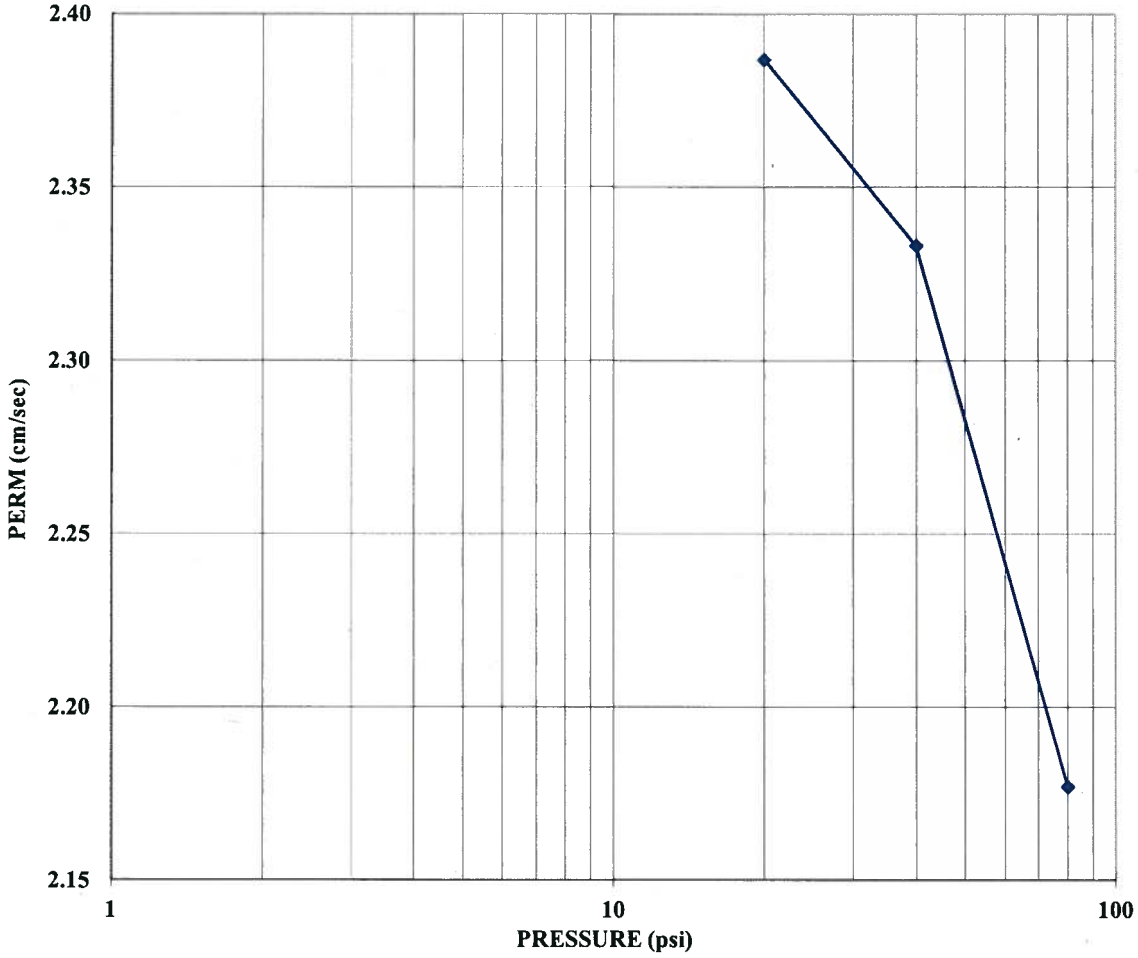
SAMPLE #:	**BGC-GD-01 (25mm)**
DESCRIPTION:	**Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate**

DATE	8/8/2012
TECH	Ace
REVIEW	PRH

Tetra Tech/Aggregate/Yukon
11-1415-0013.2000

GOLDER ASSOCIATES INC.
LAKEWOOD, COLORADO

ONE-DIMENSIONAL CONSOLIDATION



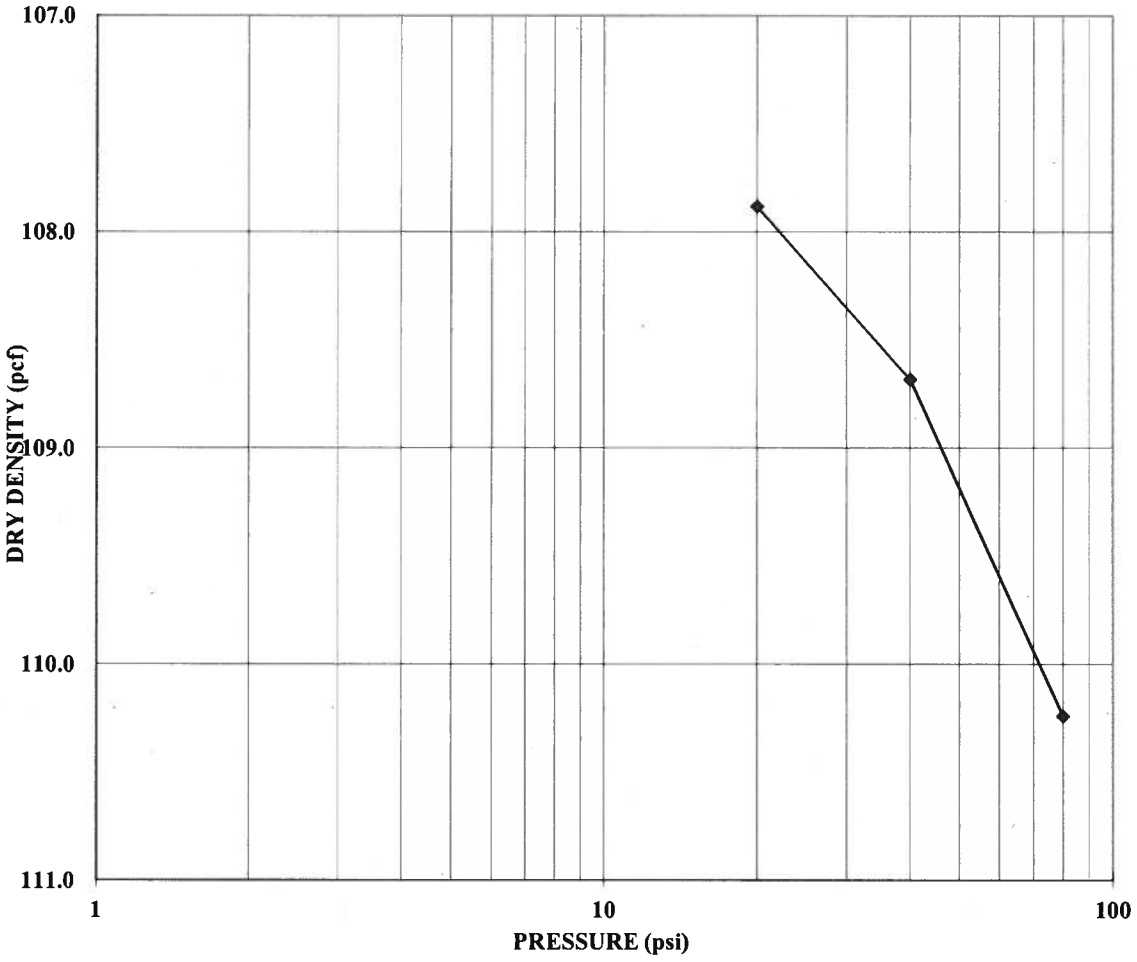
SAMPLE #:	**BGC-GD-01 (25mm)**
DESCRIPTION:	**Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate**

Tetra Tech/Aggregate/Yukon
11-1415-0013.2000

DATE	8/8/2012
TECH	Ace
REVIEW	PRH

GOLDER ASSOCIATES INC.
LAKEWOOD, COLORADO

ONE-DIMENSIONAL CONSOLIDATION



SAMPLE #:	**BGC-GD-01 (25mm)**
DESCRIPTION:	**Dry, light yellowish brown sandy GRAVEL, poorly graded, angular, brittle aggregate**

DATE	8/8/2012
TECH	Ace
REVIEW	PRH

Tetra Tech/Aggregate/Yukon
11-1415-0013.2000

GOLDER ASSOCIATES INC.
LAKEWOOD, COLORADO

Golder Associates

September 14, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner load testing on Liner System A sample "BGC-GD-01 (25mm)" and Liner System B sample "BGC-GD-01 (25mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER:	11-1415-0013\2000	UNDERLINER:	Silt
JOB NAME:	Tetra Tech Eagle Gold/Yukon	OVERLINER	BGC-GD-01 (25mm)
DATE TESTED:	8/23/12		

Clay Liner

Initial Moisture Content

Tare:	PAN
Wet Weight & Tare, g:	466.84
Dry Weight & Tare, g:	446.18
Tare Weight, g:	311.52
Moisture, %:	**15.3**

Final Moisture Content

Tare:	Q-4
Wet Weight & Tare, g:	214.84
Dry Weight & Tare, g:	192.07
Tare Weight, g:	27.45
Moisture, %:	**13.8**

Overliner

Initial Moisture Content

Tare:	X-14
Wet Weight & Tare, g:	288.51
Dry Weight & Tare, g:	287.40
Tare Weight, g:	31.70
Moisture, %:	**0.4**

Final Moisture Content

Tare:	M-7R
Wet Weight & Tare, g:	648.98
Dry Weight & Tare, g:	647.01
Tare Weight, g:	94.98
Moisture, %:	**0.4**

Initial Height Determination (Inches)

	Clay Liner	Overliner
1.	2.86	2.314
2.	2.86	2.434
3.	2.86	2.493
4.	2.75	2.449
5.	2.75	2.372
6.	2.79	2.294
Average	2.812	2.393
Cell Height	--	16.250
Sample Height[1]	2.812	10.274

Density	**Clay liner**		**Overliner**	
Wet Weight:	9,860.00	g	24949.10	g
Dry Weight:	8,548.47	g	24841.26	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	2.812	in	10.274	in
Final Height[2]:	2.590	in	8.556	in
Initial Volume:	0.184	ft^3	0.67	ft^3
Final Volume:	0.170	ft^3	0.56	ft^3
Initial Wet Density:	118.2	pcf	81.9	pcf
Final Wet Density:	128.3	pcf	98.3	pcf
Initial Dry Density:	102.5	pcf	81.5	pcf
Final Dry Density:	111.3	pcf	97.9	pcf

General Test Notes:

Consolidate @ 640psi for 48hrs.

Post-Test: No visual or vacuum-tested punctures present in either "Top" or "Bottom" 60 mil microspike texture/texture LLDPE liner. "Top" liner had approximately 24 notable dimples, geocomposite had 13 dimples, while the "Bottom" liner had approximately 9 notable dimples. GCL had 9 dimples.

TOP LINER Visual puncture inspection: PASS Vacuum Test: PASS

GCL and GEOCOMPOSITE No damage, only indentations.

BOTTOM LINER Visual puncture inspection: PASS Vacuum Test: PASS

Liner Thickness (in)

	Top	Bottom	Geonet	
1.	0.058	0.059	0.352	
2.	0.059	0.060	0.333	
3.	0.061	0.058	0.372	
4.	0.060	0.060	0.370	
5.	0.059	0.058	0.355	
6.	0.061	0.060	0.353	
Average	0.060	0.059	0.356	(in)
	59.67	59.17	355.83	(mils)

Remold Instructions

Approximately 9" thickness for overliner material. Compaction to 95% of standard Proctor maximum dry density and +/- 2% of standard Proctor optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech Eagle Gold/Yukon

JOB NUMBER: 11-1415-0013\2000

DATE: 8/23/2012

Underliner (Bedding) Source: Silt

Underliner Classification: --

Atterberg Limits: --

Maximum Dry Density (pcf): 107.8

Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (25mm)

Overliner Classification: GP

Atterberg Limits: --

Dry Density (pcf): 81.5

Geosynthetic Manufacturer/Supplier: Agru America LLDPE Microspike (60-mil)

Geocomposite Manufacturer/Supplier: SYNTEC

Liner Type	Ave. Liner Thickness (mls)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
(Top) LLDPE Microspike 60	59.67	72	95.1	15.3	640	1.718	PASS	PASS
Tendrain 770-2 Double-sided (Highload)	355.83	72	95.1	15.3	640	1.718	PASS	--
(Bottom) LLDPE Microspike 80	59.17	72	95.1	15.3	640	1.718	PASS	PASS
GCL	0.3	72	95.1	15.3	640	1.718	PASS	--

General Test Notes: Test was conducted using a 12" diameter cell. GCL was placed on top of approximately 2.8 inches of underliner soil. 60 mil microspike texture/texture LLDPE liner was placed on top of the GCL, followed by GEONET drain material, a second layer of 60 mil microspike texture/texture LLDPE liner and approximately 8.9 inches of overliner material. Approximately 26 rocks were hand placed pointing downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of approximately 21 hours. The load was maintained for 72 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, top liner was inspected and tested for punctures visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG.

Liner observations: No visual puncturing of either geomembrane or Geonet. No leaks were observed durin the vacuum test. Approximately 24 notable dimples were present on the surface of the "Top" LLDPE liner. The "Bottom" LLDPE liner had only 9 notable dimples. GCL and geonet (13 dimples) have only indentations that mimic the dimples from overlying geosynthetic materials.

Underliner was remolded to 95.1% of standard Proctor maximum dry density at +0.1% of standard Proctor optimum moisture. Overliner was loosely placed and slightly tampe(

Date: 8/23/12

Tech: ACE

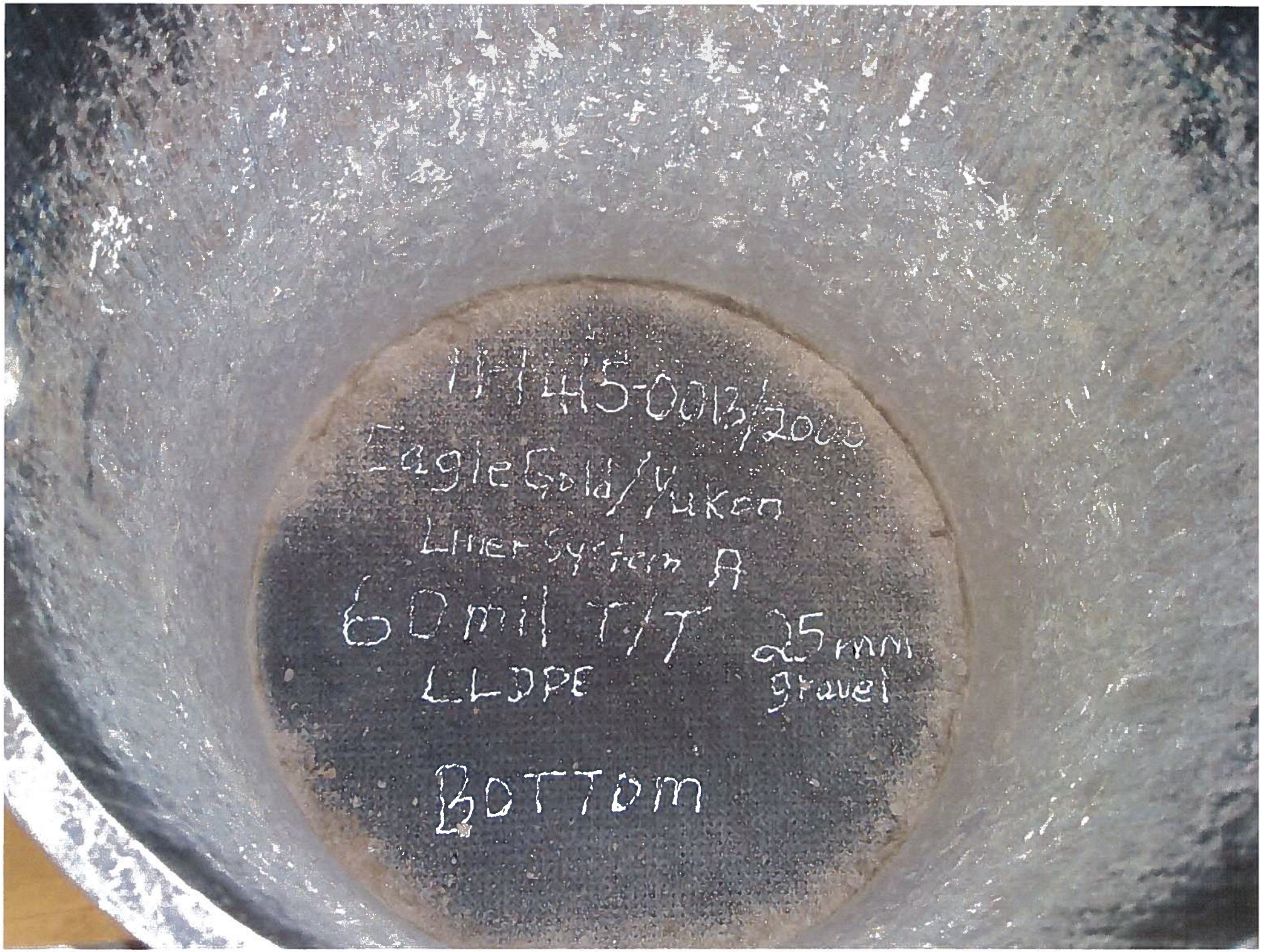
Review: MB

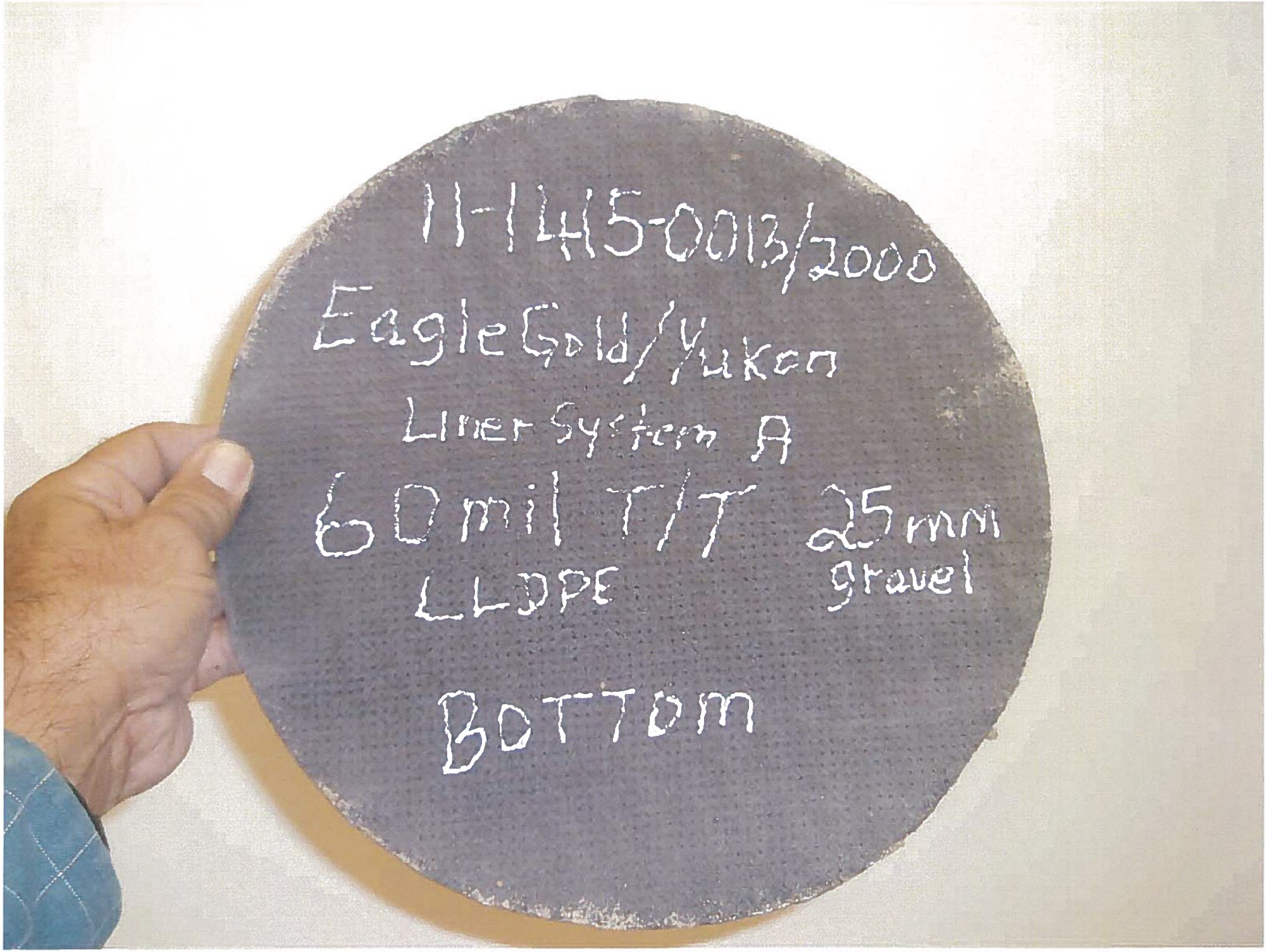

8-15-12
11-1415-0013/2000
Eagle Gold / Yukon
3" Silt @ 7.8 pcf
25mm Overliner / 60 mil LLDPE TT
GEONET
GCL
Liner System A
8-27-12/160-640psi
TEST COMPLETED
Made in USA



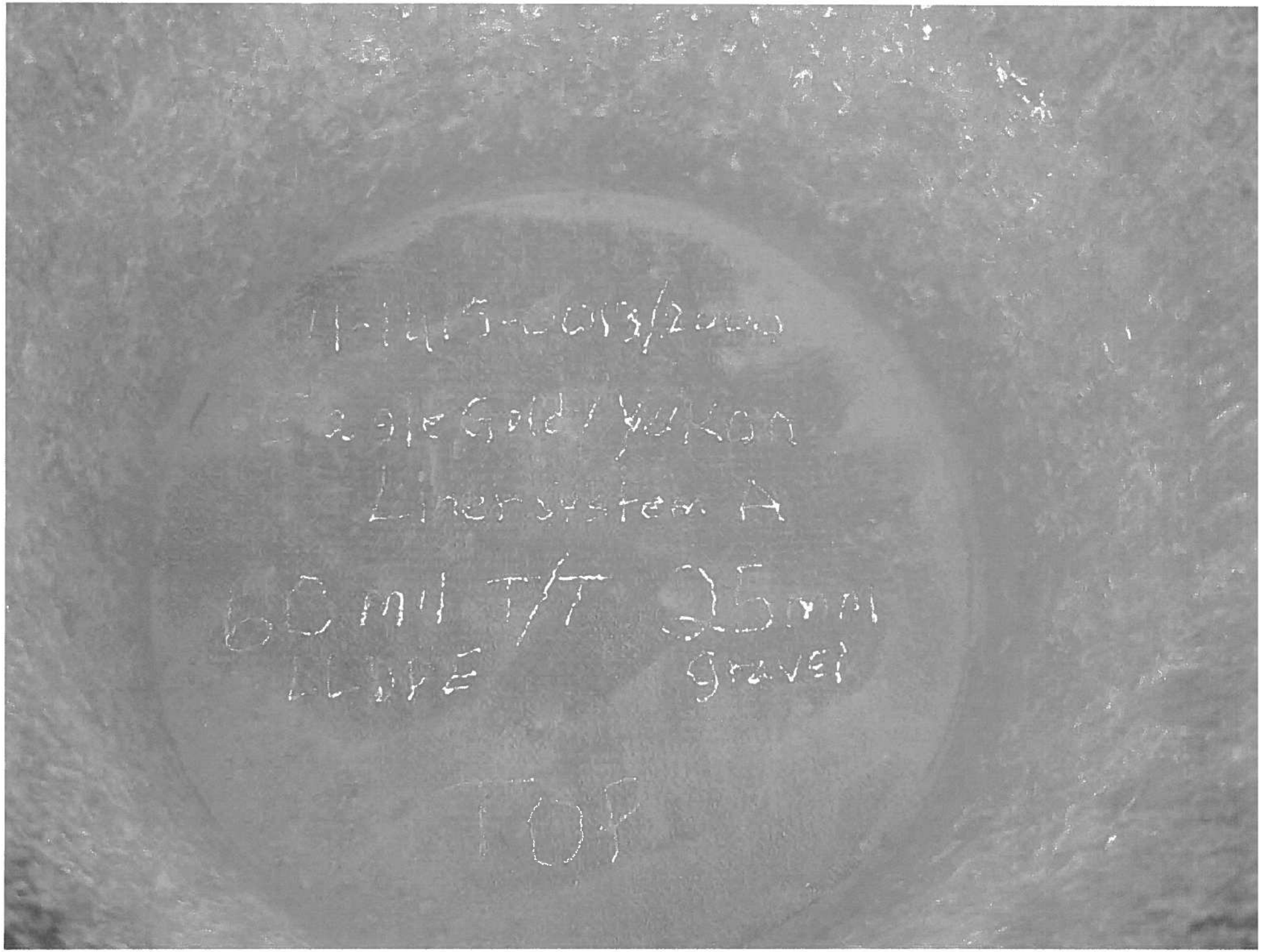




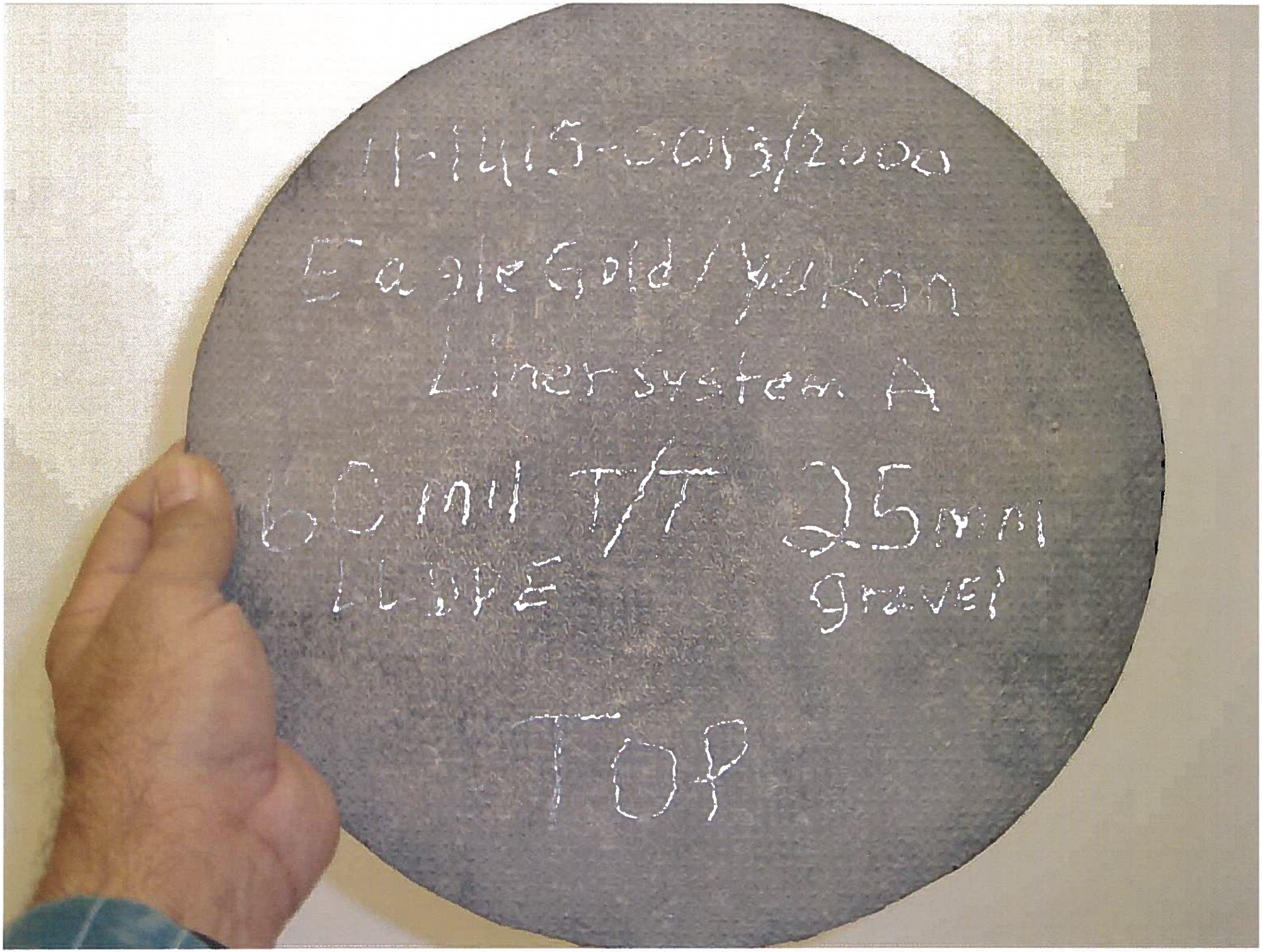

11-1145-0013/2000
Eagle Gold/Yukon
Liner System A
60 mil T/T
LLDPE
25 mm
gravel
Bottom


11-1145-0013/2000
EagleGold/Yukon
Liner System A
60mil T/T 25mm
LLDPE gravel
Bottom




4-1419-0013/2000
Eagle Gold / Yukon
Liner system A
60 mil T/T 25mm
LLDPE gravel
TOP




11-1415-0013/2000
EagleGold/Yukon
Liner System A
60 mil T/T 25mm
LLDPE gravel
TOP



12 inch Liner Load Test

JOB NUMBER:	11-1415-0013/2000	UNDERLINER:	Silt
JOB NAME:	Tetra Tech/Aggregate/Yukon	OVERLINER	BGC-GD-01 (25mm)
DATE TESTED:	08/27/12		

Clay Liner		**Overliner**	
Initial Moisture Content		**Initial Moisture Content**	
Tare:	Q-6	Tare:	M-7R
Wet Weight & Tare, g:	205.46	Wet Weight & Tare, g:	648.98
Dry Weight & Tare, g:	182.07	Dry Weight & Tare, g:	647.01
Tare Weight, g:	27.97	Tare Weight, g:	94.98
Moisture, %:	**15.2**	Moisture, %:	**0.4**
Final Moisture Content		**Final Moisture Content**	
Tare:	F-3	Tare:	M-53
Wet Weight & Tare, g:	190.70	Wet Weight & Tare, g:	612.54
Dry Weight & Tare, g:	171.60	Dry Weight & Tare, g:	610.54
Tare Weight, g:	29.10	Tare Weight, g:	94.89
Moisture, %:	**13.4**	Moisture, %:	**0.4**

Initial Height Determination (Inches)	Underliner	Overliner
1.	2.904	2.543
2.	3.061	2.573
3.	3.022	2.690
4.	2.943	2.560
5.	2.904	2.669
6.	2.904	2.743
Average	2.956	2.630
Cell Height	--	16.250
Sample Height	2.956	10.582

Density	**Underliner**		**Overliner**	
Wet Weight:	10,560.1	g	25518.90	g
Dry Weight:	9,168.5	g	25428.16	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	2.956	in	10.582	in
Final Height:	2.799	in	9.381	in
Initial Volume:	0.193	ft^3	0.69	ft^3
Final Volume:	0.183	ft^3	0.61	ft^3
Initial Wet Density:	120.4	pcf	81.3	pcf
Final Wet Density:	127.2	pcf	91.7	pcf
Initial Dry Density:	104.5	pcf	81.0	pcf
Final Dry Density:	110.4	pcf	91.4	pcf

General Test Notes:

Consolidate @ 640 psi for 48 hours.

Post-Test: No visual puncture of geomembrane. No penetrations observed during the vacuum test.

Approximately 44 notable, rounded dimples on the surface of the membrane.

Approximately 31 notable dimples on the surface of the GCL.

Liner Thickness (in)		
1.	0.082	
2.	0.081	
3.	0.082	
4.	0.084	
5.	0.081	
6.	0.082	
Average	0.082	(in)
	82.00	(mils)

Remold Instructions

Approximately 10" thickness for overliner material. Compaction to 95% of standard Proctor maximum dry density. +/- 2% of standard Proctor optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: Tetra Tech/Aggregate/Yukon

JOB NUMBER: 11-1415-0013/2000

DATE: 8/27/2012

Underliner (Bedding) Source: Silt

Underliner Classification: --

Atterberg Limits: --

Maximum Dry Density (pcf): 107.5

Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (25mm)

Overliner Classification: GP

Atterberg Limits: --

Dry Density (pcf): 81.0

Geosynthetic Manufacturer/Supplier: Argu America LLDPE Microspike (60-mil)

Liner Type	Ave. Liner Thickness (mls)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
LLDPE Microspike 80	82.0	48	97.2	15.2	640	1.359	PASS	PASS
GCL	284	48	97.2	15.2	640	1.359	--	--

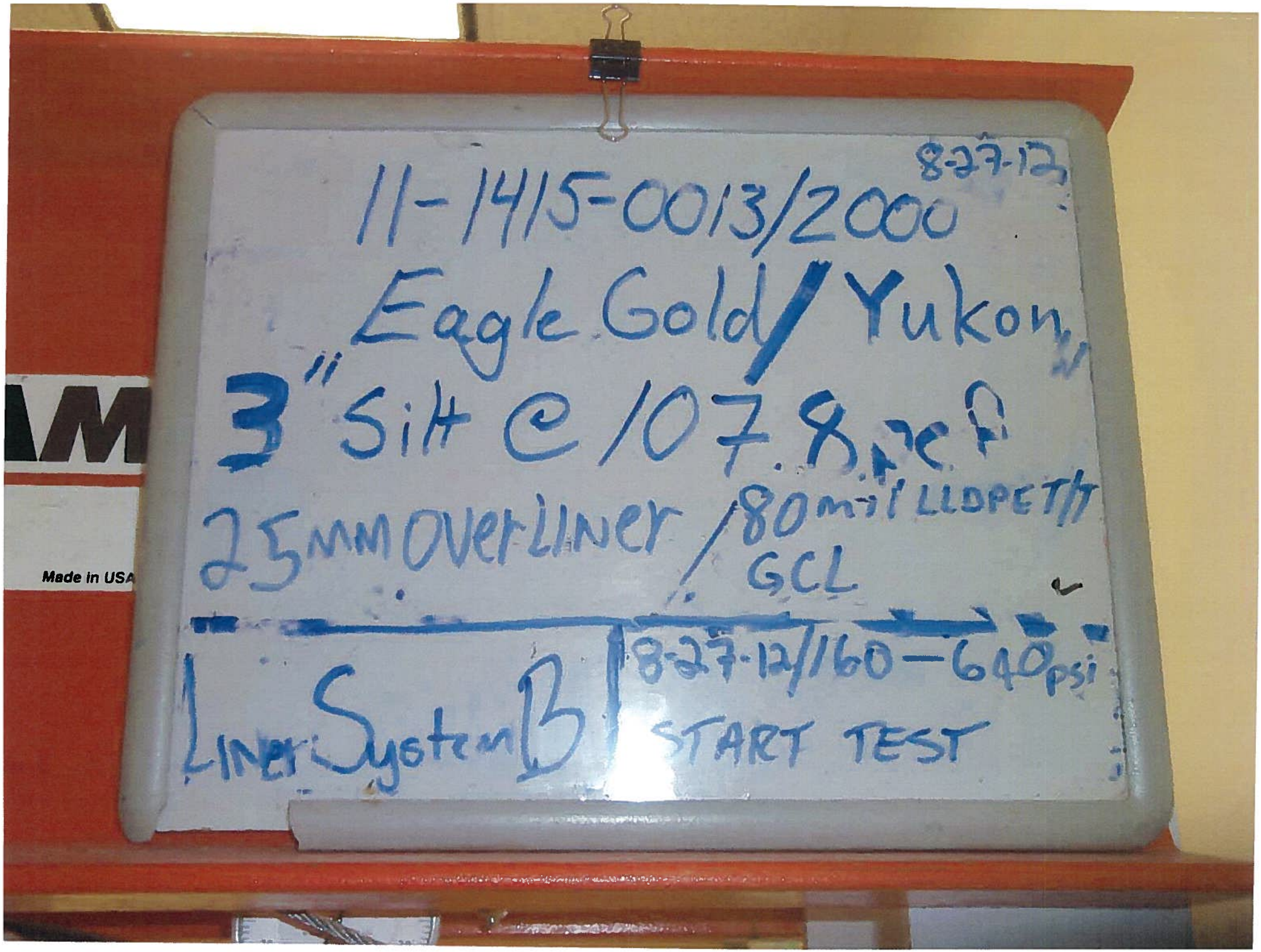
General Test Notes:

Test was conducted using a 12" diameter cell. The 80 mil texture/texture microspike liner was placed on top of moistened GCL which was placed on top of approximatly 3 inches of underliner soil, then covered with approximately 10.5 inches of overliner material. Approximately 15 rocks were hand placed with points downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of 5 hours. The load was maintained for 48 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, the liner was inspected and tested for punctures both visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG.

Liner observations: No punctures were present but numerous dimples (approximately 44) and scratches. There was no apparent damage to the underlying GCL, only depressions (33) which mimicked the overlying geomembrane dimples.

Underliner was remolded to 97.2% of standard Proctor maximum dry density at optimum moisture of standard Proctor. Overliner was loosely placed and slightly tamped.

Tech:	JAM
Review:	MB


8-27-12
11-1415-0013/2000
Eagle Gold / Yukon
3" Silt @ 107.8 pcf
25mm Overliner / 80mil LLDPET/T
GCL
Liner System B
8-27-12/160-640psi
START TEST
Made in USA





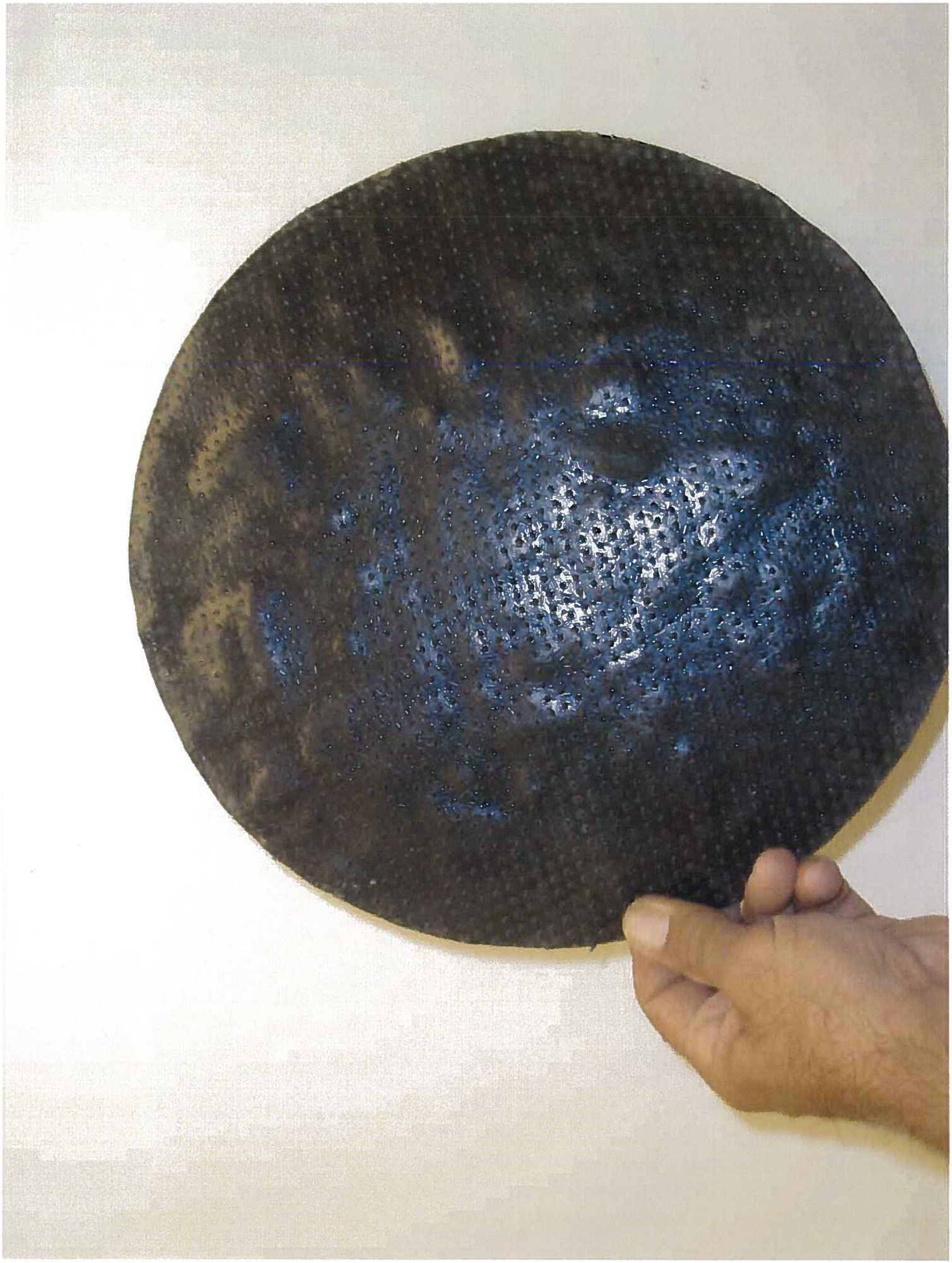

11-145-0013-2000
TETRA TECH
EAGLE GOLD/YUKON
80 mil T/T LINER SYSTEM B
25 MM GRAVEL
7-31-12


-2000
TETRA
AGLE GOLD / YUKON
LINER B
Gravel
7-31-


TETRA TECH
80 mil
7-31-12


TETRA TECH
EAGLE GOLD, YUKON
80 mil T/T LINER
0.5 mm GRAVEL
7-31-12





September 14, 2012 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

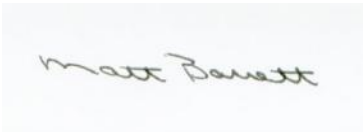
Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner load testing on Liner System C sample "BGC-GD-01 (25mm)". All pending laboratory tests results will be forwarded when completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.



Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

12 inch Liner Load Test

JOB NUMBER:	11-1415-0013/2000	UNDERLINER:	Silt
JOB NAME:	Tetra Tech/Aggregate/Yukon	OVERLINER	BGC-GD-01 (25mm)
DATE TESTED:	08/29/12		

Clay Liner

Initial Moisture Content

Tare:	Y-2
Wet Weight & Tare, g:	218.55
Dry Weight & Tare, g:	193.26
Tare Weight, g:	28.00
Moisture, %:	**15.3**

Final Moisture Content

Tare:	K-9
Wet Weight & Tare, g:	149.00
Dry Weight & Tare, g:	134.89
Tare Weight, g:	22.40
Moisture, %:	**12.5**

Overliner

Initial Moisture Content

Tare:	M-53
Wet Weight & Tare, g:	612.54
Dry Weight & Tare, g:	610.54
Tare Weight, g:	94.89
Moisture, %:	**0.4**

Final Moisture Content

Tare:	WU-10
Wet Weight & Tare, g:	591.50
Dry Weight & Tare, g:	589.88
Tare Weight, g:	128.41
Moisture, %:	**0.4**

Initial Height Determination (Inches)

	Clay Liner	Overliner
1.	2.983	3.519
2.	2.983	3.458
3.	2.904	3.513
4.	2.825	3.639
5.	2.983	3.506
6.	2.943	3.598
Average	2.937	3.539
Cell Height	--	16.250
Sample Height	2.937	9.744

Density	**Clay liner**		**Overliner**	
Wet Weight:	10,211.9	g	25970.00	g
Dry Weight:	8,856.8	g	25866.53	g
Diameter:	12.000	in	12.000	in
Area:	113.10	in^2	113.10	in^2
Initial Height:	2.937	in	9.744	in
Final Height:	2.825	in	8.469	in
Initial Volume:	0.192	ft^3	0.64	ft^3
Final Volume:	0.185	ft^3	0.55	ft^3
Initial Wet Density:	117.2	pcf	89.8	pcf
Final Wet Density:	121.9	pcf	103.4	pcf
Initial Dry Density:	101.7	pcf	89.5	pcf
Final Dry Density:	105.7	pcf	103.0	pcf

General Test Notes:

Consolidate @ 640 psi for 48 hours. Approximately 3" of subgrade.

15 rocks positioned above PVC membrane prior to overliner addition.

PVC LINER: Visual puncture inspection: PASS Vacuum Test: PASS

More than 50 notable dimples noted on the 0.75mm PVC membrane at the conclusion of the test

Liner Thickness (in)

1.	0.030	
2.	0.030	
3.	0.030	
4.	0.030	
5.	0.029	
6.	0.030	
Average	0.030	(in)
	30.00	(mils)

Remold Instructions

Approximately 11.5" thickness for overliner material. Compaction to 95% of standard Proctor maximum dry density. +/- 2% of standard Proctor optimum moisture.

GEOMEMBRANE LINER LOAD TEST SUMMARY

JOB NAME: **Tetra Tech/Aggregate/Yukon**

JOB NUMBER: **11-1415-0013/2000**

DATE: **8/29/2012**

Underliner (Bedding) Source: Silt

Underliner Classification: -- Atterberg Limits: --

Maximum Dry Density (pcf): 107.8 Optimum Moisture: 15.2

Overliner Material Source: BGC-GD-01 (25mm)

Overliner Classification: GP Atterberg Limits: --

Dry Density (pcf): 89.5

Geosynthetic Manufacturer/Supplier: Nan Ya Plastics Corporation, America 0.75 mm PVC

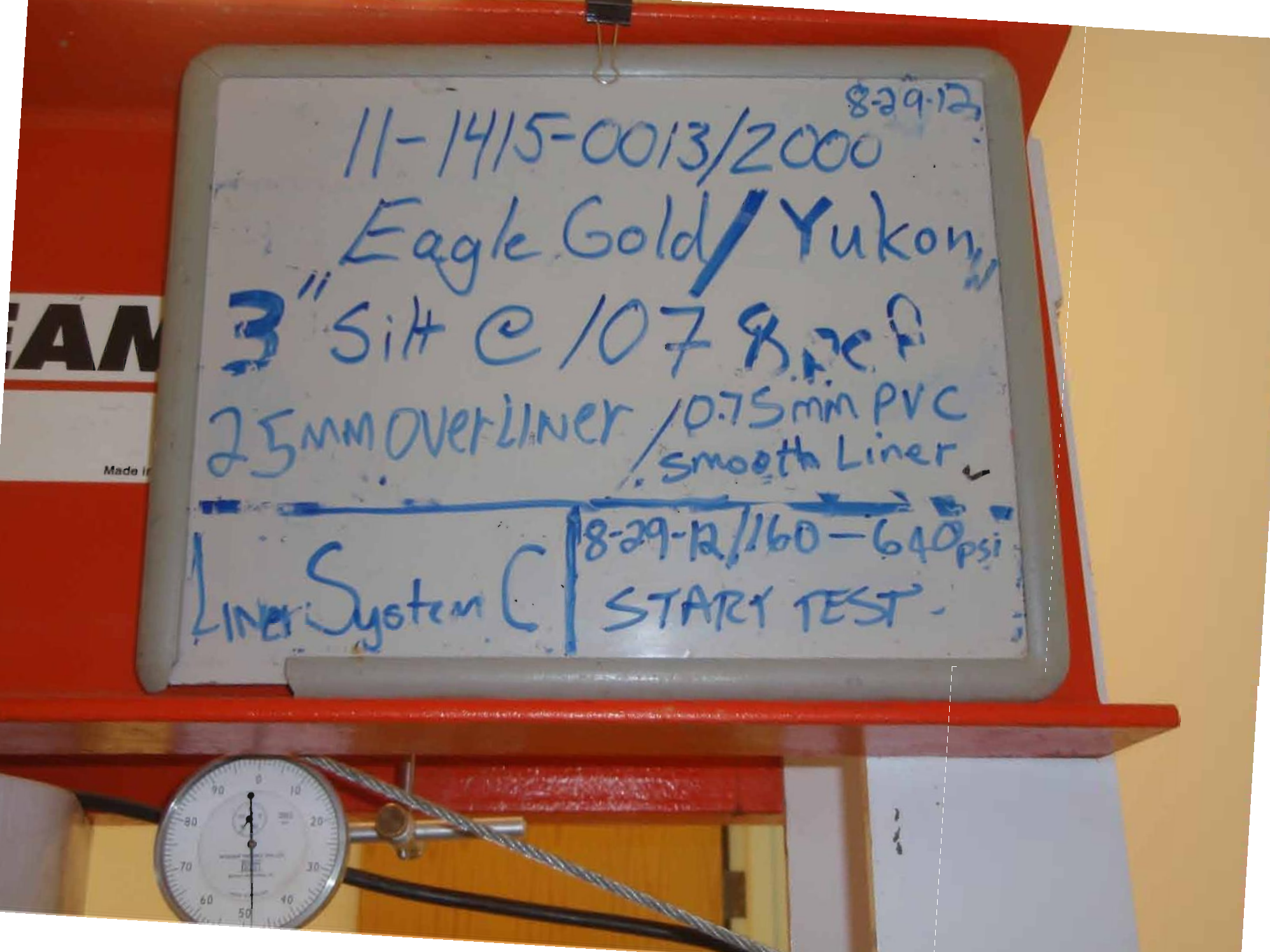
Liner Type	Ave. Liner Thickness (mils)	Duration of Test (hrs.)	Underliner Compaction %	Moisture %	Load Applied (psi)	Change in total sample height (in)	Test Results	
							Visual	Vacuum
0.75mm PVC	30.000	93	94.3	15.3	640	1.387	PASS	PASS

General Test Notes: Test was conducted using a 12" diameter cell. Smooth 0.75mm PVC was placed on top of approximately 3.0 inches of silt then overlain by approximatley 10.2 inches of overliner material. Approximately 15 rocks were hand placed pointing downward on the liner prior to placement of remaining overliner material. A hydraulic jack was used to apply a load of 640 psi to the sample over a period of 17 hours. The load was maintained for 93 hours. A dial gage was used to monitor deformation of the sample. At the conclusion of the test, the PVC liner was inspected and tested for punctures visually and by application of a vacuum. The vacuum pressure was approximately 465 mmHG.

Liner observations: No visual puncturing of PVC liner. No penetrations observed during the vacuum test. Over 50 notable dimples observed on the surface of the PVC liner.

Underliner was remolded to 94.3% of standard Proctor maximum dry density and +0.1% of standard Proctor optimum moisture content. Overliner was loosely placed and slightly tamped

Date:	8/29/12
Tech:	ACE
Review:	MB


8-29-12
11-1415-0013/2000
Eagle Gold/Yukon
3" Silt @ 1078 pcf
25mm Overliner / 0.75mm PVC
smooth Liner
Liner System C
8-29-12/160-640psi
START TEST






0.75mm PVC
11-1415-0013/2000
Eagle Gold/Yukon
25mm Gravel








0.75mm PVC
11-1415-0013/2000
Eagle Gold/Yukon
2.5mm Gravel


0.75mm PVC
2.5mm Gr


0.75mm PVC
11-1415-0013/2000
Eagle Gold/Yukon
25mm Gravel



January 8, 2013 Our Ref.: 11-1415-0013.2000

Mr. Troy Meyer, P.E., P.Eng
120 West Park Drive
Suite 204
Grand Junction, CO 81505

Attention: Mr. Troy Meyer

RE: LABORATORY TEST RESULTS FOR TETRA TECH, PROJECT – YUKON

Dear Mr. Meyer:

Golder Associates Inc. (Golder) has prepared this report to present the results of geotechnical laboratory testing conducted on samples submitted from the Golder Office in Burnaby, British Columbia, Canada. The samples were tested at Golder's Soils Laboratory in Lakewood, Colorado. This report presents the results of liner interface shear testing. All assigned laboratory tests have been completed. Hard copies of test results will be mailed to you under separate cover.

Thank you for the opportunity to provide these laboratory testing services and we look forward to assisting you on any future projects.

Should you have any questions or comments, please do not hesitate to call.

Sincerely,

GOLDER ASSOCIATES INC.

Matt Barrett

Matt Barrett
Lab Manager

MB/MB

Attachments

Golder Associates Inc.
9197 West 6th Ave, Building C Suite 100
Lakewood, CO 80215 USA
Tel: (303) 980-0540 Fax: (303) 985-2080 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation

ATTACHMENTS

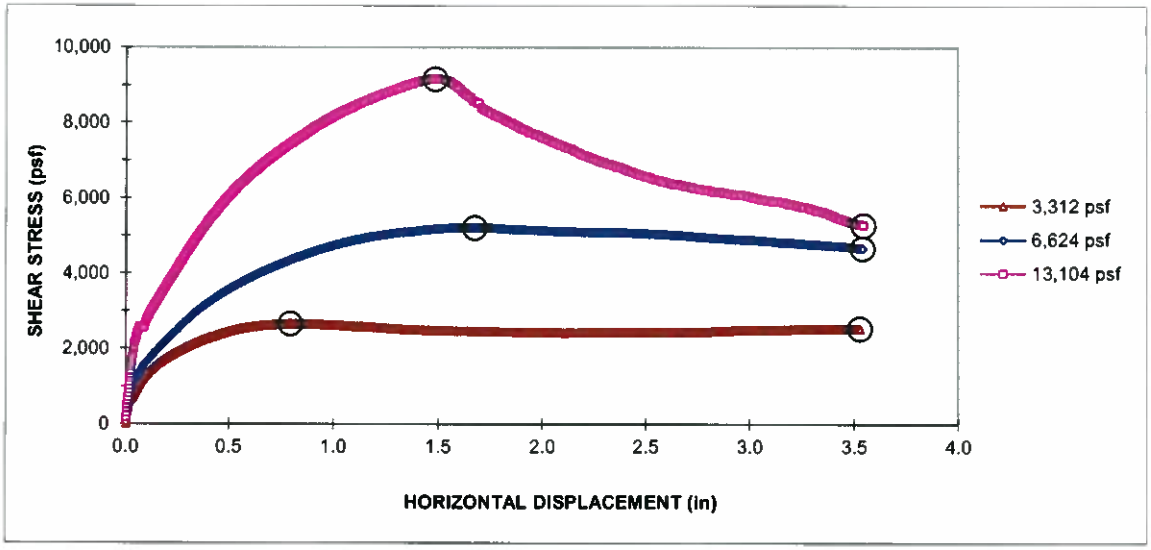
1/7/2013 11-1415-0013

DIRECT SHEAR TEST RESULTS

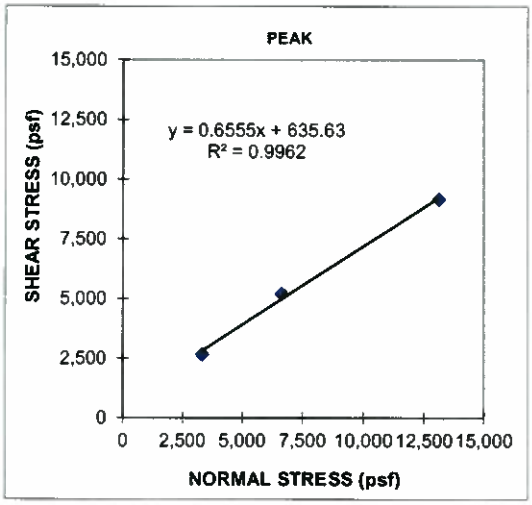
ASTM D5321

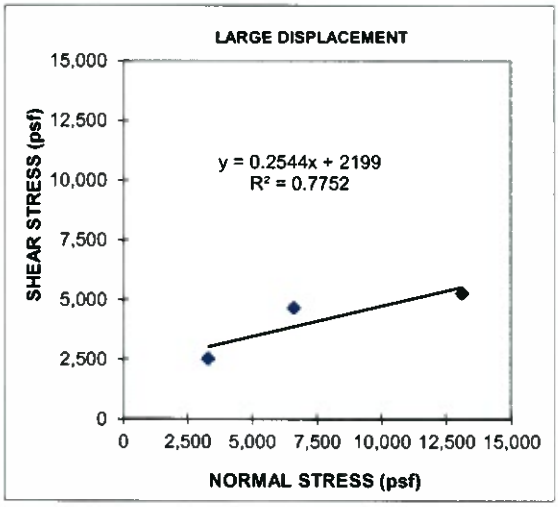
PROJECT NAME: Tetra Tech/Aggregate/Yukon
SAMPLE NUMBER: Silt

APPARATUS: 12"x12" shear box; air bladder used for all normal loads
INTERFACE TESTED: Top: Silt underliner (remolded to 102.4 pcf @ 15.2% moisture content)
Middle: Cetco DN GCL, unclamped
Bottom: ~1.5 inch gravel
TEST CONDITIONS: GCL hydrated 72 hours under 2.5 psi normal load; consolidated 24 hours at normal load
SHEAR RATE: 0.04 in/min



Normal Stress (psf)	Shear Stress		Peak		Large Displacement	
	Peak[1] (psf)	Lg. Displ. (psf)	Friction Angle	Adhesion[2] (psf)	Friction Angle	Adhesion[2] (psf)
3,312	2,656	2,529				
6,624	5,205	4,659	33.2	635.6	14.3	2199.0
13,104	9,148	5,271				





Observations After Test
3,312 psf: Shear appears to have occurred between the GCL/Silt interface.
6,624 psf: Shear appears to have occurred between the GCL/Silt interface.
13,104 psf: Shear appears to have occurred between the GCL/Silt interface followed by tearing of the top geotextile in tension.

Tech: PRH
Review: CCS

(1) Peak shear stresses for 3,312 psf, 6,624 psf, and 13,104 psf normal stresses were chosen at 0.796 in, 1.677 in, and 1.487 in horizontal displacements, respectively.
(2) Interface shear parameters are based on the "best-fit" line, per ASTM D5321. Interpretation of the data by a qualified professional for the specific application is required. Adhesion may result from the line fitting rather than physical adhesion.





SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

November 4, 2011
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

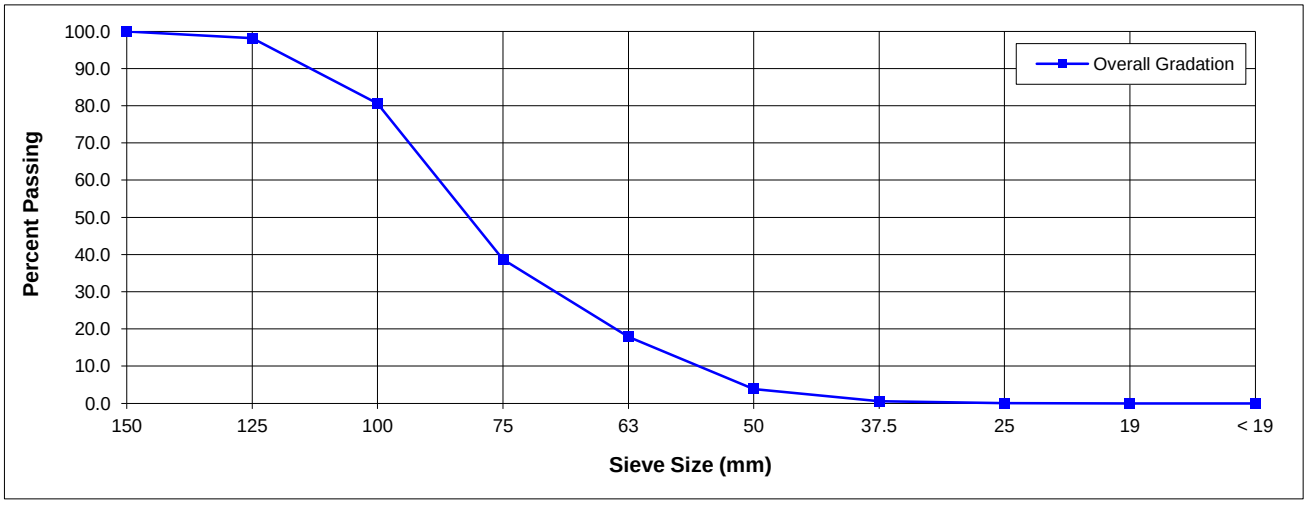
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF , As Received**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: November 3, 2011
DATE TESTED: November 4, 2011

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					**MATERIAL SPECIFICATION :**
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)		
			+ < 19	- < 19	
150	0.0	100.0	0.0		
125	1.8	98.2	1.8		
100	17.6	80.6	17.6		
75	41.9	38.7	41.9		
63	20.8	17.9	20.8		
50	14.0	3.9	14.0		
37.5	3.3	0.6	3.3		
25	0.5	0.0	0.5		
19	0.0	0.0	0.0		
< 19	0.0	0.0	0.0		
Total	100.0		100.0		



Remarks: Entire sample received sieved; total mass: 174928 g

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

November 7, 2011
Project number: 11-1415-0013/1000

ATTENTION: Mr. Troy Meyers, P.E.

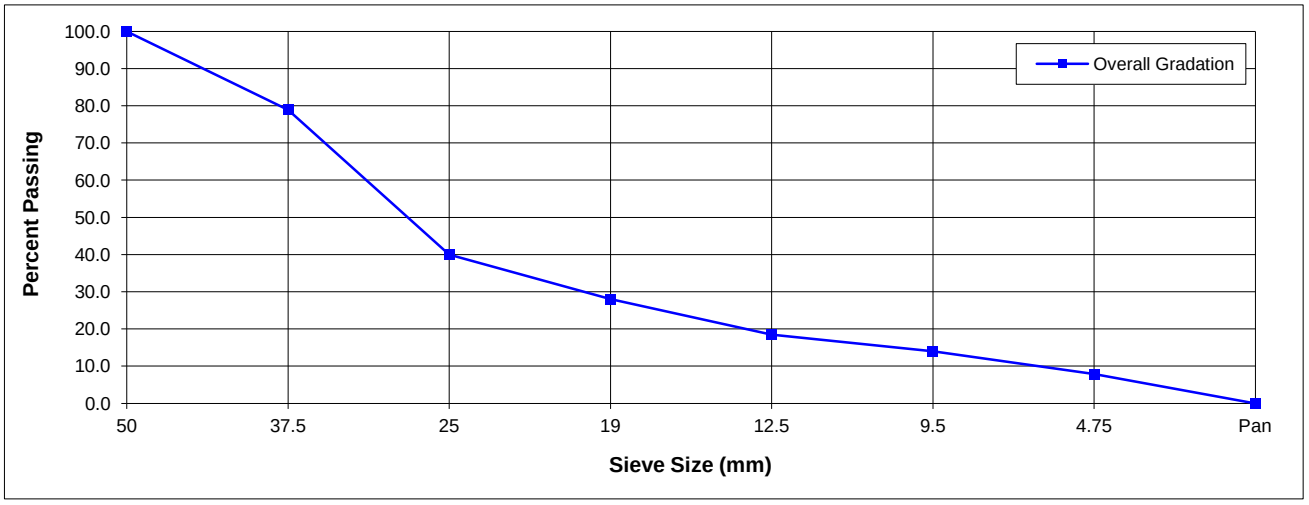
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF, 50mm Crushed**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: November 3, 2011
DATE TESTED: November 7, 2011

SAMPLED BY: N/A
TESTED BY: IC

SIEVE ANALYSIS					MATERIAL SPECIFICATION :
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)		
			+ 4.75	- 4.75	
50	0.0	100.0	0.0		
37.5	21.1	78.9	22.9		
25	38.9	40.0	42.2		
19	12.0	28.0	13.0		
12.5	9.6	18.4	10.4		
9.5	4.5	14.0	4.8		
4.75	6.1	7.9	6.7		
Pan	7.9	0.0		100.0	
Total	100.0		100.0	100.0	



Remarks: Sample crushed to 50mm minus by jaw crusher.
Combined Sample (BGC-GD-1,2,3,4,5 and BGC-MS-1,2,3,4,5)

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

November 4, 2011
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

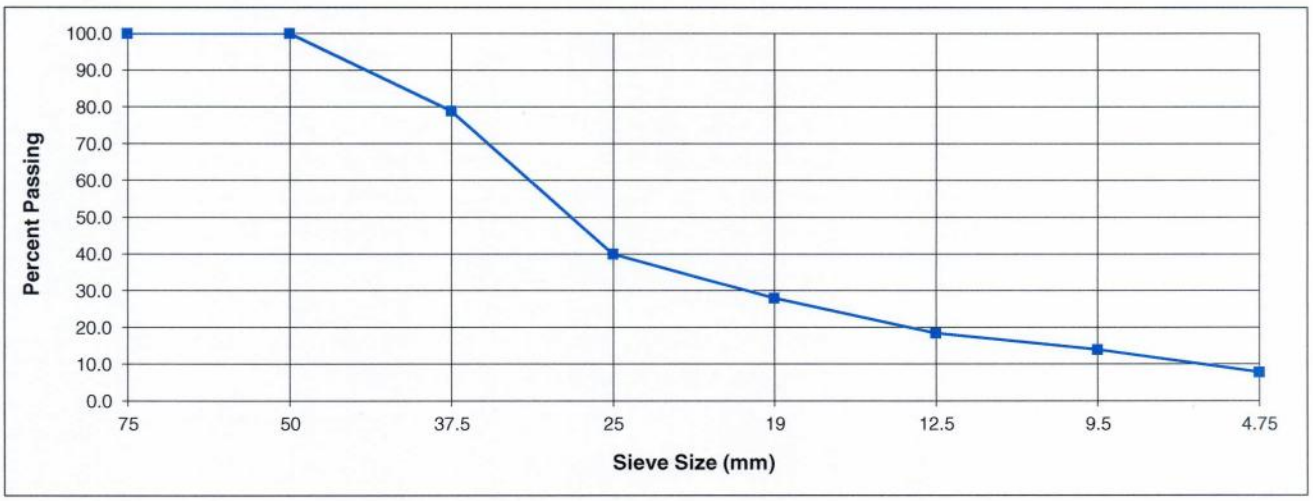
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF, 50mm minus lab crushed**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: November 3, 2011
DATE TESTED: November 7, 2011

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					MATERIAL SPECIFICATION :
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)		
			+ 4.75	- 4.75	
75	0.0	100.0	0.0		
50	0.0	100.0	0.0		
37.5	21.1	78.9	22.9		
25	38.9	40.0	42.2		
19	12.0	28.0	13.0		
12.5	9.6	18.4	10.4		
9.5	4.5	14.0	4.8		
4.75	6.1	7.9	6.7		
PAN	7.9			100.0	
Total	100.0		100.0	100.0	



Remarks: Combined Sample(BGC-GD-1, 2,3,4,5 and BGC-MS-1, 2,3,4,5)
Sample crushed to 50mm minus by lab jaw crusher.

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

MAXIMUM AND MINIMUM INDEX DENSITY USING A VIBRATORY TABLE

ASTM D 4253 & D 4254

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 50 mm minus lab crushed**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: December 21, 2011

Date received: November 3, 2011
Tested by: DC

Trial	Maximum Index Density (Dry method 2A) kg/m^3	Maximum Index Density (Wet method 2B) kg/m^3	Minimum Index Density (Method A) kg/m^3
1	1755	1764	1400
2	--	--	--
AVERAGE	**1755**	**1764**	**1400**

Note: Tests were carried out with the large mould.

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF COARSE AGGREGATE

ASTM C 127

December 12, 2011
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 50mm minus crushed, Coarse Portions**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: November 30, 2011

Date received: November 3, 2011
Tested by: DC

Size Fractions	Relative Density (oven dry basis) g/cm^3	Relative Density (SSD basis) g/cm^3	Relative Density (Apparent) g/cm^3	Absorption (%)
50 x 37.5mm	2.661	2.683	2.722	0.84
37.5 x 25.0mm	2.643	2.665	2.702	0.82
25.0 x 12.5mm	2.634	2.659	2.701	0.94
12.5 x 4.75mm	2.603	2.638	2.697	1.33

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF FINE AGGREGATE

ASTM C 128

December 12, 2011
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 50mm minus crushed, Passing 4.75mm Portion**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: November 30, 2011

Date received: November 3, 2011
Tested by: DC

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.452	2.545	2.704	3.79
2	2.458	2.550	2.707	3.73
AVERAGE	**2.455**	**2.548**	**2.705**	**3.76**

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Golder Associates

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

January 12, 2012
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

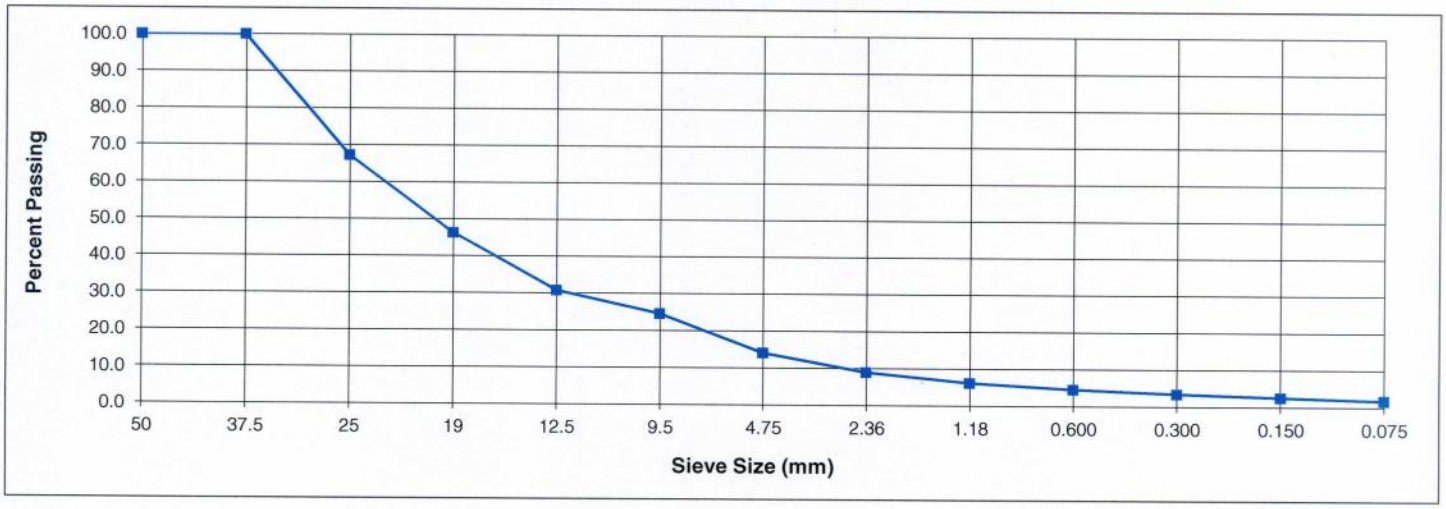
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF, 37.5mm minus lab crushed**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: November 3, 2011
DATE TESTED: December 20, 2011

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
50	0.0	100.0	0.0			
37.5	0.0	100.0	0.0			
25	32.7	67.3	38.1			
19	21.0	46.3	24.4			
12.5	15.5	30.8	18.1			
9.5	6.2	24.6	7.2			
4.75	10.4	14.2	12.2			
2.36	5.2	9.0		36.5		
1.18	2.7	6.3		19.3		
0.600	1.6	4.6		11.4		
0.300	1.2	3.5		8.2		
0.150	0.8	2.7		5.8		
0.075	0.8	1.8		5.9		
PAN	1.8	0		12.9		
Total	100.0		100.0	100.0		



Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

MAXIMUM AND MINIMUM INDEX DENSITY USING A VIBRATORY TABLE

ASTM D 4253 & D 4254

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 37.5 mm minus lab crushed**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 5, 2012

Date received: November 3, 2011
Tested by: DC

Trial	Maximum Index Density (Dry method 2A) kg/m^3	Maximum Index Density (Wet method 2B) kg/m^3	Minimum Index Density (Method A) kg/m^3
1	1854	1908	1553
2	1891	--	1532
AVERAGE	**1872**	**1908**	**1543**

Note: Tests were carried out with the large mould.

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF FINE AGGREGATE

ASTM C 128

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 37.5mm minus lab crushed, passing 4.75mm portion**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: December 21, 2011

Date received: November 3, 2011
Tested by: DC

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.609	2.637	2.683	1.05
2	2.610	2.635	2.678	0.97
AVERAGE	**2.610**	**2.636**	**2.681**	**1.01**

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RESISTANCE TO DEGRADATION OF SMALL-SIZE COARSE AGGREGATE BY ABRASION & IMPACT IN THE LOS ANGELES MACHINE

ASTM C 131

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 37.5mm minus lab crushed**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 9, 2012

Date received: November 3, 2011
Tested by: DC

Grading	**A**
Number of revolutions	500
Loss after 500 revolutions (%)	**28.4**

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

January 12, 2012
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

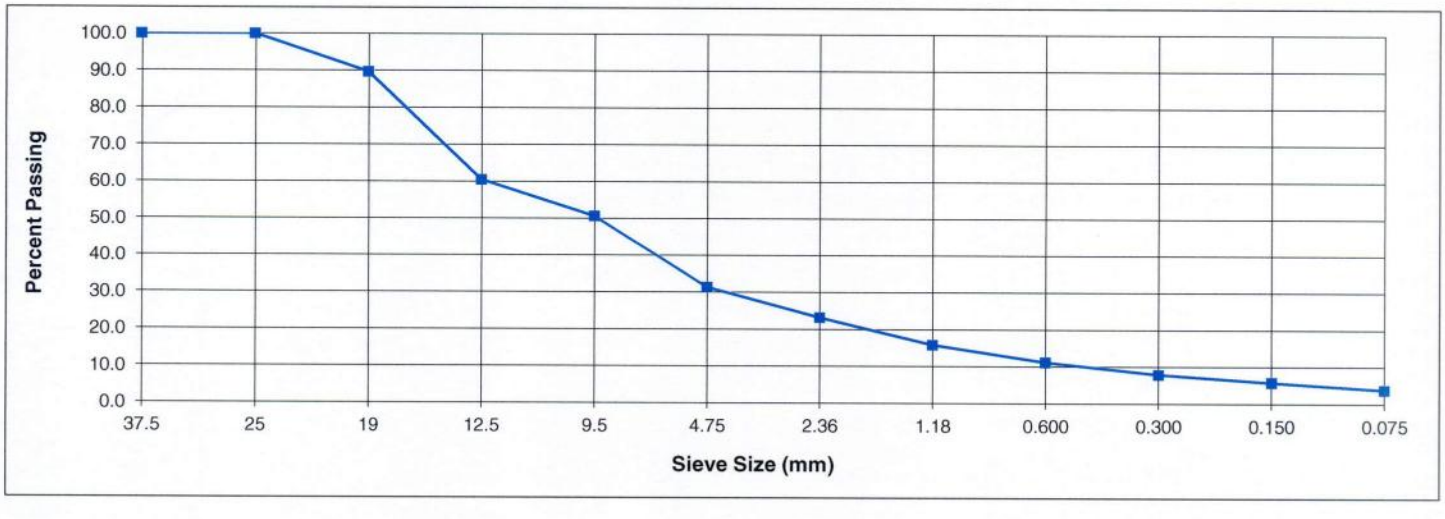
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF, 25mm minus lab crushed**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: November 3, 2011
DATE TESTED: January 9, 2012

SAMPLED BY: BGC
TESTED BY: DC

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
37.5	0.0	100.0	0.0			
25	0.0	100.0	0.0			
19	10.3	89.7	15.1			
12.5	29.2	60.5	42.5			
9.5	9.8	50.7	14.3			
4.75	19.3	31.4	28.1			
2.36	8.2	23.2		26.0		
1.18	7.3	16.0		23.1		
0.600	4.7	11.3		15.0		
0.300	3.3	8.0		10.5		
0.150	2.1	5.8		6.8		
0.075	2.0	3.8		6.4		
PAN	3.8	0		12.2		
Total	100.0		100.0	100.0		



Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

MAXIMUM AND MINIMUM INDEX DENSITY USING A VIBRATORY TABLE

ASTM D 4253 & D 4254

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF, 25 mm minus lab crushed**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 11, 2012

Date received: November 3, 2011
Tested by: DC

Trial	Maximum Index Density (Dry method 2A) kg/m^3	Maximum Index Density (Wet method 2B) kg/m^3	Minimum Index Density (Method A) kg/m^3
1	1991	2108	1620
2	1984	--	1634
AVERAGE	**1988**	**2108**	**1627**

Note: Tests were carried out with the large mould.

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF COARSE AGGREGATE

ASTM C 127

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr. Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 25mm minus crushed, retain on 4.75mm portions**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 10, 2012
Date received: November 3, 2011
Tested by: DC

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.638	2.661	2.699	0.87
2	2.634	2.658	2.700	0.93
AVERAGE	**2.636**	**2.660**	**2.700**	**0.90**

Reported by: I. Chung

Reviewed by: _____
L. Hu, MSc.E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF FINE AGGREGATE

ASTM C 128

January 12, 2012
Project number: 11-1415-0013/1000

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**ODF 25mm minus lab crushed, passing 4.75mm portion**
Source:	**Eagle Gold, Yukon**

Date sampled: Not provided
Date tested: January 10, 2012

Date received: November 3, 2011
Tested by: IC

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.601	2.639	2.704	1.48
2	2.610	2.646	2.708	1.39
AVERAGE	**2.605**	**2.643**	**2.706**	**1.43**

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

PARTICLE SIZE ANALYSIS OF SOILS

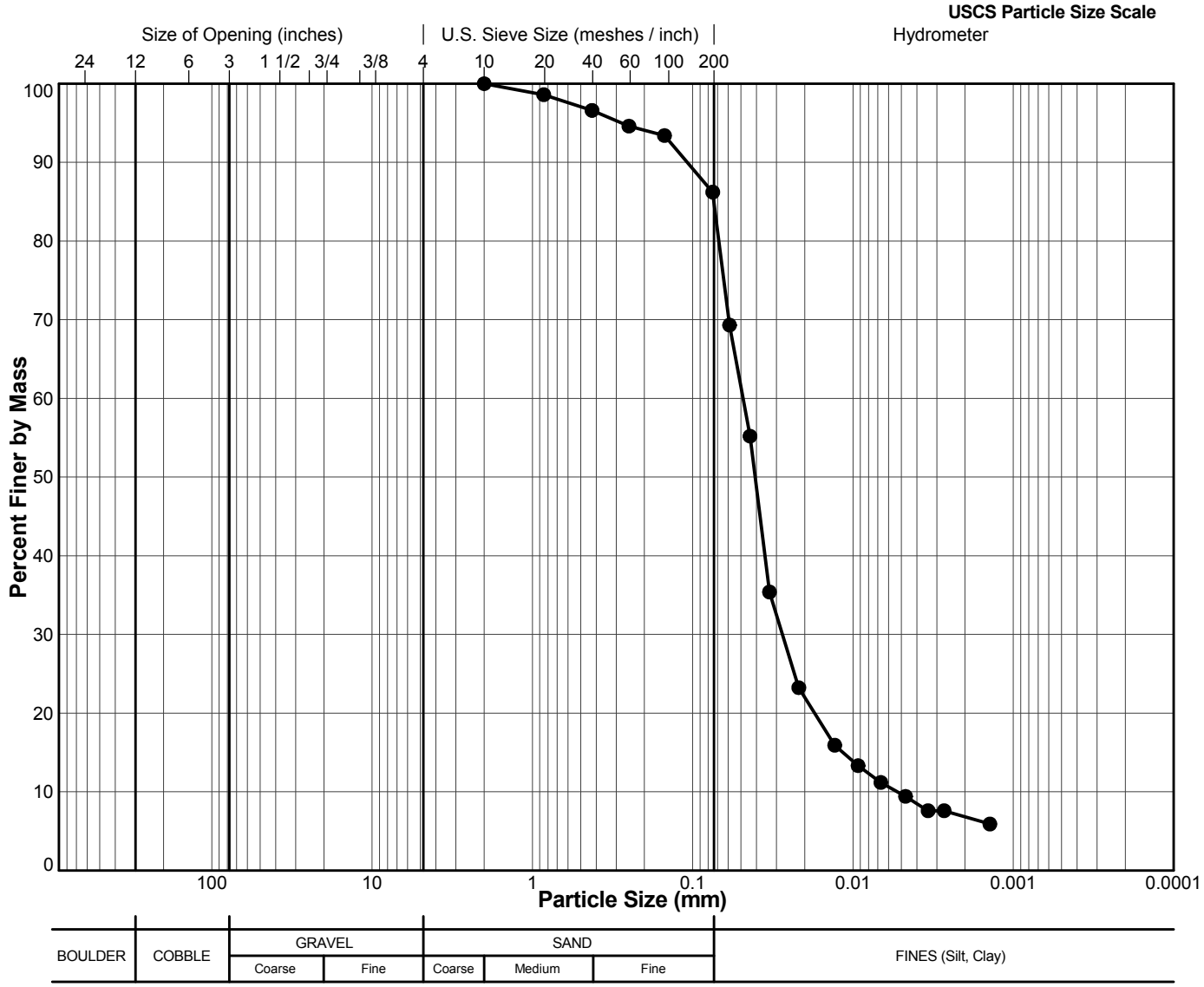
Reference(s)
ASTM D 422-63 (2007)

Client: Tetra Tech	**ID: Section 2 Silt**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 2	**Dispersion Method: Stirring**
Method: Split, Washed	**Dispersion Period (min): 1**

Hydrometer ID: BURNABY - 87024



SK	**12/5/2011**	**LP**	**12/21/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB ebarnes 09/13/12

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

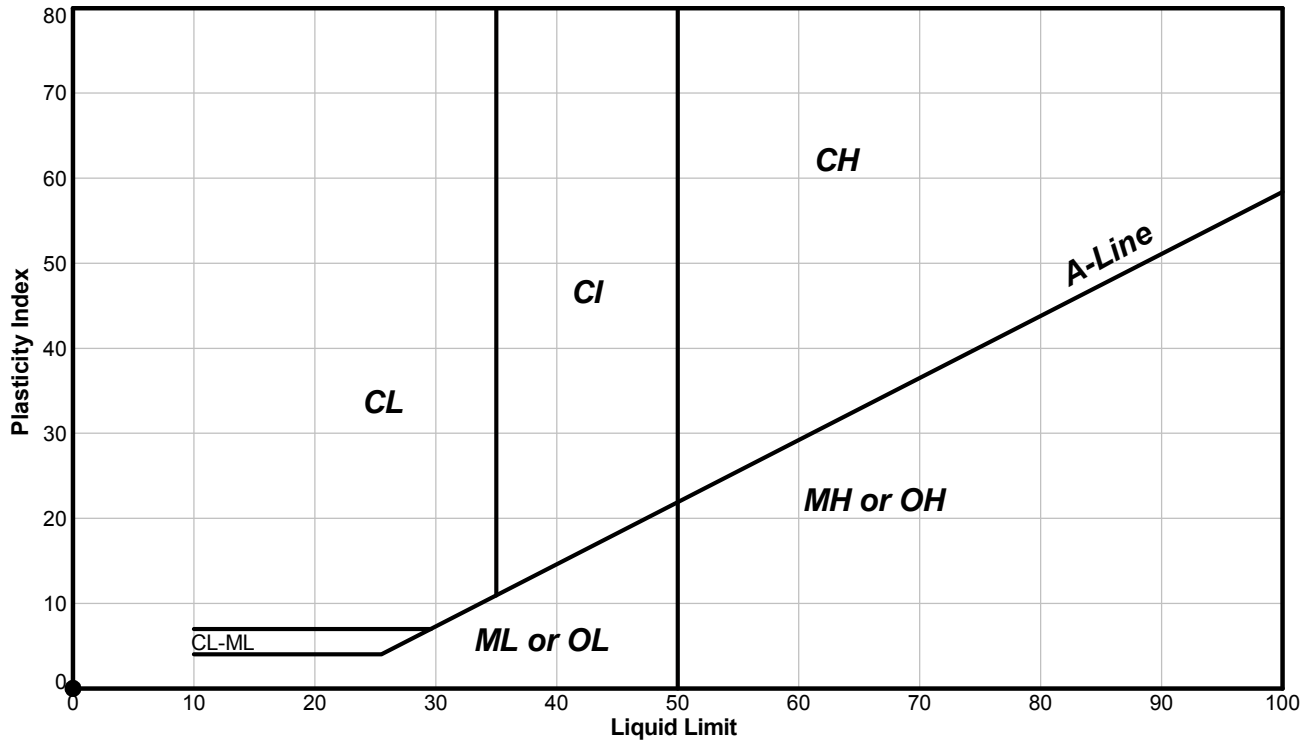
Client: Tetra Tech	**ID: Section 2 Silt**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	Section 2 Silt	N/A	0.00	0.00	97	NP	NP	NP	21.1	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	12/5/2011	LP	12/21/2011
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB ebarnes 09/13/12

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-06 Method B

Project No.:	11-1415-0013/1000	**Borehole**	**Section 2 Silt**
Client:	Tetra Tech	**Sample No.:**	N/A
Project:	Aggregate Testing	**Depth (m):**	N/A
Location:	Eagle Gold, Yukon	**Lab Sch No:**	211

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		100		
Test Number		1		2
Flask Number		5		6
Air Removal Method		Vacuum		Vacuum
Mass of Flask (g)		174.83		173.41
Mass of Flask + Dry Soil (g)	M_P	248.33		251.02
Mass of Dry Soil (g)		73.37		77.76
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	719.75		720.71
Test Temperature (g)	T_t	18.50		18.40
Mass of Flask + Water (g)	$M_{\rho w,t}$	673.08		671.53
Mass of Dish + Dry Soil (g)		252.00		424.26
Mass of Dish (g)		178.63		346.50
Mass of Oven Dry Soil (g)	M_S	73.37		77.76
Temperature Coefficient	K	1.00		1.00
Density of Solids (g/cm3)	ρ_s	2.75		2.72
Specific Gravity at Test Temperature	G_t	2.75		2.72
Specific Gravity at 20ºC	$G_{20°C}$	2.75		2.73
AVERAGE SPECIFIC GRAVITY		**2.74**		

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		0
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	
Apparent	C/(C-A)	
Absorbtion (%)	(B-C)/C	

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	$G_{avg\ @20°C}$	

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

SK/RS	December 5, 2011	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory

4280 Still Creek Drive

Burnaby, B.C. Canada V5C 6C8

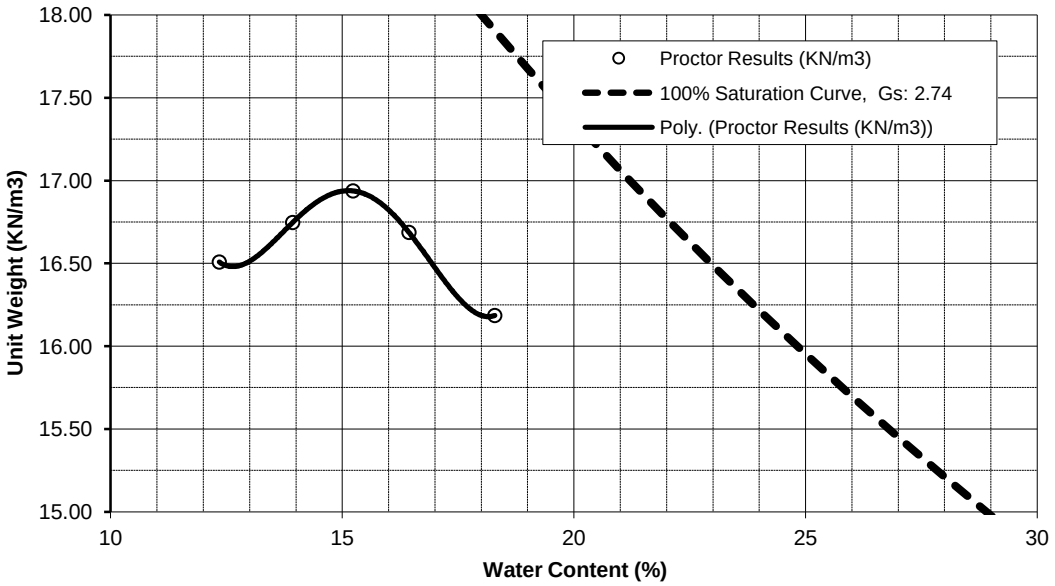
Compaction of Soil Using Standard Effort

Reference ASTM D 698-07

Client:	Tetra Tech	**Sample No.:**	Section 2 Silt
Project:	Aggregate Testing	**Sample Location:**	
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013/1000	**Lab ID No:**	211
Effort Type:	Standard	**Visual Description:**	-
Test Method:	A	**Type of Rammer:**	Mechanical
Preparation Method:	Moist	**Mould Volume (m^3):**	0.000945
Remarks:			

Compaction Results

Trial No.:	1	2	3	4	5
Unit Weight (KN/m^3)	16.51	16.75	16.94	16.19	16.7
Water Content (%):	12.3	13.9	15.2	18.3	16.4



Uncorrected Optimum w (%):	15.2	**Uncorrected Unit Weight (KN/m^3)**	16.93

ASTM D 4718-87 (2007) Correction for oversize particles

Max Percent Oversize (%):	25	**Sieve Size (mm):**	4.75
Oversized Fraction		***Test Fraction***	
Percent Oversized Fraction (%):	0.0	**Percent Test Fraction (%):**	100.0
Gsc (calculated):	2.74	**Gsf (calculated):**	2.74
Water Content of Oversized (%):	16.3	**Water Content of Test (%):**	15.2

Final Results

Corrected Optimum w (%):	15.2	**Corrected Unit Weight (KN/m^3)**	16.93
		Corrected Dry Density (Kg/m3)	1726

SK	December-09-11	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Measurements of Hydraulic Conductivity Using a Flexible Wall Permeameter

Reference: ASTM D5084-10 Method C

Client	Tetra Tech	**Sample No:**	SECTION 2 Silt	**Falling Head, rising tailwater elevation**	
Project	Aggregate Testing	**Sample ID:**	N/A		
Location	Eagle Gold, Yukon	**Depth:**	N/A		
Project #	11-1415-0013 Phase 1000	**Test Number**	Ktest-1	**Lab ID**	211

Remarks:

Sample Geometry

	Initial	Final	
Diameter =	10.16	10.16	cm
Length =	10.64	10.64	cm
Area =	81.14	81.14	cm^2
Volume =	863.1	863.1	cm^3

Test Parameters

Cell Pressure =	90.0	psi
Back Pressure =	80.0	psi
σ'_{3c} =	10.0	psi
δV_c =	-2.0	cc
B $_{value}$ =	1.00	
a_{in} =	1.00	cm^2
a_{out} =	1.00	cm^2

Phase Relationships

	Initial	Final
Wet Weight (g) =	1625.0	1758.9
Dry Weight (g) =	1410.6	1410.6
w (%) =	15.2	24.7
ρ_{dry} (kg/m^3) =	1634	1634
S (%) =	61.6	100.0
e =	0.68	0.68
G_s (test value) =	2.74	2.74

Read #	Date (mm/dd/yy)	Time (hh:mm)	Elapsed Time (min)	Burette Readings		Applied Pressure		Head Loss			Flow Volume		Viscosity Correction		k_{20} (cm/sec)
				Bottom (cc)	Top (cc)	p_{bot} (psi)	p_{top} (psi)	h (cm)	h_1 (cm)	h_2 (cm)	V_{in} (cc)	V_{out} (cc)	Temp (°C)	R_t	
0	1/23/2012	8:17	0.0	0.1	25.0	80.0	80.0	24.9	--	--	0.0	0.0	23.0	0.931	--
1			1.0	1.0	24.1	80.0	80.0	23.1	24.9	23.1	0.9	0.9	22.9	0.933	7.7E-05
2			2.0	1.8	23.4	80.0	80.0	21.6	24.9	21.6	1.7	1.6	23.0	0.931	7.2E-05
3			3.0	2.5	22.7	80.0	80.0	20.2	24.9	20.2	2.4	2.3	23.0	0.931	7.1E-05
4			4.0	3.2	21.9	80.0	80.0	18.7	24.9	18.7	3.1	3.1	23.0	0.931	7.3E-05
5			5.0	3.8	21.3	80.0	80.0	17.5	24.9	17.5	3.7	3.7	22.9	0.933	7.2E-05
6			10.0	6.4	18.7	80.0	80.0	12.3	24.9	12.3	6.3	6.3	22.9	0.933	7.2E-05
7			15.0	8.2	16.9	80.0	80.0	8.7	24.9	8.7	8.1	8.1	22.8	0.936	7.2E-05
8			20.0	9.4	15.7	80.0	80.0	6.3	24.9	6.3	9.3	9.3	22.8	0.936	7.0E-05
9			30.0	11.0	14.0	80.0	80.0	3.0	24.9	3.0	10.9	11.0	22.7	0.938	7.2E-05
10			40.0	11.6	13.4	80.0	80.0	1.8	24.9	1.8	11.5	11.6	22.7	0.938	6.7E-05
Trial-1											**Average k_{20} (cm/sec) last 4 readings =**				**7.0E-05**
1	1/22/2012	9:06	0.0	0.1	25.0	80.6	80.0	67.1	--	--	0.0	0.0	22.7	0.938	--
2			1.0	2.3	22.8	80.6	80.0	62.7	67.1	62.7	2.2	2.2	22.7	0.938	7.0E-05
3			2.0	4.5	20.7	80.6	80.0	58.4	67.1	58.4	4.4	4.3	22.7	0.938	7.1E-05
4			3.0	6.4	18.8	80.6	80.0	54.6	67.1	54.6	6.3	6.2	22.7	0.938	7.0E-05
5			4.0	8.3	16.8	80.6	80.0	50.7	67.1	50.7	8.2	8.2	22.7	0.938	7.2E-05
6			5.0	9.9	15.2	80.6	80.0	47.5	67.1	47.5	9.8	9.8	22.7	0.938	7.1E-05
7			7.5	13.7	11.4	80.6	80.0	39.9	67.1	39.9	13.6	13.6	22.7	0.938	7.1E-05
8			10.0	16.7	8.3	80.6	80.0	33.8	67.1	33.8	16.6	16.7	22.7	0.938	7.0E-05
9			12.5	19.4	5.7	80.6	80.0	28.5	67.1	28.5	19.3	19.3	22.7	0.938	7.0E-05
10			15.0	21.3	3.7	80.6	80.0	24.6	67.1	24.6	21.2	21.3	22.7	0.938	6.9E-05
11			17.5	23.1	2.0	80.6	80.0	21.1	67.1	21.1	23.0	23.0	22.7	0.938	6.8E-05
Trial-2											**Average k_{20} (cm/sec) last 4 readings =**				**6.9E-05**

Sample Description:

Conversion from pressure to water head:

Comments : Compacted to 95% of Standard Proctor Density at Optimum Water Content

1 psi = 70.305 cm of H_2O

Permeant Liquid : Tap water

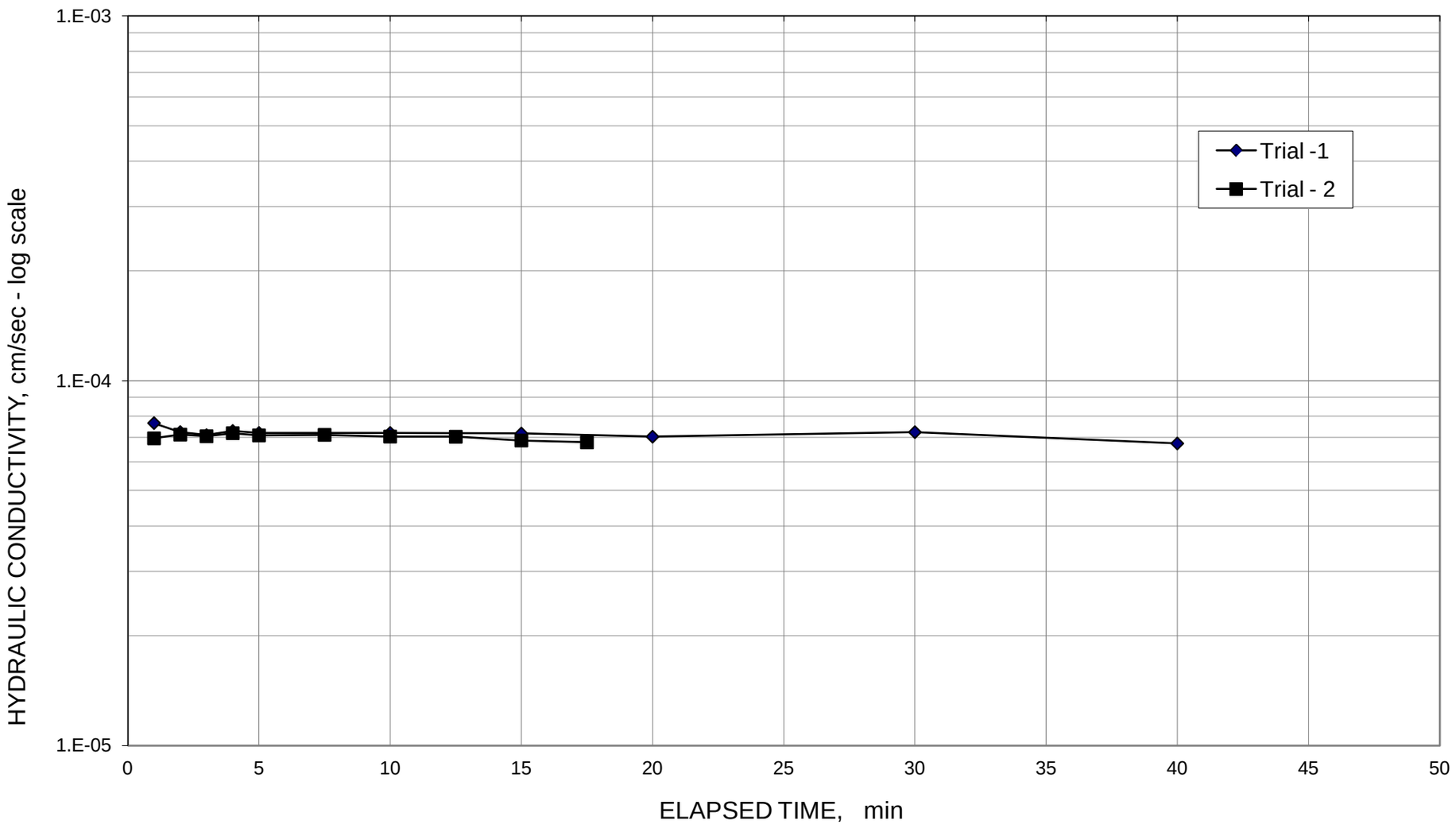
TM	5-Jun-09	LP	June 1, 2012
Tested By	Date	Reviewed By	Date

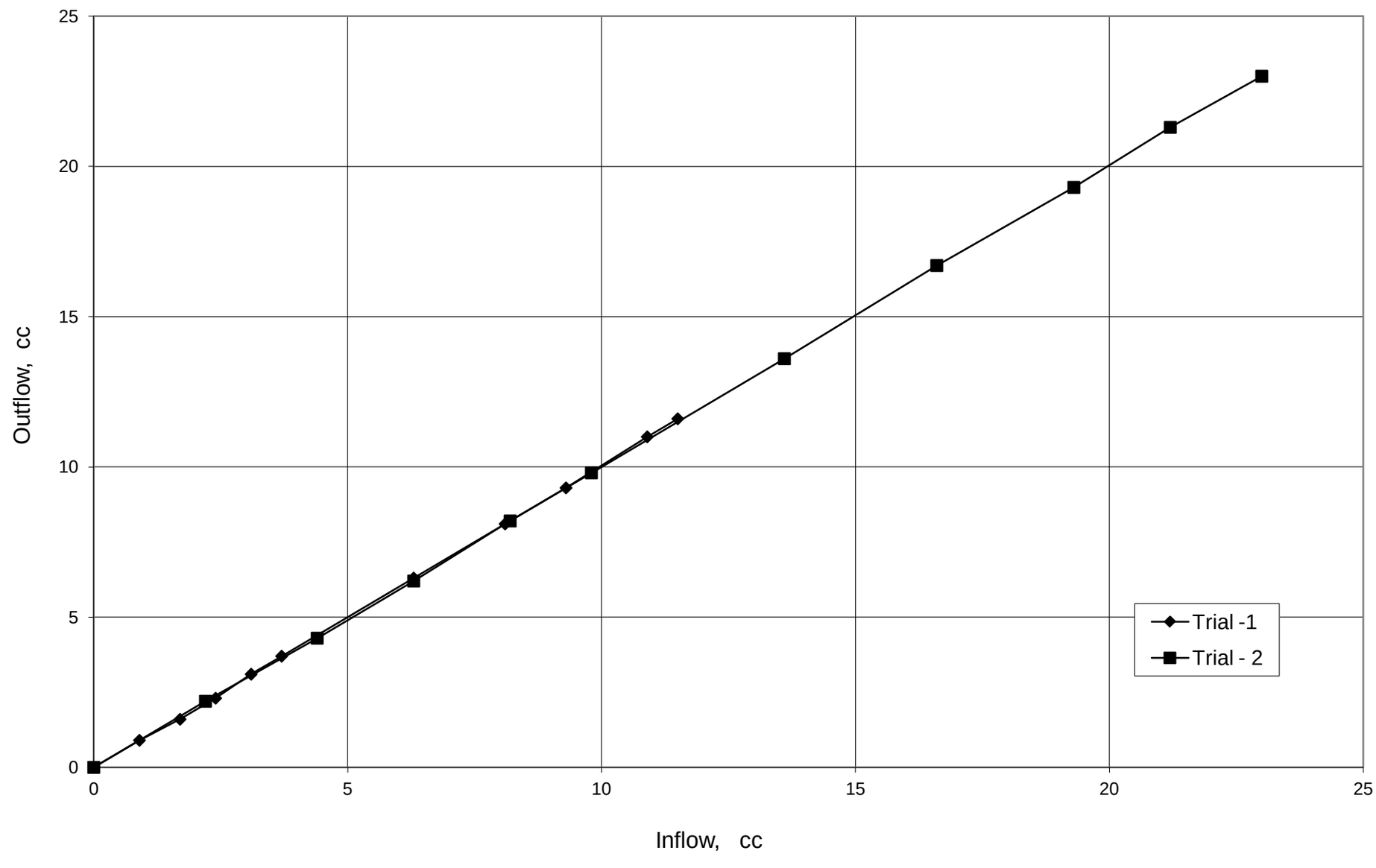
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Measurements of Hydraulic Conductivity Using a Flexible Wall Permeameter

Reference: ASTM D5084-10 Method C

Client	Tetra Tech	**Sample No:**	SECTION 2 Silt	**Falling Head, rising tailwater elevation**	
Project	Aggregate Testing	**Sample ID:**	N/A		
Location	Eagle Gold, Yukon	**Depth:**	N/A		
Project #	11-1415-0013 Phase 1000	**Test Number**	Ktest-1	**Lab ID**	211





TM	5-Jun-09	LP	June 1, 2012
Tested By	Date	Reviewed By	Date

Golder Associates Ltd. - Burnaby Laboratory

4280 Still Creek Drive

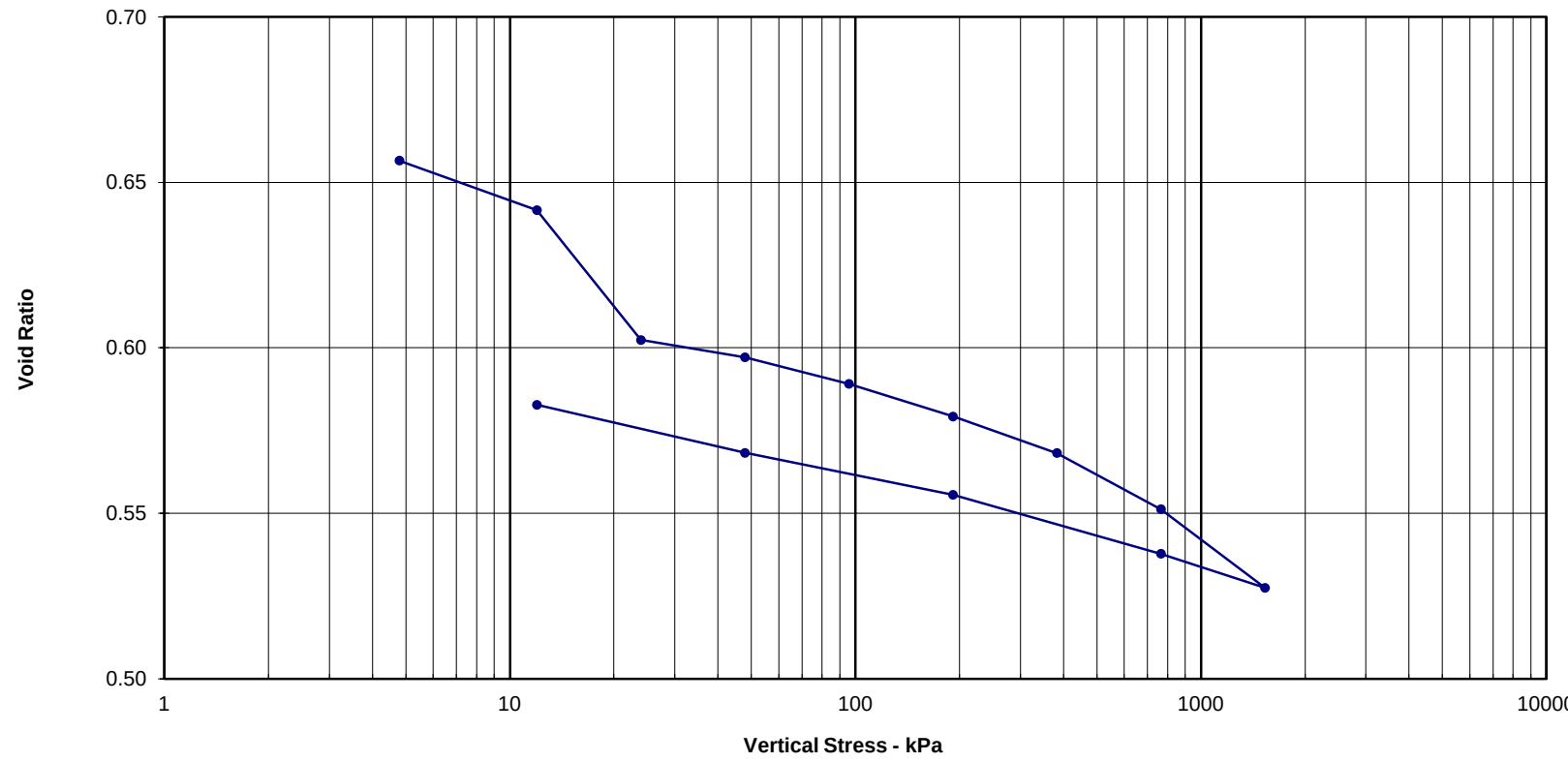
Burnaby, B.C. Canada V5C 6C8

One-Dimensional Consolidation Properties of Soils

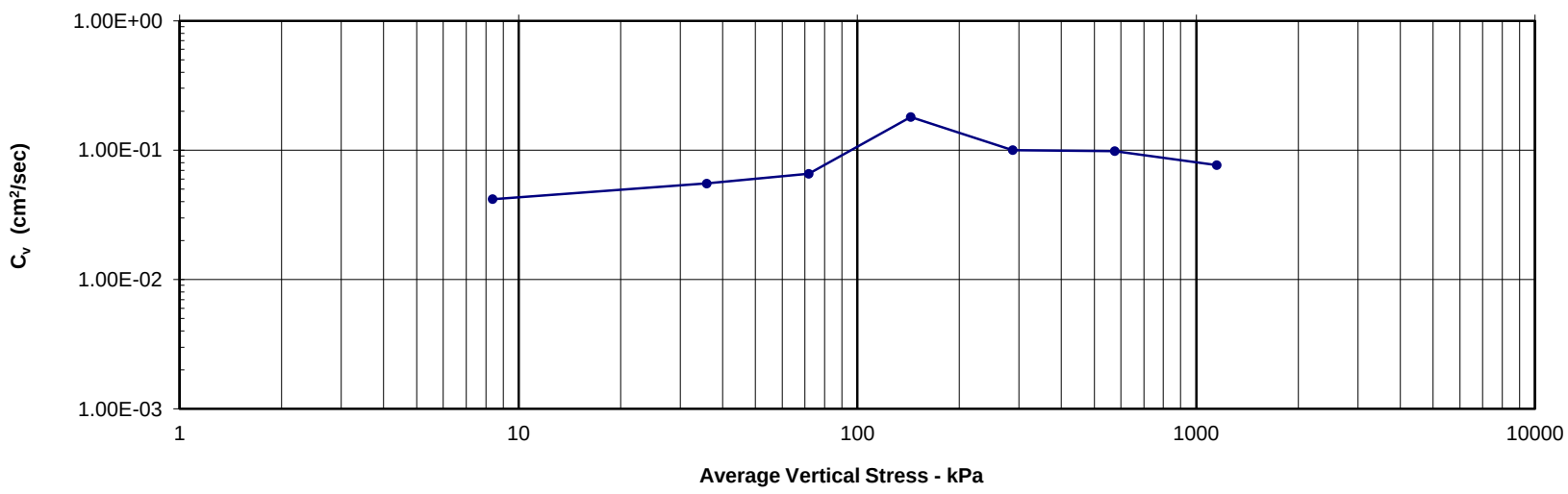
Reference(s)
ASTM D 2435/D 2435M-11

Project No. :	11-1415-0013 1000	**Client :**	Tetra Tech	**Sample No :**	Section 2 Silt
Sch No.	211	**Project :**	Aggregate Testing	**Sample ID :**	n/a
Lab Work:	TM	**Location:**	Eagle Gold, Yukon	**Depth (m) :**	n/a

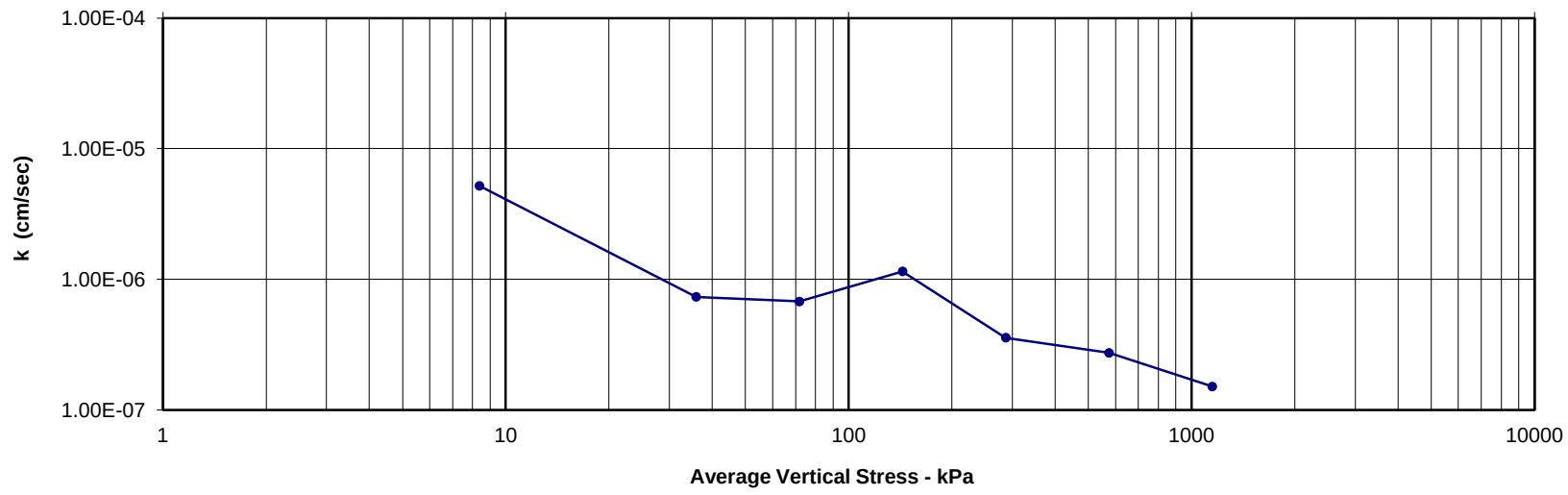
Vold Ratio vs Stress



Coefficient of Consolidation vs Stress



Coefficient of Permeability vs Stress



TM	January 20, 2012	ROB	Tuesday, May 22, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory

4280 Still Creek Drive

Burnaby, B.C. Canada V5C 6C8

One-Dimensional Consolidation Properties of Soils

Reference(s)
ASTM D 2435/D 2435M-11

Project No. :	11-1415-0013 1000	**Client :**	Tetra Tech	**Sample No :**	Section 2 Silt
Sch No.	211	**Project :**	Aggregate Testing	**Sample ID :**	n/a
Lab Work:	TM	**Location:**	Eagle Gold, Yukon	**Depth (m) :**	n/a

Equipment

Machine:	Sigma-1
Mach No.	Station 1
Ring No.	1 A
Drainage:	Double-sided

Specimen Geometry

	Initial	Final
Height (mm) =	22.43	21.41
Diameter (mm) =	63.30	63.30
Area (cm^2) =	31.47	31.47
Volume (cm^3) =	70.57	67.36

Phase Relationships

	Initial	Final
Wet Wt (g) =	133.64	141.35
Dry Wt (g) =	116.61	116.61
w (%) =	14.60	21.22
e =	0.66	0.58
ρ_{wet} (kg/m^3) =	1894	2098
ρ_{dry} (kg/m^3) =	1652	1731
S (%) =	61	100

Remarks

ASTM Method:	B - Constant Time Increment
Method for Cv :	Taylor
H_{avg} **:**	Half the specimen height
Time Increment:	120 minutes

Sample Properties

G_s =	2.74	Calculated
H_s (mm) =	13.52	

Load #	Stress (kPa)	ΔH (mm)	Corrected d_f (mm)	ε Σ ΔH / Ho (%)	H-H_s (mm)	e (H-H_s)/H_s	Stress $_{avg}$ (kPa)	e_{avg}	H_{avg} (mm)	t 90 (min)	Cv (cm^2/sec)	k (cm/sec)
1	5	0.02	22.40	0.10	8.88	0.66						
2	12	0.20	22.20	1.01	8.68	0.64	8	0.65	11.15	0.42	4.2E-02	5.2E-06
3	24	0.53	21.67	3.37	8.15	0.60	18	0.62				
4	48	0.07	21.60	3.69	8.08	0.60	36	0.60	10.82	0.30	5.5E-02	7.4E-07
5	96	0.11	21.49	4.17	7.97	0.59	72	0.59	10.77	0.25	6.6E-02	6.8E-07
6	192	0.13	21.36	4.77	7.83	0.58	144	0.58	10.71	0.09	1.8E-01	1.2E-06
7	383	0.15	21.21	5.43	7.69	0.57	287	0.57	10.64	0.16	1.0E-01	3.6E-07
8	766	0.23	20.98	6.46	7.46	0.55	575	0.56	10.55	0.16	9.8E-02	2.7E-07
9	1532	0.32	20.66	7.89	7.13	0.53	1149	0.54	10.41	0.20	7.7E-02	1.5E-07
10	766	-0.14	20.80	7.27	7.27	0.54						
11	192	-0.24	21.04	6.19	7.51	0.56						
12	48	-0.17	21.21	5.43	7.69	0.57						
13	12	-0.20	21.41	4.56	7.88	0.58						

Comments: Reconsituted to 95% Standard Proctor at optimum moisture content

Description: SILT, some fine sand

TM	January 20, 2012	ROB	Tuesday, May 22, 2012
TESTED BY	DATE	CHECKED BY	DATE

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

December 16, 2011
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

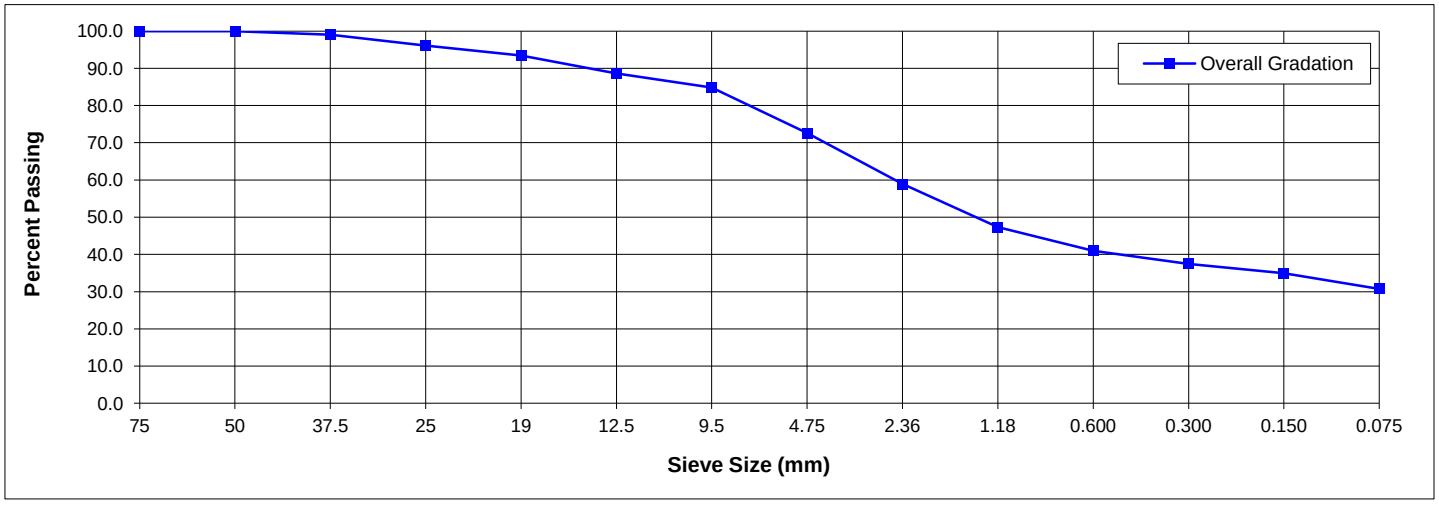
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**Section 3 Colluvium**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: December 15, 2011
DATE TESTED: December 16, 2012

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					**MATERIAL SPECIFICATION :**	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
75	0.0	100.0	0.0			
50	0.0	100.0	0.0			
37.5	0.9	99.1	3.5			
25	2.9	96.1	10.7			
19	2.7	93.4	9.8			
12.5	4.8	88.6	17.5			
9.5	3.8	84.8	13.9			
4.75	12.2	72.6	44.7			
2.36	13.7	58.9		18.8		
1.18	11.6	47.3		15.9		
0.600	6.3	41.0		8.7		
0.300	3.5	37.5		4.8		
0.150	2.5	34.9		3.5		
0.075	4.2	30.7		5.8		
PAN	30.7	0		42.4		
Total	100.0		100.0	100.0		



Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RESISTANCE OF COARSE AGGREGATE TO DEGRADATION BY ABRASION IN THE MICRO-DEVAL APPARATUS

ASTM D 6928

January 18, 2012
Project number: 11-1415-0013/1000

TETRA TECH
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
U.S.A.

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**Section 3 Colluvium**
Source:	**Eagle Gold, Yukon**

Date sampled: Not Given
Date tested: January 16, 2012

Sampled by: Client
Tested by: VN

Grading	Section 8.2 – 19x16, 16x12.5, 12.5x9.5mm
Loss at conclusion of test (%)	**16.6**

Validation Test Data: Control Aggregate (Drain Bros. stone)	
Test date	January 10, 2012
Percent loss	12.7%
Valid range	11.4 – 14.8%

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

PARTICLE SIZE ANALYSIS OF SOILS

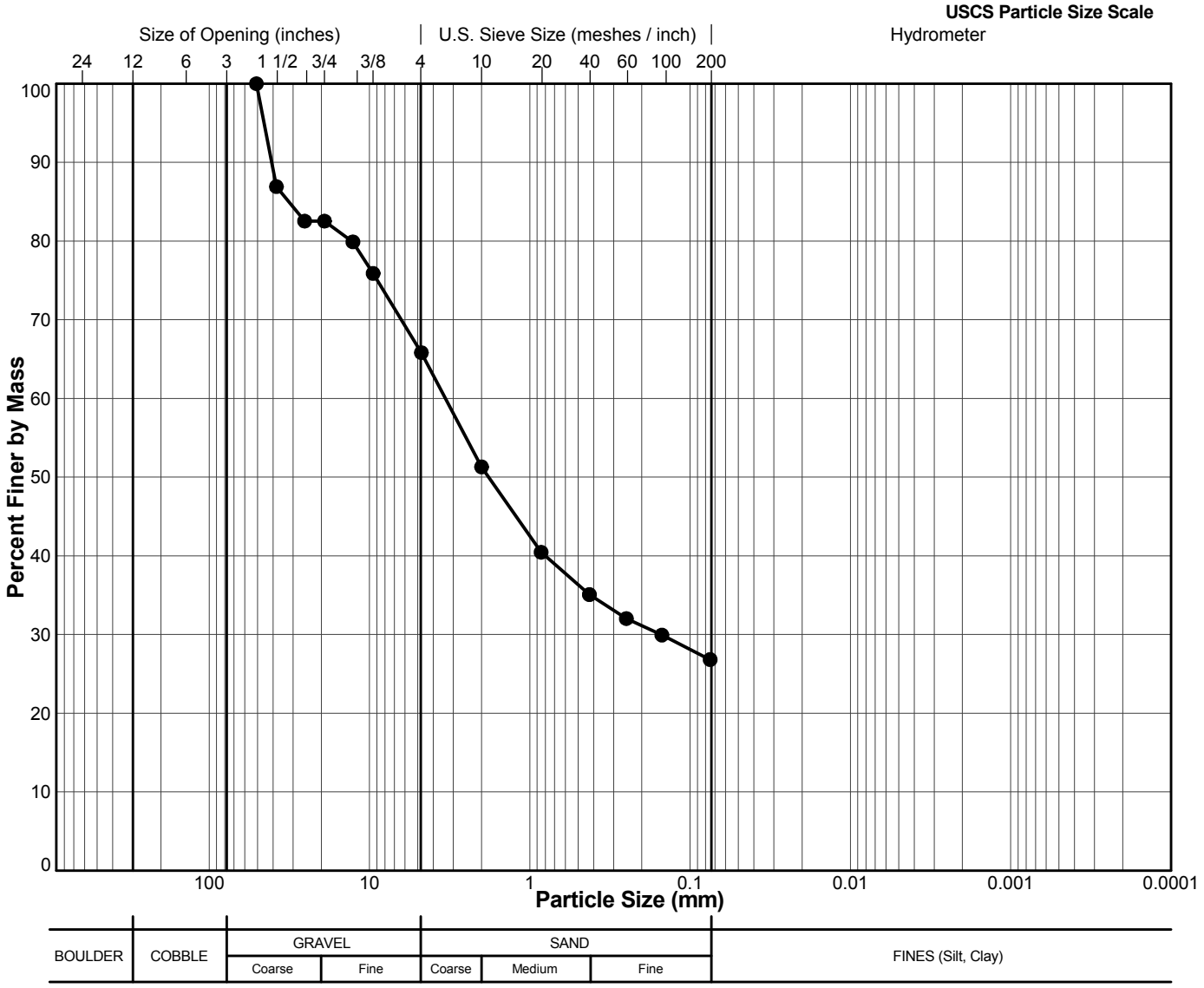
Reference(s)
ASTM D 422-63 (2007)

Client: Tetra Tech	**ID: Section 3 Colluvium**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 50.8	

Method: Split, Washed



SK	**12/8/2011**	**LP**	**12/21/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB ebarnes 09/13/12

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

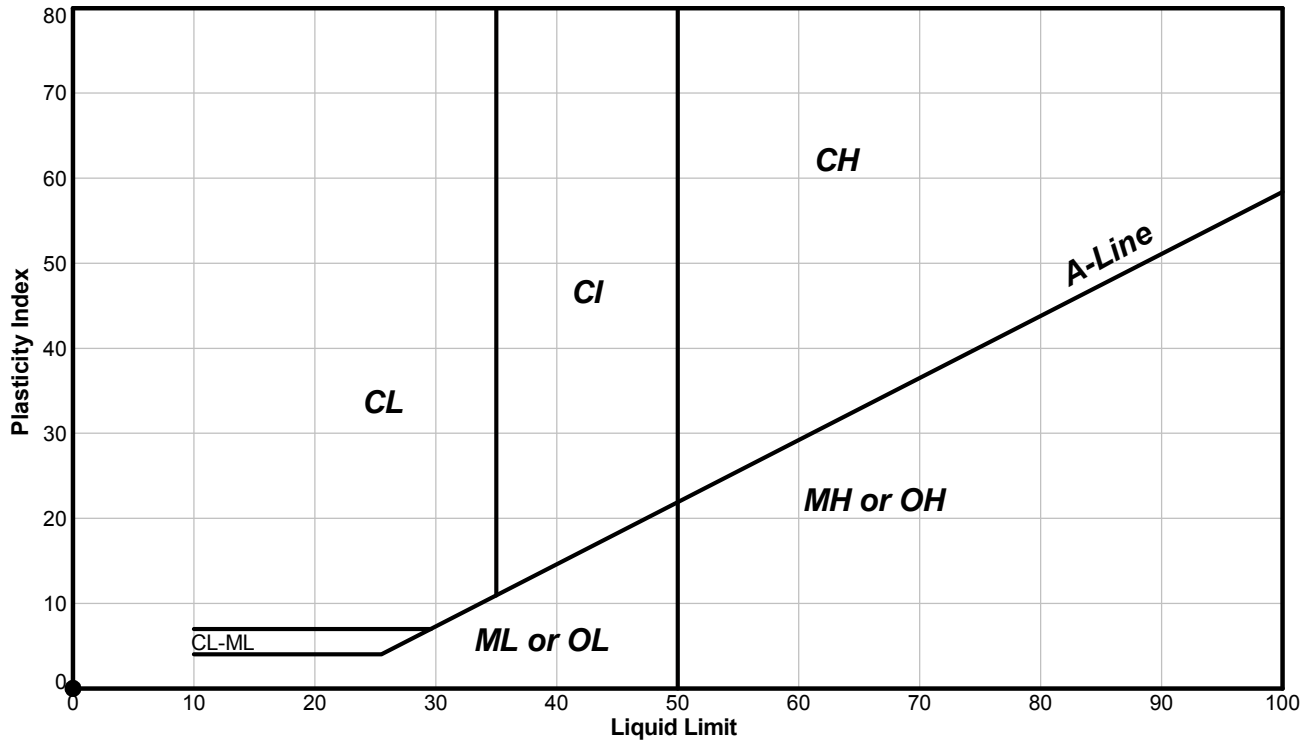
Client: Tetra Tech	**ID: Section 3 Colluvium**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	Section 3 Colluvium	N/A	0.00	0.00	35	NP	NP	NP	6.8	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	12/5/2011	LP	12/21/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB ebarnes 09/13/12

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-06 Method B

Project No.:	11-1415-0013/1000	**Borehole**	**Section 3 Colluvium**
Client:	Tetra Tech	**Sample No.:**	N/A
Project:	Aggregate Testing	**Depth (m):**	N/A
Location:	Eagle Gold, Yukon	**Lab Sch No:**	211

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		65.82		
Test Number		1		2
Flask Number		5		6
Air Removal Method		Vacuum		Vacuum
Mass of Flask (g)		174.83		173.38
Mass of Flask + Dry Soil (g)	M_P	266.76		270.74
Mass of Dry Soil (g)		91.66		97.03
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	731.54		733.22
Test Temperature (g)	T_t	19.40		19.40
Mass of Flask + Water (g)	$M_{\rho w,t}$	673.04		671.44
Mass of Dish + Dry Soil (g)		202.22		207.55
Mass of Dish (g)		110.56		110.52
Mass of Oven Dry Soil (g)	M_S	91.66		97.03
Temperature Coefficient	K	1.00		1.00
Density of Solids (g/cm3)	ρ_s	2.76		2.75
Specific Gravity at Test Temperature	G_t	2.77		2.76
Specific Gravity at 20ºC	$G_{20°C}$	2.77		2.76
AVERAGE SPECIFIC GRAVITY		**2.76**		

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		31.39
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	2.54
Apparent	C/(C-A)	2.71
Absorbtion (%)	(B-C)/C	4.09

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	Gavg @20°C	2.75

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

SK/RS	November 15, 2011	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory

4280 Still Creek Drive

Burnaby, B.C. Canada V5C 6C8

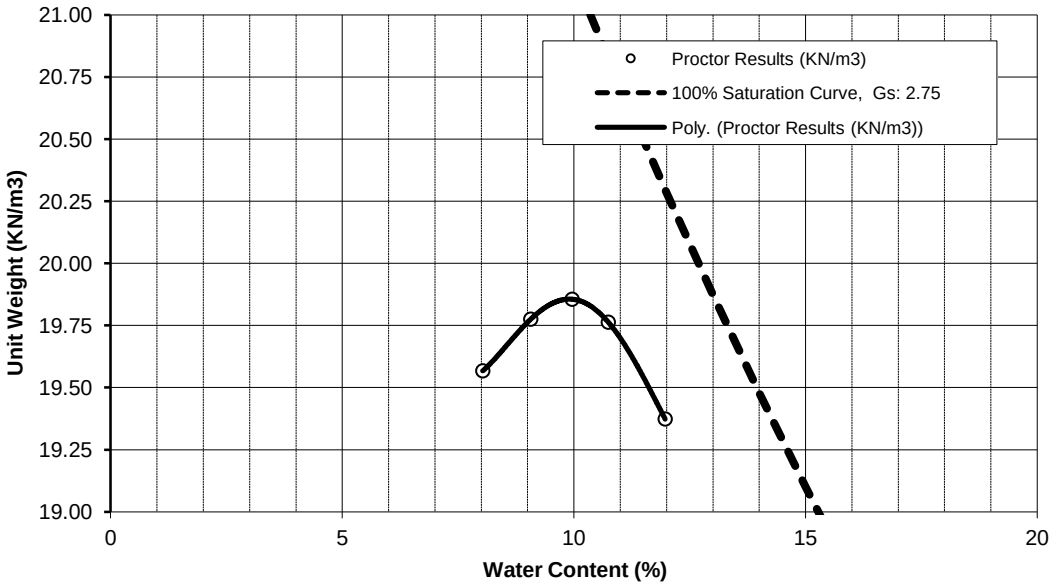
Compaction of Soil Using Standard Effort

Reference ASTM D 698-07

Client:	Tetra Tech	**Sample No.:**	Section 3 Colluvium
Project:	Aggregate Testing	**Sample Location:**	
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013/1000	**Lab ID No:**	211
Effort Type:	Standard	**Visual Description:**	-
Test Method:	C	**Type of Rammer:**	Mechanical
Preparation Method:	Moist	**Mould Volume (m^3):**	0.002122
Remarks:			

Compaction Results

Trial No.:	1	2	3	4	5
Unit Weight (KN/m^3)	19.57	19.78	19.86	19.76	19.4
Water Content (%):	8.0	9.1	10.0	10.7	12.0



Uncorrected Optimum w (%):	10.0	**Uncorrected Unit Weight (KN/m^3)**	19.86

ASTM D 4718-87 (2007) Correction for oversize particles

Max Percent Oversize (%):	25	**Sieve Size (mm):**	20.00
Oversized Fraction		***Test Fraction***	
Percent Oversized Fraction (%):	17.0	**Percent Test Fraction (%):**	83.0
Gsc (calculated):	2.75	**Gsf (calculated):**	2.75
Water Content of Oversized (%):	1.5	**Water Content of Test (%):**	10.0

Final Results

Corrected Optimum w (%):	8.6	**Corrected Unit Weight (KN/m^3)**	20.79
		Corrected Dry Density (Kg/m3)	2119

SK	December 21,2011	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Testing of Soils Under Consolidated Drained Conditions

Reference
ASTM D 3080-11

Client:	Tetra Tech	**Sample No :**	SECTION 3 - COLLUVIUM
Project:	Aggregate Testing	**Sample ID :**	
Location:	Eagle Gold, Yukon	**Depth (m):**	-
Project No.:	11-1415-0013 /1000	**Lab ID No:**	211

Test Condition:	95% Std Proctor at opt. moisture	**Equipment Description:**		LDS
Visual Description:	SILTY SAND, some gravel, brown	**Normal LVDT:**	Serial No.:	HLS50/9686
	RECONSTITUTED	**Shear Load Cell:**	Serial No.:	2C202 10K
	Peak and residual	**Vertical LVDT:**	Serial No.:	HLS25M4407

Remarks: Area correction not applied to normal and shear stress calculation
Multi-stage test: peak + 3 residuals

Initial Sample Dimensions

Test No.	1		2	3		
Shear box geometry	Rectangular		Rectangular	Rectangular		
Length (mm)	250		250	250		
Width (mm)	150		150	150		
Depth (mm)	198		198	198		
Area (cm^2)	3.75E+02		3.75E+02	3.75E+02		
Volume (cm^3)	7.42E+03		7.42E+03	7.42E+03		

Weight Volume Relationships

Sample Type	PEAK		RESIDUAL	RESIDUAL		
Dry Mass (g)	14075	---	14063	14063		
Initial γ_{wet} (kN/m^3)	20.54	---	20.49	20.50		
Final γ_{wet} (kN/m^3)	20.76	---	20.74	20.75		
Initial γ_{dry} (kN/m^3)	18.60	---	18.54	18.55		
Final γ_{dry} (kN/m^3)	18.82	---	18.82	18.82		
Initial water content (%)	10.4	---	10.5	10.5		
Final water content (%)	10.3	---	10.2	10.3		
Specific Gravity (assumed)	2.75	---	2.75	2.75		
Initial Void Ratio, e	0.45	---	0.45	0.45		
Initial Saturation (%)	n/a	---	n/a	n/a		

Test Results

Rate of Deformation (mm/min)	0.83	0.83	0.83	0.83		
Normal Stress (kPa)	138	138	276	552		
Peak Shear Stress (kPa)		---	---	---		
Residual Shear Stress (kPa)	---					

Consolidation Results

Normal Stress (kPa)	138	---	276	552		
t_{90} (Taylor Method) (min)	---	---	---	---		
Calculated t_{50} (min)	---	---	---	---		
Change in height ΔH_c (mm)	---	---	---	---		

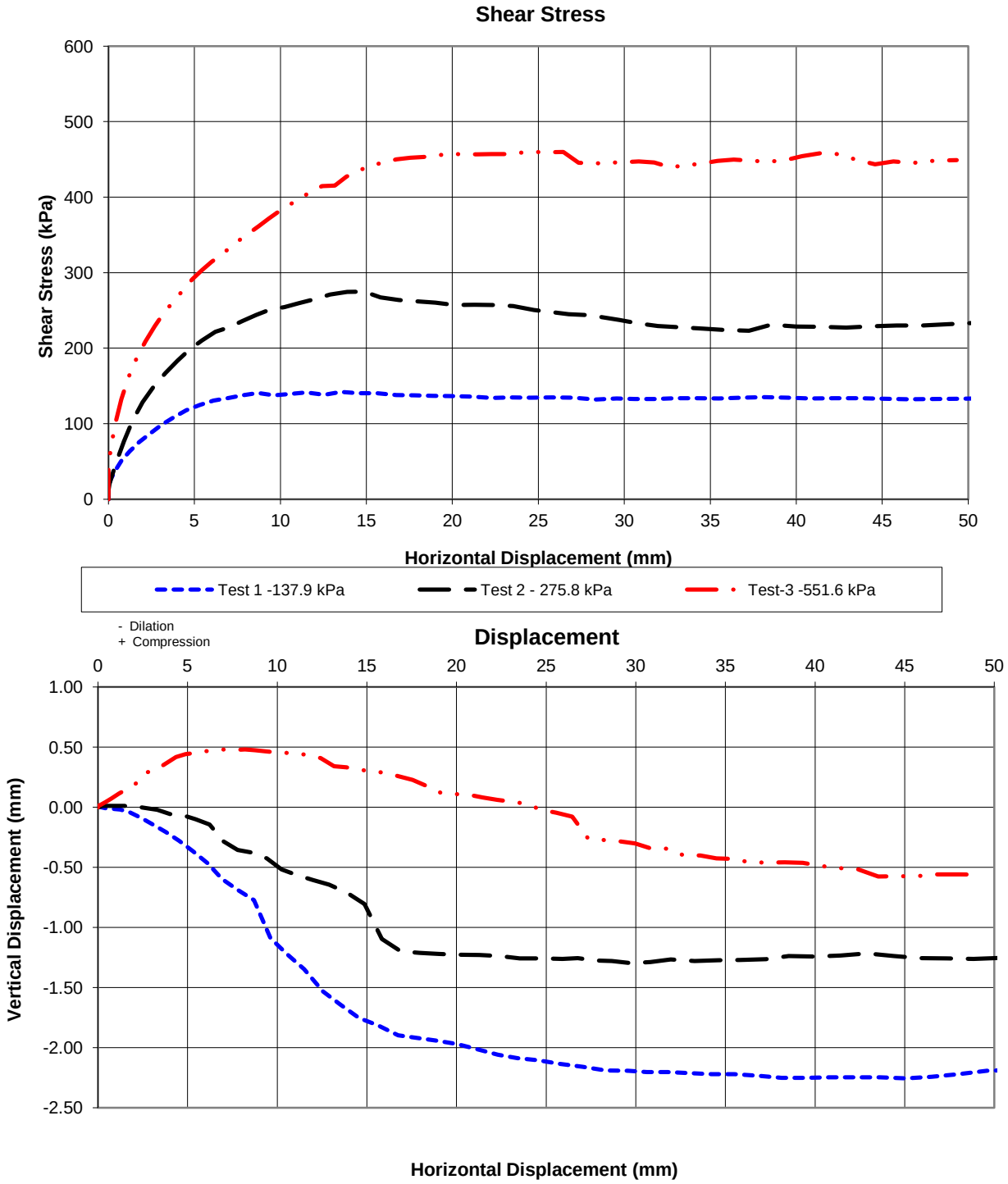
LP	February 22,2012	M. SANIN	May 31, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Testing of Soils Under Consolidated Drained Conditions

Reference
ASTM D 3080-11

Client:	Tetra Tech	**Sample No :**	SECTION 3 - COLLUVIUM
Project:	Aggregate Testing	**Sample ID :**	-
Location:	Eagle Gold, Yukon	**Depth (m):**	-
Project No.:	11-1415-0013 /1000	**Lab ID No:**	211



LP	February 22,2012	M. SANIN	May 31, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Testing of Soils Under Consolidated Drained Conditions

Reference ASTM D 3080-11

Client:	Tetra Tech	**Sample No :**	SECTION 3 - COLLUVIUM
Project:	Aggregate Testing	**Sample ID :**	-
Location:	Eagle Gold, Yukon	**Depth (m):**	-
Project No.:	11-1415-0013 /1000	**Lab ID No:**	211

OPEN	
Normal Stress , kPa	

Horz Disp mm	Shear Stress kPa	Vert Disp mm

			21.15	135.73	-2.0136	22.40	256.97	-1.2388	16.75	450.14	0.2575
			22.30	134.01	-2.0599	23.53	255.65	-1.2569	17.55	452.15	0.2274
			23.39	134.68	-2.0875	24.75	250.56	-1.2571	18.33	453.22	0.1780
			24.55	134.48	-2.1060	25.91	247.39	-1.2629	19.11	455.22	0.1204
			25.78	134.71	-2.1364	26.76	245.09	-1.2551	19.86	457.20	0.1090
			27.03	134.33	-2.1607	27.74	244.06	-1.2743	20.65	456.72	0.1044
			28.34	132.05	-2.1906	28.67	241.03	-1.2804	21.45	456.83	0.0812
			29.56	133.33	-2.1917	29.73	237.34	-1.2979	22.26	456.84	0.0614
			30.61	132.65	-2.2031	30.80	232.62	-1.2894	23.06	457.09	0.0460
			31.79	132.78	-2.2044	31.95	229.19	-1.2666	23.88	458.63	0.0292
			33.00	133.54	-2.2118	33.29	227.56	-1.2803	24.73	459.80	-0.0223
			34.23	133.75	-2.2217	34.60	225.84	-1.2730	25.57	459.48	-0.0463
			35.49	133.38	-2.2217	35.82	224.04	-1.2712	26.45	459.75	-0.0785
			36.81	134.53	-2.2332	37.25	223.14	-1.2633	27.33	445.54	-0.2597
			38.14	135.13	-2.2517	38.53	230.86	-1.2388	28.21	444.55	-0.2720
			39.49	134.35	-2.2520	39.99	228.62	-1.2428	29.10	445.69	-0.2836
			40.81	133.45	-2.2480	41.43	228.19	-1.2329	29.96	446.10	-0.3002
			42.23	133.61	-2.2475	42.90	227.10	-1.2170	30.83	447.14	-0.3422
			43.63	133.62	-2.2476	44.40	229.06	-1.2385	31.74	445.73	-0.3438
			45.08	132.95	-2.2552	45.83	230.08	-1.2560	32.65	439.57	-0.3987
			46.50	132.33	-2.2421	47.34	229.87	-1.2574	33.60	442.23	-0.4024
			48.01	132.56	-2.2210	48.84	231.83	-1.2622	34.50	444.36	-0.4249
			49.59	133.09	-2.1921	50.41	233.32	-1.2542	35.42	447.87	-0.4304
			51.16	133.83	-2.1858	51.65	232.86	-1.2629	36.36	449.72	-0.4581
									37.33	448.15	-0.4600
									38.30	446.75	-0.4577
									39.31	448.76	-0.4617
									40.34	454.14	-0.4892
									41.37	458.05	-0.5055
									42.40	457.14	-0.5176
									43.52	449.44	-0.5773
									44.59	443.44	-0.5740
									45.64	447.33	-0.5742
									46.75	445.04	-0.5589
									48.06	448.24	-0.5585
									49.33	448.85	-0.5599
									50.58	456.22	-0.5794

LP	February 22,2012	M. SANIN	May 31, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D2850 - 03a (2007)**

Client:	Tetra Tech	**Sample No:**	Section 3 Colluvium
Project:	Aggregate Testing	**Test ID:**	UU-1 (20 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211

Visual Description:	SILTY SAND, some gravel, brown
Sample Type:	Reconsituted to 95% Standard Proctor at optimum moisture content
Other Remarks:	Material used for the UU test scalpled on 3/8 inch screen

Sample Data	
	Initial Sample Charateristics
Height (cm):	20.45
Diameter (cm):	10.15
Area (cm^2):	80.99
Volume (cm^3):	1656.7
Wet Weight (g):	3448.1
γ_{wet} (kN/m^3):	20.41
γ_{dry} (kN/m^3):	18.47
Water content, w (%):	10.5
Saturation (%):	63
Void ratio, e:	0.46
Gs (calculated)	2.75

Atterberg Limit Results	
Liquid Limits	N/A
Plastic Limits	N/A
Plastic Index	Non-Plastic
Classification	SM

Strength Results	
q_{MAX} ($\sigma_{1\ total}$ - $\sigma_{3\ total}$) at failure (kPa):	469
Strain, ε_f:	14.4
$\sigma_{1\ total}$ (kPa):	607
$\sigma_{3\ total}$ (kPa):	139

Equipment	
Machine:	Station 1 Load Frame 10 K
Load Cell:	400469
Axial DCDT:	LP-174
Cell Pressure:	PS-3119
Feed Rate (%/min):	1.00

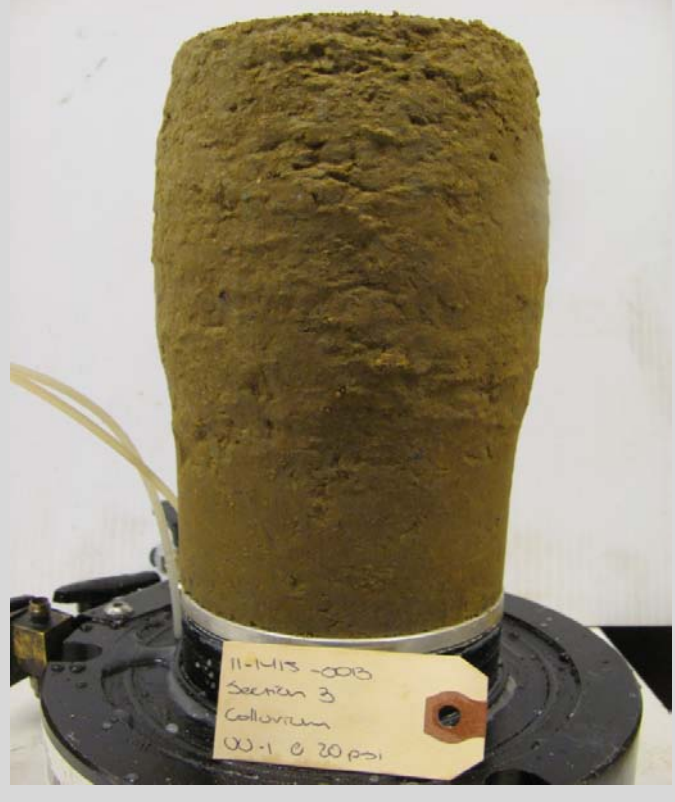


PHOTO AT END OF TEST

TM	February 17, 2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

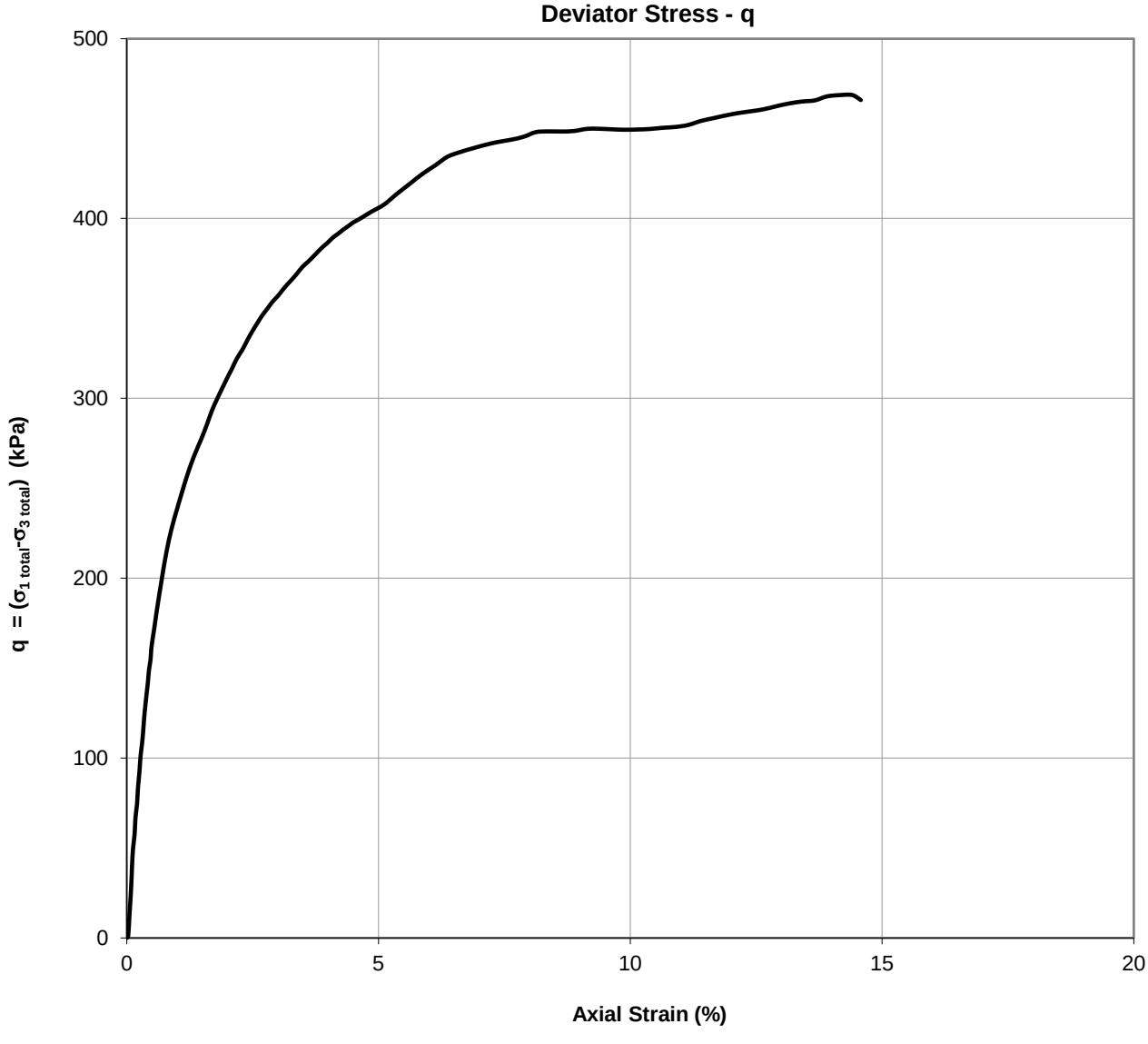
O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 3 Colluvium\Triaxials\UU-1 @ 20psi\[Section-3 Colluvium UU-1 Report .xlsm]Report 1

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference
ASTM D2850 - 03a (2007)

Client:	Tetra Tech	**Sample No:**	Section 3 Colluvium
Project:	Aggregate Testing	**Test ID:**	UU-1 (20 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211



Remarks:

TM	February 17, 2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 3 Colluvium\Triaxials\UU-1 @ 20psi\[Section-3 Colluvium UU-1 Report .xlsm]Report 1

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D2850 - 03a (2007)**

Client:	Tetra Tech	**Sample No:**	Section 3 Colluvium
Project:	Aggregate Testing	**Test ID:**	UU-2 (40 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211

Visual Description:	SILTY SAND, some gravel, brown
Sample Type:	Reconsituted to 95% Standard Proctor at optimum moisture content
Other Remarks:	Material used for the UU test scalpled on 3/8 inch screen

Sample Data		**Equipment**	
	Initial Sample Charateristics	**Machine:**	Station 1 Load Frame 10 K
Height (cm):	20.42	**Load Cell:**	305670
Diameter (cm):	10.15	**Axial DCDT:**	LP-174
Area (cm^2):	80.99	**Cell Pressure:**	PS-3119
Volume (cm^3):	1653.6	**Feed Rate (%/min):**	1.00
Wet Weight (g):	3437.7		
γ_{wet} (kN/m^3):	20.39		
γ_{dry} (kN/m^3):	18.51		
Water content, w (%):	10.1		
Saturation (%):	61		
Void ratio, e:	0.46		
Gs (calculated)	2.75		



PHOTO AT END OF TEST

Atterberg Limit Results	
Liquid Limits	N/A
Plastic Limits	N/A
Plastic Index	Non-Plastic
Classification	SM

Strength Results	
q_{MAX} ($\sigma_{1\ total}$ - $\sigma_{3\ total}$) at failure (kPa):	739
Strain, ε_f:	13.7
$\sigma_{1\ total}$ (kPa):	1015
$\sigma_{3\ total}$ (kPa):	277

TM	February 24, 2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

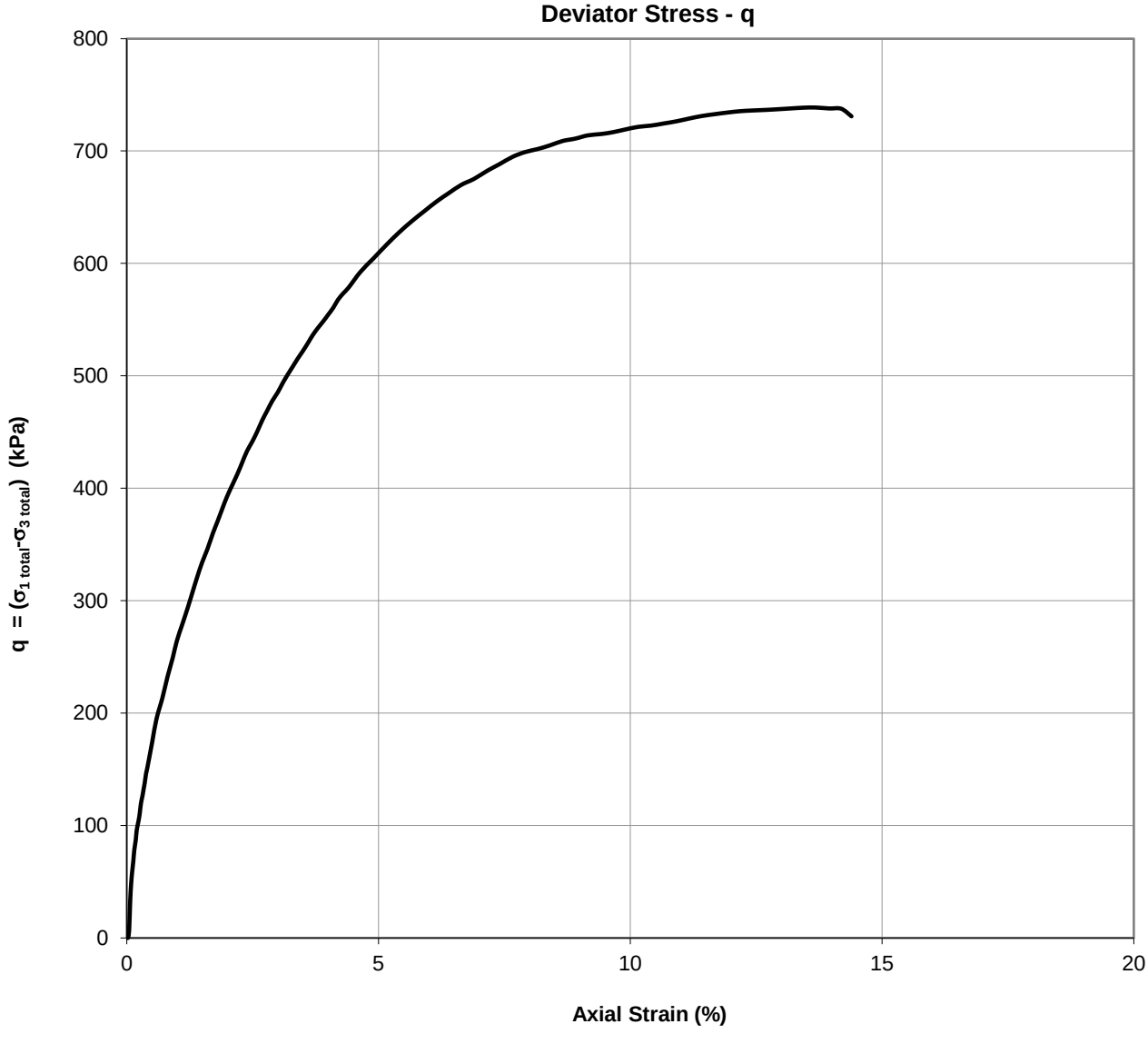
O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 3 Colluvium\Triaxials\UU-2 @ 40psi\[Section-3 Colluvium-UU-2 Report .xlsm]Report 1

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D2850 - 03a (2007)**

Client:	Tetra Tech	**Sample No:**	Section 3 Colluvium
Project:	Aggregate Testing	**Test ID:**	UU-2 (40 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211



Remarks:

TM	February 24, 2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 3 Colluvium\Triaxials\UU-2 @ 40psi\[Section-3 Colluvium-UU-2 Report .xlsm]Report 1

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D2850 - 03a (2007)**

Client:	Tetra Tech	**Sample No:**	Section 3 Colluvium
Project:	Aggregate Testing	**Test ID:**	UU-3 (40 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211

Visual Description:	SILTY SAND, some gravel, brown
Sample Type:	Reconsituted to 95% Standard Proctor at optimum moisture content
Other Remarks:	Material used for the UU test scalpled on 3/8 inch screen

Sample Data	
	Initial Sample Charateristics
Height (cm):	20.41
Diameter (cm):	10.13
Area (cm^2):	80.67
Volume (cm^3):	1646.4
Wet Weight (g):	3440.5
γ_{wet} (kN/m^3):	20.49
γ_{dry} (kN/m^3):	18.48
Water content, w (%):	10.9
Saturation (%):	65
Void ratio, e:	0.46
Gs (calculated)	2.75

Atterberg Limit Results	
Liquid Limits	N/A
Plastic Limits	N/A
Plastic Index	Non-plastic
Classification	SM

Strength Results	
q_{MAX} ($\sigma_{1\ total}$ - $\sigma_{3\ total}$) at failure (kPa):	1138
Strain, ε_f:	13.6
$\sigma_{1\ total}$ (kPa):	1691
$\sigma_{3\ total}$ (kPa):	552

Equipment	
Machine:	Station 2 Load Frame 5K
Load Cell:	305670
Axial DCDT:	LP-267
Cell Pressure:	PS-3118
Feed Rate (%/min):	1.00



PHOTO AT END OF TEST

TM	20/02/2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

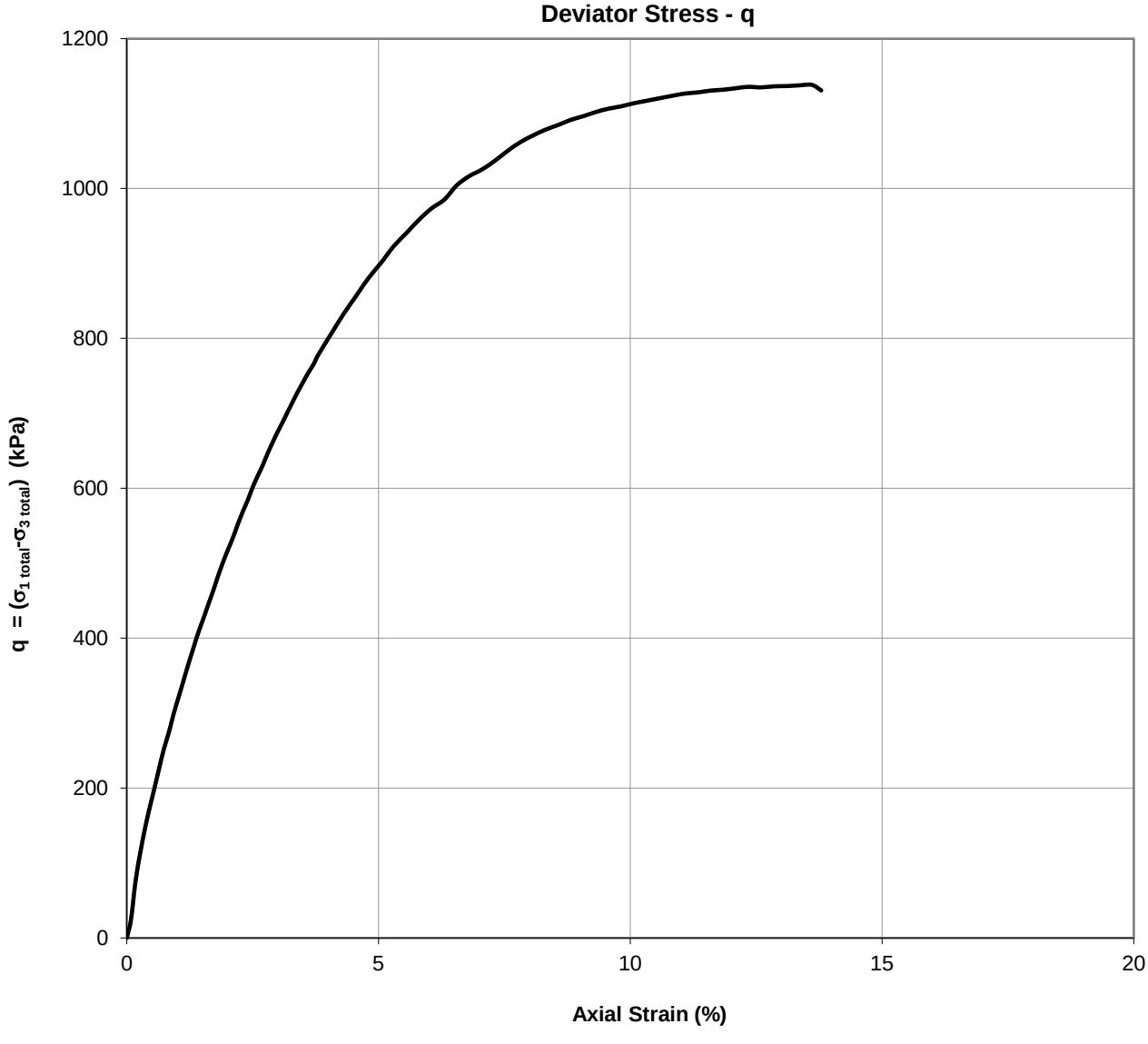
O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 3 Colluvium\Triaxials\UU-3 @ 80psi\[Section-3 Colluvium UU-3 Report .xlsm]Report 2

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D2850 - 03a (2007)**

Client:	Tetra Tech	**Sample No:**	Section 3 Colluvium
Project:	Aggregate Testing	**Test ID:**	UU-3 (40 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211



Remarks:

TM	20/02/2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 3 Colluvium\Triaxials\UU-3 @ 80psi\[Section-3 Colluvium UU-3 Report .xlsm]Report 2

Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 3 Colluvium
Project:	Aggregate Testing	**Sample ID :**	CIU SUMMARY
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013/1000	**Lab ID No:**	211

Test	CIU1	CIU2	CIU3		
Sample	138 kPa	276 kPa	552 kPa		
Initial Dimensions					
H_o (cm)	20.38	20.37	20.40		
D_o (cm)	10.14	10.1	10.02		
Gs (calculated)	2.75	2.75	2.75		
w (%)	10.9	10.5	10.5		
$\gamma_{o\ dry}$ (kN/m^3)	18.55	18.61	19.11		
Sat. (%)	66	64	70		
e_o	0.45	0.45	0.41		
B_{Value}	1.00	1.00	0.98		
Consolidation Results					
σ_{CELL} (kPa)	1165	1309	1582		
OCR	n/a	n/a	n/a		
$\sigma_{3c'}$ (kPa)	135	273	546		
ΔV_c (cc)	-26.0	-56.0	-78.2		
t_{50} (min)	1.6	2.6	3.3		
After Consolidation Dimensions					
H_c (cm)	20.38	20.37	20.40		
D_c (cm)	10.06	9.97	9.89		
A_c (cm^2)	79.47	77.99	76.74		
V_c (cm^3)	1619	1589	1566		
$\gamma_{c\ dry}$ (kN/m^3)	18.85	19.27	19.63		
e_c	0.43	0.40	0.37		
w (%)	15.7	14.6	13.6		
Sat (%)	100	100	100		
Failure At Maximum Deviator Stress $\sigma_1'-\sigma_3'$:					
$\sigma_1'-\sigma_3'$ (kPa) :	202	353	651		
ε_f (%)	19.99	19.87	19.94		
u (kPa)	92	215	372		
σ_3' (kPa)	41	58	174		
σ_1' (kPa)	243	411	825		

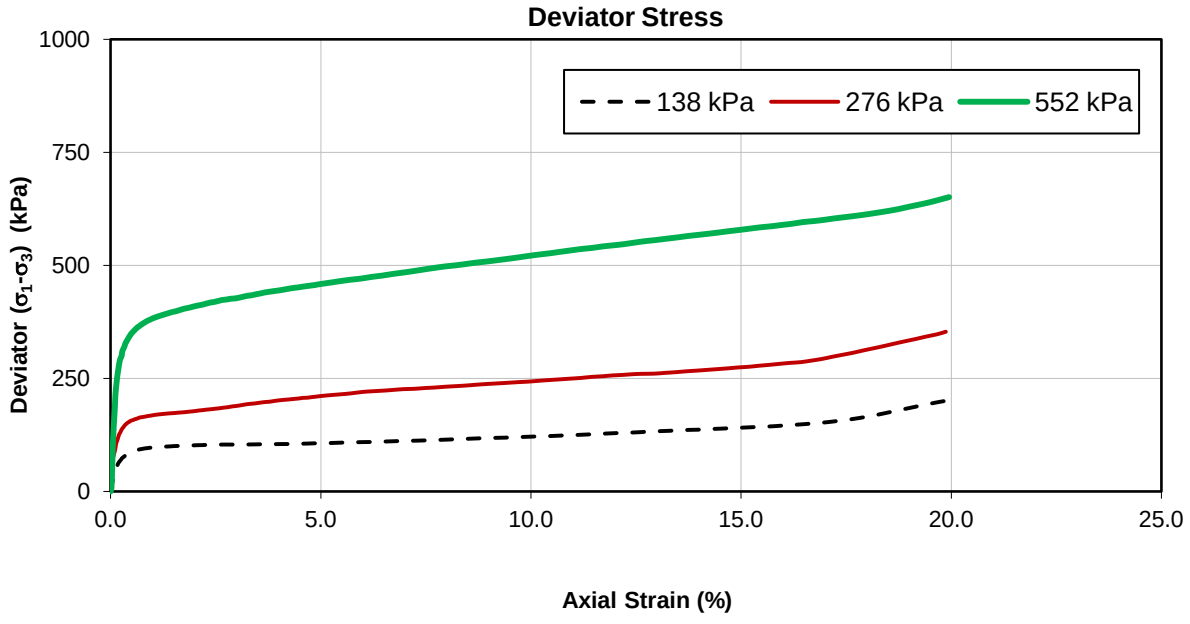
TM	February 17, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

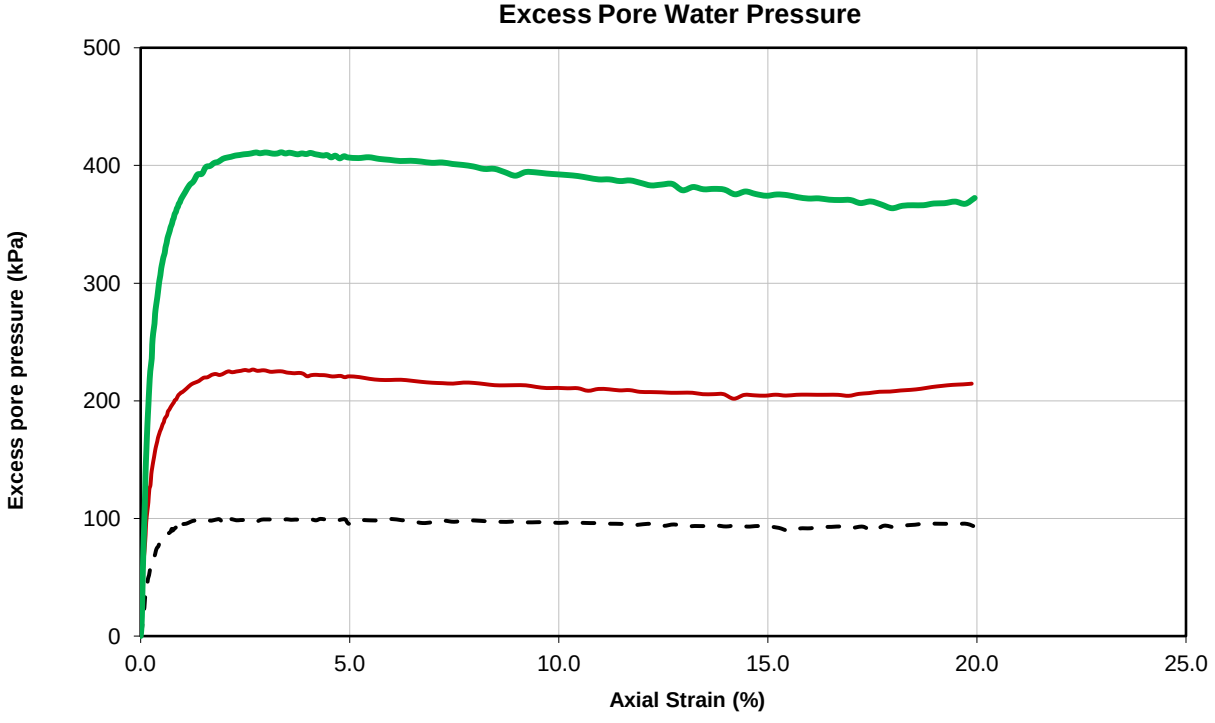
Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference
ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 3 Colluvium
Project:	Aggregate Testing	**Sample ID :**	CIU SUMMARY
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 / 1000	**Lab ID No:**	211





TM	February 17, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

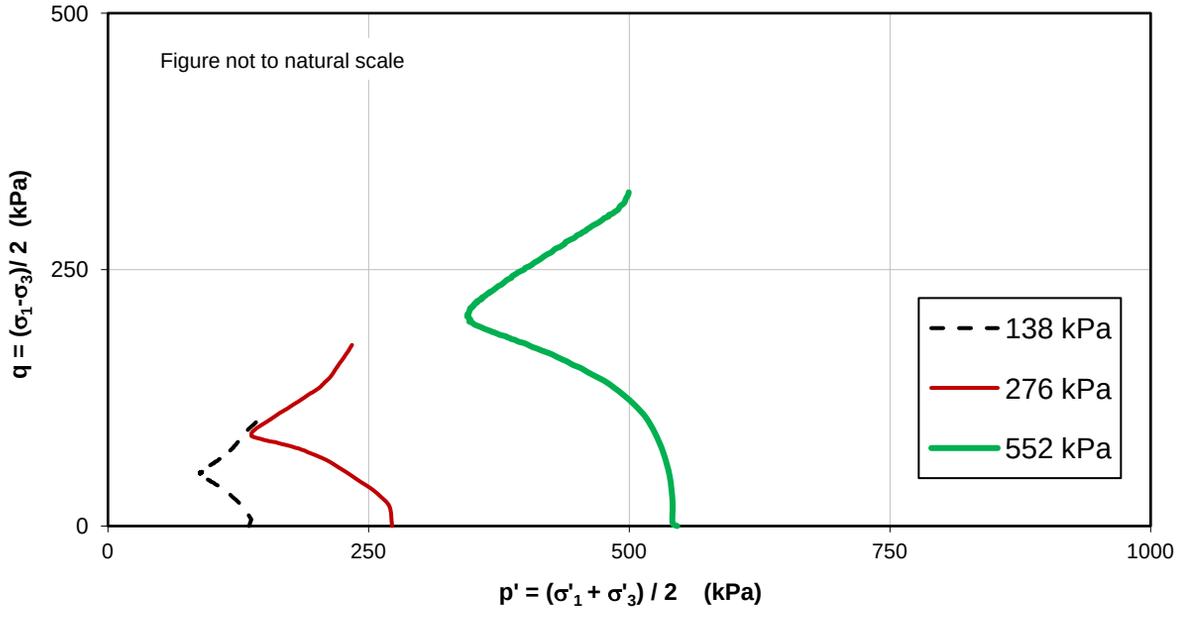
Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

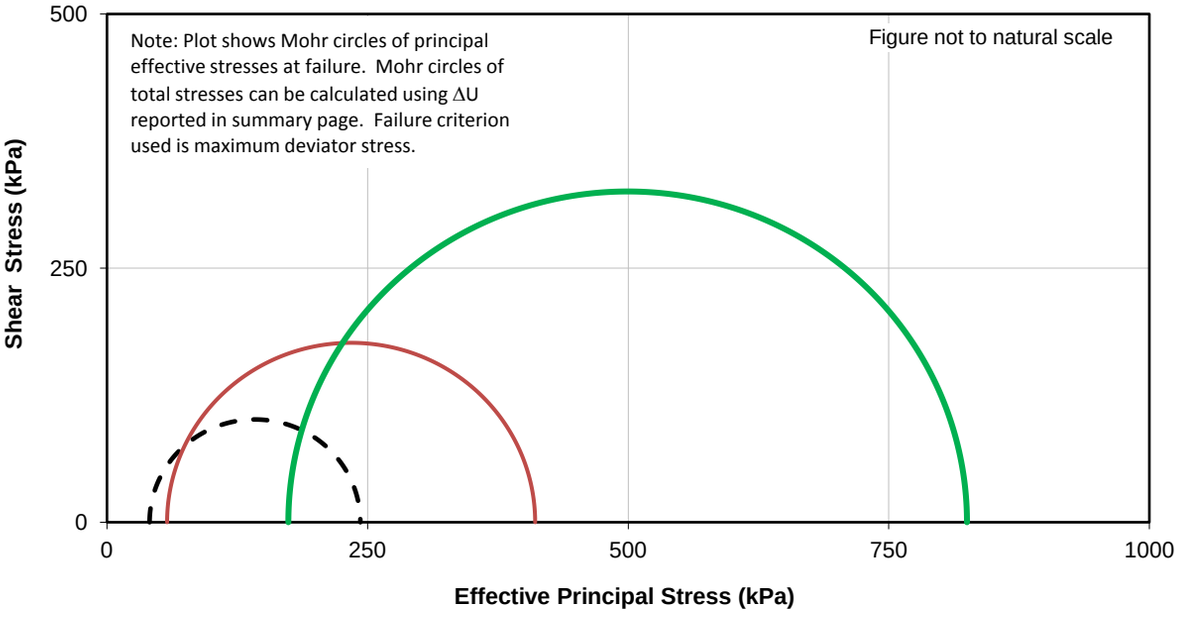
Reference: ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 3 Colluvium
Project:	Aggregate Testing	**Sample ID :**	CIU SUMMARY
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 / 1000	**Lab ID No:**	211

Stress Paths



Mohr Circles Deviator Stress



TM	February 17, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 3 Colluvium
Project:	Aggregate Testing	**Sample ID :**	CIU SUMMARY
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 / 1000	**Lab ID No:**	211

Type :	Reconstututed	**Soil Classification:**	SM
Saturation Method:	WET	**Material Type**	N/A

Visual Description	SILTY SAND, some gravel, brown
Other Remarks:	Material used for the triaxial test was scalped on the 3/8 inch sieve
	Reconstituted to 95% Standard Proctor at optimum moisture content

Sample Data

	Before Consolidation	After Consolidation
Height (cm):	20.38	20.38
Diameter (cm):	10.14	10.06
Area (cm^2):	80.75	79.47
Volume (cm^3):	1646	1619
γ_{dry} (kN/m^3):	18.55	18.85
γ_{sat} (kN/m^3):	20.58	21.80
Water content, w (%):	10.9	15.7
Saturation (%):	66	100
Void ratio, e:	0.45	0.43
Gs (calculated):	2.75	2.75

Equipment

Machine:	Truepath Load Frame - Stn.2
Chamber:	KW
Load Cell:	205857
Axial DCDT:	LP-267
Cell Pressure:	PS-3118
Back Pressure:	PS-2840
Pore Pressure:	PS-3278
Feed Rate (%/hr):	2.00

PHOTO AT END OF TEST



Consolidation Results

$\sigma'_{eff} = \sigma_{cell} - \sigma_{pwp}$ (kPa):	135
σ_{pwp} (kPa):	1030
B value:	1.00
Volume Change (cc):	-26.0
t_{50} (min):	1.60

Strength Results

$\sigma_1' - \sigma_3'_{MAX}$:	202
Strain, ε_f:	19.99
u (kPa):	92
σ_1' (kPa):	243
σ_3' (kPa):	41

TM	February 17, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 3 Colluvium
Project:	Aggregate Testing	**Sample ID :**	CIU SUMMARY
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 / 1000	**Lab ID No:**	211

Type :	Reconstututed	**Soil Classification:**	SM
Saturation Method:	WET	**Material Type**	N/A

Visual Description	SILTY SAND, some gravel, brown
Other Remarks:	Material used for the triaxial test was scalped on the 3/8 inch sieve
	Reconstituted to 95% Standard Proctor at optimum moisture content

Sample Data

	Before Consolidation	After Consolidation
Height (cm):	20.37	20.37
Diameter (cm):	10.14	9.97
Area (cm^2):	80.74	77.99
Volume (cm^3):	1645	1589
γ_{dry} (kN/m^3):	18.61	19.27
γ_{sat} (kN/m^3):	20.57	22.07
Water content, w (%):	10.5	14.6
Saturation (%):	64	100
Void ratio, e:	0.45	0.40
Specific Gravity (calculated)	2.75	2.75

Consolidation Results

$\sigma'_{eff} = \sigma_{cell} - \sigma_{pwp}$ (kPa):	273
σ_{pwp} (kPa):	1037
B value:	1.00
Volume Change (cc):	-56.0
t_{50} (min):	2.6

Strength Results

$\sigma_1' - \sigma_3'_{MAX}$:	353
Strain, ε_f:	19.87
u (kPa):	215
σ_1' (kPa):	411
σ_3' (kPa):	58

Equipment

Machine:	Truepath Load Frame - Stn. 1
Chamber:	KW
Load Cell:	305670
Axial DCDT:	LP-174
Cell Pressure:	PS-3119
Back Pressure:	PS-3127
Pore Pressure:	PS-3125
Feed Rate (%/hr):	2.00

PHOTO AT END OF TEST



TM	February 17, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference
ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 3 Colluvium
Project:	Aggregate Testing	**Sample ID :**	CIU SUMMARY
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 /1000	**Lab ID No:**	211

Type :	Reconstututed	**Soil Classification:**	SM
Saturation Method:	WET	**Material Type**	N/A
Visual Description	SILTY SAND, some gravel, brown		
Other Remarks:	Material used for the triaxial test was scalped on the 3/8 inch sieve		
	Reconstituted to 95% Standard Proctor at optimum moisture content		

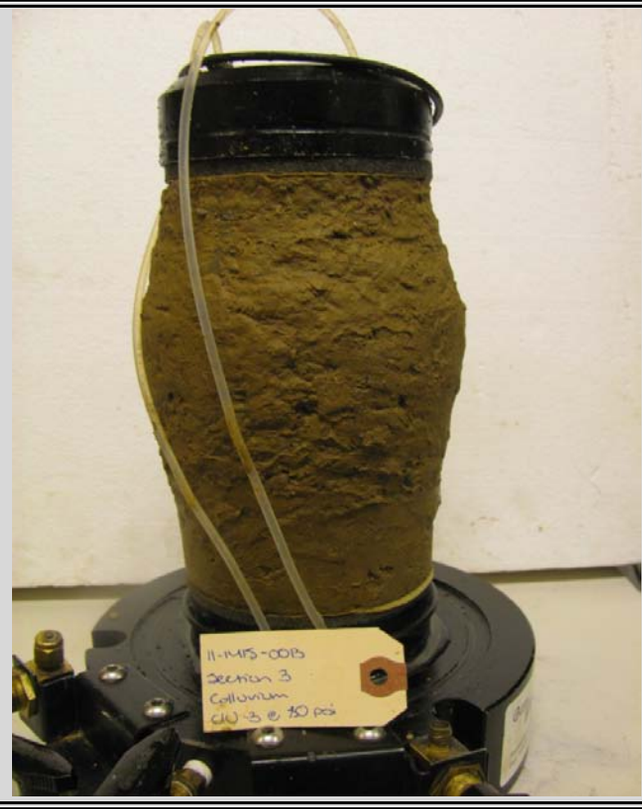
Sample Data

	Before Consolidation	After Consolidation
Height (cm):	20.40	20.40
Diameter (cm):	10.02	9.89
Area (cm^2):	78.81	76.74
Volume (cm^3):	1608	1566
γ_{dry} (kN/m^3):	19.11	19.63
γ_{sat} (kN/m^3):	21.11	22.30
Water content, w (%):	10.5	13.6
Saturation (%):	70	100
Void ratio, e:	0.41	0.37
Specific Gravity (calculated)	2.75	2.75

Equipment

Machine:	Truepath Load Frame - Stn. 2
Chamber:	KW
Load Cell:	305670
Axial DCDT:	LP-267
Cell Pressure:	PS-3118
Back Pressure:	PS-2840
Pore Pressure:	PS-3278
Feed Rate (%/hr):	2.00

PHOTO AT END OF TEST



Consolidation Results

$\sigma'_{eff} = \sigma_{cell} - \sigma_{pwp}$ (kPa):	546
σ_{pwp} (kPa):	1036
B value:	0.98
Volume Change (cc):	-78.2
t_{50} (min):	3.3

Strength Results

$\sigma_1' - \sigma_3'_{MAX}$:	651
Strain, ε_f:	19.94
u (kPa):	372
σ_1' (kPa):	825
σ_3' (kPa):	174

TM	February 17, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

ASTM C 136

Tetra Tech
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
United States

December 16, 2011
Project number: 11-1415-0013/1000

ATTENTION: Mr.Troy Meyer, P.E.

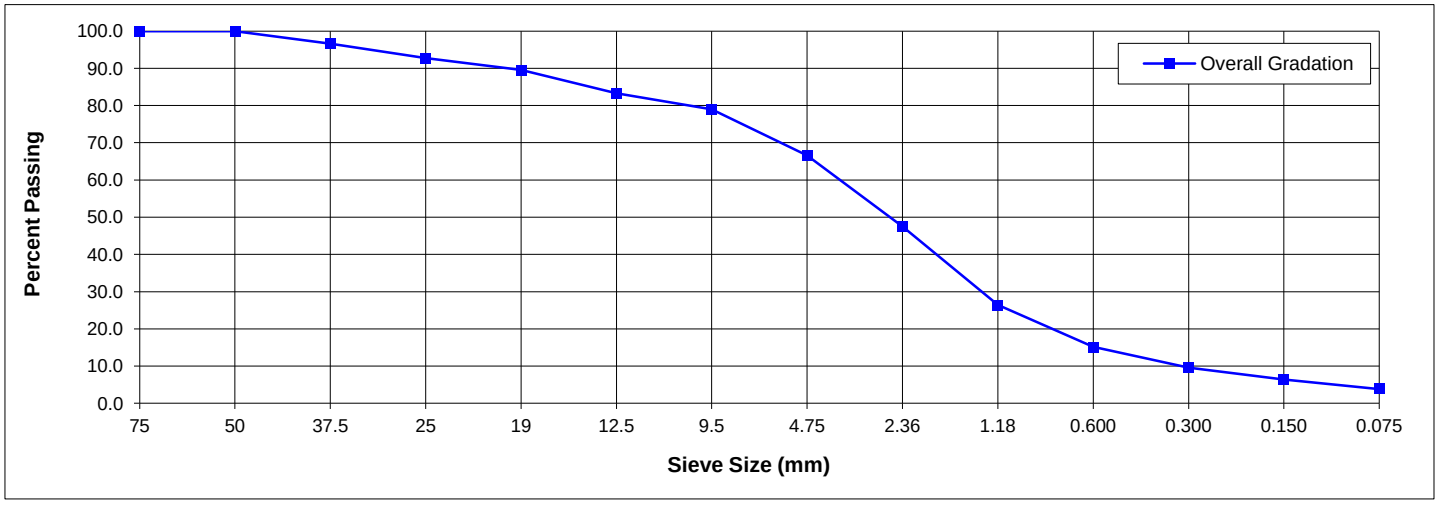
PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**Section 4 Placer Tails**
Source	**Eagle Gold, Yukon**

DATE RECEIVED: December 15, 2011
DATE TESTED: December 16, 2012

SAMPLED BY: BGC
TESTED BY: IC

SIEVE ANALYSIS					**MATERIAL SPECIFICATION :**	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
75	0.0	100.0	0.0			
50	0.0	100.0	0.0			
37.5	3.4	96.6	10.1			
25	3.9	92.7	11.7			
19	3.2	89.5	9.6			
12.5	6.2	83.3	18.6			
9.5	4.3	79.0	12.9			
4.75	12.4	66.6	37.2			
2.36	19.1	47.5		28.6		
1.18	21.1	26.4		31.7		
0.600	11.3	15.1		16.9		
0.300	5.6	9.6		8.3		
0.150	3.2	6.4		4.8		
0.075	2.5	3.9		3.8		
PAN	3.9	0		5.8		
Total	100.0		100.0	100.0		



Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other zones/depths. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

RESISTANCE OF COARSE AGGREGATE TO DEGRADATION BY ABRASION IN THE MICRO-DEVAL APPARATUS

ASTM D 6928

January 18, 2012
Project number: 11-1415-0013/1000

TETRA TECH
Ste 204, 120 West Park Dr.
Grand Junction, CO 81505
U.S.A.

ATTENTION: Mr.Troy Meyer, P.E.

PROJECT: TETRA TECH/ AGGREGATE/ YUKON

Sample:	**Section 4 Placer Tails**
Source:	**Eagle Gold, Yukon**

Date sampled: Not Given
Date tested: January 16, 2012

Sampled by: Client
Tested by: VN

Grading	Section 8.2
Loss at conclusion of test (%)	**32.1**

Validation Test Data: Control Aggregate (Drain Bros. stone)	
Test date	January 10, 2012
Percent loss	12.7%
Valid range	11.4 – 14.8%

Reported by: I. Chung

Reviewed by: _____
L. Hu, M. Sc. E.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

PARTICLE SIZE ANALYSIS OF SOILS

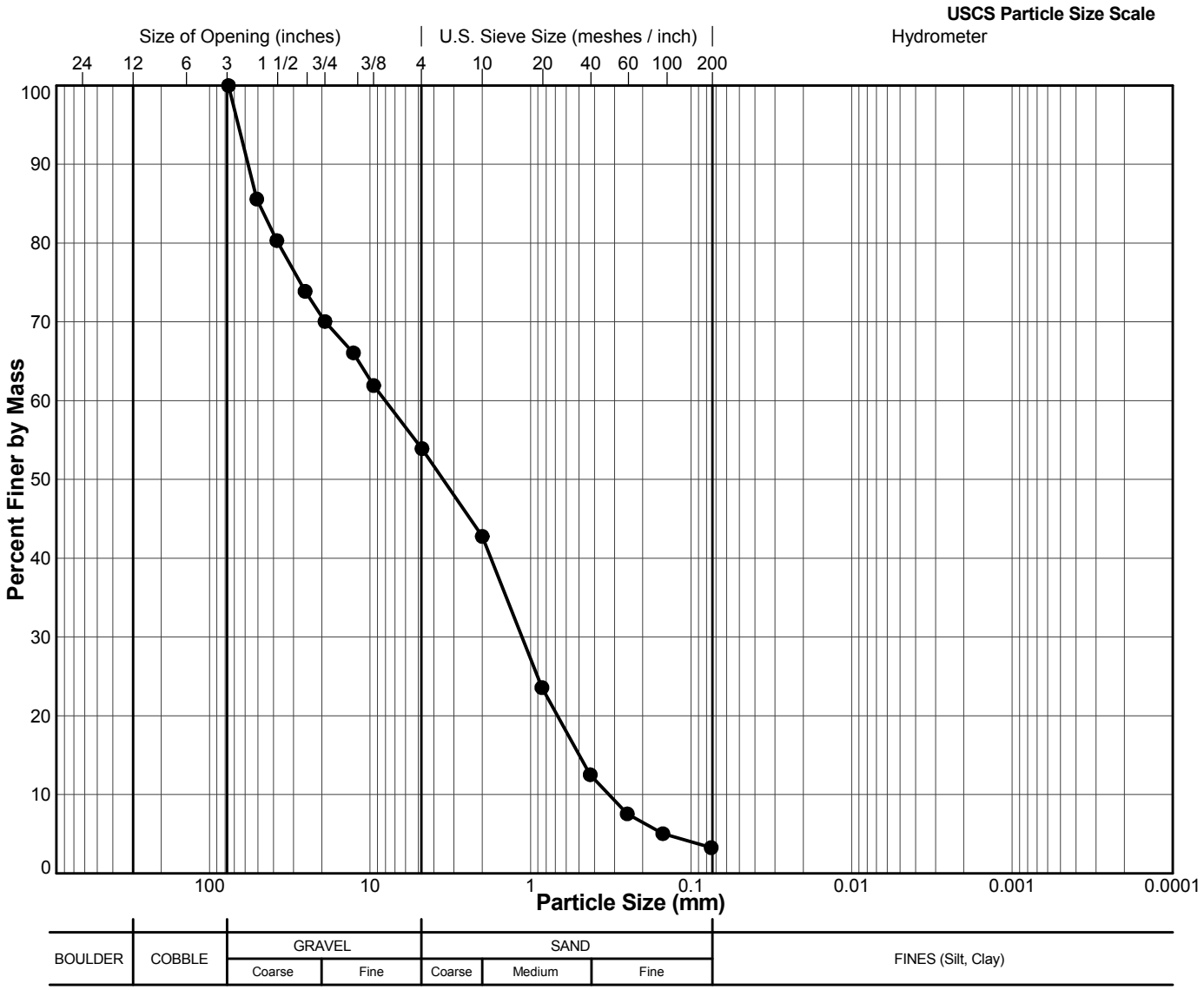
Reference(s)
ASTM D 422-63 (2007)

Client: Tetra Tech	**ID: Section 4 Placer Tails**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 76.2	

Method: Split, Washed



		LP	**12/21/2011**
Tech	Date	Checked	Date

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB ebarnes 09/13/12

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS

Reference(s)
ASTM D 4318-10

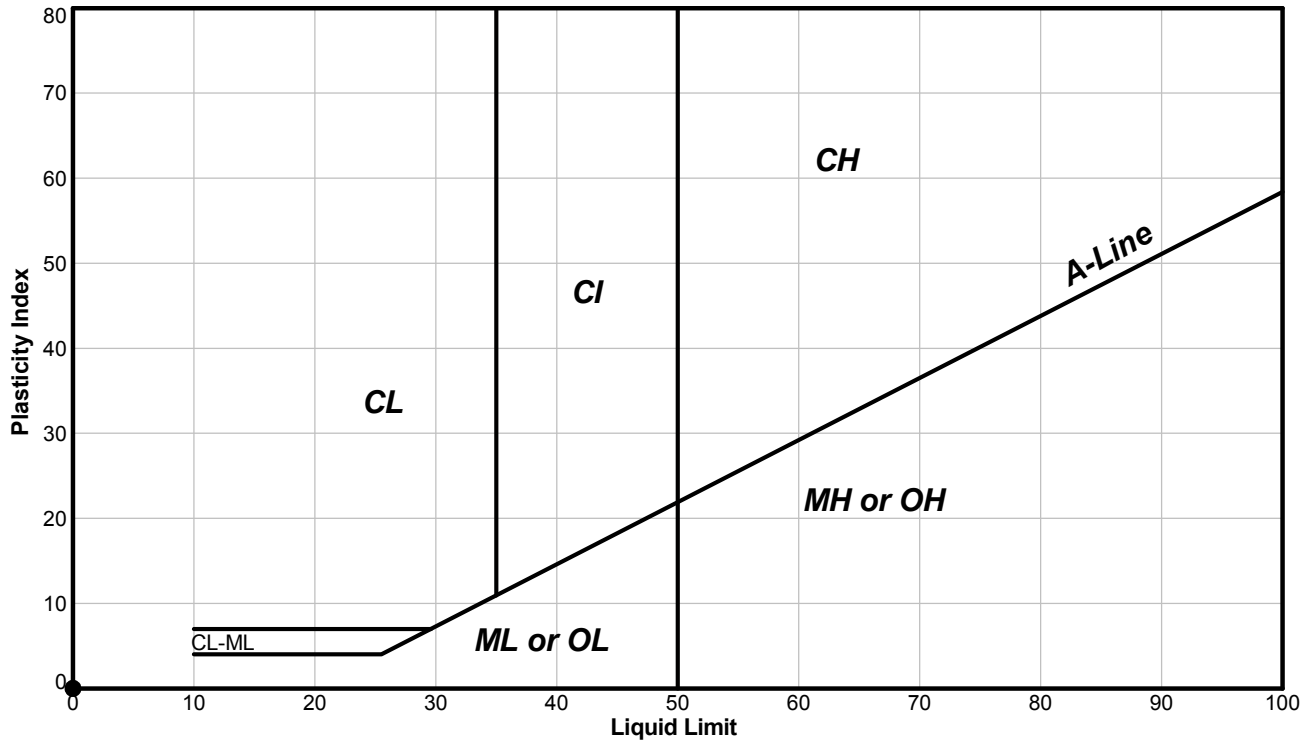
Client: Tetra Tech	**ID: Section 4 Placer Tails**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Classification and Definition: **Non-Plastic Soil (NP).**

Other Remarks: **N/A**

Test Method: A-Multi Point | **Preparation Method: Wet**

PLASTICITY CHART



Sym.	Sample Location	Sample Number	Depth (m)	Bottom (m)	Percent Passing #40 Sieve (%)	Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content (%)	Liquidity Index
●	Section 4 Placer Tails	N/A	0.00	0.00	12	NP	NP	NP	2.1	NP

Note: The test data given herein pertain to the sample provided only. This report constitutes a testing service only.

SK	12/5/2011	LP	12/21/2011
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1415\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_ATTERBERG CASAGRANDE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB ebarnes 09/13/12

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

SPECIFIC GRAVITY OF SOIL SOLIDS

Reference
ASTM C 127-07
ASTM D 854-06 Method B

Project No.:	11-1415-0013/1000	**Borehole**	**Section 4 Placer Tails**
Client:	Tetra Tech	**Sample No.:**	N/A
Project:	Aggregate Testing	**Depth (m):**	N/A
Location:	Eagle Gold, Yukon	**Lab Sch No:**	211

Specific Gravity of Fine Fraction (ASTM D 854-06)

Percentage Passing #4 sieve		62.99		
Test Number		1		2
Flask Number		4		3
Air Removal Method		Vacuum		Vacuum
Mass of Flask (g)		172.71		173.97
Mass of Flask + Dry Soil (g)	M_P	286.80		285.41
Mass of Dry Soil (g)		113.77		111.24
Mass of Flask + Soil + Water (g)	$M_{\rho ws,t}$	742.87		742.45
Test Temperature (g)	T_t	19.00		18.90
Mass of Flask + Water (g)	$M_{\rho w,t}$	671.38		672.50
Mass of Dish + Dry Soil (g)		480.30		221.58
Mass of Dish (g)		366.53		110.34
Mass of Oven Dry Soil (g)	M_S	113.77		111.24
Temperature Coefficient	K	1.00		1.00
Density of Solids (g/cm3)	ρ_s	2.69		2.69
Specific Gravity at Test Temperature	G_t	2.70		2.70
Specific Gravity at 20ºC	$G_{20°C}$	2.70		2.70
AVERAGE SPECIFIC GRAVITY		**2.70**		

Specific Gravity of Coarse Fraction (ASTM C 127-07)

Percentage Retained on #4 sieve		31.39
Mass of Sample in Water (g)	A	
Mass of Sample @ SSD (g)	B	
Mass of Oven Dryed Sample (g)	C	
Bulk G (Oven Dry)	C/(B-A)	
Bulk G (SSD)	B/(B-A)	2.63
Apparent	C/(C-A)	2.70
Absorbtion (%)	(B-C)/C	1.65

Combined Specific Gravity

COMBINED SPECIFIC GRAVITY	$G_{avg\ @20°C}$	2.70

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.*

SK/RS	November 15, 2011	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory

4280 Still Creek Drive

Burnaby, B.C. Canada V5C 6C8

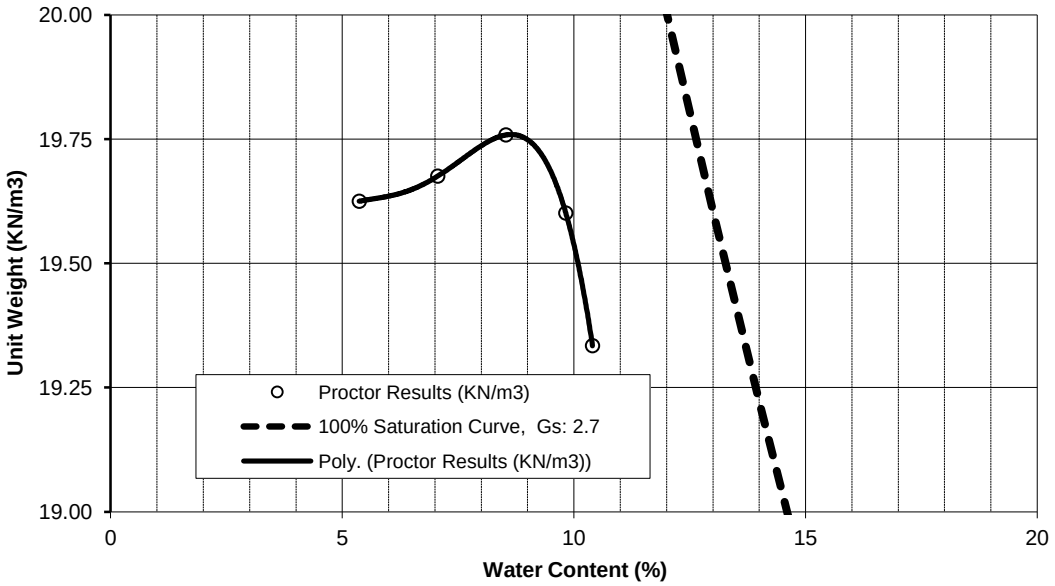
Compaction of Soil Using Standard Effort

Reference ASTM D 698-07

Client:	Tetra Tech	**Sample No.:**	Section 4 - Placer Tails
Project:	Aggregate Testing	**Sample Location:**	
Location:	Eagle Gold, Yukon	**Depth (m):**	
Project No.:	11-1415-0013/1000	**Lab ID No:**	211
Effort Type:	Standard	**Visual Description:**	-
Test Method:	C	**Type of Rammer:**	Mechanical
Preparation Method:	Moist	**Mould Volume (m^3):**	0.002122
Remarks:			

Compaction Results

Trial No.:	1	2	3	4	5
Unit Weight (KN/m^3)	19.63	19.68	19.76	19.60	19.3
Water Content (%):	5.4	7.1	8.5	9.8	10.4



Uncorrected Optimum w (%):	8.5	**Uncorrected Unit Weight (KN/m^3)**	19.80

ASTM D 4718-87 (2007) Correction for oversize particles

Max Percent Oversize (%):	20	**Sieve Size (mm):**	20.00
Oversized Fraction		***Test Fraction***	
Percent Oversized Fraction (%):	30.0	**Percent Test Fraction (%):**	70.0
Gsc (calculated):	2.70	**Gsf (calculated):**	2.70
Water Content of Oversized (%):	1.5	**Water Content of Test (%):**	8.5

Final Results

Corrected Optimum w (%):	6.4	**Corrected Unit Weight (KN/m^3)**	21.42
		Corrected Dry Density (Kg/m^3)	2183

SK, RS	December-15-11	LP	December 21,2011
TESTED BY	DATE	CHECKED BY	DATE

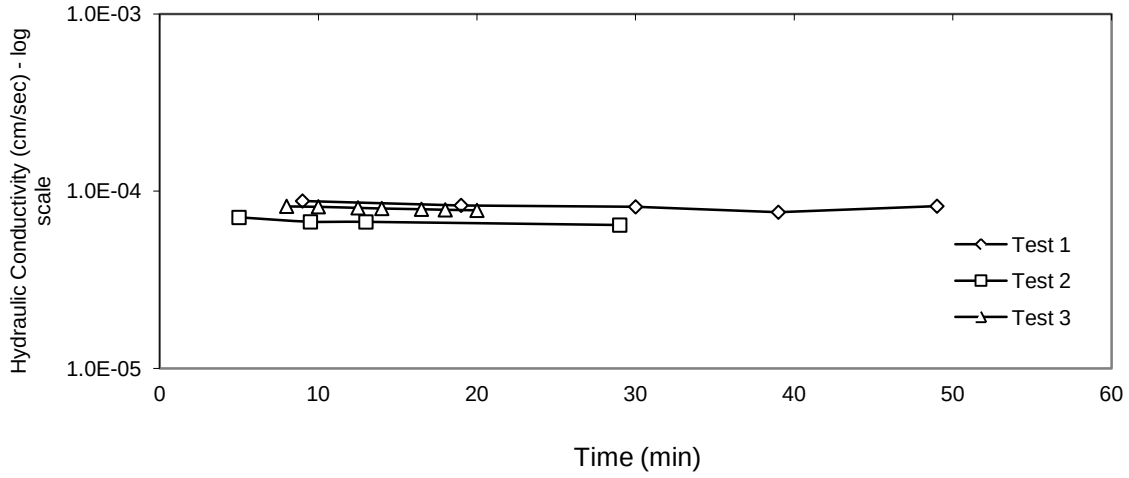
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

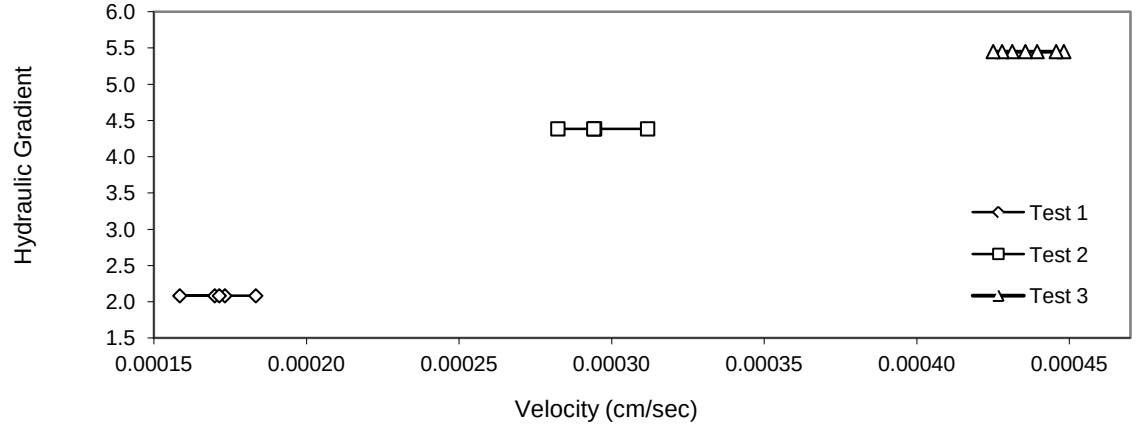
Measurement of Hydraulic Conductivity of Porous Material Using a Rigid-Wall, Compaction-Mold Permeameter

Reference: ASTM D 2434-68 (2006)

Project No:	**11-1415-0013/1000**	**Sample ID:**	**Section 4 Placer Tails**
Client:	**Tetra Tech**		
Project:	**Aggregate Testing**	**Test Parameters:**	95% of Std. Proctor at opt moisture content
Location	**Eagle Gold, Yukon**	**Lab ID No:**	211

Test Method:	A: Constant Head	**Permeameter :**	Single Ring Base Plate	**Permeant Liquid:**	De-aired Tap Water
Compaction:	Hand Compaction	**Initial Diameter, cm**	15.21	**Initial Water Content, %**	6.1
Target Compaction	95% Standard	**Initial Height, cm**	11.85	**Initial ρ_{dry}, kg/m^3:**	2074
Max ρ_{dry} (kg/m^3):	2074	**Initial Volume, cm^3**	2153.7	**Initial Void Ratio**	0.30
Gs (measured)	2.70	**Final Diameter, cm**	15.21	**Final Water Content, %**	8.9
		Final Height, cm	12.01	**Final ρ_{dry}, kg/m^3:**	2046
		Final Volume, cm^3	2182.2	**Final Void Ratio**	0.32





Test Comments: 3/4" Scalped. Coarse pore stone used with filter paper.

No. of Pore Volumes 1.71	Range of Hydraulic Gradient 2.08 to 5.45	**HYD. CONDUCTIVITY k_{20},cm/s** **7.7E-05**

EB	13-Jan-12	LP	June 7, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Testing of Soils Under Consolidated Drained Conditions

Reference
ASTM D 3080-04

Client:	Tetra Tech	**Sample No :**	SECTION 4 - PLACER TAILS
Project:	Aggregate Testing	**Sample ID :**	
Location:	Eagle Gold, Yukon	**Depth (m):**	-
Project No.:	11-1415-0013 /1000	**Lab ID No:**	211

Test Condition:	95% Std Proctor at opt. moisture	**Equipment Description:**		LDS
Visual Description:	GRAVEL and SAND, trace silt	**Normal LVDT:**	Serial No.:	HLS50/9686
	RECONSTITUTED	**Shear Load Cell:**	Serial No.:	2C202 10K
	Peak and residual	**Vertical LVDT:**	Serial No.:	HLS25M4407

Remarks: Area correction not applied to normal and shear stress calculation
Multi-stage test: peak + 3 residuals

Initial Sample Dimensions

Test No.	1		2	3		
Shear box geometry	Rectangular		Rectangular	Rectangular		
Length (mm)	250		250	250		
Width (mm)	150		150	150		
Depth (mm)	198		199	198		
Area (cm^2)	3.75E+02		3.75E+02	3.75E+02		
Volume (cm^3)	7.42E+03		7.42E+03	7.42E+03		

Weight Volume Relationships

Sample Type	PEAK		RESIDUAL	RESIDUAL		
Dry Mass (g)	14261	---	14261	14274		
Initial γ_{wet} (kN/m^3)	20.18	---	20.12	20.11		
Final γ_{wet} (kN/m^3)	20.45	---	20.42	20.42		
Initial γ_{dry} (kN/m^3)	18.60	---	18.54	18.55		
Final γ_{dry} (kN/m^3)	18.82	---	18.82	18.82		
Initial water content (%)	8.5	---	8.5	8.4		
Final water content (%)	8.7	---	8.5	8.5		
Specific Gravity (test value)	2.70	---	2.70	2.70		
Initial Void Ratio, e	0.41	---	0.41	0.41		
Initial Saturation (%)	n/a	---	n/a	n/a		

Test Results

Rate of Deformation (mm/min)	0.83	0.83	0.83	0.83		
Normal Stress (kPa)	138	138	276	552		
Peak Shear Stress (kPa)		---	---	---		
Residual Shear Stress (kPa)	---					

Consolidation Results

Normal Stress (kPa)	138	---	276	552		
t_{90} (Taylor Method) (min)	---	---	---	---		
Calculated t_{50} (min)	---	---	---	---		
Change in height ΔH_c (mm)	---	---	---	---		

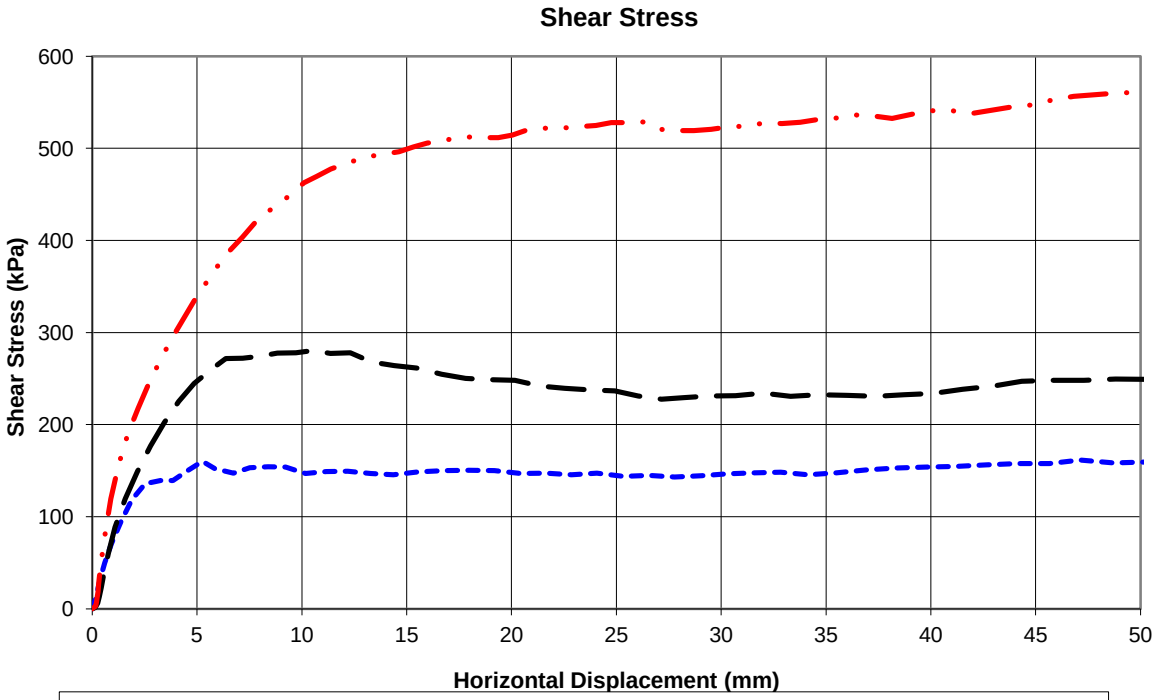
LP	February 22,2012	M. SANIN	May 31, 2012
TESTED BY	DATE	CHECKED BY	DATE

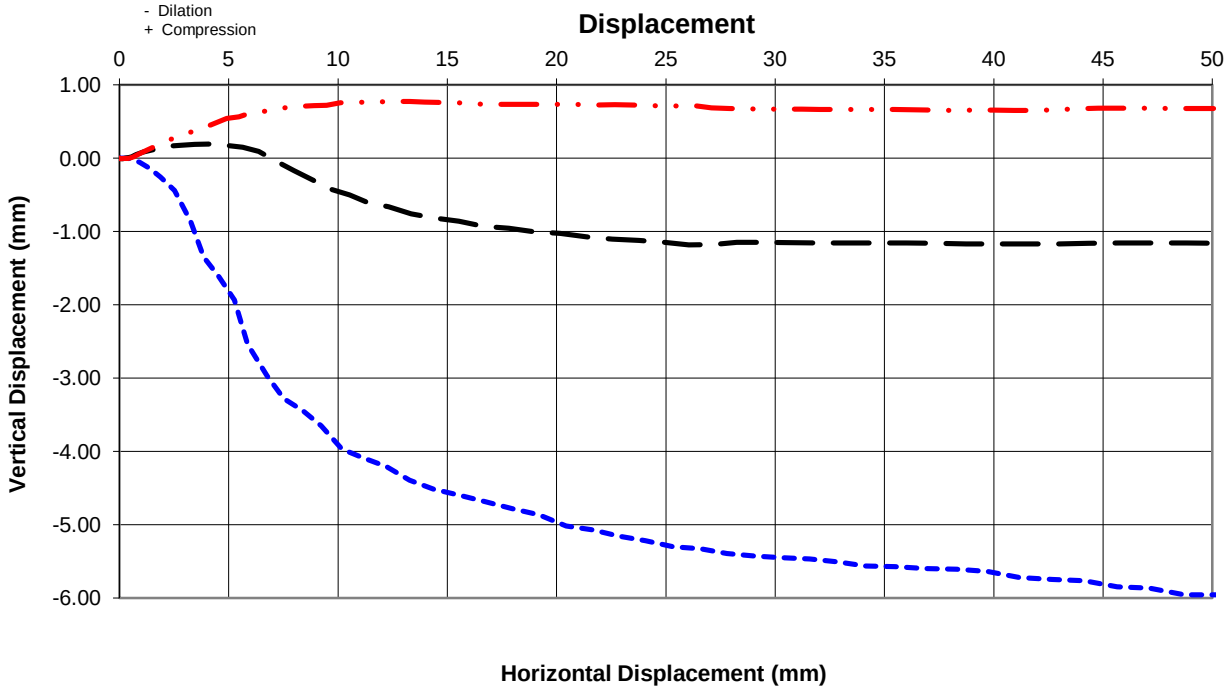
Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Testing of Soils Under Consolidated Drained Conditions

Reference
ASTM D 3080-11

Client:	Tetra Tech	**Sample No :**	SECTION 4 - PLACER TAILS
Project:	Aggregate Testing	**Sample ID :**	-
Location:	Eagle Gold, Yukon	**Depth (m):**	-
Project No.:	11-1415-0013 /1000	**Lab ID No:**	211





LP	February 22,2012	M. SANIN	May 31, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Direct Shear Testing of Soils Under Consolidated Drained Conditions

Reference
ASTM D 3080-11

Client:	Tetra Tech	**Sample No :**	SECTION 4 - PLACER TAILS
Project:	Aggregate Testing	**Sample ID :**	-
Location:	Eagle Gold, Yukon	**Depth (m):**	-
Project No.:	11-1415-0013 /1000	**Lab ID No:**	211

OPEN	
Normal Stress , kPa	

Horz Disp mm	Shear Stress kPa	Vert Disp mm

			22.87	145.53	-5.1561	26.04	230.95	-1.1830	15.98	505.65	0.7508
			24.07	147.10	-5.2181	27.16	227.49	-1.1793	16.65	508.02	0.7373
			25.34	143.62	-5.3022	28.24	229.39	-1.1489	17.32	510.91	0.7348
			26.57	144.83	-5.3284	29.42	231.06	-1.1469	18.01	512.41	0.7342
			27.78	142.98	-5.3935	30.68	231.33	-1.1539	18.69	511.58	0.7344
			29.07	144.36	-5.4276	32.00	234.24	-1.1542	19.36	511.75	0.7352
			30.30	146.61	-5.4511	33.30	230.59	-1.1585	20.03	514.37	0.7345
			31.58	147.62	-5.4663	34.65	232.43	-1.1572	20.70	519.47	0.7344
			32.84	148.33	-5.5063	36.01	231.71	-1.1543	21.35	521.58	0.7318
			34.13	145.58	-5.5650	37.39	230.75	-1.1610	21.93	522.06	0.7286
			35.49	147.62	-5.5753	38.73	232.45	-1.1692	22.65	522.27	0.7319
			36.88	150.68	-5.5971	40.10	233.76	-1.1705	23.37	523.62	0.7274
			38.30	152.66	-5.6099	41.51	238.41	-1.1685	24.02	524.84	0.7203
			39.72	153.91	-5.6407	42.97	241.78	-1.1682	24.75	527.90	0.7146
			41.17	154.66	-5.7221	44.34	247.06	-1.1616	25.51	527.78	0.7149
			42.67	156.12	-5.7483	45.76	247.99	-1.1564	26.30	528.51	0.7174
			44.14	157.77	-5.7664	47.30	247.94	-1.1548	27.09	520.64	0.6881
			45.65	157.58	-5.8471	48.82	249.57	-1.1556	27.89	519.22	0.6791
			47.11	161.34	-5.8679	50.36	249.00	-1.1595	28.70	519.16	0.6744
			48.72	158.48	-5.9593				29.53	520.56	0.6697
			50.35	159.54	-5.9575				30.38	523.30	0.6676
									31.22	524.13	0.6679
									32.06	527.41	0.6632
									32.90	526.95	0.6657
									33.77	528.18	0.6653
									34.64	531.46	0.6666
									35.46	532.73	0.6639
									36.34	536.24	0.6620
									37.22	535.37	0.6565
									38.16	532.60	0.6539
									39.08	537.04	0.6575
									39.99	540.70	0.6569
									40.94	541.15	0.6539
									41.90	537.65	0.6533
									42.83	541.09	0.6610
									43.76	544.64	0.6758
									44.79	547.11	0.6809
									45.81	552.70	0.6816
									46.806	556.49	0.6814
									48.391	559.24	0.6792
									50.052	561.31	0.6766

LP	February 22,2012	M. SANIN	May 31, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D 2850-03a (2007)**

Client:	Tetra Tech	**Sample No:**	Section 4 Placer Tails
Project:	Aggregate Testing	**Test ID:**	UU-1 (20 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013/1000	**Lab ID No:**	211

Visual Description:	GRAVEL and SAND, trace silt
Sample Type:	Reconsituted to 95% Standard Proctor at optimum moisture content
Other Remarks:	Material used for the UU test was scalped on the 3/8 inch sieve

Sample Data	
	Initial Sample Charateristics
Height (cm):	20.28
Diameter (cm):	10.12
Area (cm^2):	80.39
Volume (cm^3):	1630.0
Wet Weight (g):	3369.2
γ_{wet} (kN/m^3):	20.27
γ_{dry} (kN/m^3):	18.47
Water content, w (%):	9.7
Saturation (%):	61
Void ratio, e:	0.43
Gs (calculated)	2.70

Atterberg Limit Results	
Liquid Limits	N/A
Plastic Limits	N/A
Plastic Index	NP
Classification	GW/SW

Strength Results	
q_{MAX} ($\sigma_{1\ total}$ - $\sigma_{3\ total}$) at failure (kPa):	538
Strain, ε_f:	4.76
$\sigma_{1\ total}$ (kPa):	678
$\sigma_{3\ total}$ (kPa):	140

Equipment	
Machine:	Station 1 Load Frame 10 K
Load Cell:	400469
Axial DCDT:	LP-174
Cell Pressure:	PS-3119
Feed Rate (%/min):	1.00



PHOTO AT END OF TEST

TM	February 14, 2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

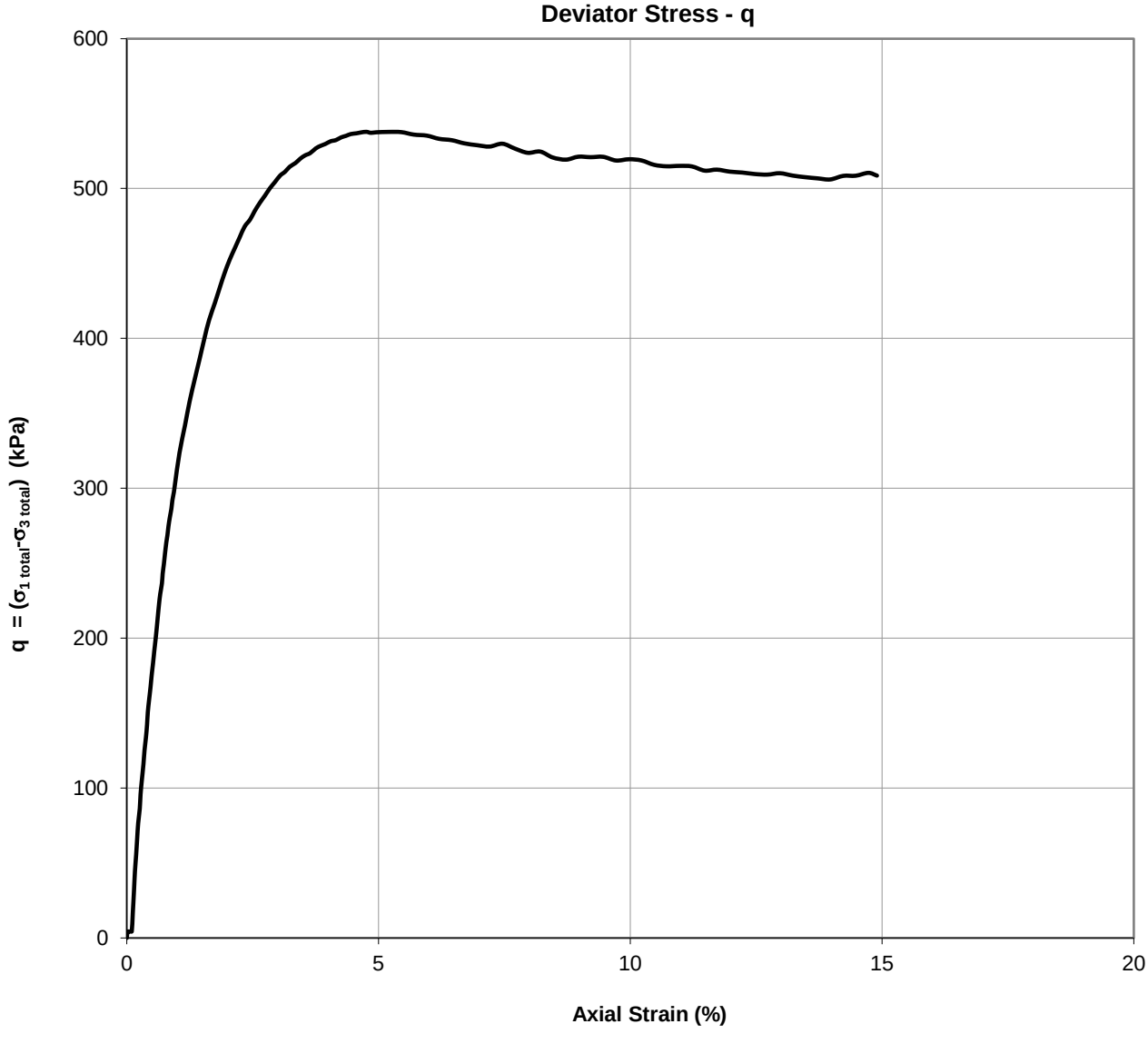
O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 4 Placer Tails\Triaxials\UU-3 @ 80psi\[Section 4 Placer Tails UU-3 Report .xlsm]Report 1

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D 2850-03a (2007)**

Client:	Tetra Tech	**Borehole.:**	Section 4 Placer Tails
Project:	Aggregate Testing	**Sample :**	UU-1 (20 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013/1000	**Lab ID No:**	211



Remarks:

TM	February 14, 2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 4 Placer Tails\Triaxials\UU-3 @ 80psi\[Section 4 Placer Tails UU-3 Report .xlsm]Report 1

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D 2850-03a (2007)**

Client:	Tetra Tech	**Sample No:**	Section 4 Placer Tails
Project:	Aggregate Testing	**Test ID:**	UU-2 (40 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211

Visual Description:	GRAVEL and SAND, trace silt
Sample Type:	Reconsituted to 95% Standard Proctor at optimum moisture content
Other Remarks:	Material used for the UU test was scalped on the 3/8 inch sieve

Sample Data	
	Initial Sample Charateristics
Height (cm):	20.28
Diameter (cm):	10.12
Area (cm^2):	80.39
Volume (cm^3):	1630.2
Wet Weight (g):	3369.3
γ_{wet} (kN/m^3):	20.27
γ_{dry} (kN/m^3):	18.38
Water content, w (%):	10.3
Saturation (%):	63
Void ratio, e:	0.44
Gs (calculated)	2.70

Atterberg Limit Results	
Liquid Limits	N/A
Plastic Limits	N/A
Plastic Index	NP
Classification	GW/SW

Strength Results	
q_{MAX} ($\sigma_{1\ total}$ - $\sigma_{3\ total}$) at failure (kPa):	883
Strain, ε_f:	7.72
$\sigma_{1\ total}$ (kPa):	1159
$\sigma_{3\ total}$ (kPa):	277

Equipment	
Machine:	Station 1 Load Frame 10 K
Load Cell:	305670
Axial DCDT:	LP-174
Cell Pressure:	PS-3119
Feed Rate (%/min):	1.00



PHOTO AT END OF TEST

TM	February 14, 2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

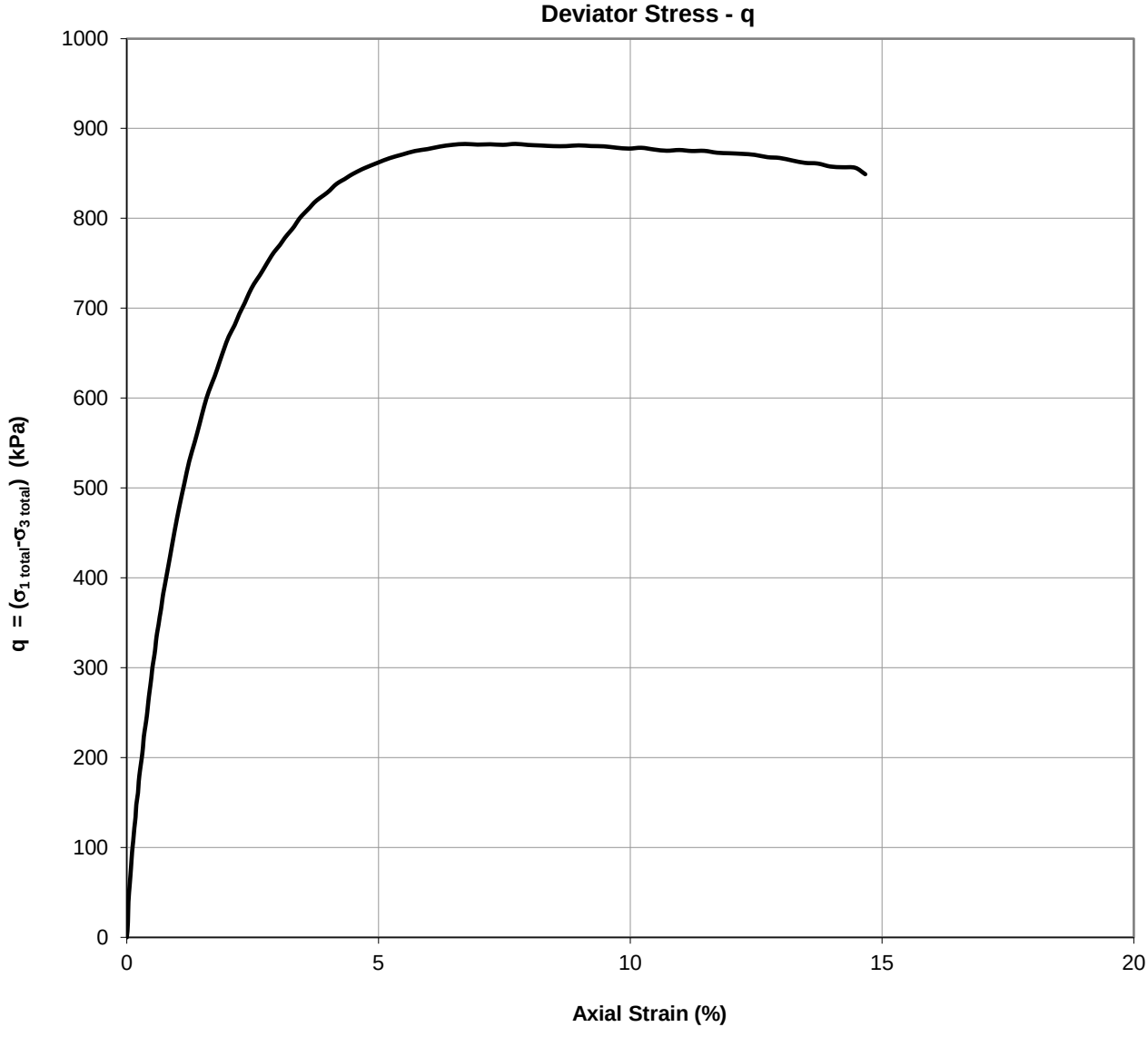
O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 4 Placer Tails\Triaxials\UU-1 @ 20psi\[Section 4 Placer Tails UU-1 Report .xlsm]Report 1

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D 2850-03a (2007)**

Client:	Tetra Tech	**Borehole.:**	Section 4 Placer Tails
Project:	Aggregate Testing	**Sample :**	UU-2 (40 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211



Remarks:

TM	February 14, 2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 4 Placer Tails\Triaxials\UU-1 @ 20psi\[Section 4 Placer Tails UU-1 Report .xlsm]Report 1

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D 2850-03a (2007)**

Client:	Tetra Tech	**Sample No:**	Section 4 Placer Tails
Project:	Aggregate Testing	**Test ID:**	UU-3 (80 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211

Visual Description:	GRAVEL and SAND, trace silt
Sample Type:	Reconsituted to 95% Standard Proctor at optimum moisture content
Other Remarks:	Material used for the UU test was scalped on the 3/8 inch sieve

Sample Data	
	Initial Sample Charateristics
Height (cm):	20.31
Diameter (cm):	10.10
Area (cm^2):	80.10
Volume (cm^3):	1627.3
Wet Weight (g):	3369.3
γ_{wet} (kN/m^3):	20.30
γ_{dry} (kN/m^3):	18.41
Water content, w (%):	10.3
Saturation (%):	63
Void ratio, e:	0.44
Gs (calculated)	2.70

Atterberg Limit Results	
Liquid Limits	N/A
Plastic Limits	N/A
Plastic Index	NP
Classification	GW/SW

Strength Results	
q_{MAX} ($\sigma_{1\ total}$ - $\sigma_{3\ total}$) at failure (kPa):	1600
Strain, ε_f:	9.06
$\sigma_{1\ total}$ (kPa):	2153
$\sigma_{3\ total}$ (kPa):	554

Equipment	
Machine:	Station 1 Load Frame 10 K
Load Cell:	305670
Axial DCDT:	LP-174
Cell Pressure:	PS-3119
Feed Rate (%/min):	1.00



PHOTO AT END OF TEST

TESTED BY	DATE	CHECKED BY	DATE
TM	February 14, 2012	M. SANIN	April 16, 2012

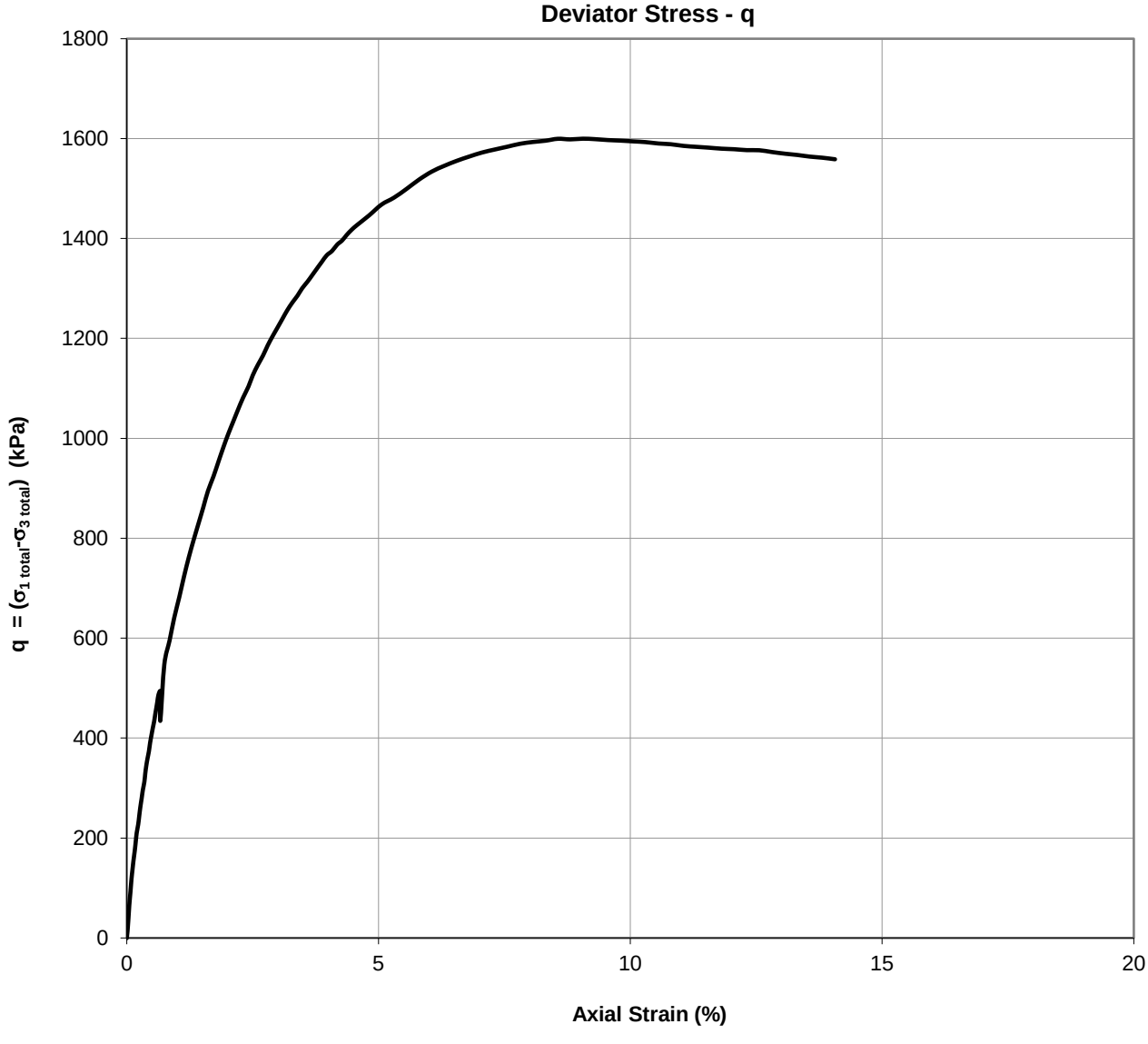
O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 4 Placer Tails\Triaxials\UU-2 @ 40psi\[Section 4 Placer Tails UU-2 Report .xlsm]Report 2

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

Unconsolidated Undrained Triaxial Compression Test on Cohesive Soils

Reference: **ASTM D 2850-03a (2007)**

Client:	Tetra Tech	**Borehole.:**	Section 4 Placer Tails
Project:	Aggregate Testing	**Sample :**	UU-3 (80 PSI)
Location:	Eagle Gold, Yukon	**Depth (m):**	n/a
Project No.:	11-1415-0013/1000	**Lab ID No:**	211



Remarks:

TM	February 14, 2012	M. SANIN	April 16, 2012
TESTED BY	DATE	CHECKED BY	DATE

O:\Active_2011\1415\11-1415-0013 Tetra Tech\Phase 1000- Aggregate Testing\Section 4 Placer Tails\Triaxials\UU-2 @ 40psi\[Section 4 Placer Tails UU-2 Report .xlsm]Report 2

Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 4 Placer Tails
Project:	Aggregate Testing	**Test ID :**	CIU Summary
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013/1000	**Lab ID No:**	211

Test	CIU1	CIU2	CIU3		
Sample	138 kPa	276 kPa	552 kPa		
Initial Dimensions					
H_o (cm)	19.90	20.23	20.28		
D_o (cm)	9.98	10.09	9.94		
Gs (assumed)	2.75	2.75	2.75		
w (%)	9.3	9.3	10.1		
$\gamma_{o\ dry}$ (kN/m^3)	19.28	18.59	19.08		
Sat. (%)	64	57	67		
e_o	0.40	0.45	0.41		
B_{Value}	0.95	0.99	0.99		
Consolidation Results					
σ_{CELL} (kPa)	1101	1241	1102		
OCR	n/a	n/a	n/a		
$\sigma_{3c'}$ (kPa)	141	274	554		
ΔV_c (cc)	-17.8	-31.3	-39.0		
t_{50} (min)	0.8	1.7	1.6		
After Consolidation Dimensions					
H_c (cm)	19.90	20.12	20.28		
D_c (cm)	9.93	10.02	9.82		
A_c (cm^2)	77.38	78.85	75.72		
V_c (cm^3)	1540.0	1586.7	1535.4		
$\gamma_{c\ dry}$ (kN/m^3)	19.51	18.96	19.56		
e_c	0.38	0.42	0.38		
w (%)	13.9	15.4	13.8		
Sat (%)	100	100	100		
Failure At Maximum Deviator Stress $\sigma_1'-\sigma_3'$:					
$\sigma_1'-\sigma_3'$ (kPa) :	887	749	999		
ε_f (%)	19.39	20.11	12.39		
u (kPa)	-120	99	263		
σ_3' (kPa)	260	174	290		
σ_1' (kPa)	1147	923	1289		

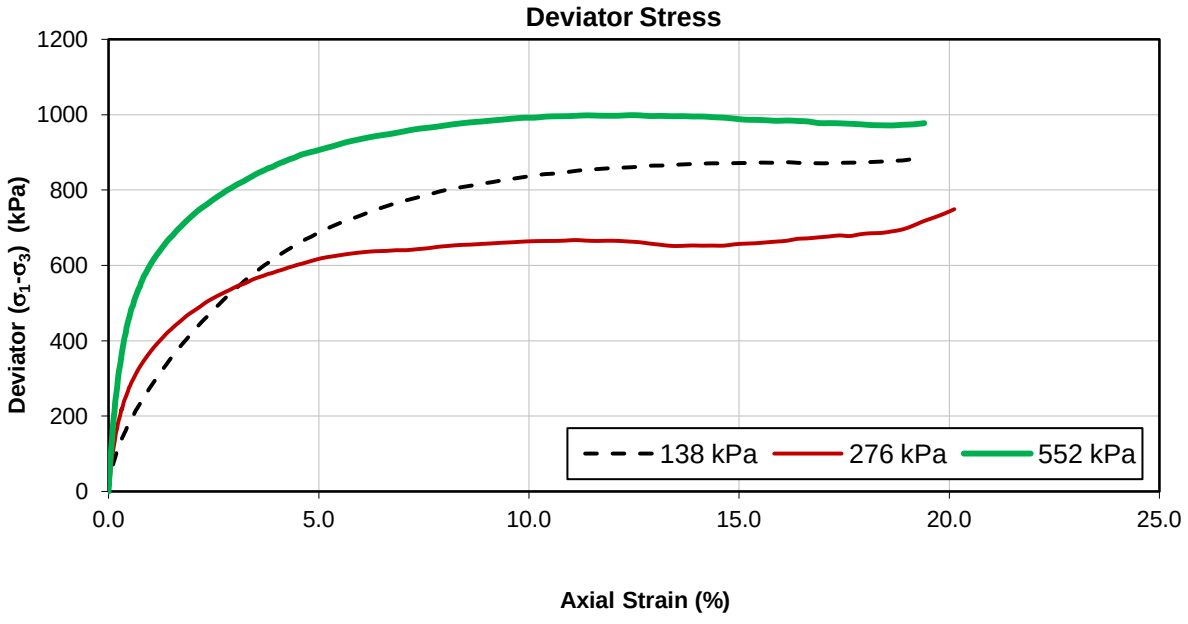
TM	February 9, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

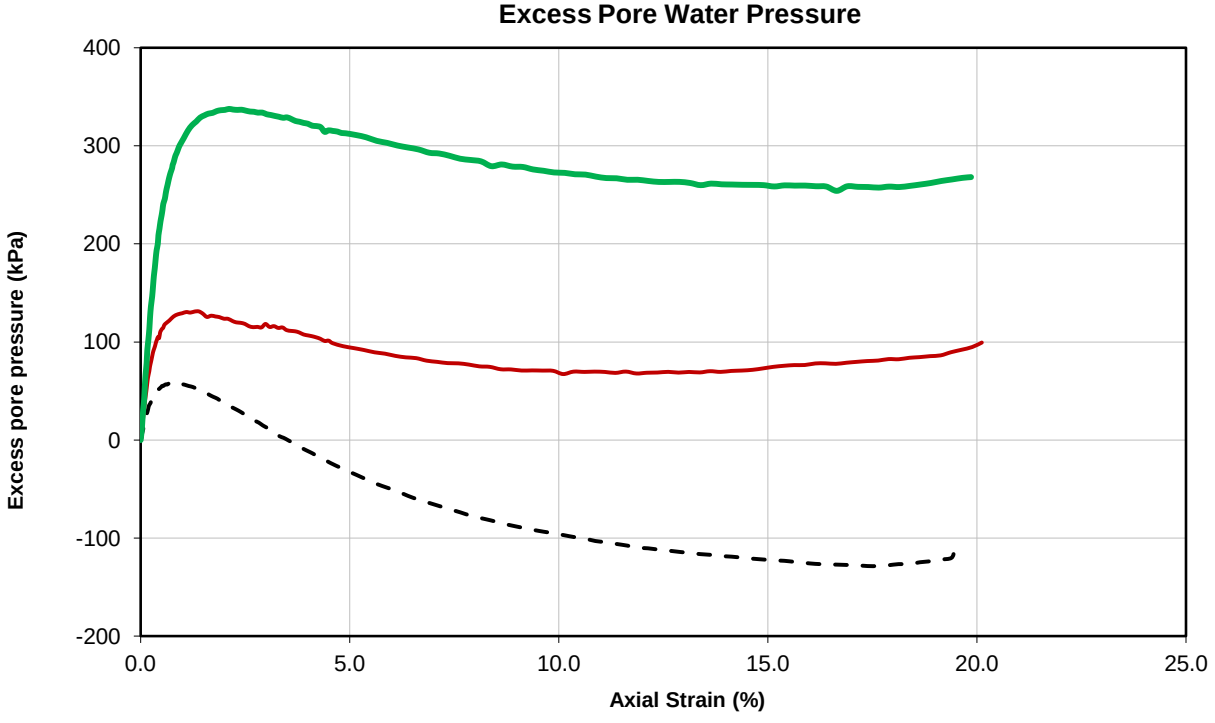
Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference
ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 4 Placer Tails
Project:	Aggregate Testing	**Test ID :**	CIU Summary
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 / 1000	**Lab ID No:**	211





TM	February 9, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

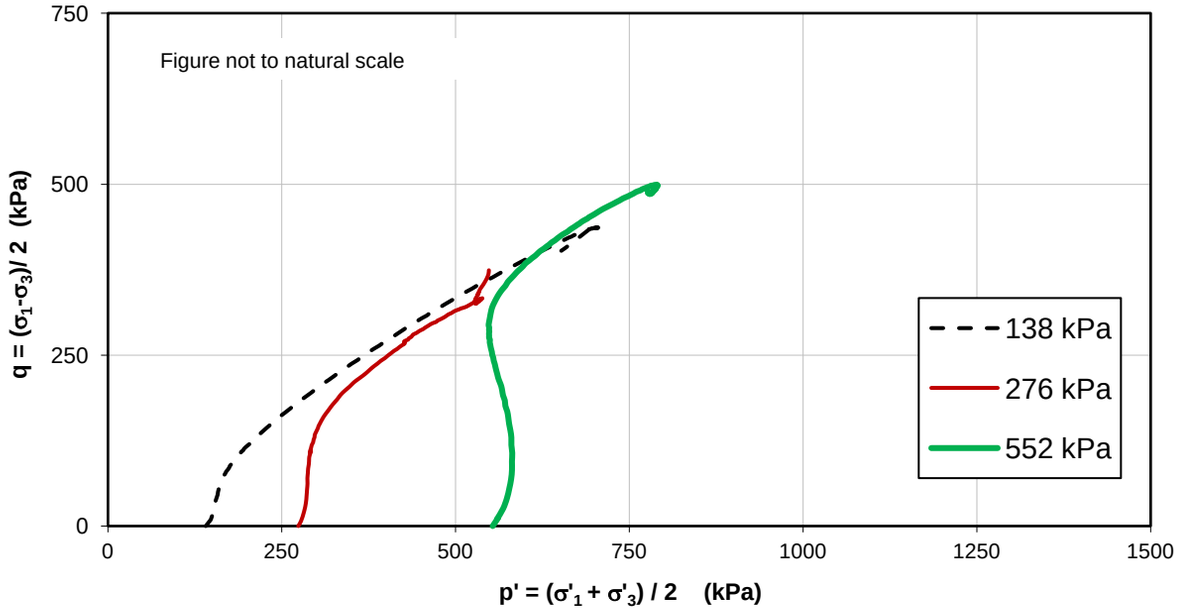
Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

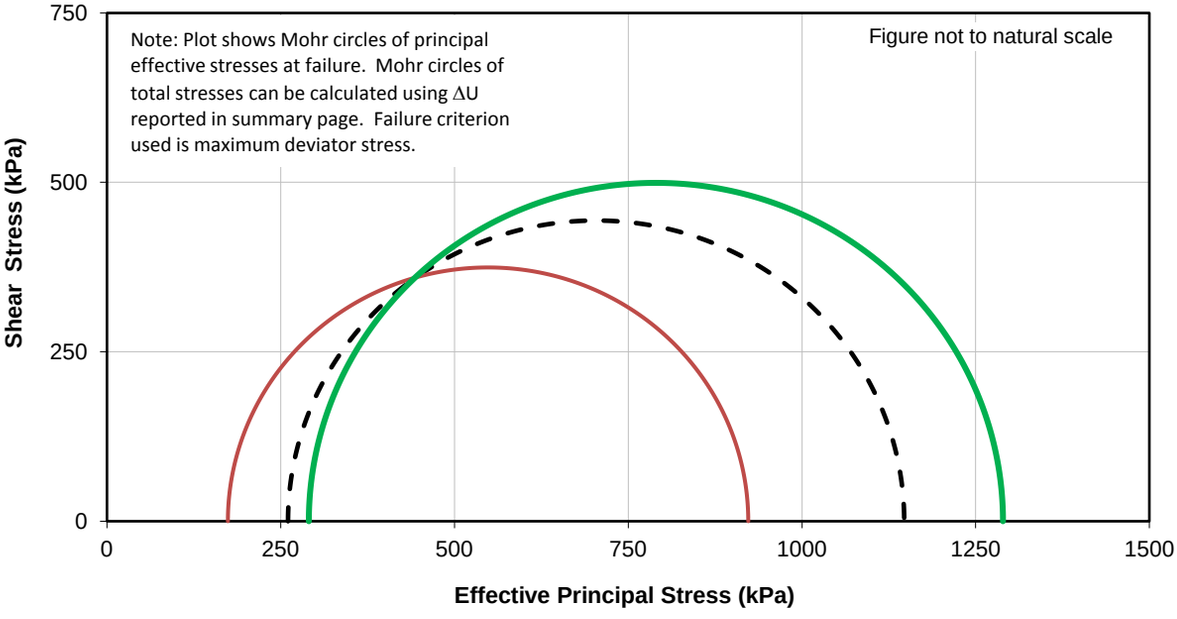
Reference ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 4 Placer Tails
Project:	Aggregate Testing	**Test ID :**	CIU Summary
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 / 1000	**Lab ID No:**	211

Stress Paths



Mohr Circles Deviator Stress



TM	February 9, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 4 Placer Tails
Project:	Aggregate Testing	**Test ID :**	CIU-1
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 / 1000	**Lab ID No:**	211

Type :	Reconstututed	**Soil Classification:**	GW/SW
Saturation Method:	WET	**Material Type**	N/A

Visual Description	GRAVEL and SAND, trace silt
Other Remarks:	Material used for the triaxial test was scalped on the 3/8 inch sieve
	Reconstituted to 95% Standard Proctor at optimum moisture content

Sample Data

	Before Consolidation	After Consolidation
Height (cm):	19.90	19.90
Diameter (cm):	9.98	9.93
Area (cm^2):	78.27	77.38
Volume (cm^3):	1558	1540
γ_{dry} (kN/m^3):	19.28	19.51
γ_{sat} (kN/m^3):	21.07	22.22
Water content, w (%):	9.3	13.9
Saturation (%):	64	100
Void ratio, e:	0.40	0.38
Gs (assumed):	2.75	2.75

Consolidation Results

$\sigma'_{eff} = \sigma_{cell} - \sigma_{pwp}$ (kPa):	141
σ_{pwp} (kPa):	961
B value:	0.95
Volume Change (cc):	-17.8
t_{50} (min):	0.83

Strength Results

$\sigma_1' - \sigma_3'_{MAX}$:	887
Strain, ε_f:	19.39
u (kPa):	-120
σ_1' (kPa):	1147
σ_3' (kPa):	260

Equipment

Machine:	Truepath Load Frame - Stn.2
Chamber:	KW
Load Cell:	205857
Axial DCDT:	LP-267
Cell Pressure:	PS-3118
Back Pressure:	PS-2840
Pore Pressure:	PS-3278
Feed Rate (%/hr):	2.00

PHOTO AT END OF TEST



TM	February 9, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference
ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 4 Placer Tails
Project:	Aggregate Testing	**Test ID :**	CIU-2
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 / 1000	**Lab ID No:**	211

Type :	Reconstututed	**Soil Classification:**	GW/SW
Saturation Method:	WET	**Material Type**	N/A

Visual Description	GRAVEL and SAND, trace silt
Other Remarks:	Material used for the triaxial test was scalped on the 3/8 inch sieve
	Reconstituted to 95% Standard Proctor at optimum moisture content

Sample Data

	Before Consolidation	After Consolidation
Height (cm):	20.23	20.12
Diameter (cm):	10.09	10.02
Area (cm^2):	79.99	78.85
Volume (cm^3):	1618	1587
γ_{dry} (kN/m^3):	18.59	18.96
γ_{sat} (kN/m^3):	20.33	21.88
Water content, w (%):	9.3	15.4
Saturation (%):	57	100
Void ratio, e:	0.45	0.42
Specific Gravity (calculated)	2.75	2.75

Equipment

Machine:	Truepath Load Frame - Stn. 4
Chamber:	KW
Load Cell:	305670
Axial DCDT:	LP-764
Cell Pressure:	PS-5112
Back Pressure:	PS-5115
Pore Pressure:	PS-3373
Feed Rate (%/hr):	2.00

PHOTO AT END OF TEST



Consolidation Results

$\sigma'_{eff} = \sigma_{cell} - \sigma_{pwp}$ (kPa):	274
σ_{pwp} (kPa):	967
B value:	0.99
Volume Change (cc):	-31.3
t_{50} (min):	1.7

Strength Results

$\sigma_1' - \sigma_3'_{MAX}$:	749
Strain, ε_f:	20.11
u (kPa):	99
σ_1' (kPa):	923
σ_3' (kPa):	174

TM	February 9, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd -Burnaby Laboratory
4280 Still Creek Drive
Burnaby,B.C. Canada V5C 6C8

Consolidated Undrained Triaxial Compression Test for Soils

Reference
ASTM D4767-11

Client:	Tetra Tech	**Sample No :**	Section 4 Placer Tails
Project:	Aggregate Testing	**Test ID :**	CIU-3
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Project No.:	11-1415-0013 /1000	**Lab ID No:**	211

Type :	Reconstututed	**Soil Classification:**	GW/SW
Saturation Method:	WET	**Material Type**	N/A
Visual Description	GRAVEL and SAND, trace silt		
Other Remarks:	Material used for the triaxial test was scalped on the 3/8 inch sieve		
	Reconstituted to 95% Standard Proctor at optimum moisture content		

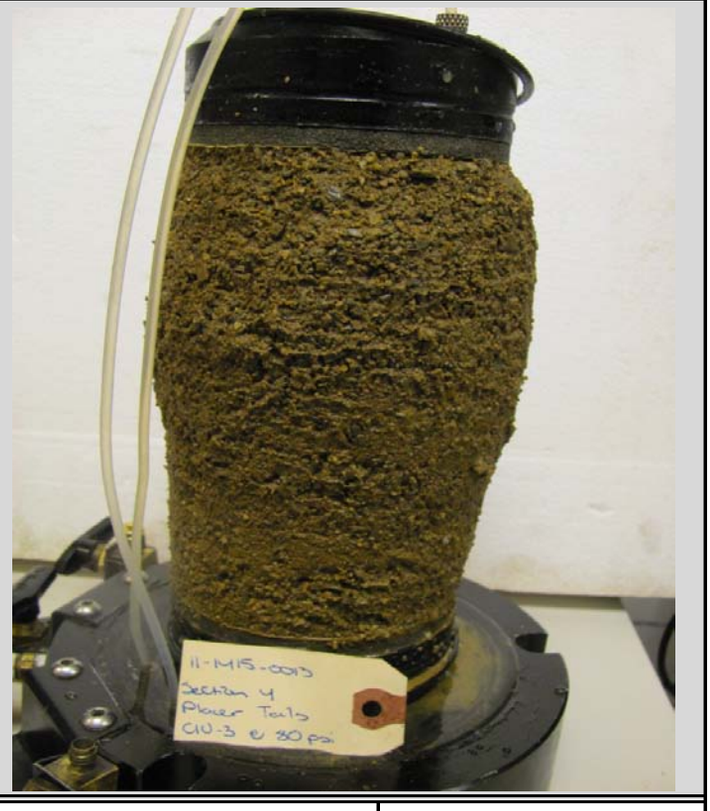
Sample Data

	Before Consolidation	After Consolidation
Height (cm):	20.28	20.28
Diameter (cm):	9.94	9.82
Area (cm^2):	77.65	75.72
Volume (cm^3):	1574	1535
γ_{dry} (kN/m^3):	19.08	19.56
γ_{sat} (kN/m^3):	21.00	22.26
Water content, w (%):	10.1	13.8
Saturation (%):	67	100
Void ratio, e:	0.41	0.38
Specific Gravity (calculated)	2.75	2.75

Equipment

Machine:	Truepath Load Frame - Stn. 2
Chamber:	KW
Load Cell:	305670
Axial DCDT:	LP-267
Cell Pressure:	PS-3118
Back Pressure:	PS-2840
Pore Pressure:	PS-3278
Feed Rate (%/hr):	2.00

PHOTO AT END OF TEST



Consolidation Results

$\sigma'_{eff} = \sigma_{cell} - \sigma_{pwp}$ (kPa):	554
σ_{pwp} (kPa):	549
B value:	0.99
Volume Change (cc):	-39.0
t_{50} (min):	1.6

Strength Results

$\sigma_1' - \sigma_3'_{MAX}$:	999
Strain, ε_f:	12.39
u (kPa):	263
σ_1' (kPa):	1289
σ_3' (kPa):	290

TM	February 9, 2012	M. SANIN	April 15, 2012
TESTED BY	DATE	CHECKED BY	DATE

PARTICLE SIZE ANALYSIS OF SOILS

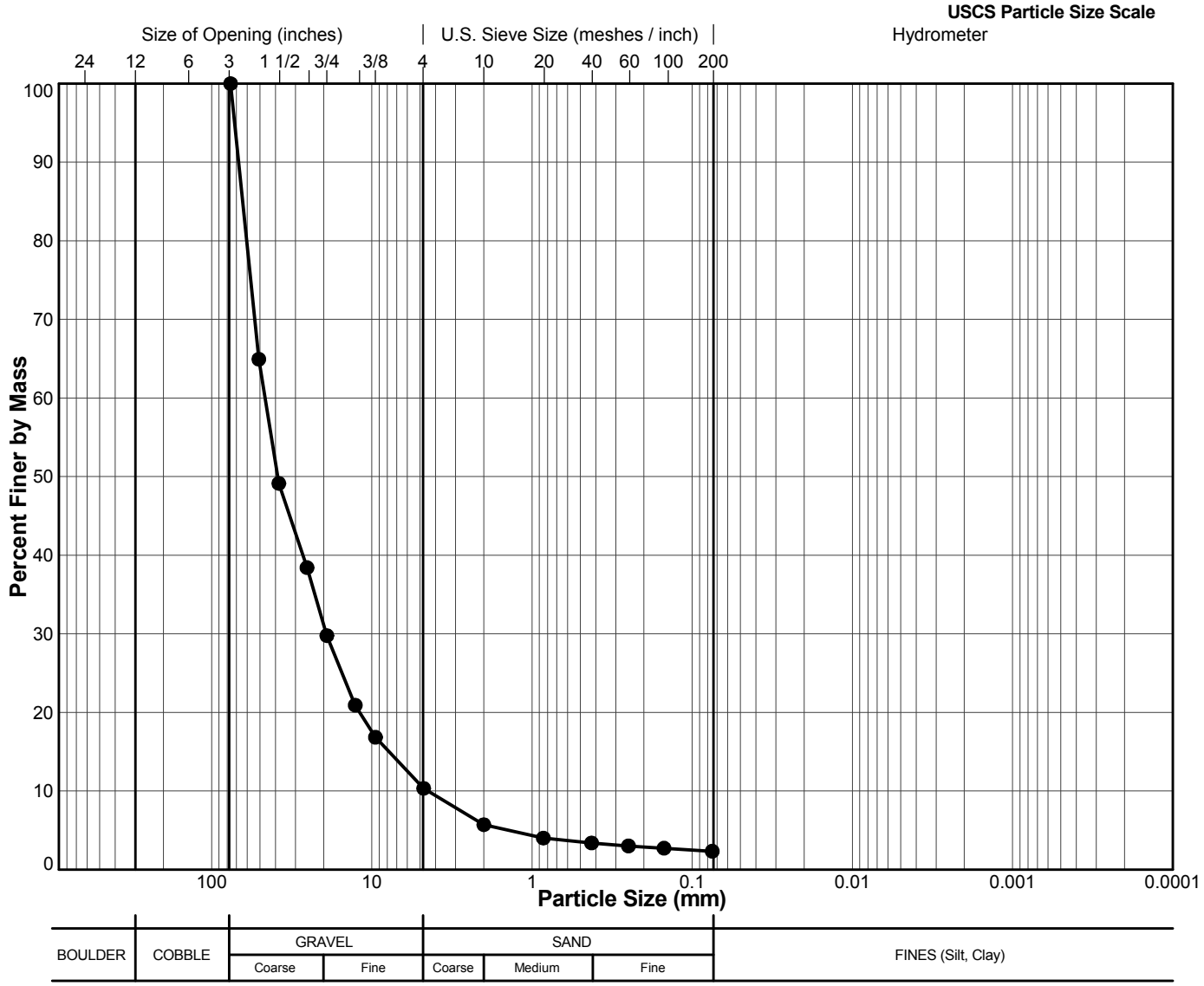
Reference(s)
ASTM D 422-63 (2007)

Client: Tetra Tech	**ID: Section 5 Weathered Rock**
Project: Aggregate Testing	**Sample No.: N/A**
Location: Eagle Gold, Yukon	**Depth Interval (m):** N/A
Project No.: 11-1415-0013 **Phase:** 1000	**Lab Schedule No.:** 211

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 76.2	

Method: Split, Washed



SK	**12/15/2011**	**LP**	**12/21/2011**
Tech	Date	Checked	Date

File:N:\BUR-GRAPHICS\PROJECTS\2011\1416\11-1415-0013\11-1415-0013 PHASE 1000\11-1415-0013 PHASE 1000.GPJ Output Form: _LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB ebarnes 09/13/12

Golder Associates Ltd.
500 - 4260 Still Creek Drive Burnaby, British Columbia V5C 6C6
Tel: (604) 296 4200 Fax: (604) 298 5253 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Golder Associates Ltd. - Burnaby Laboratory
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C8

POINT LOAD STRENGTH INDEX TEST

Reference
ASTM D5731 - 08

Project No	11-1415-0013/1000	Sch. #	211
Client	Tetra Tech	Machine ID	BUR010024
Project	Aggregate Testing		
Location	Eagle Gold, Yukon		

Lump Test

Test #	Borehole No.	Sa#	Depth m	D mm	W mm	Guage Reading kN	Load P MN	$D_e^2 = D^2$ mm^2	$I_s = P/D_e^2$ MPa	$F = (D_e/50)^{0.45}$	$I_{s(50)}$ MPa	Type	Direction	Remarks
1	Section 5	1	Combined	30.00	52.40	2.053	0.00205	900.0	2.28	0.795	**1.81**	L	p	
2	Section 5	2	Combined	38.32	71.01	21.987	0.02199	1468.4	14.97	0.887	**13.28**	L	p	Sample was very strong - hard to cut into block shape
3	Section 5	3	Combined	31.19	51.98	4.253	0.00425	972.8	4.37	0.809	**3.54**	L	p	
4	Section 5	4	Combined	30.99	58.98	5.113	0.00511	960.4	5.32	0.806	**4.29**	L	p	
5	Section 5	5	Combined	39.69	59.61	5.130	0.00513	1575.3	3.26	0.901	**2.94**	L	p	
6	Section 5	6	Combined	32.81	48.90	2.289	0.00229	1076.5	2.13	0.827	**1.76**	L	p	
7	Section 5	7	Combined	32.62	69.34	1.428	0.00143	1064.1	1.34	0.825	**1.11**	L	p	
8	Section 5	8	Combined	48.39	61.74	1.48	0.00148	2341.4	0.63	0.985	**0.62**	L	\\	
9	Section 5	9	Combined	33.27	56.93	2.63	0.00263	1106.9	2.38	0.833	**1.98**	L	p	
10	Section 5	10	Combined	32.11	62.75	3.83	0.00383	1031.1	3.71	0.819	**3.04**	L	p	
11	Section 5	11	Combined	27.85	81.18	4.97	0.00497	775.6	6.41	0.768	**4.92**	L	\\	

$I_{s(50)}$ = Size Corrected Point Load Strength
$I_{s(50)} = FI_s$

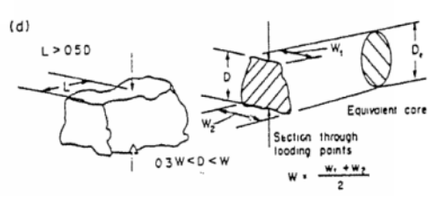
I_s = Uncorrected Point Load Strength
$I_s = P/D_e^2$

F = Size Correction Factor
$F = (D_e/50)^{0.45}$

D_e = equivalent core diameter (mm)
$D_e^2 = D^2$ (mm^2)

Direction
\\ = parallel
p = perpendicular to planes of weakness

Lump Test



G. Patton	1/5/2012	LP	January 17,2012
Tested By	Date	Checked By	Date

Golder Associates Ltd. - Burnaby Lab
4280 Still Creek Drive
Burnaby, B.C. Canada V5C 6C6

Slake Durability of Shales and Similar Weak Rocks

Reference
ASTM D4644-08

Project No.:	11-1415-0013/1000	**Borehole:**	**Weathered Rock**
Project:	Aggregate Testing	**Sample Number:**	N/A
Location:	Eagle Gold, Yukon	**Depth (m):**	N/A
Client:	Tetra Tech	**Lab ID No:**	211

Test Results

I_{d1} = Slake Durability index after 1st Cycle	97.6	%
I_{d2} = Slake Durability index after 2nd Cycle	95.6	%
I_{d3} = Slake Durability index after 3rd Cycle	94.1	%

Initial Sample Description	Final Description of Fragments in Drum
10 irregular lumps of weathered rock	I_{d1} Type II - Retained pieces consists of large and small pieces
	I_{d2} Type II - Retained pieces consists of large and small pieces
	I_{d3} Type II - Retained pieces consists of large and small pieces

Temperature ° C		Calibration	
Max	**22.2**	Machine ID	BUR010002
Min	**18.1**	Drum ID	A
Average	**20.1**	Thermometer ID	FB61328

Comments

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



BEFORE



AFTER

G. Patton	December 19, 2011	LP	December 23,2011
TESTED BY	DATE	CHECKED BY	DATE

APPENDIX A-5
SEISMIC PEAK GROUND ACCELERATIONS FOR DESIGN, TETRA TECH, 2012

TETRA TECH

350 Indiana Street, Suite 500
Golden, CO 80401
Tel (303) 217-5700 **Fax** (303) 217-5705
www.tetratech.com

Technical Memorandum

To:	File	**From:**	Diana Cook, Dave Hallman
Company:	Victoria Gold Corp.	**Date:**	November 8, 2012
Re:	Dublin Gulch – Seismic Peak Ground Accelerations for Design	**Project #:**	114-201068x
CC:	Troy Meyer		

EXECUTIVE SUMMARY

This document provides a summary of the seismic hazard analysis performed for Victoria Gold Corporation's Dublin Gulch property. This seismic hazard analysis includes results from both deterministic and probabilistic methods. Deterministic analyses were performed using five equally weighted attenuation relationships to evaluate seismic hazard for the Dublin Gulch Property resulting from a maximum credible earthquake (MCE). An MCE, by definition, has no specific recurrence interval and is the largest reasonably conceivable earthquake that appears possible along a recognized fault or within a geographically defined tectonic province, under the presently known or presumed tectonic framework. Theoretically, no earthquake should occur which exceeds that of the MCE. A deterministic analysis therefore allows for a conservative approach to the determination of risks associated with identified seismic hazards. Data published by Natural Resources Canada (NRCAN) were used in the probabilistic analysis to estimate the probability of exceedance of peak ground accelerations (PGA) at the site for several return periods.

Tetra Tech recommends a design PGA of 0.35g for facilities requiring low-probability or MCE ground motions. This level of ground motion was estimated for an MCE of moment magnitude 6.0 for the background source area assuming this event occurs directly beneath the site at a depth of 6 km. For facilities requiring a PGA based on a return period of 2,475 years or less, the National Building Code of Canada (NBCC) values from Table 3 may be used. At present there is an insufficient level of understanding of the seismicity of the region to derive reliable estimates of ground motion levels for lower probability, longer return period events.

1.0 Introduction

This document provides a summary of a seismic hazard analysis for the Eagle Gold Project at Dublin Gulch, located approximately 85 km by road north of Mayo, and 20km northwest of Elsa in the Yukon Territory of Canada. For the purposes of this seismic hazard study, the site is assumed to be centered at 64.0^0 N Latitude and 135.9^0 W Longitude. Access to the site is by way of Silver Trail

Highway from Mayo, and South McQuesten River Road, which connects to the highway approximately 39 km northeast of Mayo. The purpose of this document is to provide ground motions that may be used in design procedures for facilities on the mine site. This updated seismic hazard analysis includes results from both deterministic and probabilistic analyses.

2.0 Tectonic Setting and Seismicity

Regionally, the site is contained within the northern Canadian Cordillera, which encompasses an area stretching between approximately Latitudes 55 to 70 N, and Longitudes 110 to 150 W (Figure 1). More specifically, the site is located in the Selwyn Basin and lies within the Tombstone Thrust and Robert Service Thrust fault zones (Figure 2), where more than 100 km of structural overlap was accommodated during the Cretaceous (Mair et al., 2006). Much of the mineralization present in the Selwyn Basin is due to collision-related deformation of the Yukon Tanana terrane onto the ancient continental margin before 100 million years ago (Ma), followed by the intrusion of granitic magma around 93 Ma. This new assembly experienced lateral displacement along the Tintina fault (located south of the site) during the Late Cretaceous (post-85 Ma). During recent geologic history, however, the Dublin Gulch area has generally been categorized as an area of low seismicity (Colpron, 2011), compared to other areas in Yukon Territory. These more seismically active areas include, but are not limited to, the Wernecke and Mackenzie Mountains to the east-northeast, the Ogilvie Mountains to the west-northwest, the Richardson Mountains to the north, and the Denali Fault zone to the southwest.

According to Natural Resources Canada (NRCAN), the northern Rocky Mountains region, which runs along the border of the Yukon and Northwestern Territory before extending westward, is one of the most seismically active areas in Canada. Earthquakes along the mountain front north and east of the Ogilvie, Wernecke, and Mackenzie Mountains, on the opposite side of these ranges from the Dublin Gulch site, are related to the northeastward push by the Yakutat microplate against the St. Elias Mountains in the south. Earthquakes are not nearly as common along the southern boundary of these ranges, closer to the site.

The largest earthquake recorded in the northern Rocky Mountains area was the magnitude 6.9 Nahanni earthquake that occurred on December 23, 1985 in the Mackenzie Mountains of the Northwest Territories, at a distance of approximately 622 km east of the site, according to available records. Other 6-plus magnitude earthquakes have occurred in the Richardson Mountains of the Yukon Territory and include: M=6.2 in May, 1940; M=6.5 in June, 1940, and M=6.6 in March, 1955.

3.0 Seismic Hazard Analysis

Seismic hazard analyses are typically conducted using one of two readily available methods: (1) deterministic analysis or (2) probabilistic analysis. Evaluating potential ground motions from an assumed earthquake, such as the maximum credible earthquake (MCE), along a known fault or seismogenic source zone, is a deterministic method. By definition, the MCE is the largest reasonably conceivable earthquake that can occur in conjunction with a seismic source given the current known tectonics of the region and has no specific return period or probability of occurrence. Evaluating ground motions from an MCE therefore requires a deterministic approach.

Probabilistic analyses are commonly used where the earthquakes occur in conjunction with known structures with known activity rates and in areas of diffuse historic seismicity where large regions of similar historic seismicity can be assigned characteristic ground motions based on the rate of historic earthquakes. This type of analysis results in probabilities of occurrence or non-exceedance versus time or return period. Both approaches were used in this study.

3.1 Deterministic Analysis

There are four key elements to performing deterministic seismic hazard analyses (DSHA) for use in project design, namely: (1) determination of seismogenic structures or seismogenic source zones; (2) definition of the associated characteristic earthquake magnitudes; (3) the distances between the project site and the seismogenic sources, and; (4) selection of an appropriate attenuation function(s) to represent the decay of earthquake ground motions with distance and estimate the ground motions at the project site. The following sections outline these key elements and discuss the assumptions and methodologies employed in determining each of these elements for the current study.

3.1.1 Earthquake Database

The deterministic seismic hazard analysis conducted for this study included a review of earthquake records from the Canadian National Earthquake Database (NEDB). A search of the NEDB was performed for a 150 km radius around a central Latitude and Longitude of 64.0^0 N and 135.9^0 W for Dublin Gulch (Figure 2). The search was initially restricted to earthquakes with moment magnitudes of 4 or greater, as magnitudes below this will have little impact on engineering works. Due to the historic, and even current, paucity of seismograph stations in the region, the database only includes earthquakes that have occurred since 1985.

The results of the earthquake search included local magnitude (M_L), short-wave body magnitude (m_b), and moment magnitude (M_w). These magnitude measurement scales are essentially equal for moment magnitudes of 6 or less (Idriss, 1985). They were therefore not converted to reflect the same magnitude scale. The search yielded 20 shallow earthquakes (18 km depth or less) that occurred within a 150 km radius, 17 between magnitudes 4 and 4.9, and three between magnitude 5 and 5.1. The two largest earthquakes in the 150 km record were located east and northeast of the site, at distances of 89 km and 148 km, respectively. These earthquakes were both magnitude 5.1, and occurred on November 25, 1997 and September 24, 2005 in the region of the Mackenzie Mountains.

3.1.2 Seismogenic Source Zones

Assessment of seismic hazards for the Eagle Gold site requires consideration of potential earthquake source zones, either identifiable seismogenic faults or larger areas with common seismogenic characteristics. Once source zones have been identified, maximum earthquakes can be assigned for each source zone. In the following sections, potential fault sources and source zones are identified. Considering that ground motions resulting from earthquakes with source-to-site distances greater than about 150 km are relatively small, the study area for the hazard assessment was restricted to those sources lying within 150 km of the project site.

Typically deterministic studies are restricted to assessing faults or source zones (large areas with common seismogenic characteristics) that have shown to or are suspected of having displaced Quaternary-age (less than approximately 1.8 million years) deposits, and are therefore generally considered "active." A site-specific search was conducted to identify all known faults near Dublin Gulch, using Geographic Information System (GIS) shapefiles provided through the Yukon Geological Survey. The search resulted in 3,145 individual fault listings within 150 km of the site. The majority of these faults do not appear to have been studied in detail, and few details are available concerning type, orientation, total length, or age. However, many of the individual fault segments are part of larger fault systems, which have been studied. Assuming that major faults capable of producing a significant earthquake would have been studied to some degree, the catalog of faults (Table 1) was restricted to named faults in the area, most of which can be tracked in a literature search. The faults listed in Table 1 are also included labeled in Figure 2. Table 1 includes the length of the longest individual fault segments and the closest distance to the site for each fault segment. However, there are no known faults in the Yukon Geologic Survey data base that exhibit Quaternary displacement within the study area. Maurice Colpron of the Yukon Geological Survey has also indicated that the Dublin Gulch area is not known to contain Quaternary-age faults (Personal Communication, 2011).

Table 1: Named Faults Near Dublin Gulch

FAULT ID	FAULT TYPE	FAULT NAME	LENGTH (km)	NEAREST DISTANCE TO SITE (km)
10666	Fault, defined, thrust, upright	CALLISON LAKE NORMAL FAULT	8.2	72.1
7568	Fault, defined, thrust, upright	CALLISON LAKE THRUST FAULT	26.4	62.6
7997	Fault, assumed, thrust, upright	DAWSON THRUST	216.5	44.2
7997	Fault, assumed, thrust, upright	DAWSON THRUST	126.5	114.3
8287	Fault, defined, normal/reverse	FOREST FAULT	15.0	109.5
13066	Fault, assumed, movement undefined	JOSEPHINE CREEK FAULT	10.1	53.7
11592	Fault, assumed, movement undefined	KATHLEEN LAKES FAULT	27.4	73.7
7792	Fault, defined, thrust, upright	LOWER LAKE CREEK THRUST	40.1	66.7
11707	Fault, assumed, thrust, upright	MOOSE LAKE THRUST	80.9	89.3
7542	Fault, defined, thrust, upright	NORTH FORK THRUST FAULT	68.3	123.2
11171	Fault, defined, thrust, upright	ROBERT SERVICE THRUST	398.2	15.2
13559	Fault, assumed, movement undefined	SIDESLIP LAKE FAULT	43.8	95.4
13665	Fault, approximate, normal/reverse	SPRAGUE CREEK FAULT	11.0	34.7
17536	Fault, assumed, movement undefined	TINTINA FAULT	820.2	82.5
13679	Fault, approximate, thrust, upright	TOMBSTONE STRAIN ZONE UPPER BOUNDARY	79.1	6.8
7604	Fault, assumed, thrust, upright	TOMBSTONE THRUST	113.8	16.1
7604	Fault, assumed, thrust, upright	TOMBSTONE THRUST	131.4	64.3
8273	Fault, defined, thrust, upright	UPPER LAKE CREEK THRUST	25	67.3
10298	Fault, assumed, thrust, upright	WERNICKE FAULT	36.8	129.4

The youngest known fault in the vicinity of the site which is large enough to generate a significant earthquake and strong ground motions appears to be the Tintina Fault, which is a major strike-slip fault that stretches from British Columbia to Alaska. This fault is estimated to have last moved during the Eocene epoch (approximately 54-36 Ma). However, Leonard, et. al. (2008) characterize the region as an area with low-level seismicity (up to M~5) and suggest that this fault no longer accommodates significant seismic deformation.

Other large historic faults in the area include the Dawson, Tombstone, and Roberts Service thrust faults, which are Cretaceous in age (approximately 141-65 Ma). Leonard et. al. (2008) suggest that seismicity in the region of these faults indicates reactivation of these structures to accommodate right-lateral transpression. Reactivation of these structures does not appear to have been substantiated through other sources, such as NRCAN. Reactivation of these structures in response to a right-lateral component of motion would also seem to require a shift in the seismotectonics of the region or the motion would be accommodated along the nearby right-lateral Tintina fault.

The remaining faults listed in Table 1 appear to be related to NE-SW collisional-deformation during the Cretaceous period. It must be emphasized that these structures were active during a very different seismogenic framework than exists in the area today, and they are therefore not included in the DSHA. While earthquakes have occurred in the area near Dublin Gulch in the recent past, they do not appear to be associated with specific geologic structures exhibiting offset or displacement at the ground surface.

A review of potential earthquake source zones in the project area, based on recent earthquake history and the existing seismogenic framework, confirms seismic activity related to movement associated with the nearby mountain ranges. Areas that show a concentration of earthquake activity (Figures 2 and 3) include the Wernecke and Ogilvie Mountains, as noted previously in Section 2.0. Similar source zones have been identified by others (e.g., Adams and Halchuk, 2003; Leonard et. al., 2008), though the interpretation of areal extents tends to differ. For purposes of the DSHA, the distance to these two source zones was assumed to approximately coincide with the base of the mountains at their nearest point to the site. This coincides with the edge of the Dawson Fault (Figure 3) for the Wernecke Mountains, and, for the Ogilvie Mountains, to a location northwest of the site which was chosen based on fault boundaries and the historic earthquake record.

A typical method for assigning a MCE to site-specific area sources is to add 0.5 to 1.0 magnitude to the maximum magnitude in the earthquake history (Coppersmith, 1991; McGuire, 1993), which would result in a MCE value of approximately magnitude 6.0. However, due to the short span of the earthquake history, and considering the earthquake magnitudes on a regional scale (Section 2.0), a magnitude of 7.0 was assigned to these two source zones. This is also consistent with the range of values used by NRCAN in the development of Canada seismic hazard maps (Adams and Halchuk, 2003) and the largest of the 1985 Nahanni NWT earthquakes (M=6.9).

A background source zone was also considered in the DSHA to account for the diffuse low magnitude events recorded within the Selwyn Basin. The MCE for this background source zone was assumed to be equal to approximately 1.0 magnitude larger than the maximum magnitude event in the historic earthquake data for the basin (Coppersmith, 1991; McGuire, 1993), which equates to a magnitude 6.0 for the MCE. In addition, the PGA for the background source zone was calculated assuming the corresponding earthquake occurs directly above the site, at a depth of 6 km.

The source zones and associated MCE's adopted in this DSHA are summarized below:

- Wernecke Mountains Source Zone, M = 7.0, Epicentral Distance (D) = 50 km
- Ogilvie Mountains Source Zone, M = 7.0, D = 30 km
- Background Source Zone, M = 6.0, D = 6 km

3.1.3 Attenuation Relations

Seismic hazard analyses require an attenuation relationship to represent the decay of earthquake ground motions with distance, or a combination of weighted attenuation relationships, in order to produce estimated ground motions for use in project design. Most recently published applicable attenuation relationships are based on a database of worldwide strong motion recordings provided by the Pacific Earthquake Engineering Research (PEER) Center for their Next Generation Attenuation (NGA) project. In general, these world-wide strong ground motion prediction equations (GMPE) are considered applicable to western North America and other tectonically active regions that experience shallow crustal faulting (Campbell and Bozorgnia, 2007). As noted by Adams and Halchuk (2003), "eastern and western Canada must be treated slightly differently because of the different properties of the crust." GMPE for western strong ground motions were therefore used by Adams and Halchuk (2003) for the 2005 NRCAN seismic hazard mapping project, and Adams (2011) states that the new generation of NBCC maps will "certainly include GMPEs derived by the NGA project for western North American crustal earthquakes." In addition, since alternate GMPE will provide a range in predicted ground motions, and include various levels of uncertainty in and of themselves, choosing just one will create bias in the predicted ground motions. An equally weighted average of the GMPE encompassed by the NGA project was therefore used to estimate anticipated ground motions at the Dublin Gulch Property, given its location within the North American Cordillera.

The NGA project supported five teams in the development of new empirical ground motion models for the estimation of peak ground accelerations and 5%-damped pseudo-acceleration response spectra. Each team was given access to the same database and a set of criteria dictating the limiting parameters of the final product, but otherwise the researchers were allowed to make their own interpretations. The five NGA model development teams included Abrahamson and Silva (2008); Boore and Atkinson (2008); Campbell and Bozorgnia (2008); Chiou and Youngs (2008); and Idriss (2008). In general, the NGA models provide median and aleatory uncertainty values for peak ground acceleration (PGA), peak ground velocity (PGV), peak ground displacement (PGD), and response spectral acceleration (PSA) and displacement (SD) for oscillator periods ranging from 0.01 to 10.0 seconds. The models are valid for earthquake magnitudes ranging from 4.0 to 8.0, and distances ranging from 0 to 200 km. A Microsoft Excel spreadsheet published by Dr. Linda Al Atik in September, 2009, includes the five NGA attenuation models and allows for the calculation of averages weighted at the user's discretion. The spreadsheet is available through the PEER website (http://peer.berkeley.edu/ngawest/index.html) and, according to Dr. Atik, has been compared with success to other calculation files (Al Atik, Linda, 2010).

3.1.4 Attenuation Model Input

The NGA spreadsheet requires earthquake magnitude and specific fault parameters be input, namely geometry-related values such as: site-to-source distances, fault rupture depth, fault rupture

width, and dip of rupture plane; depths to 1.0 km/s and 2.5 km/s shear wave velocity horizons; average shear wave velocity in the upper 30 m of the foundation materials (V_{s30}); sense of fault movement (i.e., normal, reverse, strike-slip, or unspecified); and, whether the site lies on the hanging wall (hanging wall factor) or foot wall, in the case of normal or reverse faults. This last factor is meant to account for the fact that ground motions on the hanging wall are typically higher than those observed on the footwall of a fault.

According to Cassidy et al. (2005), large earthquakes that have occurred in the Mackenzie Mountains are generally shallow thrust faults that often do not have a surface expression. This is assumed to be the case for earthquakes in the Dublin Gulch region in general, based on the tectonic framework of the area and the northeasterly movement of the Yukatat microplate, though Ristau et. al. (2007) note that strike-slip mechanisms are also important in this area. All source zones were modeled assuming movement on a thrust fault dipping to the south/southwest. This is a conservative assumption, as this puts the Dublin Gulch Property on the hanging wall for the area source zones, which results in higher ground motions. In addition, a shallow dip of 30 degrees and a depth of 6 km were assumed, based on the earthquake history and the gentle to moderate dip described for historic shallow thrust faults in the area (Mair et al., 2006). Within the likely range of possible orientation and depth, these assumptions also place the sources closer to the site and result in higher ground motions.

Empirical relationships presented by Wells and Coppersmith (1994), which relate segment lengths to magnitude, and magnitude to rupture area, were used to back-calculate segment lengths, and then, based on the segment lengths, estimate rupture widths. Depths to 1.0 km/s and 2.5 km/s shear wave velocity horizons are not known, but as this is the expected case for most sites, default values of 24.5 to 35.8 m and 65 m, respectively (based on typical crustal properties) are provided by the NGA models, which were then used for the Dublin Gulch Property. The average shear wave velocity in the upper 30 m of the foundation (V_{s30}) was assumed to be 750 m/s, a typical value for the National Building Code of Canada (NBCC) “firm ground” soil class C, which includes dense soils and soft rock.

3.1.5 Notes on Deterministic Model Conservatism

Conservative assumptions for this portion of the study mainly relate to magnitude and source orientation, and the method of analysis itself (deterministic using the MCE). MCE events are the largest possible earthquake that could reasonably be associated with a seismogenic structure under the presently known or presumed tectonic framework, with no consideration given to the probability that such an event will occur. The MCE is also conservatively assumed to occur at the closest point of the source zone to the project site. Theoretically, no earthquake should occur which exceeds that of the MCE.

The value used for shear wave velocity in the upper 30 m of the foundation was based on a regional average used in the NBCC. Considering the shallow depth to bedrock at the site, the actual value may well be higher, which would lead to a lower anticipated PGA. However, raising it to 1100 m/s (i.e., rock), only reduces the PGA by 0.01g to 0.03g from the PGA values reported (Table 2).

3.1.6 Deterministic Peak Ground Accelerations

A primary result of deterministic seismic hazard analysis is an estimate of peak ground acceleration (PGA) that can be expected at the site given the various geological and seismological parameters of the region. Table 2 presents a comparison of PGA estimates for the two sources expected to contribute the greatest potential ground motions within the 150 km radius of the Eagle Gold property. All PGA estimates presented in Table 2 reflect an average value derived from applying equal weights to the 2008 NGA models discussed previously.

Table 2: Deterministic Peak Ground Acceleration Estimates for Dublin Gulch

Seismic Source	Distance from Site (km)	MCE	PGA (g)
Wernecke Mountains Source Zone	50	7.0	0.15
Ogilvie Mountains Source Zone	30	7.0	0.31
Background Source Zone	6	6.0	0.35

3.2 Probabilistic Analysis

A consequence of deterministic analyses is that there is no consideration of probability or risk associated with the identified hazards. Ground motions associated with MCE are discrete values, whereas ground motions derived from probabilistic analyses, by definition, have likelihoods of occurrence associated with them. For instance, interpolation of the NRCAN 2005 National Building Code of Canada Seismic Hazard data indicates a ground motion of 0.14g at Dublin Gulch (Table 3) has a 10 percent chance of exceedance in 50 years. This equates to a risk of an earthquake occurring that exceeds 0.14g approximately every 475 years. A probabilistic analysis is included in order to assist Victoria Gold Corp. with quantification of the risks associated with seismic hazards at the Eagle Gold property.

The probabilistic analysis was conducted using the NRCAN 2005 National Building Code Seismic Hazard website (http://earthquakescanada.nrcan.gc.ca/hazard-alea/interpolat/index-eng.php) to determine the peak horizontal ground acceleration (PGA) for various return periods. The website is a tool developed by NRCAN to calculate probabilistic response spectra with different hazard levels for spectral periods up to 2.0 seconds at any location (the equivalent spectral response period for peak ground acceleration is 0.0 seconds). The on-line calculator uses an average shear wave velocity in the upper 30 meters (V_{s30}) that corresponds to NBCC 2005 soil class C (360-750 m/s). The peak ground accelerations for 10%, 5%, and 2% probabilities of exceedance in 50 years were calculated using the on-line calculator, and are shown in Table 3.

Table 3: Probabilistic Ground Motions for Dublin Gulch
NRCAN 2005 National Building Code of Canada Seismic Hazard Interpolation

Probability of Exceedance in 50 years (%)	Approximate Equivalent Return Period (yrs)	PGA (g)
10%	475	0.14
5%	975	0.18
2%	2475	0.25

4.0 Discussion

The design PGA should be chosen based on regulatory requirements and the level of tenable risk to the project. The Yukon Water Board Licensing Guidelines reference use of the MCE, but also defer to the 2007 Canadian Dam Association (CDA) guidelines for water management structures. Table 6-1 of the CDA guidelines provides a list of suggested earthquake design levels based on annual exceedance probabilities. Two points related to this table should be noted prior to its application in regards to the ground motions provided in this document.

First, though some of the CDA hazard classifications recommend the use of low-probability ground motions, (e.g., 1 in 5,000, or 1 in 10,000-yr event ground motions), PGA corresponding to events with lower probabilities, or return periods longer than the 1 in 2,475 event, are not available through NRCAN, as these low-probability values are beyond the intended purpose of the NBCC models (Personal Communication with Stephen Halchuck, 2011). While NRCAN provides some guidance for extrapolating low-probability ground motions (http://www.earthquakescanada.nrcan.gc.ca/hazard-alea/interpolat/lowprobability-eng.php) they emphasize that low-probability values extrapolated from their models can be given little credence, as the extrapolation is not constrained by the current tectonic environment, and should only be used as a screening tool to determine if a site-specific seismic hazard assessment is warranted. The site specific hazard study has shown that there is a very short earthquake history for the area. In particular, there have been very few earthquakes large enough to formulate a meaningful site-specific earthquake recurrence forecast model, which would be required to perform a site-specific probabilistic analysis that would significantly improve upon values established by NRCAN. We therefore recommend that a deterministic PGA be used for low-probability ground motions suggested by the CDA, as the 2007 CDA guidelines also specifically note that deterministic methods have “generally been very successful” and “remain essential methods of dam safety management”.

Second, the CDA guidelines recommend the use of mean (rather than median) ground motions. However, all of the values reported in this document are median values. In general, the 2007 CDA guidelines state that the ground motion values for each hazard classification should conform to societal norms of acceptable risk. Use of median values rather than mean values is considered justifiable for the purposes of the SHA for several reasons. Published GMPE typically provide median spectral accelerations rather than mean spectral accelerations; calculation of mean values generally requires coefficients which are not included in the published models. In addition, median values were chosen for the NBCC because “it is a robust parameter and can be expected to remain stable

as the range of scientific opinion changes" (Adams et. al., 2000). This was supported by the Canadian National Committee on Earthquake Engineering (CANCEE), as the mean is affected by uncertainty; uncertainty that was considered too incomplete to adopt into the code (Adams and Atkinson, 2003). In addition, Adams and Atkinson (2003) note:

"As a certain conservative bias has been included in the hazard model, particularly through the definition of upper and lower bound values, it is anticipated that the estimated median values presented here may actually lie between the true median and the true mean hazard values. Thus, as improved knowledge about epistemic uncertainty is incorporated into the analysis, a future change to using mean values may not be a large one."

5.0 Conclusions and Recommendations

This memorandum provides a summary of a seismic hazard analysis performed for Victoria Gold Corporation's Eagle Gold project, located near Dublin Gulch in the Yukon Territory, Canada. Peak ground accelerations were developed for both deterministic analyses and probabilistic analyses. A Microsoft Excel spreadsheet that applies a weighted average to five attenuation relationships developed through the PEER NGA project was used for the deterministic analyses, while data published by NRCAN was used to determine probabilistic site ground motions and their corresponding probabilities of occurrence. These results are summarized in Tables 2 and 3.

Tetra Tech recommends a design PGA of 0.35g for facilities requiring low-probability or MCE ground motions, as determined using an MCE of moment magnitude 6.0. For facilities requiring a PGA based on a return period of 2,475 years or less, the NBCC values from Table 3 should be used.

It is worth noting here that, if the Roberts Service Thrust or Tombstone Thrust faults become reactivated, the MCE PGA is likely to be larger than has been estimated in this SHA, based on the distances and fault lengths listed in Table 1. In the event that additional studies pertaining to these faults become available, and/or additional earthquake events occur, that provide new information, Tetra Tech recommends that the ground motions contained in this study be re-evaluated.

6.0 References

Adams, J., 2011, Seismic Hazard Maps for the National Building Code of Canada, CSCE 2011 General Conference, June 14-17, 2011, Ottawa, Ontario.

Adams, J., and Atkinson, G.M., 2003, Development of Seismic Hazard Maps for the 2005 National Building Code of Canada. Canadian Journal of Civil Engineering, April 2003.

Adams, J., and Halchuk, S., 2003, Fourth generation seismic hazard maps of Canada: Values for over 650 Canadian localities intended for the 2005 National Building Code of Canada. Geological Survey of Canada Open File 4459.

Adams., J., Halchuk, S., and Weichert, D.H., 2000, Lower probability hazard, better performance? Understanding the shape of the hazard curves from Canada's fourth generation seismic hazard results, Proceedings of the 12th World Conference on Earthquake Engineering, 30 Jan. – 4 Feb. 2000, Auckland, New Zealand.

Abrahamson, N. A. and W. J. Silva, 2008, Summary of the Abrahamson and Silva NGA Ground-Motion Relations, Earthquake Spectra, 24: 67-97.

Al Atik, Linda, 2010, University of California, Berkeley, personal communication.

Boore, David M. and Atkinson, Gail M., 2008, Ground-Motion Prediction Equations for the Average Horizontal Component of PGA, PGV, and 5%-Damped PSA at Spectral Periods between 0.01 s and 10.0 s, Earthquake Spectra, 24: 99-138.

Canadian Dam Association, 2007, Dam Safety Guidelines.

Cassidy, John F., Rogers, Garry C., and Ristau, J., 2005, Seismicity in the vicinity of the SNORCLE corridors of the northern Canadian Cordillera, Canadian Journal of Earth Science, 42: 1137-1148.

Campbell, Kenneth W. and Bozorgnia, Yousef, 2007, Campbell-Bozorgnia NGA Ground Motion Relations for the Geometric Mean Horizontal Component of Peak and Spectral Ground Motion Parameters, Prepared for the Pacific Earthquake Engineering Research Center, University of California, Berkeley, PEER Report 2007/02.

Campbell, Kenneth W. and Bozorgnia, Yousef, 2008, NGA Ground Motion Model for the Geometric Mean Horizontal Component of PGA, PGV, PGD and 5% Damped Linear Elastic Response Spectra for Periods Ranging from 0.01 to 10.0 s, Earthquake Spectra, 24: 139-172.

Chiou, Brian S.J. and Youngs, Robert R., 2008, An NGA Model for the Average Horizontal Component of Peak Ground Motion and Response Spectra, Earthquake Spectra, 24: 173-216.

Colpron, Maurice, 2011, Yukon Geological Survey, personal communication.

Coppersmith, K. J., 1991, Seismic Source Characterization for Engineering Seismic Hazard Analysis, Proceedings of the Fourth International Conference on Seismic *Zonation*, Vol. 1, August 25-29, 1991, Stanford,CA, Earthquake Engineering Research Institute, Oakland, CA, pp. 3-60.

Halchuk, Stephen, 2011, Natural Resources Canada, personal communication.

Idriss, I. M., 1985, Evaluating seismic risk in engineering practice, Proceedings of the 11th International Conference of Soil Mechanics and Foundation Engineering, San Francisco, CA, Vol. 1, pp. 255-320.

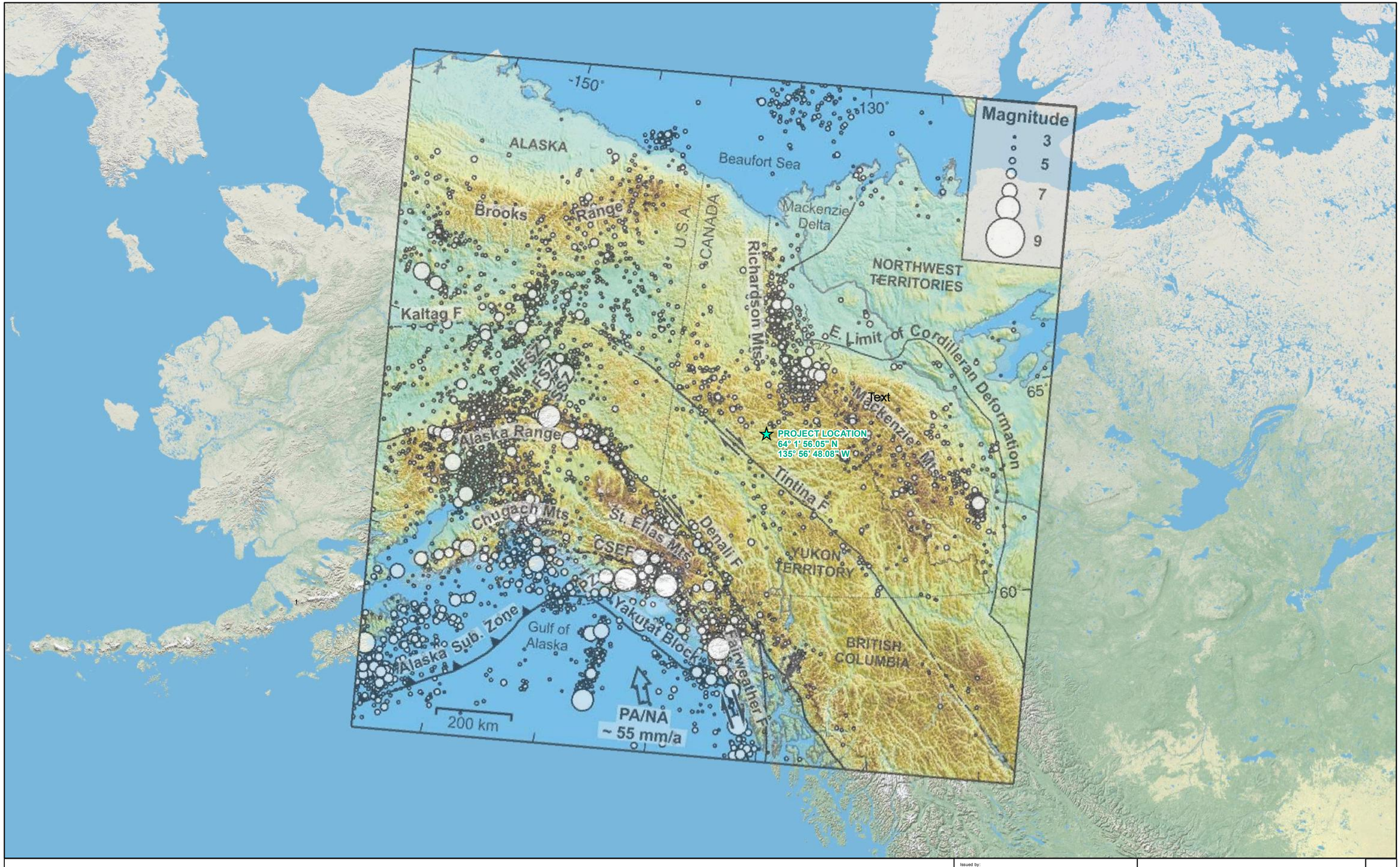
Idriss, I.M., 2008, An NGA Empirical Model for Estimating the Horizontal Spectral Values Generated By Shallow Crustal Earthquakes, Earthquake Spectra, 24: 217-242.

Leonard, L.J., Mazzotti, S., and Hyndman, R.D., 2008, Deformation rates estimated from earthquakes in the northern Cordillera of Canada and eastern Alaska, Journal of Geophysical Research, Vol. 113, B08406, doi: 10.1029/2007JB005456.

Mair, John L., Hart, Craig J.R., Stephens, Julian R., 2006, Deformation history of the northwestern Selwyn Basin, Yukon, Canada: Implications for orogen evolution and mid-Cretaceous magmatism, Geological Society of America Bulletin, 118: 304-323.

Ristau, J., G. C. Rogers, and J. F. Cassidy, 2007, Stress in western Canada from regional moment tensor analysis, Can. J. Earth Sci., 44, 127–148.

Wells, D.L., and Coppersmith, K.J., 1994, New Empirical Relationships among Magnitude, Rupture Length, Rupture Width, Rupture Area, and Surface Displacement: Bulletin of the Seismological Society of America, Vol. 84, No. 4, pp 974-1002.



Tectonic setting of the northern Canadian Cordillera. Pacific plate motion relative to North America plate; CSEF: Chugach–St. Elias fault system; PZ: Pamplona zone; MFSZ, FSZ, and SSZ: Minto Flats, Fairbanks, and Salcha seismic zones, respectively. Insert is modified from Leonard et. al., 2008.

N

INSET NOT TO SCALE

Issued by:

TETRA TECH

350 Indiana Street, Suite 500
Golden, Colorado 80401
(303) 217-5700 (303) 217-5705 fax

TECTONIC SETTING OF THE DUBLIN GULCH PROJECT AREA

A

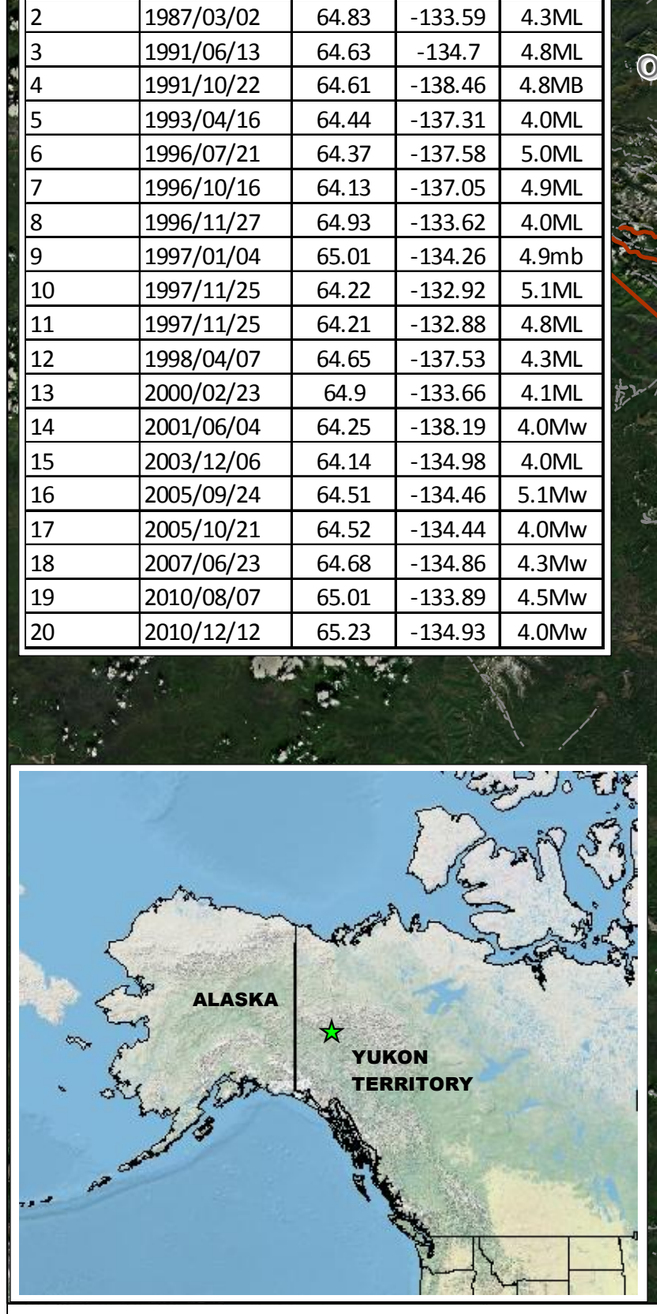
Project: EAGLE GOLD | Project no.: 114-201068x

Location: YUKON TERRITORY | Date: 11/2012

FIGURE 1

T:\GIS\TEMPORARY\Dublin_Gulch\mxds\DublinGulch_Seismic_Fig1.mxd November, 2012: sharon.reynolds

Dublin Gulch Earthquake Catalog				
Point ID	Date	Lat	Long	Mag
1	1985/08/09	64.32	-135.01	4.0ML
2	1987/03/02	64.83	-133.59	4.3ML
3	1991/06/13	64.63	-134.7	4.8ML
4	1991/10/22	64.61	-138.46	4.8MB
5	1993/04/16	64.44	-137.31	4.0ML
6	1996/07/21	64.37	-137.58	5.0ML
7	1996/10/16	64.13	-137.05	4.9ML
8	1996/11/27	64.93	-133.62	4.0ML
9	1997/01/04	65.01	-134.26	4.9mb
10	1997/11/25	64.22	-132.92	5.1ML
11	1997/11/25	64.21	-132.88	4.8ML
12	1998/04/07	64.65	-137.53	4.3ML
13	2000/02/23	64.9	-133.66	4.1ML
14	2001/06/04	64.25	-138.19	4.0Mw
15	2003/12/06	64.14	-134.98	4.0ML
16	2005/09/24	64.51	-134.46	5.1Mw
17	2005/10/21	64.52	-134.44	4.0Mw
18	2007/06/23	64.68	-134.86	4.3Mw
19	2010/08/07	65.01	-133.89	4.5Mw
20	2010/12/12	65.23	-134.93	4.0Mw



OGILVIE MOUNTAINS
MACKENZIE MOUNTAINS
WERNECKE MOUNTAINS
SELWYN BASIN
FOREST FAULT
WERNICKE FAULT
DAWSON THRUST FAULT
NORTH FORK THRUST FAULT
CALLISON LAKE THRUST FAULT
LOWER LAKE CREEK THRUST
UPPER LAKE CREEK THRUST
TOMBSTONE THRUST
ROBERT SERVICE THRUST FAULT
KATHLEEN LAKES FAULT
Tintina Fault
64° 1' 56.05" N
135° 56' 48.08" W
TOMBSTONE STRAIN ZONE UPPER BOUNDARY
SPRAGUE CREEK FAULT
Tombstone Thrust?
Moose Lake Thrust
Sideslip Lake Fault

EARTHQUAKE MAGNITUDE
4.0 - 4.9
5.0 - 5.9
Named Faults
Other Faults
Dublin Gulch Area of Interest (AOI)
AOI 150km Buffer

Source: (1) Yukon Geological Survey – http://www.geology.gov.yk.ca/databases_gis.html (2) Earthquakes Canada Online Bulletin – http://earthquakescanada.nrcan.gc.ca/stnsdata/

N

SCALE IN KILOMETERS
0 25 50

Issued by:
TETRA TECH
350 Indiana Street, Suite 500
Golden, Colorado 80401
(303) 217-5700 (303) 217-5705 fax

DUBLIN GULCH – FAULTS & EARTHQUAKE DATA

Project: EAGLE GOLD
Project no.: 114-201068x
Location: YUKON TERRITORY
Date: 11/2012

FIGURE 2

T:\GIS\TEMPORARY\Dublin_Gulch\mxds\DublinGulch_Seismic_Fig2.mxd November, 2012: sharon.reynolds

OGILVIE MOUNTAINS

MACKENZIE MOUNTAINS

WERNECKE MOUNTAINS

SELWYN BASIN

DAWSON THRUST FAULT

NORTH FORK THRUST FAULT

CALLISON LAKE THRUST FAULT

LOWER LAKE CREEK THRUST

TOMBSTONE THRUST

UPPER LAKE CREEK THRUST

ROBERT SERVICE THRUST FAULT

DAWSON THRUST FAULT

TOMBSTONE THRUST

ROBERT SERVICE THRUST FAULT

Tintina Fault

FOREST FAULT

WERNICKE FAULT

KATHLEEN LAKES FAULT

64° 1' 56.05" N
135° 56' 48.08" W

TOMBSTONE STRAIN ZONE UPPER BOUNDARY

ROBERT SERVICE THRUST FAULT

SPRAGUE CREEK FAULT

ROBERT SERVICE THRUST FAULT

Tombstone Thrust?

Tintina Fault

Moose Lake Thrust

Sideslip Lake Fault

ALASKA

YUKON TERRITORY

EARTHQUAKE MAGNITUDE[2]

- 5.0–5.9
- 4.0–4.9
- 3.0–3.9
- 2.0–2.9
- 1.0–1.9

Dublin Gulch
Area of Interest (AOI)

Area Source Zones

Ogilve Mountains Source

Wernecke Mountains Source

Named Faults

Other Faults

AOI 150km Buffer

Source: (1) Yukon Geological Survey – http://www.geology.gov.yk.ca/databases_gis.html
(2) Earthquakes Canada Online Bulletin – http://earthquakescanada.nrcan.gc.ca/stnsdata/

N

SCALE IN KILOMETERS

0 25 50

Issued by:

TETRA TECH
350 Indiana Street, Suite 500
Golden, Colorado 80401
(303) 217-5700 (303) 217-5705 fax

DUBLIN GULCH AREA SOURCES AND EARTHQUAKE DATA

A

Project: EAGLE GOLD

Project no.: 114-201068x

Location: YUKON TERRITORY

Date: 11/2012

FIGURE 3

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 500 - 980 Howe Street, Vancouver, BC Canada V6Z 0C8
Telephone (604) 684-5900 Fax (604) 684-5909

Project Memorandum

To:	**File**		
		cc:	**Troy Meyer**
From:	**Pascal Szeftel**	**Date:**	**October 2, 2017**
Subject:	**Appendix B – In-Heap Pond Spillway Analysis**		
Project No.:	**0792018**		

1.0 INTRODUCTION

This memorandum details the assumptions and methods used in the analysis of the In-Heap Pond spillway channel (Spillway Channel) completed for the proposed Heap Leach Facility (HLF) at StrataGold Corporation's (SGC) Eagle Gold Project located in Yukon Territory, Canada. SGC is a directly held, wholly owned subsidiary of Victoria Gold Corp. The In-Heap Pond will be formed by the HLF confining embankment and will contain Pregnant Leach Solution (PLS) and stormwater runoff. The Event Pond will be located downstream of the HLF and will store the PLS and stormwater runoff volume exceeding the storage capacity of the In-Heap Pond. The Spillway Channel will convey flows between the In-Heap Pond and the Event Pond.

2.0 DESIGN CRITERIA AND ASSUMPTIONS

2.1. Design Flood Event

The use of the Probable Maximum Flood (PMF) event as design basis was prescribed by the Yukon Water Board and is one of the Terms and Conditions of SGC's current permit. In the present study, the PMF flow was derived from an updated hydrologic model (see Section 3.0), taking as input the 24-hour Probable Maximum Precipitation (PMP) event of 256 mm (Knight Piésold 2013).

2.2. Peak Flow Attenuation

For sizing the spillway, the In-Heap Pond was considered to be full at the onset of the design storm. Therefore, no attenuation of the incoming peak flow was assumed due to storage within the In-Heap Pond.

2.3. Design Phase

The spillways were sized assuming Phase 1 of the pads was constructed, the pad was loaded with ore to the elevation of the spillway invert, and future pad phases were being cleared and grubbed for construction. The scenario also assumed that the loaded ore was completely saturated and that the Phase 1 temporary interceptor channel would be overtopped when the design storm event occurs.

3.0 HYDROLOGIC MODELLING

3.1. Hydrologic Model

A hydrologic modelling approach was adopted to estimate peak runoff routed through the spillway channel in response to the PMP. The hydrologic analysis uses physical characteristics of the HLF catchment, as well as a PMP hyetograph to calculate peak flows.

For this study, the Soil Conservation Service (SCS) storm hyetograph and curve number loss methods were implemented using the hydrologic modelling software HEC-HMS v4.2.1, developed by the U.S. Army Corps of Engineers.

Required inputs to the model for the SCS Type I Storm simulations include:

- A total precipitation amount (in mm) to generate the PMP hyetograph
- A runoff curve number (CN), which controls the partition between infiltration and runoff potential of a particular land use when exposed to a given storm event
- The potential maximum soil moisture retention (S, in mm), which is a function of CN
- The initial abstraction (I_a, in mm), defined as the initial amount of precipitation held by the soil before runoff can begin
- The lag time (T_L, in min), defined as the time required for runoff to travel from the most remote point of the watershed to the point of interest, which is approximately equal to 60% of the time of concentration (T_c).

3.2. Model Parameterization

Delineation of the HLF catchment resulted in an area of 0.972 km^2. The time of concentration of the HLF catchment was determined using the method presented by the BC Ministry of the Environment (BC MoE 1991), applied to this catchment area. The resulting T_c is 1.25 hours, equivalent to a T_L of 45 min. The HLF catchment was partitioned into a constructed and lined area (Phase 1 footprint) and a cleared area (Phases 2 and 3 footprints). A catchment-wide composite CN value of 70, reflective of both land covers (lined, and cleared and unlined) was chosen to model the partition between runoff and infiltration for the entire HLF catchment. An initial abstraction was not implemented to reflect the absence of storage capacity in the In-Heap Pond (See Section 2.2) and near-saturation of the HLF surface at the onset of the PMP storm. Parameterization of the HLF hydrologic model is summarized in Table B3-1.

Table B3-1. Parameters of the HEC-HMS hydrologic model of the HLF.

Parameter	Unit	Value
Design Storm Magnitude	mm	256
SCS Storm Hyetograph	Type	1
Catchment Area	km^2	0.972
Lag Time, T_L	min	45
Curve Number, CN	-	70
Initial Retention	mm	0
Soil Moisture Retention, S	mm	4.3

3.3. Model Results

The simulated hydrograph is illustrated in Figure B3-1. The resulting peak flow at the outlet of the In-Heap Pond is 12.2 m^3/s.

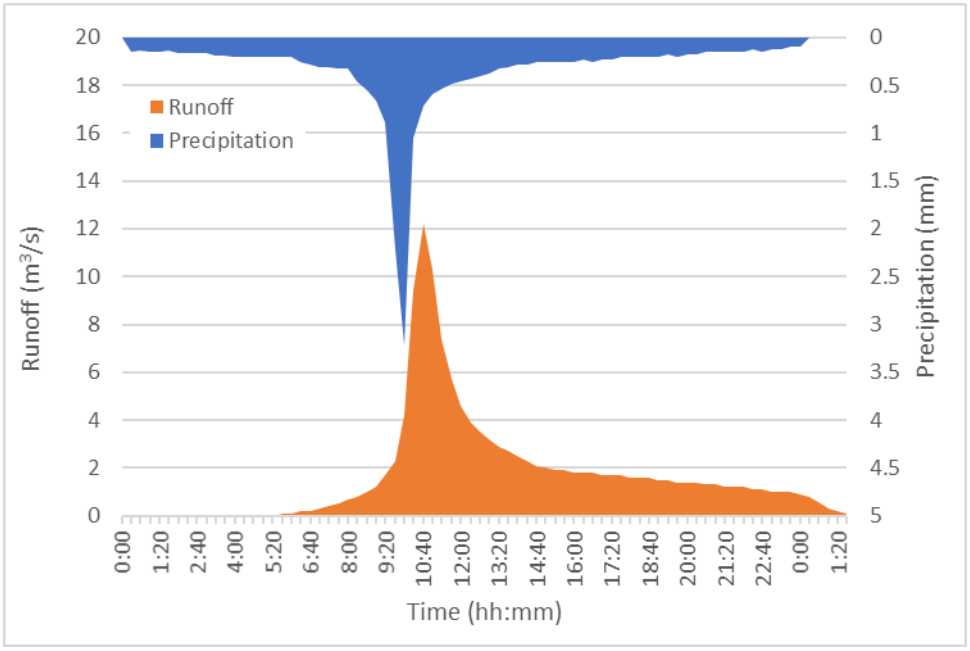


Figure B3-1. Simulated hydrograph at the outlet of the In-Heap Pond as a response to the 24-hr PMP storm.

4.0 SPILLWAY CHANNEL DESIGN

The Spillway Channel will route runoff from the In-Heap Pond (assumed to be full at the onset of the design storm) into the Event Pond. It is intended to remain dry under normal In-Heap Pond operations and only convey runoff during large precipitation events. The outlet for the In-Heap Pond, and correspondingly the inlet structure for the Spillway Channel, is comprised of two side-by-side 1.5 m x 1.5 m concrete box culverts. Located against the right abutment of the embankment, their longitudinal gradients are 2%. The Spillway Channel will have a trapezoidal

cross section with a bottom width of 3.5 m and side slopes angled at 2.5H:1V (Drawing EGHLF-XD-08-01). The channel invert gradient will vary between 2% and 14% and will traverse cross-slope to minimize gradient and limit cut and fill. The Spillway Channel will follow a 20-m radius bend prior to discharging into the Event Pond. The outlet of the Spillway Channel will consist of a trapezoidal drivable swale with a bottom width of 3.5 m and side slopes angled at 25% (4H:1V) (Drawing EGHLF-XD-07-04). Several revetment options were considered and their effect on flow dynamics evaluated. Superelevation of the water surface in the bend immediately upstream of the Event Pond was also evaluated against the available freeboard.

4.1. Hydrodynamic Modelling

The HEC-RAS v4.1 hydrodynamic modelling software developed by the U.S. Army Corps of Engineers was adopted to route flows, up to the design flow event stated in Section 3.3, and estimate hydraulic parameters used in the design of the Spillway Channel.

4.2. Revetment Options

Three criteria were retained for the selection of revetment options in the Spillway Channel: imperviousness, resistance to erosion, and durability under severe weather conditions. Each revetment is characterized by a roughness which controls the partition between kinetic energy (flow velocity) and potential energy (water depth) for a given flow. HEC-RAS implements Manning's roughness coefficient *n*; therefore, the roughness of the various revetments was expressed as an *n* value in the following sections. Fabriform Filterpoint, Nuna Concrete Cloth, and Coletanche ES3 revetments were investigated. Key characteristics of these revetments are summarized in Table B4-1.

Table B4-1. Revetment characteristics.

Revetment	Type	Manning's roughness *n*
Fabriform Filterpoint	Concrete in a woven fabric envelope	0.025
Nuna Concrete Cloth	Cement impregnated fabric	0.012
Coletanche ES3	Bituminous membrane	0.012

4.3. Modelling Results

4.3.1. Overview

Flows ranging from 0.4 m^3/s to 12.2 m^3/s (PMF) were simulated to investigate a range of operational conditions. Modelling results for the PMF event are summarized in Table B4-2.

Table B4-2. Hydraulic modelling results.

		Manning's roughness *n*	
		0.012	**0.025**
Concrete Box Culverts (2)	Velocity (m/s)	6.5	N/A[1]
	Flow depth (m)	0.63	N/A[1]
Main Spillway Channel	Velocity (m/s)	6.7 - 11.3	4.2 - 6.9
	Flow depth (m)	0.24 - 0.4	0.4 - 0.6
Spillway Channel Outlet	Velocity (m/s)	9.7	4.7
	Flow depth (m)	0.27	0.5

1. Only a smooth concrete surface was considered for the concrete box culverts.

4.3.2. Main Channel Flow Hydraulics

Results indicate that the flow regime is supercritical along the entire length of the Spillway Channel for the range of flows investigated and the three revetment options considered. Although the three revetments considered in the study are suitable for use in the Spillway Channel, the Fabriform Filterpoint revetment is recommended as its use would result in decreased flow velocities.

Cavitation Potential

Cavitation potential was further evaluated given the range of simulated flow velocities. Cavitation has the potential to damage the revetment of the Spillway Channel and cause its failure. The potential for cavitation is a function of flow velocity and pressure at the interface between the flow and the revetment. This potential is best described by the cavitation index (σ):

$$\sigma = \frac{P - P_v}{\frac{\rho V^2}{2}}$$

where P and P_v are the pressure at the flow/revetment interface and the vapor pressure of water, respectively, V is the flow velocity and ρ, the density of water.

There is potential for cavitation damage for σ between 0.2 and 0.5 and up to 1.0 if large obstructions are introduced abruptly in the flow (e.g., baffles blocks, splitter walls).

The cavitation index was estimated for flow velocities up to 11.3 m/s, flow depths down to 0.2 m, temperatures up to 30°C (on which depends the vapor pressure of water), and for an average elevation of 900 masl. The cavitation index was found to be greater than 1.37 for all scenarios, which suggests that cavitation is not a concern for the design of the Spillway Channel.

4.3.3. Spillway Channel Outlet

Superelevation

The Spillway Channel outlet will be preceded by a 20-m radius bend to align the Spillway Channel with the road crossing and the embankment of the Event Pond (Drawing EGHLF-XD-08-01). Superelevation is expected along the outside (right) bank of the Spillway Channel. For a trapezoidal cross section and under rapid flow conditions, superelevation *Δy* can be approximated as follows:

$$\Delta y = \frac{WV^2}{gr}$$

where Δy is the total water surface elevation relief between the inside and outside bend, *W* is the top width, *V* is the flow velocity, *r* is the bend radius, and *g* is the gravitational acceleration.

A superelevation above the average water depth ranging from 0.5 m to 0.7 m along the bend was estimated for a Manning roughness coefficient of 0.025 and for PMF conditions. The estimated maximum water depth along the outside bend resulting from adding the modelled water depth and the superelevation water depth is 1.1 m. It is recommended that the outside slope of the Spillway Channel bend be at least 1.5 m high to contain the PMF while still affording sufficient freeboard.

Drivable Swale

In the proposed configuration (trapezoidal cross section with a bottom width of 3.5 m, side slopes angled at 25% (4H:1V), and a 2% longitudinal gradient), the estimated water depth is 0.5 m under PMF conditions. Although the drivable swale will have minimal curvature, it will be located immediately downstream of the bend. Superelevation of the water surface is expected downstream of the bend until flow lines adjust to a straight alignment of the Spillway Channel. Superelevation at the drivable swale was estimated for PMF conditions, and based on a 20-m curvature radius. The resulting total water depth estimated at the drivable swale for PMF conditions is 1.1 m. It is recommended that the drivable swale be excavated to a depth of 1.5 m to safely convey the PMF while still affording sufficient freeboard.

4.3.4. Considerations for the Event Pond

The estimated flow velocity at the outlet of the Spillway Channel and fall height between the invert of the outlet and the bottom of the Event Pond are 4.7 m/s and 5 m, respectively. It is anticipated that a certain volume of water will be stored in the Event Pond when the PMF occurs. This volume of water will be the combination of direct precipitation onto the Event Pond during the PMP storm and runoff conveyed by the Spillway Channel during the rising limb of the hydrograph leading to the PMF (Figure B3-1) and it would help dissipate the energy produced by the PMF peak flow into the Event Pond. Therefore, engineered energy dissipation is not considered necessary.

5.0 CLOSURE

BGC Engineering Inc. (BGC) prepared this document for the account of StrataGold Corporation. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves all documents and drawings are submitted for the confidential information of our client for a specific project. That copy takes precedence over any other copy or reproduction of this document.

Yours sincerely,

BGC ENGINEERING INC.
per:

Pascal Szeftel, Ph.D.
Water Resources Specialist

Reviewed by:

Hamish Weatherly, M. Sc., P.Geo. (BC)
Principal Hydrologist

Engineers Yukon Permit to Practice
PP092 BGC Engineering Inc.

TM/HW/rm/pg

REFERENCES

BC Ministry of the Environment (BC MoE) 1991. Manual of Operational Hydrology in British Columbia. Second Edition. February 1991.

Knight Piésold Ltd. 2013. Hydrometeorology Report, Eagle Gold Project, VA101-290/6-8. August 30, 2013.

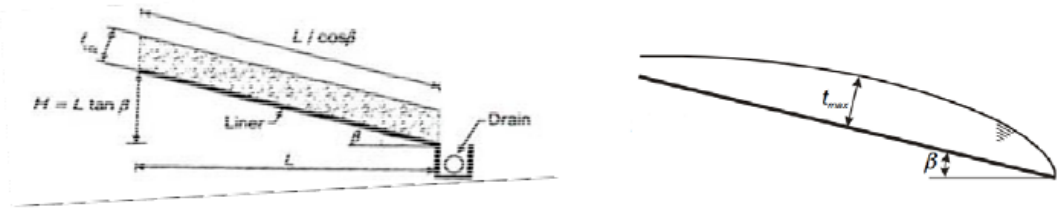
BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client:	StrataGold	Job No.:	792018
Subject:	Eagle Gold Heap Leach Facility	By:	TLM
Details:	PLS Pipe Spacing Calculations	Date:	10/2/2017

Primary Pipe Spacing [1]		
Units:	Metric	
Application Rate:	0.24	$m^3/day/m^2$
Maximum Desired Head on the Liner:	0.6	m
Hydraulic Conductivity:	17.3	m/day
Pipe Spacing:	12.4	m
Slope Between Pipes:	14.0	degrees
Pipe Spacing:	17.5	m
Slope Between Pipes:	22.0	degrees

Application Rate		
Application Rate:	0.0041	gpm/ft^2
	10.0	$l/hr/m^2$
	0.01	$m^3/hr/m^2$
	0.24	$m^3/day/m^2$
Hydraulic Conductivity [2]		
Hydraulic Conductivity:	0.020	cm/s
	56.7	ft/day
	17.3	m/day

Giroud's equation is shown graphically and mathematically (metric units) as follows:



$$t_{max} = j\frac{\sqrt{\tan^2\beta + 4q_h/k} - \tan\beta}{2\cos\beta}L$$

Where:
- ß = the basin slope between the pipes (degrees)
- q_h = the design rate of liquid supply over a horizontal surface in terms of an equivalent velocity (m/s)
- L = the drainage length of the lateral drain (m)
- K = the permeability of the lateral drain (m/s)
- t_{max} = the maximum head on the liner (m)
- j = the numerical modifying factor which depends on the basin slope (set equal to 1 for conservative solution)

Notes:

1) The slope of the HLF Pad basin generally varies from 14 to 22 degrees.

2) Specified permeability in the Overliner Drain Fill of 2 x 10^{-2} cm/s for a fully loaded scenario with a maximum design height.

Reference:

Giroud, J.P., Zornberg, J.G., & Zhao, A., (2000). Hydraulic design of geosynthetic and granular liquid collection layers. Geosynthetics International, Special Issue on Liquid Collection Systems, Vol. 7, Nos. 4-6, (pp. 285-380).

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client:	StrataGold	Job No.:	792018
Subject:	Eagle Gold Heap Leach Facility	By:	TLM
Details:	PLS Pipe Sizing (Capacity) Calculations	Date:	10/2/2017

PIPE TYPE: ADS N-12

Manning's n: 0.012 (ADS Drainage Handbook)
Pipe Slope (ft/ft): 0.100 Primary Drain Pipes

Nominal Pipe Diameter (mm)	Inside Pipe Diameter (mm) [1]	75% Flow (m^3/s) [2]	Flow Velocity (m/s) [2]
100	100	0.0161	2.56

PIPE TYPE: Solid Wall HDPE

Manning's n: 0.009 (ADS Drainage Handbook)
Pipe Slope (ft/ft): 0.130 Connect Collector & Header Drain Pipes

Nominal Pipe Diameter (mm)	Inside Pipe Diameter (mm) [1]	75% Flow (m^3/s) [2]	Flow Velocity (m/s) [2]
250 (DR11)	225	0.21	6.66

Manning's n: 0.009 (ADS Drainage Handbook)
Pipe Slope (ft/ft): 0.100 Header Drain Pipes

Nominal Pipe Diameter (mm)	Inside Pipe Diameter (mm) [1]	75% Flow (m^3/s) [2]	Flow Velocity (m/s) [2]
450 (DR11)	369	0.70	8.13

1) Pipe specifications taken from ADS N-12 ST IB PIPE (per ASTM F2648) and ISCO Product Manual
2) Mannings Equation Ref: Mays, L. W. editor. 1999. Hydraulic design handbook. McGraw-Hill.
75% flow capacity is used to account for pipe deflection and under expected load.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client:	StrataGold	Job No.:	0972018
Subject:	Eagle Gold Heap Leach Facility	By:	TLM
Details:	Primary Pipe Flow Capacity Calculations	Date:	10/2/2017

Solution Flow Rate (nominal):	2,070	m^3/hr
Active Leach Surface Area:	200,000	m^2
Solution Application Flow Rate:	10	$l/hr/m^2$
100-Year 24-Hour Precipitation:	71.6	mm
Design Flow Factor:	120%	(applied to nominal solution flow rate)
Primary Pipe Diameter:	100	mm
Controlling Design Pipe Slope:	0.10	m/m
Design Flow Capacity:	0.0161	m^3/s (calculated from Mannings Equation)

Check Primary Pipe Capacity

Calculated Pipe Spacing:	17	m
Unit Area:	17	m^2/m

Collector Pipes: ADS N-12 Perforated Pipe

120% PLS Solution + 100-Year Storm Flow

Area	Design Slope (m/m)	PLS Flow m^3/hr	PLS Flow (m^3/s)	Storm Flow (m^3/s)	Total Flow (m^3/s)
Entire Phase 1 Pad	0.1	42	0.0116	0.003	0.0145

Calculated Total Flow must be smaller than Design Flow Capacity

Primary Pipe Length: **205** m (maximum allowable for total design flow)

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client:	StrataGold	Job No.:	0792018
Subject:	Eagle Gold Heap Leach Facility	By:	TLM
Details:	Collector and Header Pipe Calculations	Date:	10/2/2017

Solution Flow Rate (nominal):	2,070	m^3/hr
Active Leach Surface Area:	200,000	m^2
Solution Application Flow Rate:	10.0	$l/hr/m^2$
100-Year 24-Hour Precipitation:	71.6	mm
Design Flow Factor:	120%	(applied to nominal solution flow rate)

	Collector Pipes	Header Pipes	
Pipe Diameter:	250	450	mm
Controlling Design Pipe Slope:	0.13	0.10	m/m (measured HLF pad slope along pipe alignment)
Design Flow Capacity:	0.2132	0.7000	m^3/s (calculated from Mannings Equation)

Phase 1West Area:	240,000	m^2
Phase 2West + 3West Area:	290,000	m^2
Total:	530,000	m^2

Collector Pipes: ADS N-12 Perforated Pipe

Area	PLS Flow m^3/hr	PLS Flow (m^3/s)	Storm Flow (m^3/s)	Total Flow (m^3/s)	Number of Pipes	Pipe Diameter (mm)
Phase 1West	2,484	0.690	0.199	0.889	**5**	**250**

Header Pipes: ADS N-12 Perforated Pipe

Area	PLS Flow m^3/hr	PLS Flow (m^3/s)	Storm Flow (m^3/s)	Total Flow (m^3/s)	Number of Pipes	Pipe Diameter (mm)
Phase 1W + 2W + 3W	2,484	0.690	0.240	0.930	**2**	**450**

A minimum of 5 collector pipes and 2 header pipes are required for the western heap leach Phases 1 through 3.

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client:	StrataGold	Job No.:	0792018
Subject:	Eagle Gold Heap Leach Facility	By:	TLM
Details:	Collector and Header Pipe Calculations	Date:	10/2/2017

Solution Flow Rate (nominal):	2,070	m^3/hr
Active Leach Surface Area:	200,000	m^2
Solution Application Flow Rate:	10.0	$l/hr/m^2$
100-Year 24-Hour Precipitation:	71.6	mm
Design Flow Factor:	120%	(applied to nominal solution flow rate)

	Collector Pipes	Header Pipes	
Pipe Diameter:	250	450	mm
Controlling Design Pipe Slope:	0.13	0.10	m/m (measured HLF pad slope along pipe alignment)
Design Flow Capacity:	0.2132	0.7000	m^3/s (calculated from Mannings Equation)

Phase 1West Area:	194,000	m^2
Phase 2West + 3West Area:	248,000	m^2
Total:	442,000	m^2

Collector Pipes: ADS N-12 Perforated Pipe

Area	PLS Flow m^3/hr	PLS Flow (m^3/s)	Storm Flow (m^3/s)	Total Flow (m^3/s)	Number of Pipes	Pipe Diameter (mm)
Phase 1 East	2,328	0.647	0.161	0.807	**4**	**250**

Header Pipes: ADS N-12 Perforated Pipe

Area	PLS Flow m^3/hr	PLS Flow (m^3/s)	Storm Flow (m^3/s)	Total Flow (m^3/s)	Number of Pipes	Pipe Diameter (mm)
Phase 1E + 2E+ 3E	2,484	0.690	0.206	0.896	**2**	**450**

A minimum of 5 collector pipes and 2 header pipes are required for the western heap leach Phases 1 through 3.

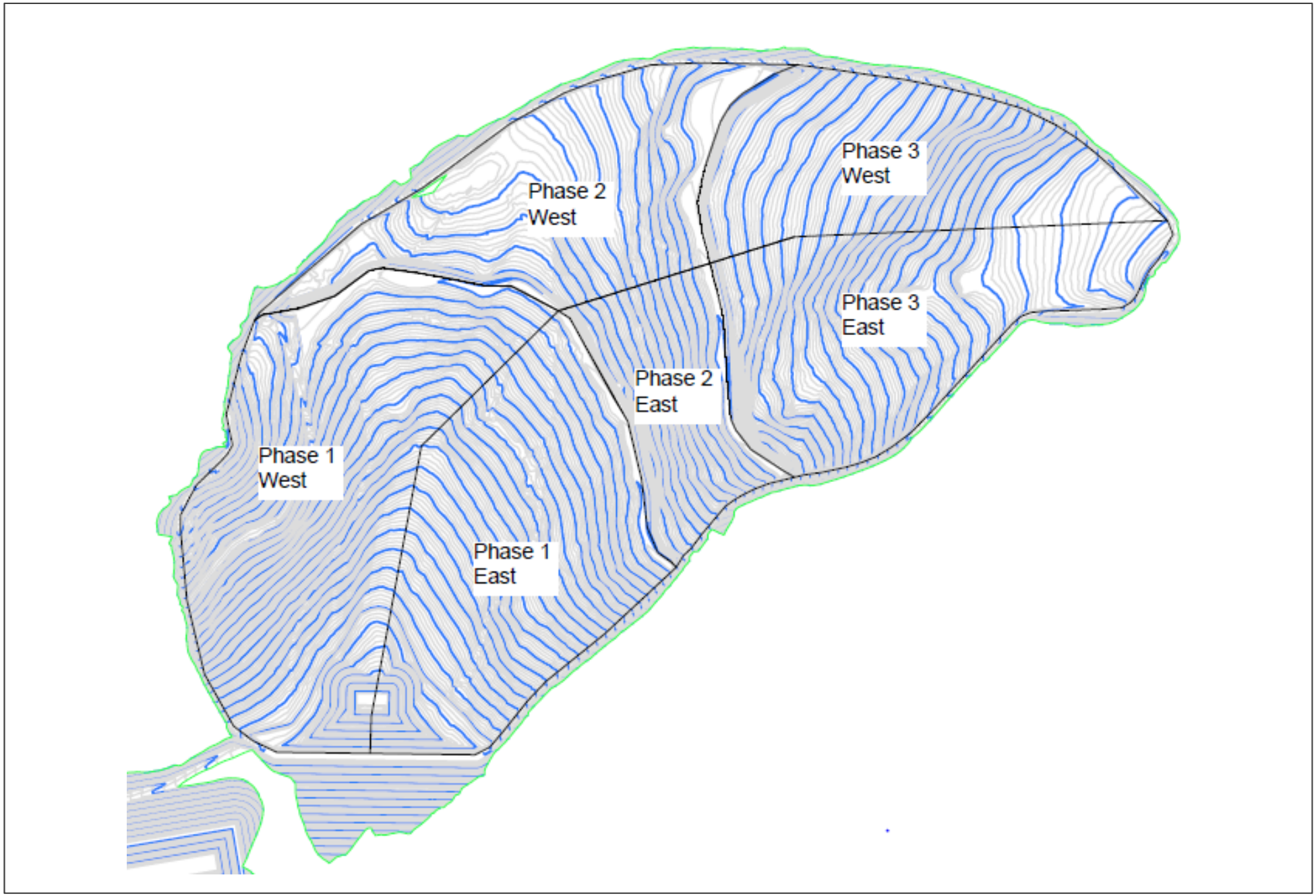


Figure C1 PLS Pipework Collection Areas

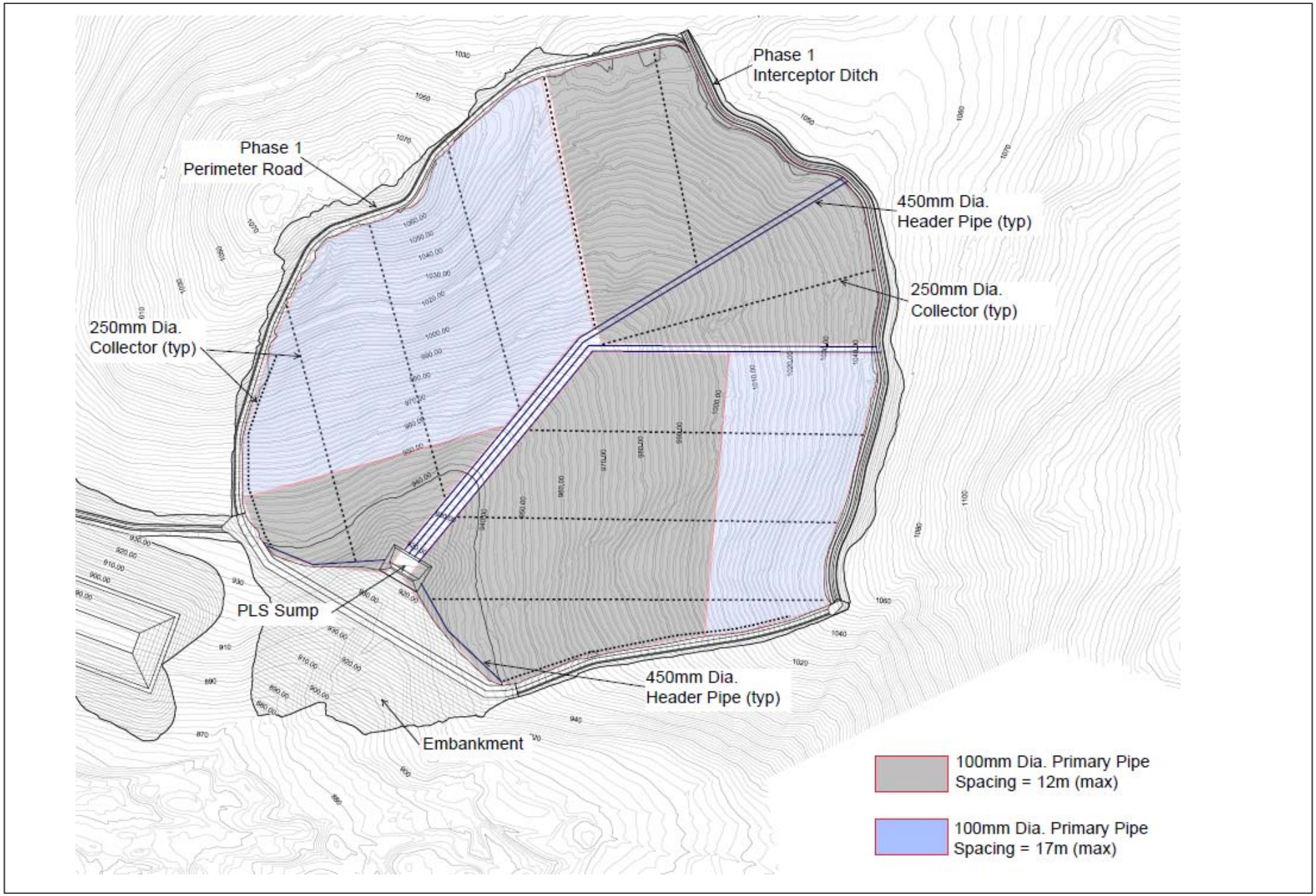


Figure C2 PLS Pipework Phase 1 Design Layout

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 500 - 980 Howe Street, Vancouver, BC Canada V6Z 0C8
Telephone (604) 684-5900 Fax (604) 684-5909

Project Memorandum

To:	**File**	**Doc. No.:**	
Attention:		**cc:**	
From:	**Troy Meyer, P.Eng.**	**Date:**	**Oct. 13, 2017**
Subject:	**Appendix D – Pipe Deflection Analysis**		
Project No.:	**0792018.02**		

1.0 INTRODUCTION

The purpose of this memorandum is to present the methods and results of the pipe deflection analysis completed for the proposed Heap Leach Facility (HLF) at StrataGold Corporation's (SGC) Eagle Gold Project located in Yukon Territory, Canada. SGC is a directly held, wholly owned subsidiary of Victoria Gold Corp.

Pregnant leach solution (PLS) will flow down through the heaped ore to the overliner drain fill and into PLS collection pipes. An underdrain collection system will also be installed under the HLF liner system to collect and convey any groundwater seeps through the facility. The ore heap above the PLS and underdrain pipes can be up to 150 meters (m) thick, loading the pipes with pressures up to 2,827 kilopascals (kPa) based on an average wet (under leach) ore density of 1,922 kg/m^3. The selected pipe materials for the project are corrugated dual-wall polyethylene (PE) pipe, and solid wall high-density polyethylene (HDPE) pipe. The effects of the load on the pipes were evaluated using finite element analysis (FEA).

2.0 MATERIALS

2.1. Corrugated N-12 PE Pipe

The corrugated dual-wall PE pipe is specified for the underdrain feeder pipes and the PLS primary pipes. The project drawings and specifications refer to this pipe material as 'N-12', the brand name manufactured by ADS. Table D-1 provides the range of N-12 pipe sizes and properties used for the analysis.

Table D-1. Perforated corrugated N-12 PE pipe properties.

Nominal Diameter (mm)	Outside Diameter (mm)	Total Wall Thickness (mm)	Effective Wall Thickness (mm)	Moment of Inertia (mm^4/mm)
100	121.4	8.6	6.6	22.9

The properties shown in Table D-2 were provided by ADS. Effective wall thickness of the double-walled pipe was back-calculated from the moment of inertia using the following formula:

$$I = \frac{t^3}{12}$$

Where:
I = moment of inertia in^4/in

T = wall thickness, in

2.2. Solid Wall HDPE Pipe

Solid wall HDPE pipe is specified for the PLS collector and header pipes and the underdrain system header pipes. Pipe sectional properties, including moment of inertia and cross-sectional area, were calculated based on general HDPE properties taken from available vendor product data. A pipe material modulus of elasticity of 758 MPa and a Poisson's ration of 0.4 were used for the model (Goddard et al. 2002). Table D-2 provides the range of smooth wall HDPE pipe sizes and wall thickness used for the analyses.

Table D-2. Non-perforated solid wall HDPE pipe properties.

Nominal Diameter (mm)	Dimension Ratio (-)	Wall Thickness (mm)	Moment of Inertia (mm^4/mm)
150	11	15.3	298
150	17	9.9	81
250	11	24.8	1274
450	11	41.6	5980

2.3. Overliner Drain Fill and Ore

The unit weight of the crushed ore was estimated from loaded column percolation laboratory tests (KCA 2012). The maximum ore thickness is 150 m in the Heap Pad Area as measured from the valley bottom to the top of the ore pile. An intermediate load equivalent to 120 m ore thickness was also analyzed, which applies to the embankment, PLS sump area, and ore pile slopes.

The vertical soil modulus (*E'*), which quantifies the vertical strain induced in response to a force applied vertically, was determined by the equation below with E'_5 value of 700 psi for granular soil with slight compaction (Goddard 2002). The soil modulus was calculated for each analyzed loading scenario and input into the model.

$$E' = E'_5(1+0.15(H-6)^{0.5})$$

Where:
E' = Soil modulus, psi

E'_5 = Soil modulus at 5 ft of fill, psi

H = Height of fill, ft.

3.0 ANALYSIS METHODS

When a buried pipe is subjected to a vertical load, the top of the pipe compresses. The vertical compression causes the pipe to oval and the sides of the pipe to expand horizontally into the surrounding material, which in turn exerts a higher reactionary force against the sides of the pipe. The change in the pipe diameter (either horizontal or vertical) is called the 'pipe deflection'. The pipe deflection can also be expressed as a percent of the original pipe diameter.

A flexible conduit derives its external load capacity from its flexibility. Under load, the pipe tends to deflect, developing soil support at the sides of the pipe. The ring deflection relieves the pipe of the major portion of the vertical soil load, which is then transferred to the soil surrounding the pipe through the soil arching action over the pipe.

For flexible pipes the design limit is controlled by vertical deflection. The design limit for flexible pipes is typically based on a performance limit with a safety factor. Generally, yielding and/or buckling of a polyethylene pipe will take place between 20 and 30 percent deflection, yet the pipe will still function for its intended purpose of providing reliable drainage to the heap leach facility (Smith et al, 2005). A deflection limitation of 15 percent is considered reasonable and conservative for this type of application (Lupo, 2005). A minimum safety factor of at least 2 against buckling is also recommended (AWWA, 2006).

The effects of the heap on the PLS and underdrain pipe deformation were analyzed using the Culvert ANalysis and DEsign (CANDE) finite element software which requires the user to input pipe, soil, and load properties. This program was originally released in 1976 under sponsorship of the Federal Highway Administration (FHWA) (Katona, 2015). CANDE's finite-element methodology is based on a two-dimensional slice of the pipe installation so that both the pipe structure and soil mass are modeled as a combined soil-structure system subjected to an incremental loading schedule. The Overliner Drain Fill (ODF) material around and over the pipe was modeled "as-placed," with the assumption of slight compaction from placement equipment. Buckling capacity and factor of safety is calculated in CANDE using a large deformation formulation with linearized buckling prediction. A safety factor of 2 requires a thrust stress at least twice the predicted stress at buckling.

Figure D-1 presents the model mesh configuration with colored regions representing the various construction and loading increments simulated by the model.

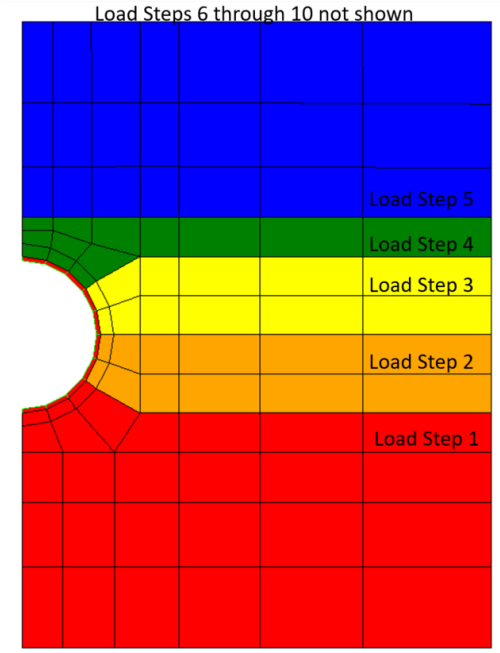


Figure D-1. CANDE model mesh configuration

4.0 ANALYSIS RESULTS

Results of the finite element analysis (FEA) are summarized in Table D-3. The FEA results indicate vertical deflection for all cases below the value of 15% as suggested by Lupo (2005). The results indicate smooth wall PE pipe with dimension ratio (DR) of 11 or less for the maximum loading condition under the ultimate ore pile, which occurs along the valley bottom. Smooth wall PE pipe with dimension ratio (DR) of 17 or less is indicated for the maximum loading condition of 2,060 kPa, equivalent to 120m ore load.

Table D-3. Summary of FEA modeling results.

Pipe	Load (kPa)	Vertical Deflection	Safety Factor against Buckling
150mm HDPE SDR11	2,827	13.9%	3.7
150mm HDPE SDR17	2,060	14.7%	2.4
250mm HDPR SDR11	2,827	13.8%	3.7
450mm HDPE SDR11	2,827	14.3%	3.5
100mm ADS N12	2,060	14.8%	2.3

Detailed results of the pipe deflection calculations are included in Attachment D-1. Figure D-2 presents the CANDE output deflected mesh (red color) overlain on the original mesh for the 450mm HDPE SDR11 simulation at 2,827 kPa load, as an example, showing a 14% (about 6 cm) vertical pipe deflection.

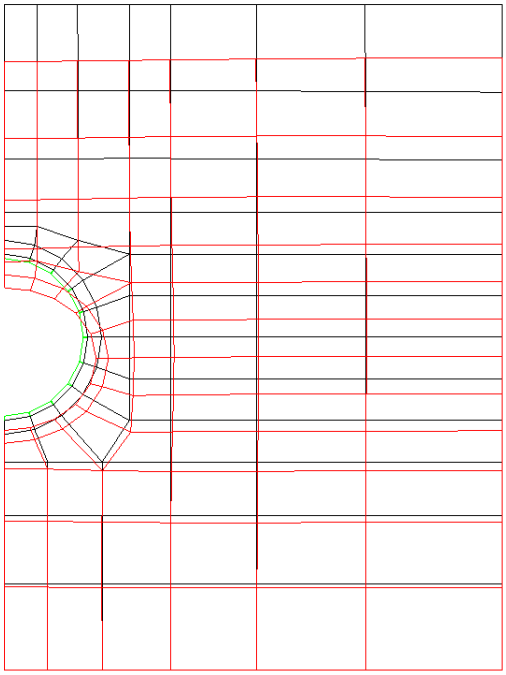


Figure D-2. CANDE model output mesh

5.0 CLOSURE

BGC Engineering Inc. (BGC) prepared this document for the account of StrataGold Corporation. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves all documents and drawings are submitted for the confidential information of our client for a specific project. A record copy of this document is on file at BGC. That copy takes precedence over any other copy or reproduction of this document.

Yours sincerely,

BGC ENGINEERING INC.
per:

Troy Meyer, P.Eng.
Principal Geotechnical Engineer

Reviewed by:

Dr. Alex Baumgard, P.Eng., P.Geo.
Principal Geological Engineer

Engineers Yukon Permit to Practice:
PP092 BGC Engineering Inc.

TLM/AB/rm/mm

REFERENCES

AWWA (2006), PE Pipe Design and Installation, M55, American Water Works Association, Denver, CO.

Goddard, J. B., Kampbell, N. E., and Kozman, D. P. 2002. Technical Note 2.130, Structural performance of corrugated PE pipe using the Burns and Richard Solution. Published by ADS, Inc.

Katona, M. (2015). CANDE 2015 - Culvert Analysis and Design Solutions Methods and Formulations: National Highway Research Project 15-28.

KCA. October 2012. Eagle Gold Project report of metallurgical test work. *Report prepared for* StrataGold Corporation, Vancouver BC, *by* Kappes Cassiday & Associates, Reno NV.

Lupo, J.F., Golder Associates, Inc., 2005, Heap Leach Facility Liner Design, dated November, 2005.

Smith, M. E., Beck, A., Thiel, R., and Metzler, P. 2005. Designing for vertical pipe deflection under high loads. Unpublished white paper.

ATTACHMENT D-1
PIPE DEFLECTION CALCULATIONS

Attachment D-1

CANDE Output

*** WELCOME TO CANDE-2017(Version 02/02/2017) ***

MASTER CONTROL AND PIPE-TYPE DATA FOR PROBLEM # 1

USER TITLE: 6" HDPE SDR11

EXECUTION MODE ....   ANALYS

SOLUTION LEVEL .... #2 AUTO

METHODOLOGY (LRFD OR SERVICE) ... SERVICE

NUMBER OF PIPE-ELEMENT GROUPS   1

MAXIMUM ITERATIONS PER STEP   30

CULVERT PIPE-TYPE ..... PLASTIC

CANNED MESH CODE #   1

NUMBER OF BEAM ELEMENTS   10

CHARACTERISTICS OF PLASTIC-TYPE ELEMENT GROUP:

TYPE OF WALL CROSS SECTION ....   SMOOTH

TYPE OF PLASTIC MATERIAL ....   HDPE

TERM OF MATERIAL LOAD DURATION ......   LONG

SHORT- AND LONG-TERM MODULUS AND STRENGTH:

SHORT-TERM YOUNGS MODULUS (psi) 80000.00

LONG-TERM YOUNGS MODULUS (psi) 110000.00

SHORT-TERM ULTIMATE STRENGTH (psi) ..   1600.00

LONG-TERM ULTIMATE STRENGTH (psi) ...   900.00

PLASTIC MATERIAL PROPERTIES USED FOR ANALYSIS:

YOUNGS MODULUS (psi)................. 110000.00

POISSONS RATIO (-) 0.40

LIMITING ULTIMATE STRENGTH (psi).....   900.00

LIMITING COMBINED STRAIN (in/in).....   0.01227

DENSITY OF PLASTIC (pci).............   0.03

SECTION PROPERTIES OF WALL:

HEIGHT OF WALL SECTION (in)..... 0.602

THRUST AREA (in**2/in) 0.602

MOMOMENT OF INERTIA (in**4/in) 0.018

DISTANCE TO CENTROID (in) 0.301

LARGE DEFORMATION/BUCKLING CODE, IBUCK... 2

IBUCK=2,MEANS LARGE DEFORMATION THEORY FOR GROUP
AND SOPHISTICATED BUCKLING PREDICTIONS FROM CANDE

- - - -

CALCULATED PERFORMANCE MEASURES AT STEP 10, FOR PLASTIC GROUP # 1

MAXIMUM-TENSILE STRAIN (in/in).....	0.026844
PERCENT VERTICAL DEFLECTION (%).....	13.87
HANDLING FACTOR RATIO = (SPAN**2/EI)/FF.....	0.28
SPAN LENGTH FOR HANDLING AND BUCKLING (in).....	6.20
FLEXIBILITY FACTOR (FF) FOR HANDLING (in/lb)	0.095

* * * * NORMAL EXIT FROM CANDE * * * *

*** WELCOME TO CANDE-2017(Version 02/02/2017) ***

MASTER CONTROL AND PIPE-TYPE DATA FOR PROBLEM # 1

USER TITLE: 6" HDPE SDR17

EXECUTION MODE ..... ANALYS

SOLUTION LEVEL ..... #2 AUTO

METHODOLOGY (LRFD OR SERVICE) ... SERVICE

NUMBER OF PIPE-ELEMENT GROUPS 1

MAXIMUM ITERATIONS PER STEP 30

CULVERT PIPE-TYPE ..... PLASTIC

CANNED MESH CODE # 1

NUMBER OF BEAM ELEMENTS 10

CHARACTERISTICS OF PLASTIC-TYPE ELEMENT GROUP:

TYPE OF WALL CROSS SECTION ..... SMOOTH

TYPE OF PLASTIC MATERIAL ..... HDPE

TERM OF MATERIAL LOAD DURATION ..... LONG

SHORT- AND LONG-TERM MODULUS AND STRENGTH:

SHORT-TERM YOUNGS MODULUS (psi) 80000.00

LONG-TERM YOUNGS MODULUS (psi) 110000.00

SHORT-TERM ULTIMATE STRENGTH (psi) .. 1600.00

LONG-TERM ULTIMATE STRENGTH (psi) ... 900.00

PLASTIC MATERIAL PROPERTIES USED FOR ANALYSIS:

YOUNGS MODULUS (psi)..... 110000.00

POISSONS RATIO (-) 0.40

LIMITING ULTIMATE STRENGTH (psi)..... 900.00

LIMITING COMBINED STRAIN (in/in)..... 0.01227

DENSITY OF PLASTIC (pci)..... 0.03

SECTION PROPERTIES OF WALL:

HEIGHT OF WALL SECTION (in)..... 0.391

THRUST AREA (in**2/in) 0.391

MOMOMENT OF INERTIA (in**4/in) 0.005

DISTANCE TO CENTROID (in) 0.196

LARGE DEFORMATION/BUCKLING CODE, IBUCK... 2

IBUCK=2,MEANS LARGE DEFORMATION THEORY FOR GROUP
AND SOPHISTICATED BUCKLING PREDICTIONS FROM CANDE

- - - -

MAXIMUM-TENSILE STRAIN (in/in).....	0.012635
PERCENT VERTICAL DEFLECTION (%).....	14.67
HANDLING FACTOR RATIO = (SPAN**2/EI)/FF.....	1.10
SPAN LENGTH FOR HANDLING AND BUCKLING (in).....	6.45
FLEXIBILITY FACTOR (FF) FOR HANDLING (in/lb)	0.095

* * * * NORMAL EXIT FROM CANDE * * * *

*** WELCOME TO CANDE-2017(Version 02/02/2017) ***

MASTER CONTROL AND PIPE-TYPE DATA FOR PROBLEM # 1

USER TITLE: 10" HDPE SDR11

EXECUTION MODE ..... ANALYS

SOLUTION LEVEL ..... #2 AUTO

METHODOLOGY (LRFD OR SERVICE) ... SERVICE

NUMBER OF PIPE-ELEMENT GROUPS 1

MAXIMUM ITERATIONS PER STEP 30

CULVERT PIPE-TYPE ..... PLASTIC

CANNED MESH CODE # 1

NUMBER OF BEAM ELEMENTS 10

CHARACTERISTICS OF PLASTIC-TYPE ELEMENT GROUP:

TYPE OF WALL CROSS SECTION ..... SMOOTH

TYPE OF PLASTIC MATERIAL ..... HDPE

TERM OF MATERIAL LOAD DURATION ..... LONG

SHORT- AND LONG-TERM MODULUS AND STRENGTH:

SHORT-TERM YOUNGS MODULUS (psi) 80000.00

LONG-TERM YOUNGS MODULUS (psi) 110000.00

SHORT-TERM ULTIMATE STRENGTH (psi) .. 1600.00

LONG-TERM ULTIMATE STRENGTH (psi) ... 900.00

PLASTIC MATERIAL PROPERTIES USED FOR ANALYSIS:

YOUNGS MODULUS (psi)..... 110000.00

POISSONS RATIO (-) 0.40

LIMITING ULTIMATE STRENGTH (psi)..... 900.00

LIMITING COMBINED STRAIN (in/in)..... 0.01227

DENSITY OF PLASTIC (pci)..... 0.03

SECTION PROPERTIES OF WALL:

HEIGHT OF WALL SECTION (in)..... 0.977

THRUST AREA (in**2/in) 0.977

MOMOMENT OF INERTIA (in**4/in) 0.078

DISTANCE TO CENTROID (in) 0.488

LARGE DEFORMATION/BUCKLING CODE, IBUCK... 2

IBUCK=2,MEANS LARGE DEFORMATION THEORY FOR GROUP
AND SOPHISTICATED BUCKLING PREDICTIONS FROM CANDE

- -

REVIEW SYSTEM INPUT DATA

LEVEL-2 DATA FOR PIPE-SHAPED CANNED MESH

THE DATA TO BE RUN IS ENTITLED

New Level 2 Pipe Mesh

TYPE OF MESH----------	EMBANKMENT
NUMBER OF LOAD STEPS----------	10
VERTICAL PIPE DIAMETER(INCHES)---------	9.97
DIAMETER RATIO (HORIZON/VERTICAL)------	1.00
SOIL HEIGHT ABOVE SPRINGLINE (FEET)----	492.00
MESH HEIGHT ABOVE SPRINGLINE (FEET)----	1.66
SOIL DENSITY ABOVE MESH (PCF)----------	120.00
PRESSURE OF TRUNCATED SOIL (PSI)-------	408.62
LIVE LOAD PRESSURE ON LAST STEP (PSI)--	0.00

ASSESSMENT SUMMARY PLASTIC-GROUP 1, LOAD-STEP 10

WORKING STRESS SAFETY FACTORS AT STEP 10, FOR PLASTIC GROUP # 1

DESIGN-CRITERION	CONTROL NODE	MAXIMUM RESPONSE	FAILURE LIMIT	SAFETY FACTOR
GLOBAL BUCKLING (psi)	6	-2505.39	9305.18	3.714

CALCULATED PERFORMANCE MEASURES AT STEP 10, FOR PLASTIC GROUP # 1

MAXIMUM-TENSILE STRAIN (in/in)..... 0.027006

PERCENT VERTICAL DEFLECTION (%).....	13.76
HANDLING FACTOR RATIO = (SPAN**2/EI)/FF.....	0.17
SPAN LENGTH FOR HANDLING AND BUCKLING (in).....	9.97
FLEXIBILITY FACTOR (FF) FOR HANDLING (in/lb)	0.095

* * * * NORMAL EXIT FROM CANDE * * * *

*** WELCOME TO CANDE-2017(Version 02/02/2017) ***

MASTER CONTROL AND PIPE-TYPE DATA FOR PROBLEM # 1

USER TITLE: 18" HDPE SDR11

EXECUTION MODE ..... ANALYS

SOLUTION LEVEL ..... #2 AUTO

METHODOLOGY (LRFD OR SERVICE) ... SERVICE

NUMBER OF PIPE-ELEMENT GROUPS 1

MAXIMUM ITERATIONS PER STEP 30

CULVERT PIPE-TYPE ..... PLASTIC

CANNED MESH CODE # 1

NUMBER OF BEAM ELEMENTS 10

CHARACTERISTICS OF PLASTIC-TYPE ELEMENT GROUP:

TYPE OF WALL CROSS SECTION ..... SMOOTH

TYPE OF PLASTIC MATERIAL ..... HDPE

TERM OF MATERIAL LOAD DURATION ..... LONG

SHORT- AND LONG-TERM MODULUS AND STRENGTH:

SHORT-TERM YOUNGS MODULUS (psi) 80000.00

LONG-TERM YOUNGS MODULUS (psi) 110000.00

SHORT-TERM ULTIMATE STRENGTH (psi) .. 1600.00

LONG-TERM ULTIMATE STRENGTH (psi) ... 900.00

PLASTIC MATERIAL PROPERTIES USED FOR ANALYSIS:

YOUNGS MODULUS (psi)..... 110000.00

POISSONS RATIO (-) 0.40

LIMITING ULTIMATE STRENGTH (psi)..... 900.00

LIMITING COMBINED STRAIN (in/in)..... 0.01227

DENSITY OF PLASTIC (pci)..... 0.03

SECTION PROPERTIES OF WALL:

HEIGHT OF WALL SECTION (in)..... 1.636

THRUST AREA (in**2/in) 1.636

MOMOMENT OF INERTIA (in**4/in) 0.365

DISTANCE TO CENTROID (in) 0.818

LARGE DEFORMATION/BUCKLING CODE, IBUCK... 2

IBUCK=2,MEANS LARGE DEFORMATION THEORY FOR GROUP
AND SOPHISTICATED BUCKLING PREDICTIONS FROM CANDE

- -

REVIEW SYSTEM INPUT DATA

LEVEL-2 DATA FOR PIPE-SHAPED CANNED MESH

THE DATA TO BE RUN IS ENTITLED

New Level 2 Pipe Mesh

TYPE OF MESH----------	EMBANKMENT
NUMBER OF LOAD STEPS----------	10
VERTICAL PIPE DIAMETER(INCHES)---------	17.52
DIAMETER RATIO (HORIZON/VERTICAL)------	1.00
SOIL HEIGHT ABOVE SPRINGLINE (FEET)----	492.00
MESH HEIGHT ABOVE SPRINGLINE (FEET)----	2.92
SOIL DENSITY ABOVE MESH (PCF)----------	120.00
PRESSURE OF TRUNCATED SOIL (PSI)-------	407.57
LIVE LOAD PRESSURE ON LAST STEP (PSI)--	0.00

ASSESSMENT SUMMARY PLASTIC-GROUP 1, LOAD-STEP 10

WORKING STRESS SAFETY FACTORS AT STEP 10, FOR PLASTIC GROUP # 1

DESIGN-CRITERION	CONTROL NODE	MAXIMUM RESPONSE	FAILURE LIMIT	SAFETY FACTOR
GLOBAL BUCKLING (psi)	6	-2605.56	9134.75	3.506

CALCULATED PERFORMANCE MEASURES AT STEP 10, FOR PLASTIC GROUP # 1

MAXIMUM-TENSILE STRAIN (in/in)..... 0.026079

PERCENT VERTICAL DEFLECTION (%).....	14.32
HANDLING FACTOR RATIO = (SPAN**2/EI)/FF.....	0.11
SPAN LENGTH FOR HANDLING AND BUCKLING (in).....	17.52
FLEXIBILITY FACTOR (FF) FOR HANDLING (in/lb)	0.095

* * * * NORMAL EXIT FROM CANDE * * * *

*** WELCOME TO CANDE-2017(Version 02/02/2017) ***

MASTER CONTROL AND PIPE-TYPE DATA FOR PROBLEM # 1

USER TITLE: 4" ADS N12

EXECUTION MODE ....   ANALYS

SOLUTION LEVEL .... #2 AUTO

METHODOLOGY (LRFD OR SERVICE) ... SERVICE

NUMBER OF PIPE-ELEMENT GROUPS   1

MAXIMUM ITERATIONS PER STEP   30

CULVERT PIPE-TYPE ..... PLASTIC

CANNED MESH CODE #   1

NUMBER OF BEAM ELEMENTS   10

CHARACTERISTICS OF PLASTIC-TYPE ELEMENT GROUP:

TYPE OF WALL CROSS SECTION .....   SMOOTH

TYPE OF PLASTIC MATERIAL .....   HDPE

TERM OF MATERIAL LOAD DURATION .....   LONG

SHORT- AND LONG-TERM MODULUS AND STRENGTH:

SHORT-TERM YOUNGS MODULUS (psi) 80000.00

LONG-TERM YOUNGS MODULUS (psi) 110000.00

SHORT-TERM ULTIMATE STRENGTH (psi) ..   1600.00

LONG-TERM ULTIMATE STRENGTH (psi) ...   900.00

PLASTIC MATERIAL PROPERTIES USED FOR ANALYSIS:

YOUNGS MODULUS (psi)..... 110000.00

POISSONS RATIO (-) 0.40

LIMITING ULTIMATE STRENGTH (psi).....   900.00

LIMITING COMBINED STRAIN (in/in).....   0.01227

DENSITY OF PLASTIC (pci).....   0.03

SECTION PROPERTIES OF WALL:

HEIGHT OF WALL SECTION (in)..... 0.260

THRUST AREA (in**2/in) 0.260

MOMOMENT OF INERTIA (in**4/in) 0.001

DISTANCE TO CENTROID (in) 0.130

LARGE DEFORMATION/BUCKLING CODE, IBUCK... 2

IBUCK=2,MEANS LARGE DEFORMATION THEORY FOR GROUP
AND SOPHISTICATED BUCKLING PREDICTIONS FROM CANDE

- - - -

PERCENT VERTICAL DEFLECTION (%).....	14.82
HANDLING FACTOR RATIO = (SPAN**2/EI)/FF.....	1.77
SPAN LENGTH FOR HANDLING AND BUCKLING (in).....	4.44
FLEXIBILITY FACTOR (FF) FOR HANDLING (in/lb)	0.095

* * * * NORMAL EXIT FROM CANDE * * * *

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client:	StrataGold	Job No.:	0972018
Subject:	Eagle Gold Heap Leach Facility	By:	TLM
Details:	In-Heap Pond Ore Porosity Calculation	Date:	10/2/2017

Equations:

$\gamma_{dry} = \frac{\gamma_{bulk}}{1+w}$ $\quad$ $V = V_a + V_w + V_s = 1$ assuming 1 m^3 of ore

$W_w = wW_s$ $\quad$ $V_v = V_a + V_w$

$V_w = \frac{W_w}{\gamma_w}$ $\quad$ $n = \frac{V_v}{V}$

$V_s = \frac{W_s}{G_s \gamma_w}$ $\quad$ $Se = wG_s$

$V_a = 1 - V_s - V_w$

Initial Conditions (Ore as Delivered, Top of Ore Pile)

Specific Gravity G_s =	2.7	
Density of Water (γ_w) =	1000	kg/m^3
Water Content as Delivered (w) =	5.00%	
Ore Density (γ_{bulk}) =	1,481	kg/m^3
Ore Density (γ_{dry}) =	1,410	kg/m^3
Weight of Water (W_w) =	70.50	kg/m^3
Volume of Water (V_w) =	0.0705	m^3
Volume of Solids (V_s) =	0.5222	m^3
Volume of Air (V_a) =	0.4073	m^3/m^3 of ore
porosity (n) =	0.4778	
void ratio (e) =	0.9149	
Saturation (S) =	14.76%	

Loaded Conditions (Bottom of In-Heap Pond)

Specific Gravity G_s =	2.7	
Density of Water (γ_w) =	1000	kg/m^3
Water Content as Delivered (w) =	5.00%	
Ore Density (γ_{bulk}) =	1,869	kg/m^3
Ore Density (γ_{dry}) =	1,780	kg/m^3
Weight of Water (W_w) =	89.00	kg/m^3
Volume of Water (V_w) =	0.0890	m^3
Volume of Solids (V_s) =	0.6593	m^3
Volume of Air (V_a) =	0.2517	m^3/m^3 of ore
porosity (n) =	0.3407	
void ratio (e) =	0.5169	
Saturation (S) =	26.12%	

Leaching Conditions/Ore Solution Storage Capacity

Water content (w) =	13.30%	
Weight of Water (W_w) =	187.53	kg/m^3
Volume of Water (V_w) =	0.1875	m^3
Volume of Solids (V_s) =	0.5222	m^3
Volume of Air (V_a) =	**0.2902**	m^3/m^3 of ore
void ratio (e) =	0.9149	check - OK
Saturation (S) =	39.25%	

Leaching Conditions/Ore Solution Storage Capacity

Water content (w) =	16.79%	
Weight of Water (W_w) =	298.86	kg/m^3
Volume of Water (V_w) =	0.2989	m^3
Volume of Solids (V_s) =	0.6593	m^3
Volume of Air (V_a) =	**0.0419**	m^3/m^3 of ore
void ratio (e) =	0.5169	check - OK
Saturation (S) =	87.71%	

Volume of Air (V_a) = **0.1661** m^3/m^3 of ore ⇦ Average Estimated Ore Solution Storage Capacity within In-Heap Pond under Loaded Conditions and under Leach

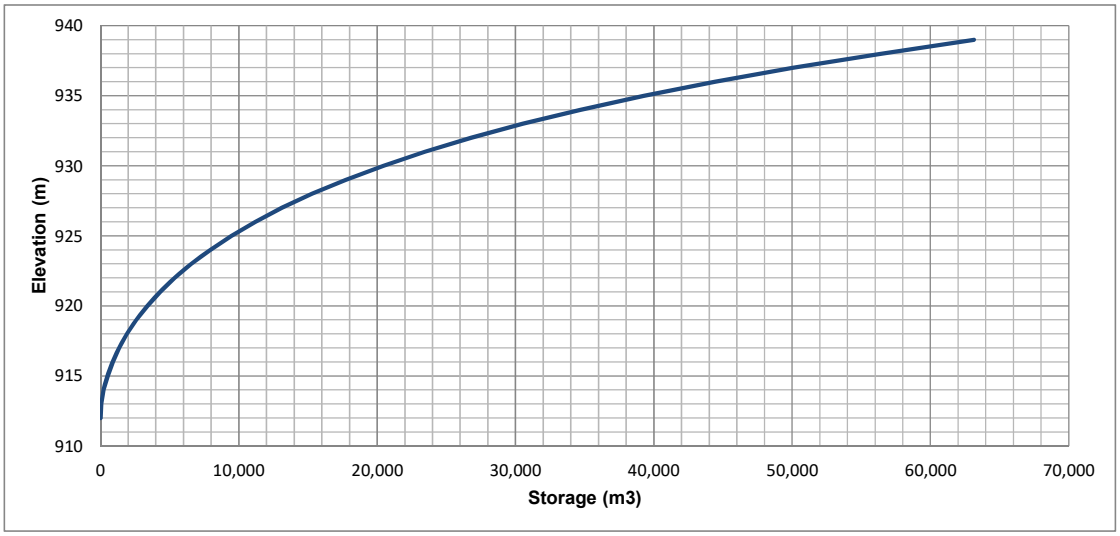
Ore properties derived from KCA (2012) in *Report on Metallurgical Test Work*, October, 2012

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client:	StrataGold	Job No.:	0972018
Subject:	Eagle Gold Heap Leach Facility	By:	TLM
Details:	In-Heap Pond Stage-Storage	Date:	10/2/2017

Volume of Air (V_a) = 0.1661

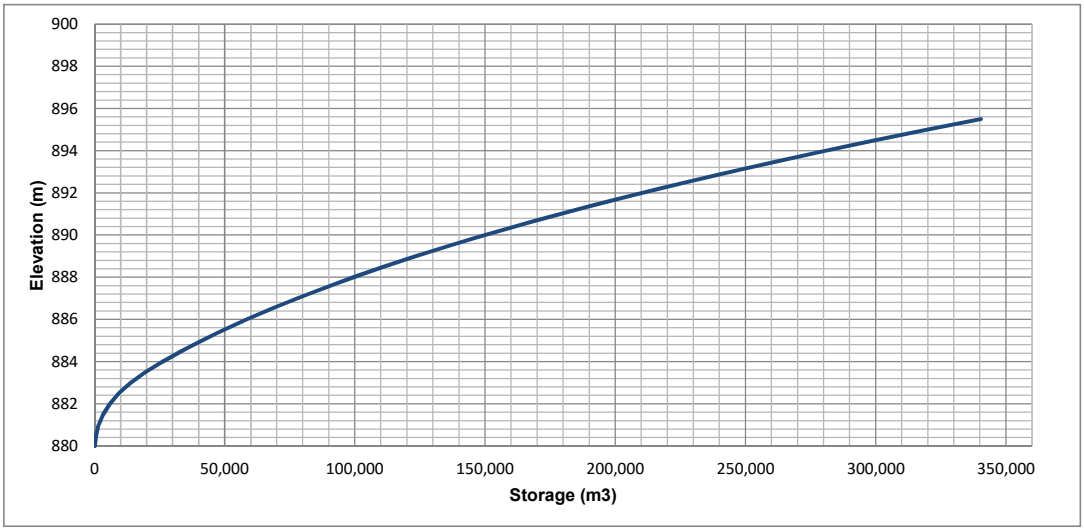
ELEV	AREA (m^2)	INCREMENTAL VOL (m^3)	GROSS TOTAL VOL (m^3)	NET TOTAL VOL (in Voids)	
912	171	85.5	85.5	14.2	
913	430.5	300.8	386.3	64.1	
914	1,497.60	964.1	1350.3	224.2	
915	1,981.80	1739.7	3090.0	513.1	
916	2,532.00	2256.9	5346.9	887.9	
917	3,083.87	2807.9	8154.8	1354.2	
918	3,708.62	3396.2	11551.1	1918.2	
919	4,405.95	4057.3	15608.4	2592.0	
920	5,153.82	4779.9	20388.3	3385.7	
921	5,941.19	5547.5	25935.8	4307.0	
922	6,778.94	6360.1	32295.8	5363.1	
923	7,677.37	7228.2	39524.0	6563.5	
924	8,674.08	8175.7	47699.7	7921.1	
925	9,781.32	9227.7	56927.4	9453.5	
926	10,993.26	10387.3	67314.7	11178.5	
927	12,381.38	11687.3	79002.0	13119.3	
928	13,893.89	13137.6	92139.6	15301.0	
929	15,473.07	14683.5	106823.1	17739.3	
930	17,172.44	16322.8	123145.9	20449.9	
931	19,102.87	18137.7	141283.5	23461.9	
932	21,171.48	20137.2	161420.7	26805.9	
933	23,594.79	22383.1	183803.8	30522.9	
934	26,242.38	24918.6	208722.4	34661.0	
935	29,267.06	27754.7	236477.2	39270.0	
936	32,462.57	30864.8	267342.0	44395.5	
937	35,992.53	34227.6	301569.5	50079.4	
938	39,714.74	37853.6	339423.2	56365.5	Spillway Invert
939	41,835.65	40775.2	380198.3	63136.7	



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

Client:	StrataGold	Job No.:	0972018
Subject:	Eagle Gold Heap Leach Facility	By:	TLM
Details:	Event Pond Stage-Storage	Date:	10/2/2017

ELEV	AREA (m^2)	INCREMENTAL VOL (m^3)	TOTAL VOL (m^3)	
879.5	311.75			
880	408	179.4	179.4	
880.5	1,432.80	434.23	613.63	
881	2,695.92	1015.68	1629.31	
881.5	4,197.77	1709.62	3338.94	
882	5,938.74	2521.58	5860.51	
882.5	7,919.29	3452.65	9313.17	
883	10,139.91	4503.38	13816.55	
883.5	12,601.09	5674.12	19490.67	
884	13,968.67	6639.5	26130.17	
884.5	15,038.23	7250.08	33380.25	
885	16,120.62	7788.14	41168.4	
885.5	17,215.83	8332.61	49501.01	
886	18,323.88	8883.49	58384.5	
886.5	19,444.78	9440.78	67825.28	
887	20,578.52	10004.49	77829.77	
887.5	21,725.10	10574.61	88404.38	
888	22,884.52	11151.15	99555.53	
888.5	24,056.79	11734.11	111289.64	
889	25,241.90	12323.48	123613.12	
889.5	26,439.85	12919.28	136532.4	
890	27,650.64	13521.49	150053.89	
890.5	28,874.27	14130.12	164184.02	
891	30,110.75	14745.18	178929.19	
891.5	31,360.07	15366.65	194295.84	
892	32,622.23	15994.54	210290.38	
892.5	33,897.23	16628.85	226919.22	
893	35,185.08	17269.58	244188.8	
893.5	36,485.77	17916.73	262105.53	
894	37,799.30	18570.3	280675.83	
894.5	39,125.67	19230.29	299906.12	Emergency Spillway Invert
895	40,464.66	19896.64	319802.76	
895.5	41,816.25	20569.3	340372.06	



BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 500 - 980 Howe Street, Vancouver, BC Canada V6Z 0C8
Telephone (604) 684-5900 Fax (604) 684-5909

Project Memorandum

To:	**File**	**Doc. No.:**	
Attention:		**cc:**	**Troy Meyer**
From:	**Tony Monasterio**	**Date:**	**October 2, 2017**
Subject:	**Appendix F - Liner Leakage Analysis**		
Project No.:	**0792018.02**		

1.0 INTRODUCTION

The purpose of this memorandum is to present the methods and results of a liner leakage analysis completed for the proposed Heap Leach Facility (HLF) at StrataGold Corporation's (SGC) Eagle Gold Project located in Yukon Territory, Canada. SGC is a directly held, wholly owned subsidiary of Victoria Gold Corp.

Liner performance is critical to the operation of an HLF, as leaks can cause environmental damage and decreases in gold recovery. Proper liner design, construction, and operational monitoring is required to adhere to regulatory requirements and optimize the performance of the HLF and corresponding Pregnant Leach Solution (PLS) recovery system.

A liner leakage analysis was completed to estimate the required sizes of leachate detection and recovery system (LDRS) components such as the geocomposite and sumps. Leakage flow alert levels were established as indicators of the performance of the liner systems, using the results of the analysis.

2.0 LINER SYSTEM DESIGN

The liner systems used at the proposed Eagle Gold HLF in-heap pond and event pond consist of four components: geomembrane, geosynthetic clay liner (GCL), geocomposite, and bedding material. The geomembrane is either 1.5 millimeter (mm) or 2.0 mm thick Linear Low-Density Polyethylene (LLDPE) which is textured on both sides to provide increased friction values and installation safety. The GCL consists of a layer of granular sodium bentonite between two nonwoven geotextiles which are needle-punched together for reinforcement. Both the geomembrane and GCL impede the flow of fluid through the liner systems. The geocomposite between the two geomembrane liners consists of a geonet heat-bonded on both sides to a nonwoven geotextile; the purpose of the geocomposite is to transmit any leakage through the top geomembrane to a collection sump. The bedding material provides a firm, smooth surface under liner system.

Two liner configurations will be used at the proposed Eagle Gold HLF: a single composite liner in areas with low hydraulic head, and a double composite liner for areas with high hydraulic head.

A single composite liner will be used in the upper Heap Pad Area, where the ground surface is sloped to direct fluid through the PLS collection pipe network to the In-Heap Pond located behind a confining embankment. The single composite liner system consists of (from top to bottom): overliner drain fill (ODF) and PLS collection piping; a 2.0 mm LLDPE geomembrane liner; a GCL; a liner bedding layer (as necessary); and prepared subgrade. Figure F-1 illustrates the typical single composite liner section for the HLF.

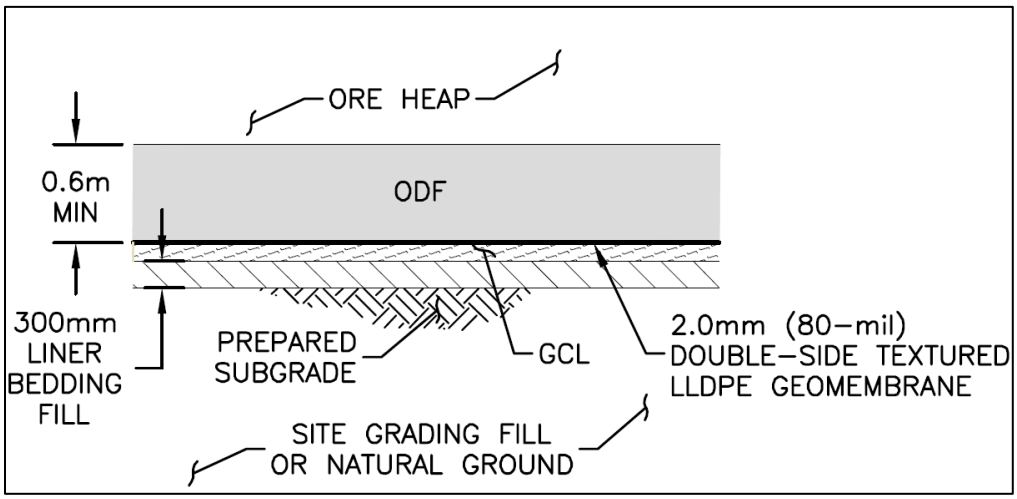


Figure F-1. HLF pad single composite liner section (not to scale).

The Event Pond and the In-Heap Pond are two areas designed to impound water and/or PLS and will be constructed with double composite liners. The In-Heap Pond is formed by the HLF confining embankment and will contain PLS and stormwater, which will be pumped from a sump within the In-Heap Pond. The transition between the single liner of the heap pad and the double liner of the In-Heap Pond will occur at the crest elevation of the confining embankment. The Event Pond is designed to contain overflow from the In-Heap Pond through a spillway.

The double composite liner system consists of (from top to bottom): ODF and PLS collection piping; a 2.0 mm primary LLDPE geomembrane liner; a GSE MineDrain (or approved equivalent) geocomposite drainage layer; a 2.0 mm secondary LLDPE geomembrane liner (1.5 mm in the Event Pond); a GCL; a liner bedding layer (as necessary); and prepared subgrade. Figure F-2 illustrates the typical double composite liner section for the HLF.

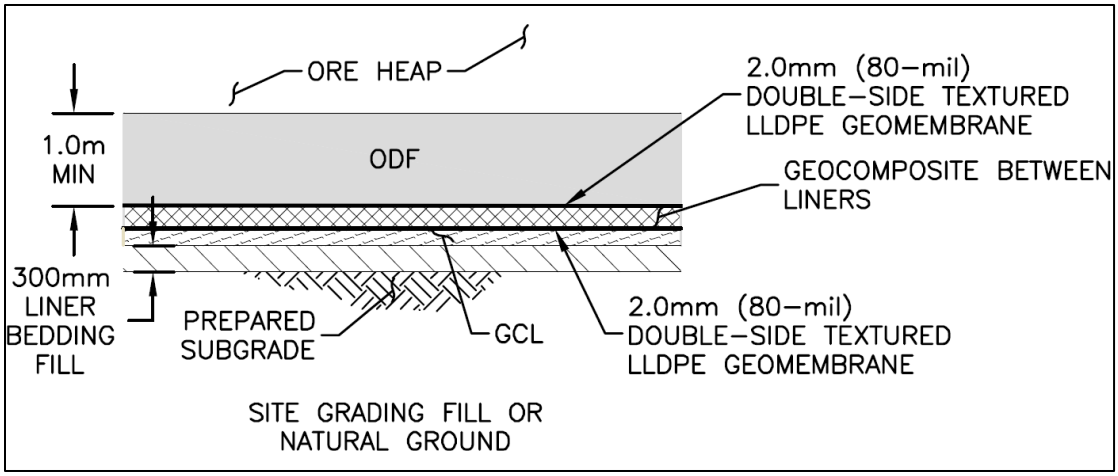


Figure F-2. HLF in-heap pond double composite liner section (not to scale).

3.0 LINER LEAKAGE CALCULATION METHODS

Total liner leakage was estimated by first calculating the flow rate through a single defect of a pre-defined size, then multiplying by a specified total number of defects over the entire lined area. The flow through a defect in a geomembrane is controlled by fluid pressure (head) difference across the liner and the defect size. Flow through a defect in a composite liner system is also controlled by transmissivity of the interface between the geomembrane and the underlying GCL, when applicable, as well as and hydraulic conductivity and thickness of the GCL (Rowe, 2011).

3.1. Geomembrane Defects

Giroud and Bonaparte (2001) recommend using 2.5 to 5 defects per hectare (ha) for design calculations of leakage for geomembranes installed with strict construction quality control and assurance programs, 5 defects per ha were assumed in this design. Rowe (2011) and others have suggested a lower bound ("small") defect size of 3.14 mm^2 and an upper bound ("large") defect size of 100 mm^2. These defect sizes were adopted for the analyses to determine two leakage flow alert levels.

3.2. Leakage Through a Geomembrane

Flow through a circular defect in a geomembrane liner that is not placed directly over a low permeability GCL layer, such as the primary (top) geomembrane in a double composite liner, is given by Bernoulli's Equation:

$$Q = C_B A_d \sqrt{2gh_w} \qquad \text{Eq. F-1}$$

Where:

$Q =$ leakage (cubic meters per second, m^3/s)

$C_B =$ coefficient related to the shape of the edges of the defect (dimensionless, 0.6 for sharp edges such as expected in a liner)

$A_d =$ area of the defect (m^2)

$g =$ acceleration due to gravity (9.81 m/s^2)

$h_w =$ head loss across the liner (m)

3.3. Leakage Through a Single Composite Liner

Composite liners consisting of a geomembrane over a GCL are very effective barriers because they use the advantages of both constituent materials to offset the weaknesses of each other. Geomembranes are effective barriers to fluid flow except where there is a hole. GCLs have somewhat greater hydraulic conductivity than geomembranes but are more resistant to puncture, have been shown to be self-healing when punctured or desiccated, and can resist a different variety of chemicals than geomembranes. (Rowe, 2011)

3.3.1. Geomembrane-GCL Interface Transmissivity

The most common methods used to calculate leakage through a composite liner employ empirical equations established by curve-fitting solutions of analytical equations for the specific situation under consideration (see Giroud and Bonaparte 1989, and Giroud 1997). These equations use a unitless 'contact quality factor' judged to be somewhere between 'good' and 'poor' to account for the distance from the defect in the overlying geomembrane that the fluid will spread outward between the geomembrane and the GCL. Since these equations were published, the characteristics which the contact factor was used to quantify have been more extensively researched. Rowe (2011, p. 147) describes the current state of practice:

> *"The transmissive zone between the geomembrane and clay layer arises due to small irregularities at the interface between the two materials that will allow fluid to migrate a distance called the wetted radius from the hole and then move by advection through the underlying liner. Thus the leakage, Q, will depend on (i) the size of the hole, (ii) the head difference across the liner, (iii) the hydraulic conductivity of the clay liner, and (iv) the transmissivity of the interface between the geomembrane and the clay liner. The very important new parameter here is the transmissivity of the interface."*

Rowe (2011) summarizes research completed by others into interface transmissivity for geomembrane-GCL composite liners: transmissivity can vary from a low of 6E-12 m^2/s to a high of 2E-10 m^2/s with an average of 4E-11 m^2/s (used in this analysis). Unlike composite liner systems with a compacted clay layer, increased pressure from fill overlying the geomembrane-GCL composite liner does not appear to have a large effect on transmissivity. The research also suggests that interface transmissivity has a much larger effect on leakage rates than GCL hydraulic conductivity.

Rowe (2011) also summarizes previous research which compares calculated leakage rates for a liner system where the geomembrane is in direct contact with the underlying clay liner with observed leakage rates at landfills with leakage detection systems. The result is that the calculations "significantly (by one or more orders of magnitude) underestimate the actual leakage

in typical North American landfills". Rowe (2011) notes that this disparity can be as large as three orders of magnitude for composite liners using GCL.

Rowe (2011) attributes this disparity to a much larger interface transmissivity than was previously recognized due to interconnected wrinkles in the geomembrane which, when located near a defect, allow flow over a much larger area than assumed in the direct-contact calculations suggested by Giroud (1997). Equation F-2 (developed by Rowe, 1998) was used to calculate the leakage and was considered by Rowe (2011) to adequately account for the disparity. It is important to note that this equation does not consider defect occurrence rate or size, because it assumes at least one defect is hydraulically connected to one wrinkle per hectare, and therefore the defect is not the limiting factor, but instead the underlying material.

$$Q = 2L[kb + (kD\theta)^{0.5}]h_d/D \qquad \text{Eq. F-2}$$

Where:

$Q =$ leakage (m^3/s)

$L =$ length of the connected wrinkle (m)

$k =$ hydraulic conductivity of the clay liner (m/s)

$b =$ half the width of the wrinkle (m) [2b is the full width]

$D =$ thickness of the clay layer (m)

$\theta =$ geomembrane-clay layer interface transmissivity (m^2/s)

$h_d =$ head loss across the composite liner (m)

3.3.2. Geomembrane Wrinkles

The longer an interconnected wrinkle, the more likely a defect is to intersect the wrinkle and communicate hydraulically with the entire area under the wrinkle. There is a reasonable probability that assuming 5 defects per hectare, at least one of them will coincide with a connected wrinkle length of less than 200 m (Rowe, 2011).

Wrinkle size and length vary throughout the day as the liner expands and contracts with sun exposure, and the wrinkles will remain in the state at the time they are covered. Rowe (2011) completed field testing to measure liner wrinkles at a site in southern Ontario, Canada. When compared to measured leakage rates at landfills, Rowe determined that the observed leakage was best correlated to connected wrinkle lengths between 400 and 700 m. These lengths correspond to placement of cover at times when wrinkling is not the most extensive during the middle of the day. Rowe (2011) recommends that if care is taken to avoid covering geomembrane when wrinkling is most extensive, a 15% wrinkle coverage, a 700 m wrinkle length, and a wrinkle width (*2b*) of 0.3 m can be used for design. These values were used in this analysis.

3.3.3. Fluid Pressure

The HLF drain system (ODF and PLS collection piping in Figure F-1) is designed to limit the head on top of the primary geomembrane to a maximum of 0.6 m (within the minimum ODF thickness). A head of 0.6 m was used for the liner leakage calculations in the upper pad area (outside of the In-Heap Pond area) which is covered by a single composite liner.

3.3.4. GCL Hydraulic Conductivity and Thickness

Most GCLs are certified by the manufacturer to have a hydraulic conductivity less than 5E-11 m/s, tested in accordance with ASTM D 5887 (as reported in CETCO 2007), and this value was selected for this analysis. The bentonite layer in most GCLs is 0.006 m thick, which was used in this analysis.

3.4. Leakage Through a Double Composite Liner

3.4.1. Leakage Through the Primary Geomembrane

The primary (top) geomembrane of the Eagle Gold HLF double composite liner system has an underlying geocomposite drainage layer. Therefore, the liner leakage calculations assume there is no fluid pressure on the underside of the primary geomembrane, and the head loss across the primary geomembrane is assumed to be equal to the pressure head of the PLS on top of the primary geomembrane.

The maximum head in the In-Heap Pond is 27 m, because the embankment crest is at EL. 939 meters above sea level (masl), and the bottom of the In-Heap Pond is at EL. 912 masl. The HLF is not expected to operate with the In-Heap Pond at this maximum elevation; pumps will be used to remove the PLS and stormwater as they accumulate during normal operations. The liner leakage rates were calculated at increments ranging from empty to full so alert levels and LDRS pumping capacities could be established.

The maximum head in the Event Pond is 13.5 m, because the spillway invert is at EL. 895.5 masl, and the bottom of the pond is at EL. 882 masl. The Event Pond is expected to be normally operated empty or near empty. The liner leakage rates were calculated at increments ranging from empty and full so that alert levels and LDRS pumping capacities could be established.

The leakage through each defect in the primary geomembrane of the In-Heap Pond was calculated using Equation F-1. The head (h_w) will vary with different fluid depths and along the liner slope, so the leakage was calculated in steps.

The lined area per meter of elevation was used to calculate the leakage for every fluid surface level up to the spillway invert, as illustrated by Figure F-3.

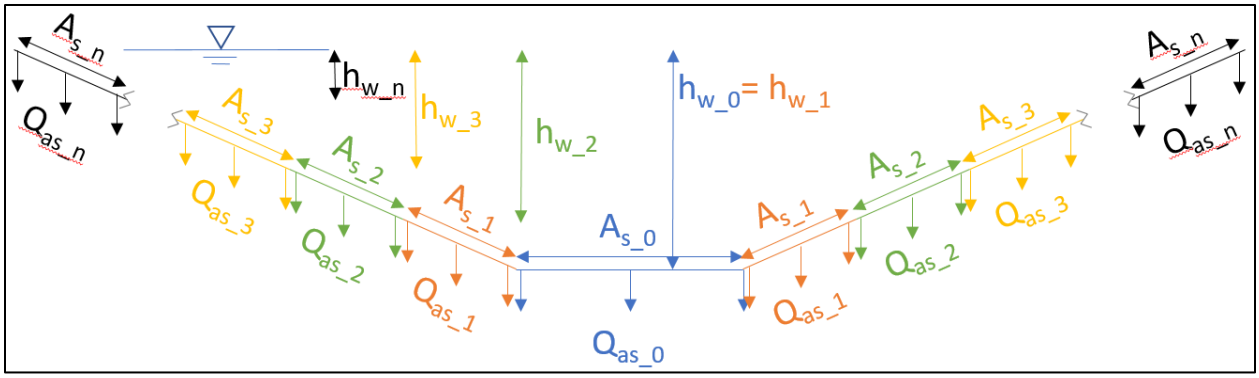


Figure F-3. Step area calculation example for areas with sloping liner, such as the In-Heap Pond and Event Pond.

The largest head from each step area was used to calculate leakage along the slopes. Once the leakage through a single defect was calculated, the defect rate and the three-dimensional lined area (A_s) were used to calculate the total leakage from each area step (Q_{as}), as shown in Equation F-3 below:

$$Q_{as} = Q \cdot (defect\ rate) \cdot A_s \qquad \text{Eq. F-3}$$

The incremental leakages from the steps below every PLS surface elevation were then summed to calculate the total leakage at each PLS level, as shown below:

$$Q_{total} = \sum Q_{as\_0}, Q_{as\_1}, Q_{as\_2}, Q_{as\_3}, \ldots, Q_{as\_n}$$

3.4.2. Flow Through the Geocomposite

Geocomposites are rated in terms of transmissivity. Transmissivity is defined as the flow rate per unit width per unit gradient, see Equation F-4.

$$\theta_{gc} = Q_{gc}/iw \qquad \text{Eq. F-4}$$

Where:

$\theta_{gc} =$ transmissivity of the geocomposite (m^2/s)

$Q_{gc} =$ flow through the geocomposite (m^3/s)

$i =$ gradient (unitless)

$w =$ width (m)

The transmissivity of the specified material (GSE's MineDrain) is at least 1.4E-3 m^2/s, tested in accordance with ASTM D 4716, at a stress of 1,200 kilopascals (kPa) (which approximately corresponds to the maximum ore height at the In-Heap Pond) and with a gradient of 0.1 (GSE, 2017). The total width of the geocomposite at the narrowest point, the edge of the LRDS Sump, is approximately 137 m.

The Event Pond will not be subjected to the same high stresses as the HLF foundation materials, therefore, a lower-capacity geocomposite was specified for use in the pond's double composite liner (GSE FabriNet 200 mil or approved equivalent). The transmissivity of the Event Pond geocomposite is at least 4.5E-4 m^2/s, tested in accordance with ASTM D 4716, at a stress of 100 kPa and with a gradient of 0.1 (GSE, 2017). The geocomposite transmissivity values reported are valid for a double-sided 8 ounce per square yard geotextile.

3.4.3. Leakage Through the Secondary Geomembrane and GCL

The leakage through the secondary geomembrane and GCL was calculated using the same method for calculating leakage through a single composite liner system, as described in Section 3.3. However, the fluid pressure on the secondary geomembrane is expected to be minimal because the geocomposite will provide effective drainage between the geomembranes. For these analyses, a head of 0.01 m was used to calculate leakage through the secondary geomembrane and GCL.

4.0 LINER LEAKAGE CALCULATION RESULTS

The results of the liner leakage calculations are presented according to area: the Heap Pad, the In-Heap Pond, and the Event Pond.

4.1. Heap Pad

The heap pad will be lined by a single composite liner, as shown in Figure F-1. Equation F-2 was used to calculate the leakage per hectare, below:

$$Q = 2L[kb + (kD\theta)^{0.5}]h_d/D$$

$$= 2 \cdot 700\,m \cdot \left[\frac{5 \cdot 10^{-11}\,m}{s} \cdot 0.15\,m + \left(\frac{5 \cdot 10^{-11}\,m}{s} \cdot 0.006\,m \cdot \frac{4 \cdot 10^{-11}\,m^2}{s}\right)^{0.5}\right] \cdot 0.6\,m/0.006\,m$$

$$= 1.5 \cdot 10^{-6}\ {}^{m^3}/_{s}\ \ per\ hectare$$

The above calculation assumes at least one defect will coincide with the connected wrinkle, and that the leakage through other defects not hydraulically connected to a wrinkle is insignificant. Considering the areas of the three planned phases of the HLF, the total flow for each phase was calculated, presented in Table F-1.

Table F-1 Calculated heap pad area composite liner leakages.

Phase	Area (m^2)	Calculated Total Liner Leakage (L/day)
Phase 1	435,000	5,800
Phase 2	213,000	2,800
Phase 3	331,000	4,400
Total	979,000	13,000

4.2. In-Heap Pond

The In-Heap Pond Area will be lined by a double composite liner system, as shown in Figure F-2. Leakage through the upper primary liner will flow through the geocomposite and report to the LDRS Sump.

4.2.1. LDRS Alert Levels

The low alert level (Alert Level 1, or AL1), is established based on the small defect leakage rate, which is intended to represent the leakage rate expected from geomembranes installed with strict construction quality assurance. The high alert level (Alert Level 2, or AL2) is intended to represent the maximum possible flow that can be transmitted to the LDRS pump system. Since the pumping system is designed to this maximum flow rate, AL2 represents the capacity of the LDRS system to evacuate leakage from the LDRS sump faster than it accumulates. The geocomposite between the primary and secondary geomembranes transmits less flow to the drain fill than the drain fill can transmit to the sump piping, therefore AL2 is based on the geocomposite transmissivity. Should leakage exceed this rate, head is theoretically building on the secondary geomembrane beneath the geocomposite.

Equation F-4 was used to calculate the flow transmitted through the geocomposite at the tested gradient, below:

$$\theta_{gc} = Q_{gc}/iw \quad \therefore \quad Q_{gc} = \theta_{gc} iw = \frac{1.4 \cdot 10^{-3}\ m^2}{s} \cdot 0.1 \cdot 137\ m$$

$$= 0.0192\ {}^{m^3}/_{s} = 1{,}657{,}152\ {}^{L}/_{day}$$

The MineDrain geocomposite can transmit up to 1,700,000 liters per day (L/day) into the LDRS sump at a gradient of 0.1.

The leakage through each defect in the primary geomembrane of the In-Heap Pond is calculated using Equation F-1, below:

$$Q = C_B A_d \sqrt{2gh_w}$$

$$= 0.6 \cdot (3.14 \cdot 10^{-6}\ m^2\ or\ 1 \cdot 10^{-4}\ m^2) \cdot \sqrt{2 \cdot \frac{9.81\ m}{s^2} \cdot h_w}$$

As described in Section 3.4.1, the head (h_w) will vary with different PLS and stormwater levels and along the liner slope, so the leakage was calculated in steps. The small defect size (A_d = *3.14 mm^2*) was used to calculate the primary alert level, and the large defect size (A_d = *100 mm^2*) was compared to the maximum flow through the geocomposite. Once the leakage through a single defect was calculated, Equation F-3 was used to calculate the total leakage from each area step (Q_{as}), below:

$$Q_{as} = Q \cdot (defect\ rate) \cdot A_s$$

$$= Q\,{}^{m^3}/_{s}\ \ per\ defect \cdot \frac{5\ defects}{ha} \cdot \frac{ha}{10{,}000\ m^2} \cdot A_s\ m^2 \cdot \frac{1{,}000\ L}{m^3} \cdot \frac{86{,}400\ s}{day} = Q_{as}\ {}^{L}/_{day}$$

The step area calculation was repeated for every one-meter interval beneath the pond surface for each one-meter increase in pond elevation, from 913 masl (1m above the bottom of the In-Heap Pond) to EL. 939 masl. Each of the increments below the pond surface were summed to produce the total flow rate for each pond level. The total leakage calculated for each pond level is illustrated in Table F-2.

Table F-2 In-Heap Pond Area primary liner leakage results.

In-Heap Pond Elevation (m)	Liner Leakage, Small Defects (L/day)	Liner Leakage, Large Defects (L/day)
913	160	5,200
914	810	26,000
915	1,300	42,000
916	1,900	61,000
917	2,600	84,000
918	3,500	110,000
919	4,400	140,000
920	5,600	180,000
921	6,800	220,000
922	8,200	260,000
923	9,700	310,000
924	11,000	360,000
925	13,000	430,000
926	16,000	500,000
927	18,000	580,000
928	21,000	670,000
929	24,000	770,000
930	28,000	880,000
931	32,000	1,000,000
932	36,000	1,200,000
933	41,000	1,300,000
934	47,000	1,500,000
935	53,000	1,700,000
936	61,000	2,000,000
937	69,000	2,200,000

938	77,000	2,500,000
939	83,000	2,600,000

The results of the liner leakage analysis show that the geocomposite can transmit the equivalent of leakage through approximately 3 large defects (100 mm^2) per hectare under the assumptions and head levels considered for the In-Heap Pond.

The AL1 flow rate is equal to the small defects flow rates. The maximum AL2 flow rate is equal to the total geocomposite transmissivity; other AL2 levels were reduced in proportion to the leakage rate expected for each pond elevation. Table F-3 presents the recommended leakage alert levels for the In-Heap Pond.

Table F-3 Recommended In-Heap Pond alert levels.

In-Heap Pond Elevation (m)	AL1 (L/day)	AL2 (L/day)
913	160	3,300
914	810	16,000
915	1,300	26,000
916	1,900	39,000
917	2,600	53,000
918	3,500	69,000
919	4,400	89,000
920	5,600	110,000
921	6,800	140,000
922	8,200	160,000
923	9,700	190,000
924	11,000	230,000
925	13,000	270,000
926	16,000	310,000
927	18,000	370,000
928	21,000	420,000
929	24,000	490,000
930	28,000	550,000
931	32,000	640,000
932	36,000	720,000
933	41,000	820,000
934	47,000	940,000
935	53,000	1,100,000

In-Heap Pond Elevation (m)	AL1 (L/day)	AL2 (L/day)
936	61,000	1,200,000
937	69,000	1,400,000
938	77,000	1,500,000
939	83,000	1,700,000

4.2.2. LDRS Sump Sizing

The LDRS Sump was designed to contain at least one hour of AL2 flow so that if the geocomposite is transmitting the maximum flow, the LDRS sump pumps only need to run once per hour to evacuate the sump. The volume of pore space provided by the current design configuration of the LDRS Sump is approximately 672 m^3, assuming a drain rock porosity of 30%. One hour of AL2 flow is approximately 69 m^3. The current sump design contains approximately 10 hours of AL2 flow.

4.2.3. Secondary Liner Leakage

The In-Heap Pond will be lined by a double composite liner system, see Figure F-2. Leakage through the primary (top) geomembrane will flow through the geocomposite, on top of the secondary (bottom) geomembrane, along the slope to the LDRS Sump where it will be pumped from the system. The secondary geomembrane will behave like a single composite liner. Leakage through the secondary geomembrane was calculated based on Equation F-2, as calculated for the Heap Pad in Section 4.1. The calculation assumes leakage is occurring through the primary (top) geomembrane.

The head on the sloped area of the secondary geomembrane was assumed to be 0.01 m since the flow will be directed to the LDRS Sump. The head in the LDRS Sump was assumed to be the maximum LDRS thickness, as if the LDRS Sump were full. Leakage through the secondary liner and GCL was calculated using the same equations presented in Section 4.1. The maximum total calculated leakage through the lower geomembrane and GCL of the In-Heap Pond double composite liner system is approximately 110 L/day.

4.3. Event Pond

The Event Pond will be lined by a double composite liner system, see Figure F-4. Leakage through the primary liner will flow through the geocomposite and report to the Event Pond LDRS Sump.

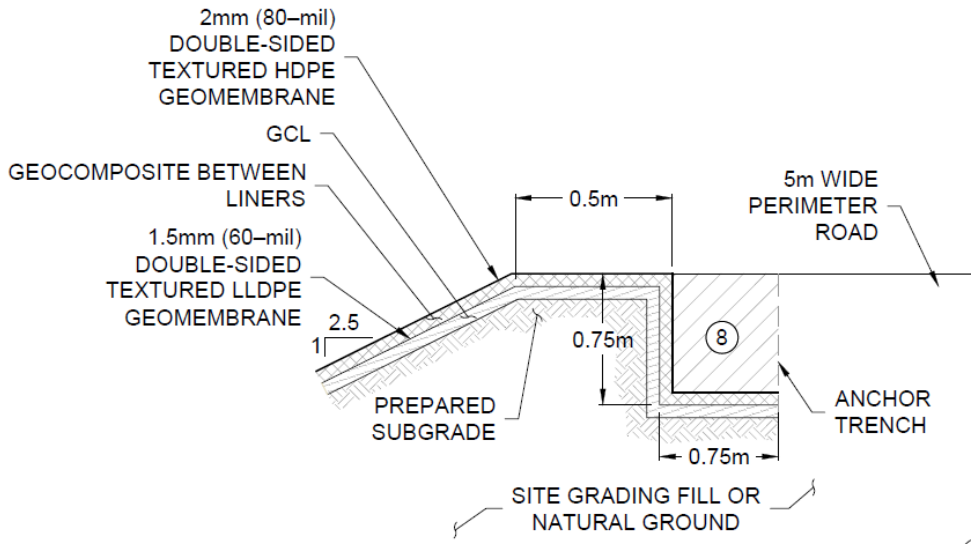


Figure F-4. Event pond liner section (not to scale).

4.3.1. LDRS Alert Levels

AL1 for the Event Pond is established based on leakage through small defects, the same criteria as the In-Heap Pond described in Section 4.2.1. AL2 for the Event Pond is established based on leakage through 5 large defects per hectare.

The leakage through each defect in the primary geomembrane of the Event Pond was calculated using Equation F-1, below:

$$Q = C_B A_d \sqrt{2gh_w}$$

$$= 0.6 \cdot (3.14 \cdot 10^{-6}\ m^2 or\ 1 \cdot 10^{-4}\ m^2) \cdot \sqrt{2 \cdot \frac{9.81\ m}{s^2} \cdot h_w}$$

As described in Section 3.4.1, the head (h_w) will vary with different water levels and along the liner slope, so the leakage was calculated in steps. The small defect size (A_d = *3.14 mm*^{2}) was used to calculate the primary alert level, and the large defect size (A_d = *100 mm*^{2}) was used to calculate the secondary alert level and determine the geocomposite dimensions required to transmit a large flow. Once the leakage through a single defect was calculated, Equation F-3 was used to calculate the total leakage from each area step (Q_{as}), below:

$$Q_{as} = Q \cdot (defect\ rate) \cdot A_s$$

$$= Q\ {}^{m^3}/_{s}\ \ per\ defect \cdot \frac{5\ defects}{ha} \cdot \frac{ha}{10{,}000\ m^2} \cdot A_s\ m^2 \cdot \frac{1{,}000\ L}{m^3} \cdot \frac{86{,}400\ s}{day} = Q_{as}\ {}^{L}/_{day}$$

The step area calculation was repeated for every one-meter interval beneath the pond surface for each one-meter increase in pond elevation, from EL. 882.5 masl to EL. 895.5 masl. Each of the increments below the pond surface were summed to produce the total flow rate for each pond level, presented in Table F-4.

Table F-4 Event Pond primary liner leakage results and alert levels.

Event Pond Elevation (m)	Liner Leakage, Small Defects (AL1) (L/day)	Liner Leakage, Large Defects (AL2) (L/day)
883	4,700	150,000
884	7,800	250,000
885	11,000	350,000
886	14,000	460,000
887	18,000	580,000
888	22,000	700,000
889	26,000	830,000
890	31,000	970,000
891	35,000	1,100,000
892	40,000	1,300,000
893	45,000	1,400,000
894	51,000	1,600,000
895	57,000	1,800,000
895.5	60,000	1,900,000

4.3.2. Leak Detection and Recovery System Sump Sizing

Equation F-4 was used to calculate the required width of the geocomposite, below:

$$\theta_{gc} = Q_{gc}/iw \quad \therefore \quad w = \frac{Q_{gc}}{i\theta_{gc}}$$

$$= \frac{0.022\, {}^{m^3}/_{s}}{1.0 \cdot 4.5 \cdot 10^{-4}\, {}^{m^2}/_{s}} = 48.9\, m$$

The results of the liner leakage analysis show that the geocomposite requires a minimum width of 49 m at the transition into the Event Pond LDRS Sump to transmit the AL2 flow into the sump. The Event Pond LDRS Sump was designed to exceed this requirement.

The Event Pond LDRS Sump was designed to store one hour of AL2 flow so that when the geocomposite is transmitting the maximum flow the LDRS sump pumps only need to run once per hour. Approximately 80 m^3/hour of leakage was calculated at AL2 levels. Assuming a porosity of 30% in the drain rock, the Event Pond LDRS Sump must have a volume of at least 264 m^3. If the Event Pond LDRS Sump is 1.5 m deep, and a top width and length of 20 m, and has side

slopes at 3H:1V, the volume is 370 m^3 and the top perimeter is 80 m. This volume and width of geocomposite is sufficient to store and transmit one hour of AL2 flow.

4.3.3. Secondary Liner Leakage

The Event Pond will be lined by a double composite liner system, see Figure F-2. Leakage through the primary geomembrane will flow through the geocomposite, on top of the secondary geomembrane, along the slope to the LDRS Sump where it will be pumped from the system. The secondary geomembrane will behave like a single composite liner. Leakage through the secondary geomembrane was calculated based on Equation F-2, as calculated for the upper heap pad area in Section 4.1. The calculation assumes leakage is occurring through the primary (top) geomembrane.

The head on the sloped area of the secondary geomembrane is assumed to be 0.01 m, since the flow will be directed to the LDRS Sump. The head in the LDRS Sump was assumed to be the LDRS depth (1.5 m as determined in Section 4.3.2) as if the LDRS Sump were full. Leakage through the secondary liner and GCL was calculated using the same equations presented in Section 4.1. The maximum total calculated leakage through the lower geomembrane and GCL of the Event Pond LDRS Sump double composite liner system is approximately 107 L/day.

5.0 CLOSURE

BGC Engineering Inc. (BGC) prepared this document for the account of StrataGold Corporation. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves all documents and drawings are submitted for the confidential information of our client for a specific project. A record copy of this document is on file at BGC. That copy takes precedence over any other copy or reproduction of this document.

Yours sincerely,

BGC ENGINEERING INC.
per:

Tony Monasterio, P.E.
Geological Engineer

Reviewed by:

Troy Meyer, P.E., P.Eng.
Principal Geological Engineer

Engineers Yukon Permit to Practice:
PP092 BGC Engineering Inc.

TLM/MH/rm/bm

REFERENCES

CETCO Mineral Technologies. 2007. Bentomat DN Certified Properties, product data sheet [online]. Available from http://www.cetco.com/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&PortalId=0&EntryId=176 [accessed June 19, 2017].

Giroud, J.P. 1997. Equations for calculating the rate of liquid migration through composite liners due to geomembrane defects. Geosynthetics International. **4**(3-4), pp. 335-348.

Giroud, J.P., and Bonaparte, R. 1989. Leakage through liners constructed with geomembranes – Part II. Composite Liners. *In* Geotextiles and Geomembranes. Elsevier Science Publishers Ltd, England, Great Britain, pp. 71-109.

Giroud, J.P., and Bonaparte, R. 2001. Geosynthetics in liquid-containing structures. *In* Geotechnical and geoenvironmental engineering handbook. *Edited by* R. K. Rowe. Kluwer Academic Publishers, Boston, pp. 789-824.

GSE Environmental. 2017. Laboratory-tested design values, provided via telephone conversation with Connie Wong, (281) 230-5830. June 20, 2017.

Rowe, R.K. 1998. Geosynthetics and the minimization of contaminant migration through barrier systems beneath solid waste. *In* Proceedings of the 6th International Conference on Geosynthetics, Atlanta, Ga., 25-29 March 1998. *Edited by* R.K. Rowe. Industrial Fabrics Association International, St. Paul, Minn. Vol. 1. pp. 27-103.

Rowe, R.K. 2011. Short- and long-term leakage through composite liners. The 7th Arthur Casagrande Lecture. Canadian Geotechnical Journal, **49**: 141-169. doi:10.1139/T11-092.

ATTACHMENT F-1

LINER LEAKAGE ANALYSIS CALCULATIONS

Project Number: 0792018
Client Name: Victoria Gold Corp
Project Name: Eagle Gold
Deliverable Name: Liner Leakage Analysis
Calculation Sheet Name: Inputs
Created By: Tony Monasterio
Reviewed By: Diana Cook, Troy Meyer

Input	Symbol	Value	Units	Source	Notes
GCL Hydraulic Conductivity	k	5.00E-11	m/s	CETCO	
GCL Thickness	D	0.006	m	CETCO	
Interface Transmissivity	theta	4.00E-11	m^2/s	Rowe, 2011	
Head on Pad Liner	hd	0.6	m	ODF Thickness	ODF is assumed to be saturated
Half Wrinkle Width	b	0.15	m	Rowe, 2011	
Connected Wrinkle Length	L	700	m	Rowe, 2011	
Phase 1 Pad Area	Aph_1	435000	m^2	DG Email, 20170612	Excludes PLS Sump area
Phase 2 Pad Area	Aph_2	213000	m^2	DG Email, 20170612	
Phase 3 Pad Area	Aph_3	331000	m^2	DG Email, 20170612	
Liters per Cubic Meter	Lpm	1000	L/m^3	definition	
Seconds per Day	spd	86400	s/d	definition	
Square Meters per Hectare	mpha	10000	m^2/ha	definition	
MineDrain Transmissivity	thetaMD	0.0014	m^2/s	GSE, 2017	
MineDrain tested Gradient	iMD	0.1	-	GSE, 2017	
'Width' of geocomposite at LDRS Sump	wMD	137	m		summed total perimeter of LDRS sump
Small defect area	Ads	3.14E-06	m^2	Rowe, 2011	
Large defect area	Adl	0.0001	m^2	Rowe, 2011	
Cb, edge coefficient	Cb	0.6	-		for sharp edges
Acceleration due to Gravity	g	9.81	m/s^2	definition	
Defect Rate	Rd	5	defects/ha	Giroud & Bonaparte, 2001	
hours per day	hpd	24	hr/day	definition	
LDRS Sump Max Depth	hd_ldrs	4.5	m	DOWL drawings	
LDRS Sump liner area	Aldrs	1104	m^2	DOWL drawings	
In-Heap Pond liner area	Apls	1431	m^2	DOWL drawings	excludes LDRS sump area
In-Heap Pond head on secondary liner	hd_pls	0.01	m	assumed	
Event Pond head on secondary liner	hd_eps	0.01	m	assumed	
FabriNet Transmissivity	thetaFD	0.00045	m^2/s	GSE, 2017	
FabriNet tested Gradient	iFD	1.0	-	GSE, 2017	
Porosity of LDRS Sump Material	n	0.3	-	assumed	
LDRS Depth	Dldrs	1.5	m	supposed	
LDRS Side Slopes	Hldrs	3	H:1V	supposed	
LDRS Top Width and Length	Wldrs	20	m	supposed	It's square
3D Area of EP LDRS Sump	AEPldrs	645	m^3	TM hand calc	Assuming 1.5 dpth, 3:1 slopes, and 20 m top width/length

Project Number:	0792018
Client Name:	Victoria Gold Corp
Project Name:	Eagle Gold
Deliverable Name:	Liner Leakage Analysis
Calculation Sheet Name:	Heap Pad Calcs
Created By:	Tony Monasterio
Reviewed By:	Diana Cook, Troy Meyer

Calculation	Symbol	Result	Units	Formula	Notes
Leakage per hectare	Qpha	1.535E-06	m^3/s	=2*L*(k*b+(k*D*theta)^0.5)*hd/D	
Phase 1 Pad Total Leakage	Qph_1	6.6771E-05	m^3/s	=Qpha*Aph_1/mpha	
Phase 1 Pad Total Leakage	Qph_1lpd	5769	L/d	=Qph_1*Lpm*spd	
Phase 2 Pad Total Leakage	Qph_2	3.2695E-05	m^3/s	=Qpha*Aph_2/mpha	
Phase 2 Pad Total Leakage	Qph_2lpd	2825	L/d	=Qph_2*Lpm*spd	
Phase 3 Pad Total Leakage	Qph_3	5.0808E-05	m^3/s	=Qpha*Aph_3/mpha	
Phase 3 Pad Total Leakage	Qph_3lpd	4390	L/d	=Qph_3*Lpm*spd	

Project Number: 0792018
Client Name: Victoria Gold Corp
Project Name: Eagle Gold
Deliverable Name: Liner Leakage Analysis
Calculation Sheet Name: In-Heap Pond Steps
Created By: Tony Monasterio
Reviewed By: Diana Cook, Troy Meyer

Inputs					Calculations	Small Defects								
Elevation	Contour Area	Depth	Incremental Volume	Cumulative Volume	3D Liner Area	Leakg_0 (bttm)	Leakg_1	Leakg_2	Leakg_3	Leakg_4	Leakg_5	Leakg_6	Leakg_7	Leakg_8
m	m2	m	m3	m3	m2	L/day								
912	171	0	0	0	180.6	-	-							
913	430.5	1	290.94	290.94	454.6	65	99							
914	1497.6	1	910.35	1201.29	1581.5	92	140	575						
915	1981.8	1	1734.06	2935.35	2092.8	113	171	704	319					
916	2532	1	2251.29	5186.63	2673.8	130	198	812	369	419				
917	3083.87	1	2803.4	7990.04	3256.6	146	221	908	412	468	470			
918	3708.62	1	3391.45	11381.48	3916.3	159	242	995	452	513	515	583		
919	4405.95	1	4052.29	15433.77	4652.7	172	261	1,075	488	554	556	629	702	
920	5153.82	1	4775	20208.77	5442.4	184	279	1,149	521	592	594	673	751	805
921	5941.19	1	5542.84	25751.61	6273.9	195	296	1,219	553	628	630	714	796	854
922	6778.94	1	6355.46	32107.08	7158.6	206	312	1,285	583	662	664	752	839	900
923	7677.37	1	7223.5	39330.57	8107.3	216	328	1,347	611	695	697	789	880	944
924	8674.08	1	8170.66	47501.23	9159.8	226	342	1,407	639	726	728	824	920	986
925	9781.32	1	9222.16	56723.39	10329.1	235	356	1,465	665	755	758	858	957	1,027
926	10993.26	1	10381.39	67104.79	11608.9	244	370	1,520	690	784	786	890	993	1,065
927	12381.38	1	11680.45	78785.23	13074.7	252	383	1,573	714	811	814	921	1,028	1,103
928	13893.89	1	13130.38	91915.61	14671.9	260	395	1,625	737	838	840	951	1,062	1,139
929	15473.07	1	14676.4	106592.01	16339.6	268	407	1,675	760	864	866	981	1,095	1,174
930	17172.44	1	16315.38	122907.39	18134.1	276	419	1,724	782	889	891	1,009	1,126	1,208
931	19102.87	1	18129.09	141036.47	20172.6	284	431	1,771	803	913	916	1,037	1,157	1,241
932	21171.48	1	20128.31	161164.79	22357.1	291	442	1,817	824	937	940	1,064	1,187	1,273
933	23594.79	1	22372.2	183536.98	24916.1	298	453	1,862	845	960	963	1,090	1,217	1,305
934	26242.38	1	24906.86	208443.84	27712.0	305	463	1,905	865	982	985	1,116	1,245	1,335
935	29267.06	1	27740.98	236184.82	30906.0	312	474	1,948	884	1,005	1,008	1,141	1,273	1,365
936	32462.57	1	30851.02	267035.84	34280.5	319	484	1,990	903	1,026	1,029	1,165	1,301	1,395
937	35992.53	1	34212.37	301248.21	38008.1	325	494	2,031	922	1,047	1,050	1,189	1,327	1,424
938	39714.74	1	37838.38	339086.59	41938.8	332	504	2,071	940	1,068	1,071	1,213	1,354	1,452
939	41835.65	1	40770.6	379857.19	44178.4	338	513	2,111	958	1,088	1,092	1,236	1,379	1,479

Leakg_9	Leakg_10	Leakg_11	Leakg_12	Leakg_13	Leakg_14	Leakg_15	Leakg_16	Leakg_17	Leakg_18	Leakg_19	Leakg_20	Leakg_21	Leakg_22	Leakg_23	Leakg_24	Leakg_25	Leakg_26
899																	
948	1,009																
994	1,058	1,134															
1,038	1,105	1,185	1,314														
1,081	1,150	1,233	1,368	1,520													
1,122	1,193	1,280	1,420	1,577	1,726												
1,161	1,235	1,325	1,470	1,633	1,787	2,047											
1,199	1,276	1,368	1,518	1,686	1,846	2,114	2,303										
1,236	1,315	1,410	1,564	1,738	1,902	2,179	2,374	2,479									
1,272	1,353	1,451	1,610	1,788	1,957	2,242	2,443	2,551	2,745								
1,307	1,390	1,491	1,654	1,837	2,011	2,303	2,510	2,621	2,820	3,203							
1,341	1,426	1,530	1,697	1,885	2,063	2,363	2,575	2,689	2,893	3,287	3,522						
1,374	1,462	1,567	1,739	1,932	2,114	2,422	2,639	2,755	2,965	3,368	3,609	4,228					
1,406	1,496	1,604	1,780	1,977	2,164	2,479	2,701	2,820	3,034	3,447	3,694	4,327	4,728				
1,438	1,530	1,640	1,820	2,022	2,213	2,534	2,761	2,883	3,103	3,524	3,777	4,424	4,834	5,522			
1,468	1,562	1,676	1,859	2,065	2,260	2,589	2,821	2,945	3,169	3,600	3,858	4,520	4,938	5,641	5,960		
1,499	1,595	1,710	1,897	2,108	2,307	2,642	2,879	3,006	3,235	3,675	3,938	4,613	5,040	5,757	6,083	6,719	
1,528	1,626	1,744	1,935	2,149	2,353	2,695	2,936	3,065	3,299	3,747	4,016	4,704	5,139	5,871	6,203	6,852	7,225
1,558	1,657	1,777	1,972	2,190	2,397	2,746	2,992	3,124	3,362	3,819	4,092	4,794	5,237	5,983	6,321	6,983	7,363

		Large Defects															
Leakg_27	Total	Leakg_0 (bttm)	Leakg_1	Leakg_2	Leakg_3	Leakg_4	Leakg_5	Leakg_6	Leakg_7	Leakg_8	Leakg_9	Leakg_10	Leakg_11	Leakg_12	Leakg_13	Leakg_14	Leakg_15
	L/day	L/day															
	-	-	-														
	164	2,073	3,146														
	806	2,932	4,449	18,297													
	1,307	3,591	5,449	22,409	10,168												
	1,928	4,146	6,292	25,875	11,741	13,341											
	2,625	4,636	7,035	28,929	13,127	14,916	14,961										
	3,458	5,078	7,707	31,691	14,380	16,340	16,389	18,554									
	4,438	5,485	8,324	34,230	15,532	17,649	17,702	20,040	22,368								
	5,549	5,864	8,899	36,593	16,604	18,867	18,925	21,424	23,913	25,646							
	6,785	6,220	9,439	38,813	17,611	20,012	20,073	22,724	25,363	27,202	28,638						
	8,161	6,556	9,949	40,912	18,564	21,094	21,159	23,953	26,735	28,673	30,188	32,119					
	9,694	6,876	10,435	42,909	19,470	22,124	22,191	25,122	28,040	30,073	31,661	33,687	36,127				
	11,439	7,182	10,899	44,817	20,336	23,108	23,178	26,239	29,287	31,410	33,069	35,185	37,733	41,861			
	13,426	7,475	11,344	46,647	21,166	24,051	24,124	27,310	30,483	32,692	34,419	36,621	39,274	43,570	48,402		
	15,659	7,757	11,772	48,408	21,965	24,959	25,035	28,341	31,634	33,926	35,718	38,004	40,756	45,215	50,229	54,979	
	18,255	8,030	12,185	50,107	22,736	25,835	25,914	29,336	32,744	35,117	36,972	39,338	42,187	46,802	51,992	56,908	65,181
	21,157	8,293	12,585	51,750	23,482	26,683	26,764	30,298	33,818	36,269	38,185	40,628	43,571	48,337	53,697	58,775	67,319
	24,287	8,548	12,972	53,343	24,205	27,504	27,587	31,231	34,859	37,385	39,360	41,878	44,911	49,824	55,350	60,583	69,390
	27,736	8,796	13,348	54,890	24,906	28,301	28,387	32,136	35,869	38,469	40,501	43,092	46,214	51,269	56,954	62,340	71,402
	31,700	9,037	13,714	56,394	25,589	29,077	29,165	33,017	36,852	39,523	41,611	44,273	47,480	52,674	58,515	64,048	73,359
	36,045	9,272	14,070	57,859	26,254	29,832	29,923	33,874	37,810	40,550	42,692	45,423	48,713	54,042	60,035	65,712	75,265
	41,163	9,501	14,418	59,288	26,902	30,569	30,662	34,711	38,743	41,551	43,746	46,545	49,916	55,377	61,518	67,335	77,123
	46,859	9,724	14,757	60,683	27,535	31,288	31,383	35,528	39,655	42,529	44,775	47,640	51,091	56,680	62,965	68,919	78,938
	53,434	9,943	15,089	62,047	28,154	31,991	32,088	36,326	40,546	43,485	45,782	48,711	52,239	57,954	64,380	70,468	80,712
	60,543	10,157	15,413	63,381	28,759	32,679	32,779	37,107	41,418	44,420	46,766	49,759	53,363	59,200	65,765	71,984	82,448
	68,511	10,366	15,731	64,688	29,352	33,353	33,455	37,873	42,272	45,336	47,731	50,785	54,463	60,421	67,121	73,468	84,148
	77,093	10,571	16,043	65,969	29,934	34,014	34,117	38,623	43,110	46,234	48,676	51,790	55,542	61,617	68,451	74,923	85,815
4,195	82,757	10,773	16,348	67,226	30,504	34,662	34,767	39,358	43,931	47,115	49,603	52,777	56,600	62,791	69,754	76,350	87,449

Leakg_16	Leakg_17	Leakg_18	Leakg_19	Leakg_20	Leakg_21	Leakg_22	Leakg_23	Leakg_24	Leakg_25	Leakg_26	Leakg_27	Total	AL1	AL2	1-hr AL2 Flow
												L/day	L/day	L/day	m3
												-			
												5,219	164	3,282	
												25,678	806	16,145	
												41,617	1,307	26,167	
												61,396	1,928	38,604	
												83,604	2,625	52,567	
												110,138	3,458	69,250	
												141,331	4,438	88,863	
												176,735	5,549	111,124	
												216,094	6,785	135,872	
												259,902	8,161	163,416	
												308,715	9,694	194,108	
												364,303	11,439	229,059	
												427,580	13,426	268,846	
												498,700	15,659	313,563	
												581,384	18,255	365,552	
73,351												673,802	21,157	423,660	
75,609	78,941											773,480	24,287	486,334	
77,801	81,230	87,412										883,317	27,736	555,395	
79,933	83,456	89,808	102,019									1,009,541	31,700	634,760	
82,009	85,624	92,141	104,669	112,161								1,147,928	36,045	721,772	
84,034	87,738	94,416	107,254	114,931	134,638							1,310,914	41,163	824,251	
86,012	89,803	96,638	109,778	117,635	137,806	150,560						1,492,323	46,859	938,315	
87,945	91,821	98,810	112,245	120,279	140,903	153,944	175,870					1,701,733	53,434	1,069,983	
89,836	93,796	100,935	114,659	122,866	143,934	157,255	179,653	189,799				1,928,133	60,543	1,212,334	
91,689	95,730	103,016	117,023	125,400	146,902	160,498	183,357	193,713	213,987			2,181,880	68,511	1,371,881	
93,505	97,626	105,057	119,341	127,883	149,811	163,676	186,988	197,549	218,225	230,110		2,455,200	77,093	1,543,734	
95,286	99,486	107,058	121,614	130,319	152,665	166,794	190,550	201,312	222,382	234,494	133,614	2,635,584	82,757	1,657,152	69.0

Project Number:	0792018
Client Name:	Victoria Gold Corp
Project Name:	Eagle Gold
Deliverable Name:	Liner Leakage Analysis
Calculation Sheet Name:	In-Heap Pond LDRS Calcs
Created By:	Tony Monasterio
Reviewed By:	Diana Cook, Troy Meyer

Calculation	Symbol	Result	Units	Formula	Notes
Flow through MineDrain	QMD	0.01918	m^3/s	=thetaMD*iMD*wMD	
Flow through MineDrain	QMDlpd	1,657,152	L/d	=QMD*Lpm*spd	
Leakage per hectare, bottom of LDRS	Qpls_pha	1.15E-05	m^3/s	=2*L*(k*b+(k*D*theta)^0.5)*hd_ldrs/D	
Leakage per hectare, side slopes of LDRS	Qpls_phas	2.56E-08	m^3/s	=2*L*(k*b+(k*D*theta)^0.5)*hd_pls/D	
PLS Sump Secondary Total Leakage	Qpls	1.27E-06	m^3/s	=Qpls_pha*Aldrs/mpha+Qpls_phas*Apls/mpha	
PLS Sump Secondary Total Leakage	Qpls_lpd	110.1	L/d	=Qpls*Lpm*spd	

Project Number: 0792018
Client Name: Victoria Gold Corp
Project Name: Eagle Gold
Deliverable Name: Liner Leakage Analysis
Calculation Sheet Name: Event Pond Steps
Created By: Tony Monasterio
Reviewed By: Diana Cook, Troy Meyer

Inputs					Calculations	Small Defects								
Elevation	Contour Area	Depth	Incremental Volume	Cumulative Volume	3D Liner Area	Leakg_0 (bttm)	Leakg_1	Leakg_2	Leakg_3	Leakg_4	Leakg_5	Leakg_6	Leakg_7	Leakg_8
m	m2	m	m3	m3	m2	L/day								
882	10125	0	0	0	10905.0	-	-							
883	12160	1	11135.5	11135.5	13096.7	3,931	790							
884	14245	1	13195.94	24331.44	15342.3	5,560	1,117	1,145						
885	16380	1	15306.27	39637.71	17641.8	6,809	1,369	1,402	1,436					
886	18565	1	17466.53	57104.24	19995.1	7,863	1,580	1,619	1,658	1,697				
887	20800	1	19676.73	76780.97	22402.3	8,791	1,767	1,810	1,854	1,897	1,940			
888	23085	1	21936.89	98717.86	24863.3	9,630	1,935	1,983	2,031	2,078	2,126	2,173		
889	25420	1	24247.04	122964.9	27378.2	10,401	2,091	2,142	2,193	2,245	2,296	2,347	2,399	
890	27805	1	26607.15	149572.05	29946.9	11,119	2,235	2,290	2,345	2,400	2,455	2,509	2,564	2,619
891	30240	1	29017.25	178589.3	32569.5	11,794	2,370	2,429	2,487	2,545	2,603	2,662	2,720	2,778
892	32725	1	31477.33	210066.63	35245.9	12,432	2,499	2,560	2,621	2,683	2,744	2,806	2,867	2,928
893	35260	1	33987.41	244054.04	37976.2	13,039	2,621	2,685	2,749	2,814	2,878	2,943	3,007	3,071
894	37845	1	36547.47	280601.51	40760.3	13,618	2,737	2,804	2,872	2,939	3,006	3,073	3,141	3,208
895	40480	1	39157.53	319759.04	43598.3	14,175	2,849	2,919	2,989	3,059	3,129	3,199	3,269	3,339
895.5	41816.25	0.5	20573.16	340332.17	45037.5	14,445	2,903	2,975	3,046	3,117	3,189	3,260	3,331	3,403

							Large Defects											
Leakg_9	Leakg_10	Leakg_11	Leakg_12	Leakg_13	Leakg_14	Total	Leakg_0 (bttm)	Leakg_1	Leakg_2	Leakg_3	Leakg_4	Leakg_5	Leakg_6	Leakg_7	Leakg_8	Leakg_9	Leakg_10
						L/day	L/day										
						-	-	-									
						4,721	125,201	25,164									
						7,822	177,061	35,587	36,462								
						11,016	216,855	43,585	44,656	45,727							
						14,417	250,402	50,328	51,564	52,801	54,037						
						18,059	279,958	56,268	57,651	59,033	60,416	61,798					
						21,956	306,679	61,639	63,153	64,668	66,182	67,697	69,211				
						26,114	331,251	66,577	68,213	69,849	71,485	73,121	74,756	76,392			
						30,536	354,122	71,174	72,923	74,672	76,421	78,169	79,918	81,667	83,416		
2,836						35,225	375,604	75,492	77,347	79,201	81,056	82,911	84,766	86,621	88,476	90,330	
2,990	3,051					40,181	395,921	79,575	81,530	83,486	85,441	87,396	89,351	91,306	93,261	95,217	97,172
3,136	3,200	3,265				45,407	415,245	83,459	85,510	87,560	89,611	91,662	93,712	95,763	97,813	99,864	101,915
3,275	3,342	3,410	3,477			50,903	433,710	87,170	89,312	91,454	93,596	95,737	97,879	100,021	102,163	104,305	106,446
3,409	3,479	3,549	3,619	3,689		56,670	451,419	90,730	92,959	95,188	97,417	99,647	101,876	104,105	106,334	108,564	110,793
3,474	3,545	3,616	3,688	3,759	1,906	59,656	460,019	92,458	94,730	97,001	99,273	101,545	103,817	106,088	108,360	110,632	112,903

Leakg_11	Leakg_12	Leakg_13	Leakg_14	Total	AL1	AL2	AL2	1-hr AL2 Flow
				L/day	L/day	L/day	m3/s	m3
				-				
				150,365	4,721	150,365	0	
				249,110	7,822	249,110	0.0029	
				350,823	11,016	350,823	0.0041	
				459,133	14,417	459,133	0.0053	
				575,124	18,059	575,124	0.0067	
				699,228	21,956	699,228	0.0081	
				831,645	26,114	831,645	0.0096	
				972,482	30,536	972,482	0.0113	
				1,121,803	35,225	1,121,803	0.0130	
				1,279,656	40,181	1,279,656	0.0148	
103,965				1,446,079	45,407	1,446,079	0.0167	
108,588	110,730			1,621,111	50,903	1,621,111	0.0188	
113,022	115,251	117,481		1,804,786	56,670	1,804,786	0.0209	
115,175	117,447	119,718	60,711	1,899,877	59,656	1,899,877	0.0220	79.2

Project Number: 0792018
Client Name: Victoria Gold Corp
Project Name: Eagle Gold
Deliverable Name: Liner Leakage Analysis
Calculation Sheet Name: EP LDRS Sump Calcs
Created By: Tony Monasterio
Reviewed By: Diana Cook, Troy Meyer

Calculation	Symbol	Result	Units	Formula	Notes
Required width of FabriNet	wFD	48.9	m	=AL2mps/(iFD*thetaFD)	
LDRS Sump Volume Goal	Vgoal	263.9	m^3	=EPldrsflow/n	
LDRS Sump Volume	VEPldrs	370.5	m^3	=(Wldrs^2*Wldrs/(2*Hldrs))/3-((Wldrs-2*(Dldrs*Hldrs))^2*(Wldrs-2*(Dldrs*Hldrs))/(2*Hldrs))/3	
Perimeter of LDRS Sump	PEPldrs	80	m	=4*Wldrs	
Leakage per hectare, in LDRS	QEP_pha	3.84E-06	m^3/s	=2*L*(k*b+(k*D*theta)^0.5)*Hldrs/D	
Leakage per hectare, in side slopes	QEP_phas	2.56E-08	m^3/s	=2*L*(k*b+(k*D*theta)^0.5)*hd_eps/D	
Area of EP side slopes	A_EP	386551	m^2	=SUM('Event Pond Steps'!B11:B25)-Wldrs^2	
PLS Sump Secondary Total Leakage	QEPldrs	1.24E-06	m^3/s	=QEP_pha*AEPldrs/mpha+QEP_phas*A_EP/mpha	
PLS Sump Secondary Total Leakage	QEPldrs_lpd	106.8	L/d	=QEPldrs*Lpm*spd	

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 500 - 980 Howe Street, Vancouver, BC Canada V6Z 0C8
Telephone (604) 684-5900 Fax (604) 684-5909

Project Memorandum

To:	**File**		
		cc:	**Troy Meyer**
From:	**Tony Monasterio**	**Date:**	**November 15, 2017**
Subject:	**Appendix G – Slope Stability Analysis**		
Project No.:	**0792018.02**		

1.0 INTRODUCTION

The purpose of this memorandum is to present the methods and results of the slope stability and dynamic deformation analyses completed for the proposed Heap Leach Facility (HLF) at StrataGold Corporation's (SGC) Eagle Gold Project located in Yukon Territory, Canada. SGC is a directly held, wholly owned subsidiary of Victoria Gold Corp.

The Ann Gulch HLF will consist of a 61-meter-high embankment (downstream toe to crest) that lies across the Ann Gulch valley about 200 m upstream of the confluence with Dublin Gulch. The ore will be stacked behind the embankment within Ann Gulch. The confining embankment is designed to provide storage for the required ore tonnages. The embankment also creates an In-Heap Pond for temporary storage of pregnant solution, which is pumped to the recovery plant. See Drawing EGHLF-XD-01-01 for the general arrangement plan.

Limit-equilibrium slope stability analyses and seismic deformation analyses were performed for the design of the HLF. Selected cross sections were evaluated for stability of the HLF under static and pseudo-static loading conditions. The results of the stability analyses were used together with the method presented by Bray and Travasarou (2007) to estimate seismic deformations.

2.0 DESIGN CRITERIA

The HLF embankment is classified as "Significant" hazard according to Canadian Dam Association (CDA) dam classification guidelines (CDA, 2014). However, for conservatism the HLF embankment design criteria for seismicity is considered as a "High" hazard. CDA recommendations for high hazard dams include consideration of the Earthquake Design Ground Motion (EDGM) with an annual exceedance probability of 1 in 2,475, and factors of safety as summarized in Table G1.

Table G1. Target factors of safety for slope stability, after CDA (2014).

Loading Condition	Minimum Factor of Safety
Static, During construction (non-impounding)	1.3
Static, Long-term (impounding)	1.5
Pseudo-static	1.0
Post-earthquake	1.2

2.1. Seismicity

According to the site-specific seismic hazard analysis previously performed for this site (Tetra Tech, 2012), a design peak ground acceleration (PGA) of 0.35g should be used for facilities requiring low-probability (e.g., 1 in 5,000, or 1 in 10,000-yr events) or maximum design earthquake (MDE) ground motions, and a PGA of 0.25g should be used for facilities requiring a 1 in 2,475-year event (equivalent to a 2 percent probability of exceedance in 50 years). The lower PGA (0.25g) was used for ground motions associated with a design basis earthquake (DBE), and the higher PGA (0.35g) was used for ground motions associated with an MDE event.

Pseudo-static analyses were performed to evaluate the stability of the HLF under seismic (earthquake) loading. A pseudo-static stability analysis incorporates the effects of seismic loads by subjecting the two-dimensional sliding mass to a horizontal acceleration equal to a seismic coefficient based on the PGA expected during an earthquake.

According to recommendations provided by the United States Army Corps of Engineers miscellaneous paper GL-84-13 (Hynes-Griffin and Franklin, 1984), a seismic coefficient equal to one-half the PGA is appropriate for a pseudo-static analysis of structures in which deformations of up to about 1 m are tolerable (i.e., 0.125g for a DBE design, and 0.175g for an MDE design at this site). The analysis method described by Bray and Travasarou (2007) was used to further define estimates of potential seismic deformation.

The DBE was used in the operational pseudo-static analyses, while the MDE was used in the post-closure pseudo-static analyses. The magnitude and distance of the DBE (NRCAN 2017a) and MDE (Tetra Tech 2012) are M = 5.7 at 17 kilometers and M = 7.0 at 30 kilometers, respectively.

2.2. Subsurface Conditions

A detailed geotechnical description of the HLF site is provided in various reports prepared by BGC (2010, 2011a, 2011b, 2012a, 2012b, 2017).

Overburden soils encountered on the sloping ground at the HLF site typically consist of a veneer of organic soils overlying a blanket of colluvium between 0.2 and 7.6 meters thick, which overlies weathered bedrock. The bedrock encountered in the area is generally classified as metamorphosed sedimentary rock, with a variably deep weathering profile. The intact rock strength is variable depending on degree of weathering, with strengths ranging between R0 class (i.e., corresponding to < 1 megapascals (MPa) Unconfined Compressive Strength, UCS) and R4

(50-100 MPa UCS). The average intact strength is estimated to be approximately R2 (5-25 MPa) in the metasedimentary rock, but with significant variability across the site. The design requires the embankments to be founded on weathered bedrock with UCS > 1Mpa. For conservatism, the bedrock was assumed to be weak, highly to completely weathered (see Section 4 for material properties).

2.3. Phreatic Conditions

2.3.1. Leach Ore Pile

The granular ore heap will be wetted by controlled leaching (irrigation applied to the top of the heap) and will have a gravity drain system above the pad liner draining to the In-Heap Pond behind the dam. Therefore, the heap will largely remain in an unsaturated state. For conservatism, the water level in the In-Heap Pond was assumed to be at the embankment spillway invert. Upgradient of the In-Heap Pond, a phreatic level of 1 m on the pad liner was assumed to correspond with the maximum Overliner Drain Fill (ODF) depth.

The liner system in the sump area will be perforated during closure to provide drainage, therefore the post-closure pseudo-static analyses used a single groundwater surface 1 m below the punctured liner.

2.3.2. Embankment and Event Pond

The heap embankment will be lined with a double geomembrane composite liner system with leak detection, designed to limit seepage to the environment. The slope stability modeling used a failure surface in the foundation materials as described in Section 2.3.3, with no phreatic surface in the embankment.

2.3.3. Foundation

Based on water level data collected since 2010/2011 from six groundwater monitoring wells in the Ann Gulch basin, depths to groundwater in the lower valley range from 3 to 8 m bgs, and in the upper valley range from 8 to 19 m bgs. In the lower valley this sometimes coincides to immediately above the colluvium-weathered bedrock contact. In the upper valley the water level is generally within the bedrock. A liner underdrain will be used to prevent upward hydraulic pressure on the liner. The combination of the liner underdrain and elimination of infiltration due to placement of the liner system is expected to result in a lower groundwater level during operations and into post-operations. Conservatively, the foundation groundwater level was assumed to be 1 m below the liner for the modeling.

3.0 METHODS OF ANALYSIS

3.1. Slope Stability

Slope stability analyses were performed for three cross sections to assess the slope stability of the design for the heap leach facility: one cross section through the maximum height section of

the embankment and ore heap (Section A); one through a steep section of the HLF which does not intersect the embankment and incorporates the plant site cut slope (Section B); and the third through the event pond (Section C). Figure G1 shows the plan view of the sections for the HLF.

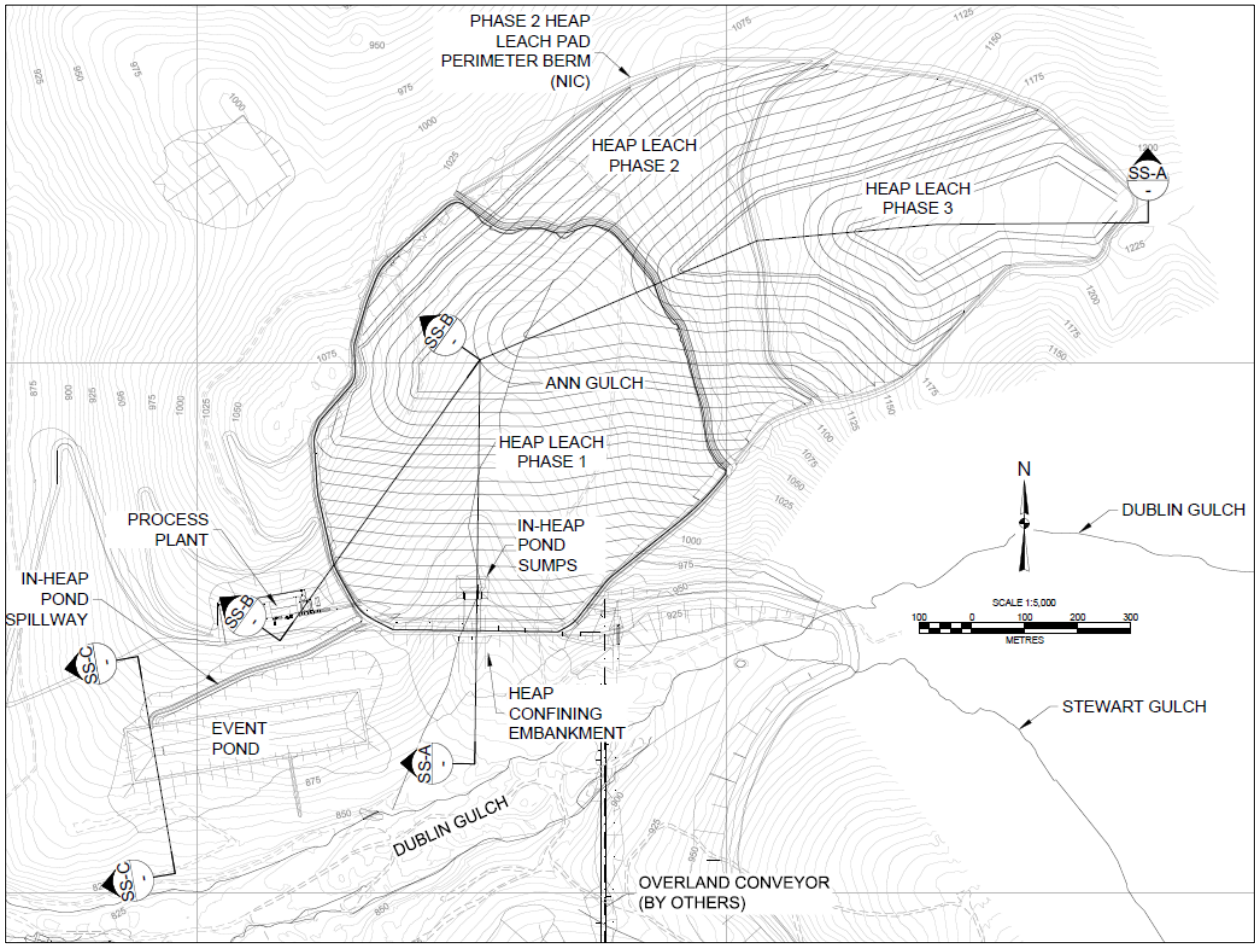


Figure G1. Eagle Gold HLF Slope Stability Sections

The stability analyses were conducted using the Slope/W component of GeoStudio 2016 (v. 8.16) by GEO-SLOPE International, Ltd. (GEO-SLOPE, 2016). Slope/W was used to conduct limit equilibrium analyses using the Morgenstern-Price method, which satisfies both moment and force equilibrium. The Slope/W program incorporates a search routine to locate the failure surfaces with the lowest factor of safety within user-defined search limits. Trial failure surfaces were defined with both “entry and exit” and “block specified” slip surface types, which allow the search routine to evaluate two different failure shapes. In the entry and exit option, the user defines a range of possible slip surface entry and exit locations within which the most critical (lowest factor of safety) circular failure surface may be identified. With the block specified option, the user defines nodes through which straight lines of the failure surface must pass; this option allows the user to focus the analysis on long, thin areas or layers of low strength (such as a liner interface) which a slip

surface could preferentially pass through, contributing to a low factor of safety. A fully-defined slip surface was used to specifically evaluate failure surfaces along the liner.

The ore will be stacked in 10m thick lifts. Bench-scale failures in the ore pile above the liner system were analyzed as well, although these are not considered critical, since the bench angles will be controlled by the ore angle of repose.

Four different conditions were analyzed under entry-exit, block, and fully specified slip surface types:

1. Static.
2. Pseudo-static.
3. Post-closure pseudo-static.
4. Post-earthquake static.

Conservatively, the post-closure pseudo-static analysis assumes the foundation phreatic conditions to be the same as those during operations, and assumes no head on the liner surface. The horizontal ground acceleration produced by the MDE event (see Section 2.1) is used in the post-closure analysis. The post-earthquake analysis uses the large-displacement liner strength, which is described further in Section 4.0.

3.2. Dynamic Deformation

A dynamic deformation analysis was completed for Section A (Figure G1) to evaluate the potential impact of deformation of the confining embankment during the design earthquake event. The deformations were estimated using the method developed by Bray and Travasarou (2007), which is based on the results of a series of finite element studies calibrated to actual measured movements in dams and other structures constructed with geomembrane liner systems. Bray and Travasarou developed a series of equations estimating potential deformations as a function of magnitude, yield acceleration (k_y), fundamental period (T_s), and the spectral acceleration at a degraded period equal to $1.5T_s$.

A magnitude of M = 5.7, corresponding to the DBE, was provided by Natural Resources Canada (NRCAN 2017a). The yield acceleration is the horizontal acceleration which produces a factor of safety of 1.0 in a pseudo-static analysis. The fundamental period of a structure corresponds to the inverse of the shortest frequency at which the structure will naturally vibrate under a dynamic disturbance, and is based on the structure's mass and stiffness characteristics.

Dynamic deformation was evaluated for both the embankment and the heap, and therefore fundamental periods are required for both structures. Stability analyses conducted on both structures indicate controlling failure planes that are largely circular. Therefore, the fundamental period (T_s) of the HLF structures was calculated using Equation G1.

$$T_s = 4\,H/V_s \qquad \text{Eq. G1}$$

Where:

H = Average height of the failure surface (from the embankment crest to the failure surface toe), m

V_s = Average shear wave velocity through the slide material, meters per second (m/s)

The average height of the failure surface through the embankment is 35 m, and 80 m through the heap. The average shear wave velocities of the embankment fill and heap material were estimated to be 400 and 150 m/s, respectively, based on literature values (Iwashita 1995, Chung 2011). Therefore, the fundamental periods of the embankment and heap were estimated as 0.35 and 2.1 seconds, respectively.

Spectral accelerations corresponding to typical periods were generated for the DBE (Figure G2) using the 2005 National Building Code Seismic Hazard Calculation tool, available through NRCAN (2017b), supplemented by the Canadian Foundation Engineering Manual (2006). These values were subsequently used to interpolate (or extrapolate) spectral accelerations for each structure at a degraded period equal to $1.5T_s$.

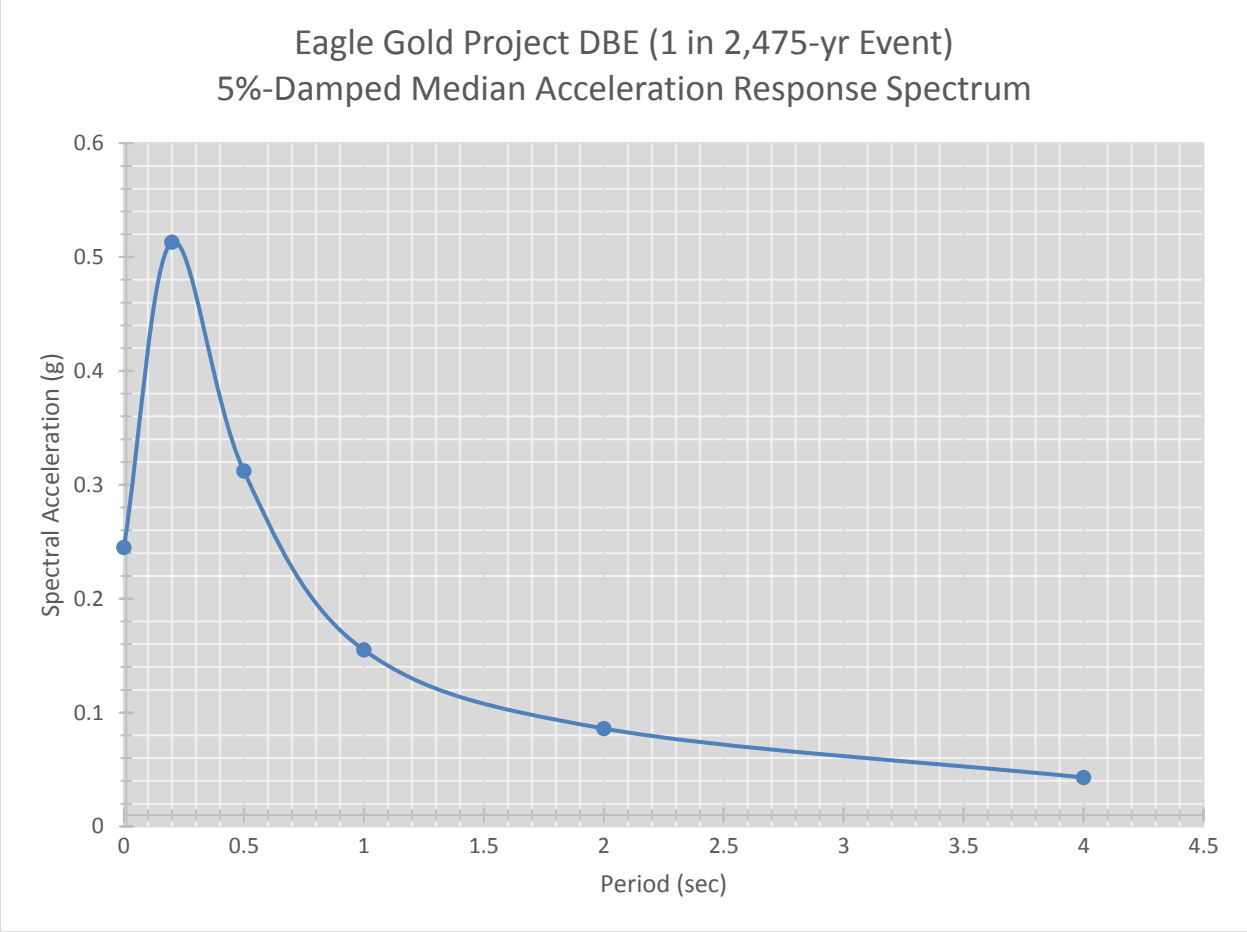


Figure G2. DBE response spectra for PGA = 0.25g

4.0 MATERIAL PROPERTIES

The material properties used in the slope stability analyses are shown in Table G2.

Table G2. Material properties used in slope stability analyses.

Material Description	Strength Model	Unit Weight (kN/m^3)	Cohesion, c' (kPa)	Friction Angle, Φ' (°)
Crushed Ore	Mohr-Coulomb	18	0	38[3]
Colluvium	Mohr-Coulomb	22	0	40
Type 3 Bedrock	Shear-Normal	22	See Note 1	See Note 1
Type 2 Bedrock	Shear-Normal	22	See Note 1	See Note 1
Liner Interface	[2]	12	See Note 2	See Note 2
Embankment Fill	Mohr-Coulomb	21.5	0	38

Notes:
[1] Shear-normal function, see Section 4.3.
[2] Shear-normal function for static and pseudo-static analyses, bilinear function for post-earthquake analysis, see Section 4.4.
[3] Undrained strength model was used for the saturated ore in the in-heap pond, Su/p' = 0.15

4.1. Ore

The unit weight of the crushed ore was estimated from loaded column percolation laboratory tests (KCA, 2012). The ore heap will generally consist of crushed material smaller than 9 millimeters (mm) in diameter. The shear strength of the crushed ore was estimated based on an empirical relationship developed by Barton (1981) based on numerous laboratory shear tests. The method uses known parameters from the ore such as uniaxial compressive strength, particle size and roughness.

Equation G2.

$$\phi' = R \log (S/s'_n) + \phi_b \qquad \text{Eq. G2}$$

Where:

ϕ' = Calculated effective friction angle (degrees)

R = Equivalent roughness (unitless), from Figure 8 of Barton (1981)

S = Equivalent strength (Mpa), from Figure 7 of Barton (1981)

s'_n = Normal stress (MPa)

ϕ_b = Basic friction angle (degrees), ranges from 25 to 30 degrees

An equivalent strength (S) of 51 MPa was based on a d_{50} particle size of 4mm and an average uniaxial compressive strength of 85 Mpa for the sedimentary host rock type (BGC, 2012b). An equivalent roughness (R) of 6 was based on a porosity of 35%. A normal stress (s'_n) of 1 MPa was used to represent the average condition and a basic friction angle of 27.5 degrees was used.

$\phi' = 6 \log (51) + 27.5 = 37.7$ degrees

The ore in the in-heap pond could be saturated during the design earthquake event and was modeled using an undrained shear strength ratio (su/p') of 0.15, based literature values (Bensoula 2015).

4.2. Colluvium

Shear strength and unit weight for the colluvium were based upon triaxial test results produced by Golder (2012).

4.3. Bedrock

The bedrock at the HLF site is composed of a fine-grained phyllitic metamorphosed sedimentary rock. Site investigation reports by BGC (2011a and 2017) provide rock laboratory test results which include unconfined compressive strength (UCS) testing and point load testing, and describe typical ranges for Geological Strength Index (GSI) for the encountered foundation rock. The laboratory tests which failed along foliations or other planes of weakness were statistically evaluated. The average UCS is 15.8 MPa with a standard deviation of 13.0 MPa; the large standard deviation is a result of three tests with results equal to or less than 2 MPa, and 2 tests with results of more than 35 MPa.

The upper weathered bedrock (referred to as Type 3) was assigned the strength equal to the UCS average minus one standard deviation, 2.8 MPa. The GSI which applies to this weak rock was estimated by BGC (2011a) to be between 15 and 25 based on typical rock mass characteristics; a value of 15 was used for conservatism. The stronger, lower bedrock (referred to as Type 2) was assigned a strength equal to the average UCS, 15.8 MPa, and a GSI value of 20. Note that these values have changed from previous analyses to incorporate the test results from the most recent field program, presented in BGC 2017.

The UCS and GSI were evaluated using the generalized Hoek-Brown criterion to create a shear-normal strength function for the rock mass. The intact rock parameter (m_i) and the disturbance factor (D) are also required inputs for the Hoek-Brown criterion. The intact rock parameter used is 19, considered the average for metasandstone, which is assumed to be representative of the metasediments in the foundation of the heap leach facility. A disturbance factor of 0.0 was used because the material is assumed to be undisturbed by blasting.

SLOPE/W calculates a shear-normal strength function using the Hoek-Brown criterion and the input parameters above (GEO-SLOPE, 2016). Selected points from the produced shear-normal function are provided in Table G3.

Table G3. Selected points from the generalized Hoek-Brown rock mass strength function produced by SLOPE/W.

Normal Stress (kPa)	Type 3 Bedrock Shear Stress (kPa)	Type 2 Bedrock Shear Stress (kPa)
0	0	0

46.6	61.2	106.3
87.6	97.3	171.2
148.1	142.2	252.2
353.3	263.5	476.3
730.6	435.1	806.8
1,385.1	668.9	1271.8
3,257.4	1,168.5	2300.4

4.4. Liner

The overall stability of the HLF is expected to be largely governed by the interface shear strength between the leach pad liner system and adjacent materials. The friction angle between a smooth geomembrane and a woven geotextile such as those sometimes used in GCLs can be as low as 9° with nearly no cohesion at peak strength, and lower after large displacements (McCartney et al., 2009). This is the reason textured geomembranes and nonwoven, needle-punched GCLs are frequently specified for use on slopes, as they are for the Eagle Gold HLF. Golder (2012) performed laboratory testing on the proposed composite liner materials, including shear strength testing. The weakest layer of the composite liner system was found to be the GCL interface with bedding fill. Further shear strength tests were completed using only these materials, and the tests were continued beyond peak strength to measure the shear strength under large displacements.

The peak shear strength is not expected to be exceeded under normal operating conditions. If the peak strength is exceeded, the interface strength decreases until it reaches what is called the 'large displacement strength'. For the GCL-Bedding interface, the lab testing showed small decreases in shear strength at large displacement for the lower normal stresses. However, under high normal stress, the shear strength decreased significantly from the peak value, likely due to partial (non-uniform) internal shearing in the GCL product. Table G4 presents the results of the peak and large displacement shear strength testing.

Table G4. Liner interface peak and large displacement shear strength versus normal stress.

Normal Stress (kPa)	Peak Shear Stress (kPa)	Large Displacement Shear Stress (kPa)
158.6	127.2	121.1
317.2	249.2	223.1
627.4	438.0	252.4

A shear stress-normal stress function using the peak shear strength data shown in Table G4 was used in analyses considering the peak strength of the liner interface, such as the static and pseudo-static analyses. The peak shear strength results do show a small apparent cohesion, but this value is low compared to the normal stresses expected in the HLF, and is therefore ignored.

A post-earthquake analysis was also completed. This analysis is intended to evaluate slope stability immediately following a large earthquake which caused significant displacement (more than 200 mm) along the liner interface. A bilinear shear strength model was used to represent the large displacement shear strength of the liner interface. The bilinear model failure envelope is basically two linear Mohr-Coulomb models; it is defined by two φ values (φ_1 and φ_2), a cohesion value (c), and a normal stress at which the break occurs (σ_n). The large displacement shear testing showed $\varphi_1 = 32.7°$, $\varphi_2 = 5.4°$, c = 19 kPa, and $\sigma_n = 317$ kPa.

The large displacement shear strength was also used in yield acceleration stability models for the dynamic deformation analysis because the purpose of the dynamic deformation analysis is to evaluate the magnitude of displacement along the yield acceleration failure surface.

4.5. Embankment Fill

The embankment will be constructed of materials from required excavations and site grading and is generally expected to be colluvium and weathered rock. Fill will be placed in horizontal lifts with a maximum thickness of 300 mm and compaction to 95% of standard Proctor density according to the specifications. Laboratory testing performed on the borrow material to be used as embankment fill was reported by BGC (2017). Six consolidated undrained triaxial tests were completed on the borrow material, resulting in an average effective friction angle of 40.6°. For conservatism, the effective cohesion was assumed to be zero and the lowest triaxial test result, 38.3°, was adopted for the slope stability analyses. The average unit weight from the triaxial testing was assigned for the embankment fill.

5.0 RESULTS

5.1. Slope Stability

The results of the slope stability analyses are shown in Table G5. The printed results produced by Slope/W are included as Attachment G1.

Table G5. Slope stability analysis results.

Stability Analysis Description	Factor of Safety		
	Circular	Block	Fully Specified
Section A			
Static	2.0	1.8	2.3
Pseudo-static	1.0	1.3	1.2
Pseudo-static Post-operation	1.3	1.1	1.5
Post-earthquake	2.0	1.8	1.2
Section B			
Static	2.0	2.3	2.0
Pseudo-static	1.5	1.6	1.4
Pseudo-static Post-operation	1.3	1.4	1.2
Post-earthquake	2.0	2.0	1.6
Section C			
Static	1.6	2.0	-
Pseudo-static	1.2	1.4	-

Acceptable factors of safety are demonstrated for both the ore pile and the confining embankment as well as the event ponds. The normal bench width of 5 m was widened to 55 m in the ore pile at EL. 985m to meet the minimum factor of safety of 1.2 for Section A, post-earthquake, fully specified case.

The heap is not oriented perpendicular to Section B. For conservatism, the ore stack in Section B was steepened in the slope stability software to reflect the 2.5H:1V maximum slope of the ore stack.

Post-closure and post-earthquake scenarios were not completed for Section C because the event pond will be removed at closure, and there is no fill above the liner to fail after an earthquake.

In addition to the critical failure surface results reported in Table G5, additional failure surfaces were evaluated which did not produce a lower factor of safety. For instance, a static failure defined along the liner was evaluated and produced a higher factor of safety. Some of these additional results are included in Attachment G1.

Bench-scale failure was also evaluated; a single 10 m tall heap ore bench at a slope of 1.4H:1V (approximated angle of repose) produced static and pseudo-static factors of safety of 1.1 and 0.9, respectively. The heap ore was modeled with no cohesion, so the shallowest failure surfaces result in the lowest factors of safety. The failure surface producing the above factors of safety was 1 m deep. For a 5m deep failure surface, the static and pseudo-static factors of safety increase to 1.7 and 1.4, respectively. This indicates that cohesionless ore with the modeled friction angle is expected to experience some surficial sloughing, especially during the design basis earthquake,

but deep-seated failures are not expected at the bench scale. These small sloughing failures are not expected to threaten the integrity of the HLF liner.

5.2. Dynamic Deformation

The dynamic deformation analysis was completed on Section A, as used in the slope stability analyses (including the 55-m-wide bench discussed in Section 5.1). Two failure surface cases were evaluated in the dynamic deformation analysis: an embankment failure, and a heap failure. Failure surfaces evaluated included: circular, block, and fully specified along the liner interface. See Attachment G1 for complete yield acceleration analysis slope stability models. The critical failure surface for both the heap and embankment cases was the optimized block failure, which showed a yield acceleration of 0.24g for the embankment, and 0.19g for the heap failure surface. The critical failure surface through the full heap was the fully specified failure surface along the liner interface, which showed a yield acceleration of 0.04g. The primary reason for such a low yield acceleration is that the large-displacement liner interface strength was considered in the analyses.

The results calculated by the method proposed by Bray and Travasarou (2007) are shown in Table G6 below.

Table G6. Dynamic deformation results: estimated vertical displacement against probability of exceedance.

Probability of Exceedance (%)	Embankment Displacement (cm)	Heap Displacement (cm)
84	<1	3.4
50	<1	6.8
16	<1	13.2

BGC considers the deformations reported above to be reasonable and the risk of loss of containment due to earthquake-induced deformation to be low.

If the design earthquake were to occur during operations, there may be displacement along the liner. Displacement along the liner system could cause tearing. The extent of tearing is difficult to predict, and may be enough to cause some loss of containment.

6.0 CLOSURE

BGC Engineering Inc. (BGC) prepared this document for the account of StrataGold Corporation. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves all documents and drawings are submitted for the confidential information of our client for a specific project. A record copy of this document is on file at BGC. That copy takes precedence over any other copy or reproduction of this document.

Yours sincerely,

BGC ENGINEERING INC.
per:

Tony Monasterio, PE
Geological Engineer

Reviewed by:

Troy Meyer, PE, P.Eng.
Principal Geological Engineer

Engineers Yukon Permit to Practice:
PP092 BGC Engineering Inc.

TLM/CW/rm/sjk

REFERENCES

Barton N, Kjærnsli B, 1981. Shear strength of rockfill. J Geotech Eng Div Proc ASCE 107(GT7):873–891 (Proc. Paper 16374, July).

Bensoula, M., Missoum, H., Bendani, K. 2015. Critical Undrained Shear Strength of Loose-Medium Sand-Silt Mixtures Under Monotonic Loading. Journal of Theoretical and Applied Mechanics.

BGC Engineering, Inc. March 5, 2010. Site facilities geotechnical investigation, factual data report. *Report prepared for* Victoria Gold Corporation.

BGC Engineering, Inc. April 21, 2011. Eagle Gold – Borrow evaluation report. *Memo prepared for* Victoria Gold.

BGC Engineering, Inc. November 17, 2011. 2010 geotechnical investigation for mine site infrastructure, factual data report. *Report prepared for* Victoria Gold Corporation.

BGC Engineering, Inc. 2012a. 2012 geotechnical investigation for mine site infrastructure, factual data report. Report prepared for Victoria Gold Corporation, November 30, 2012.

BGC Engineering, Inc. 2012b. Eagle Gold Project, Dublin Gulch, Yukon, Feasibility Study Open Pit Slope Design, Final Report, prepared January 20, 2012.

BGC Engineering, Inc. June 20, 2017. 2016 heap leach facility geotechnical investigation. *Report prepared for* Victoria Gold Corporation.

Bray, J.D., and Travasarou, T. 2007. Simplified procedure for estimating earthquake-induced deviatoric slope displacements. Journal of Geotechnical and Geoenvironmental Engineering. **133**(4): 381-392. doi: 10.1061/(ASCE)1090-0241(2007)133:4(381).

Campbell, K.W., and Bozorgnia, Y. 2007. Campbell-Bozorgnia NGC ground motion relations for the geometric mean horizontal component of peak and spectral ground motion parameters. Pacific Earthquake Engineering Research Center, 2007/02, University of California, Berkeley, CA.

Canadian Geotechnical Society. 2006. Canadian foundation engineering manual, 4th edition. 1st printing 2006, 2nd printing 2008. Canadian Geotechnical Society.

CDA. 2014. Application of dam safety guidelines to mining dams. Canadian Dam Association (CDA), Edmonton, AB.

Chung, C.K., Kim, H.K., Lee, J.-S., Jung, Y.H., Kim, D.S. 2011. Deformation Characteristics of Geomaterials: Proceedings of the Fifth International Symposium on Deformation Characteristics of Geomaterials, IS-Seoul 2011, 1-3 September 2011, Seoul, Korea.

GEO-SLOPE International Ltd. 2016. GeoStudio 2016 [computer program]. Version 8.16. GEO-SLOPE International Ltd., Calgary, AB.

Golder Associates Inc. June 4, 2012. Laboratory test results for Tetra Tech, project – Yukon. *Report prepared for* Mr. Troy Meyer, Tetra Tech, Grand Junction, CO.

Hynes-Griffin, M.E., Franklin, A.G. 1984. Rationalizing the seismic coefficient method. Army Corps of Engineers, Miscellaneous Paper GL-84-13.

Iwashita,T., Yasuda, N., Nakamura, A., Takeda, O. 1995. Dynamic Deformation Characteristics Of Rockfill Materials From Laboratory Test, In-Situ Test And Earthquake Motion Analysis, Third International Converence on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics.

Kappes Cassiday & Associates (KCA). October 2012. Eagle Gold project report of metallurgical test work. *Report prepared for* StrataGold Corp.

Leps, T.M. 1970. Review of shearing strength of rockfill. Journal of the Soil Mechanics and Foundations Division, Proceedings of the American Society of Civil Engineers. **96**(SM4): 1159-1170.

McCartney, J.S., Zornberg, J.G., and Swan Jr., R.H. 2009. Analysis of a large database of GCL-Geomembrane interface shear strength results. Journal of Geotechnical and Geoenvironmental Engineering. **135**(2): 209-223. doi: 10.1061/(ASCE)1090-0241(2009) 135:2(209).

Natural Resources Canada (NRCAN), 2017a. Personal communication with Stephen Halchuk, October 18, 2017

Natural Resources Canada (NRCAN), 2017b. 2005 National Building Code Seismic Hazard Calculation: http://www.earthquakescanada.nrcan.gc.ca/hazard-alea/interpolat/index_2005-en.php, accessed October 17, 2017.

Tetra Tech. November 8, 2012. Dublin Gulch – Seismic peak ground accelerations for design. *Memo prepared for* Victoria Gold Corp.

Tetra Tech. April 1, 2013. Eagle Gold heap leach facility – deformation. *Memo prepared for* StrataGold Corp.

Iwashita,T., Yasuda, N., Nakamura, A., Takeda, O. 1995. Dynamic Deformation Characteristics Of Rockfill Materials From Laboratory Test, In-Situ Test And Earthquake Motion Analysis, Third International Converence on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics.

ATTACHMENT G1
SLOPE STABILITY ANALYSIS RESULTS

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

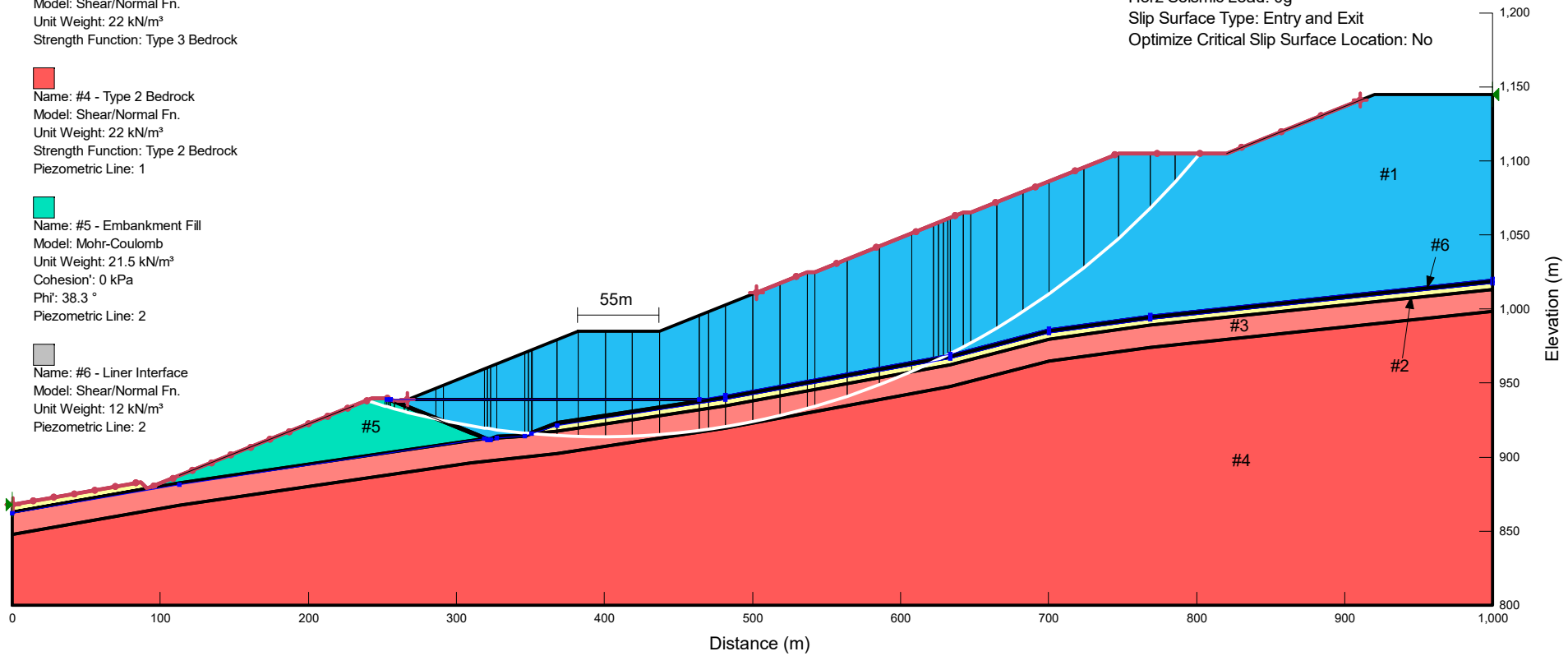
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

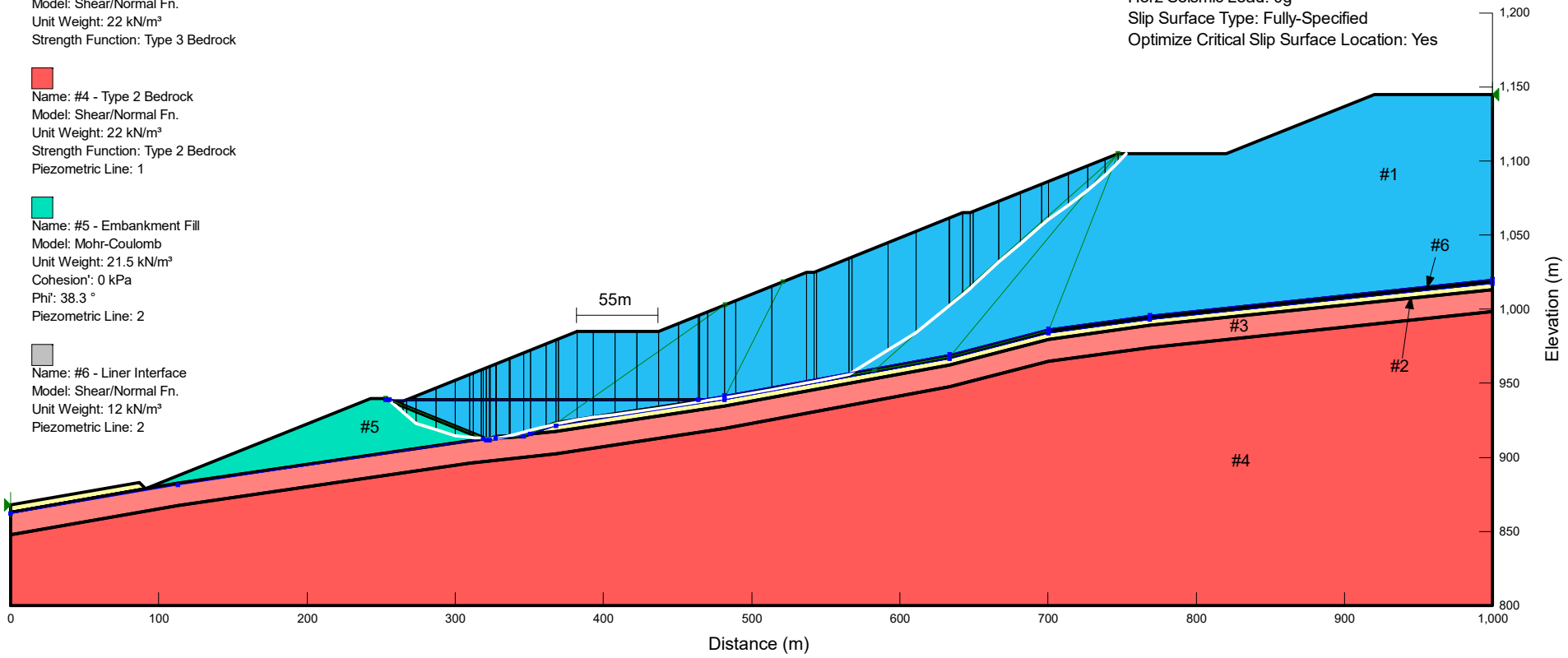
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Fully-Specified
Optimize Critical Slip Surface Location: Yes



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

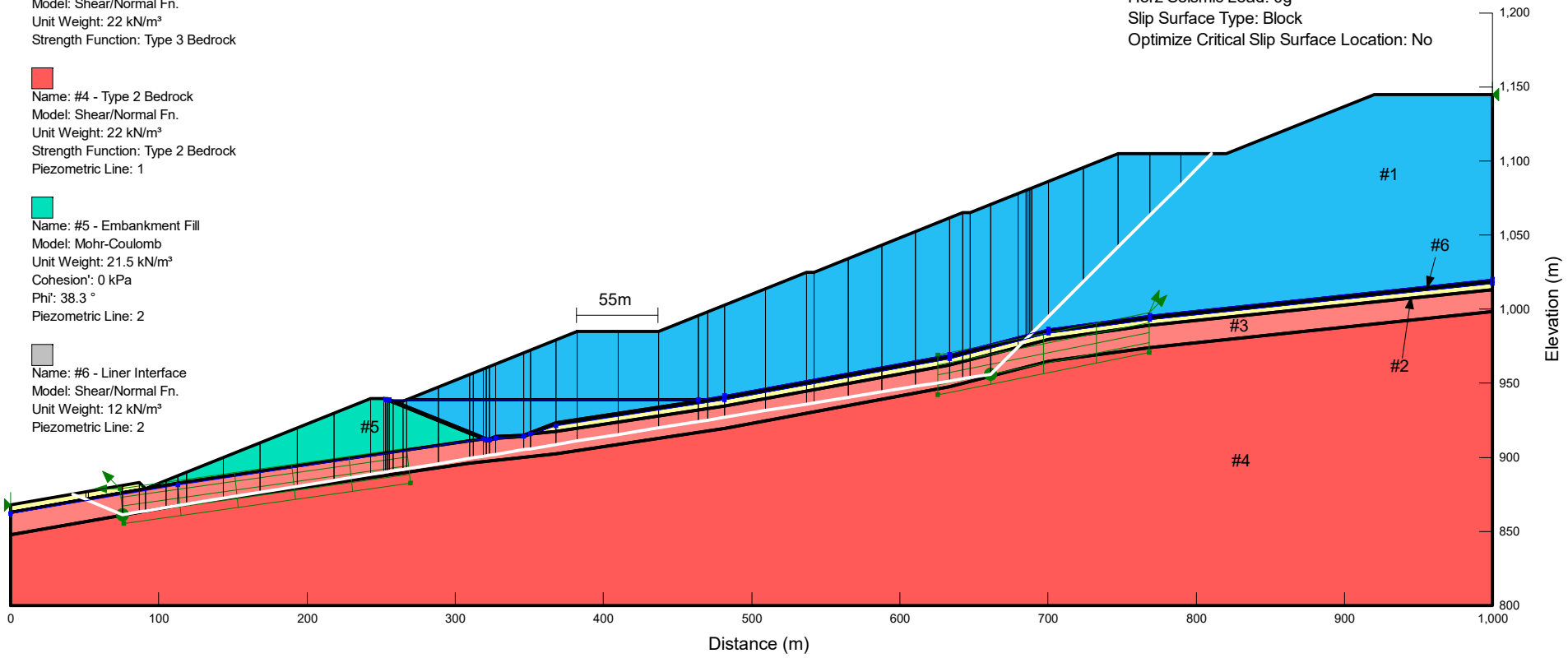
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °
Piezometric Line: 2

Name: #1a - Crushed Ore Undrained
Model: S=f(overburden)
Unit Weight: 18 kN/m³

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

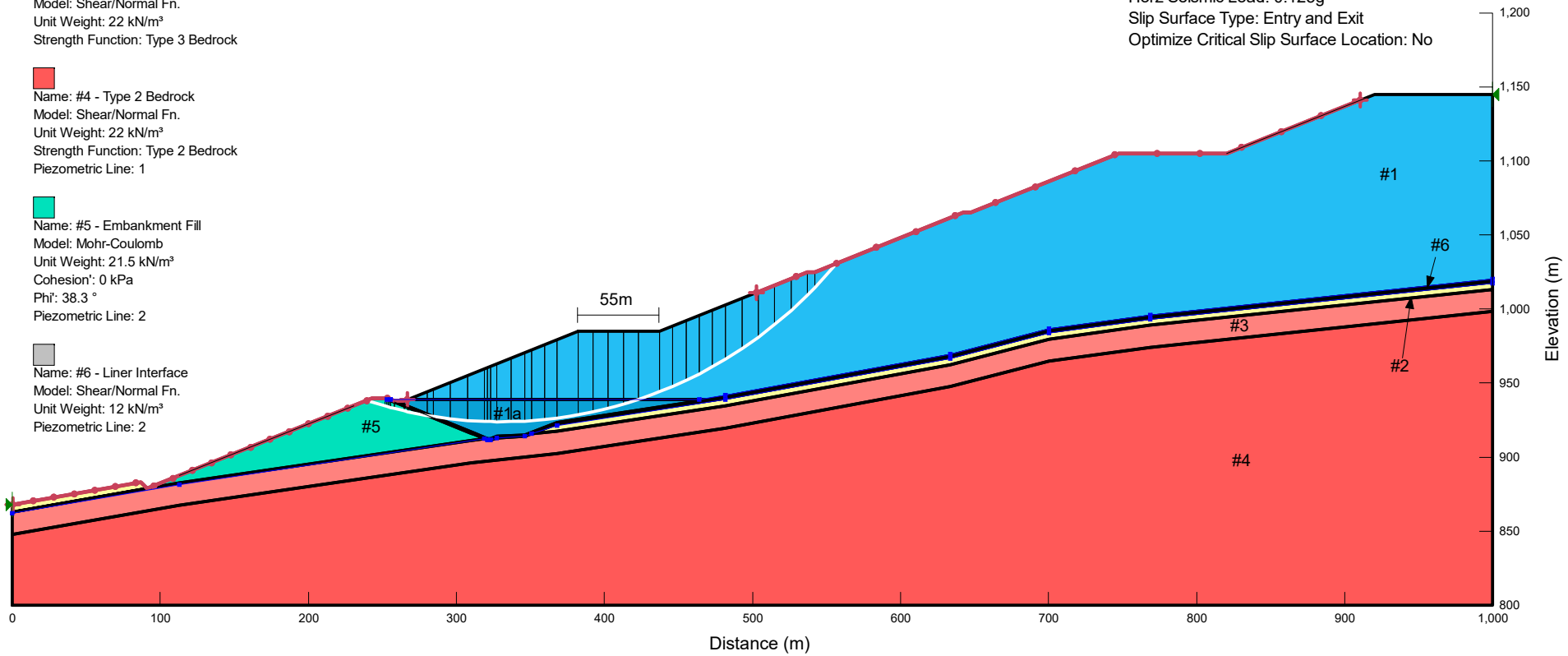
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171012.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °
Piezometric Line: 2

Name: #1a - Crushed Ore Undrained
Model: S=f(overburden)
Unit Weight: 18 kN/m³

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

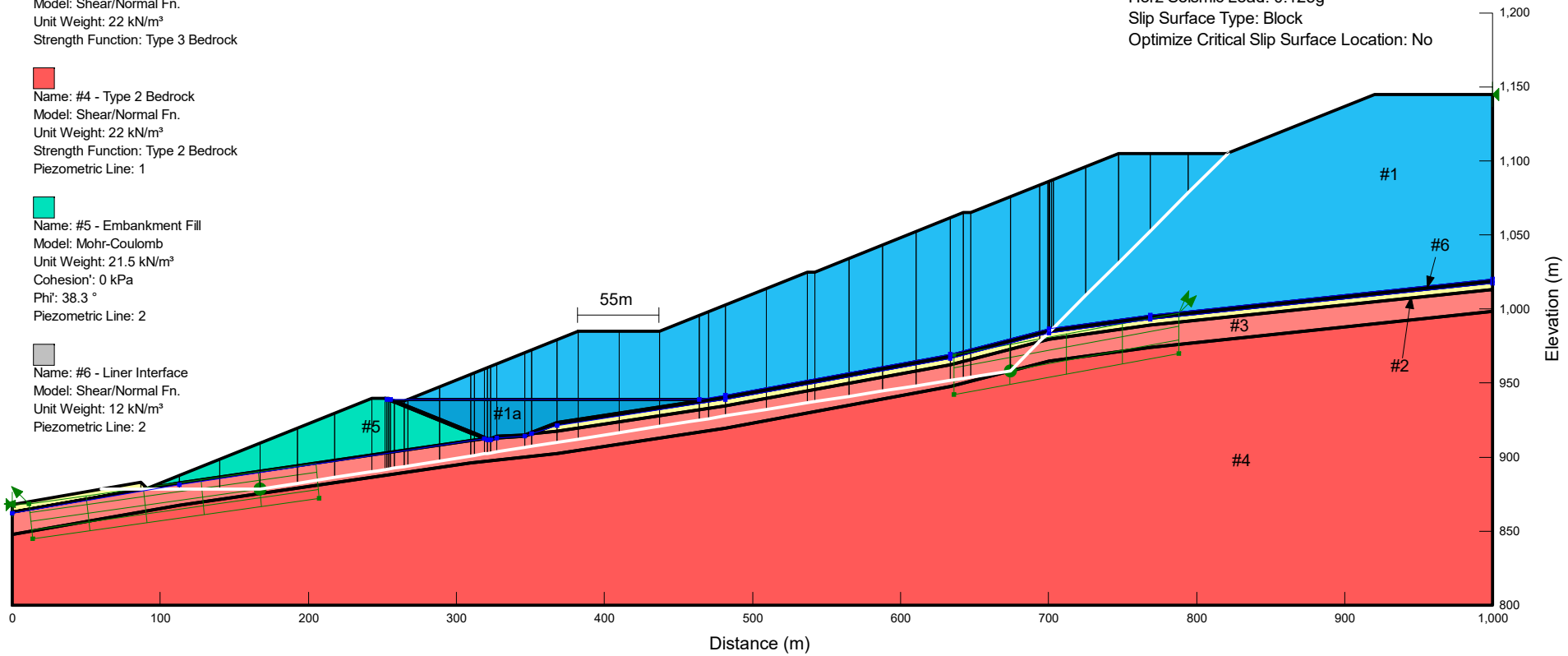
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171012.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °
Piezometric Line: 2

Name: #1a - Crushed Ore Undrained
Model: S=f(overburden)
Unit Weight: 18 kN/m³

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

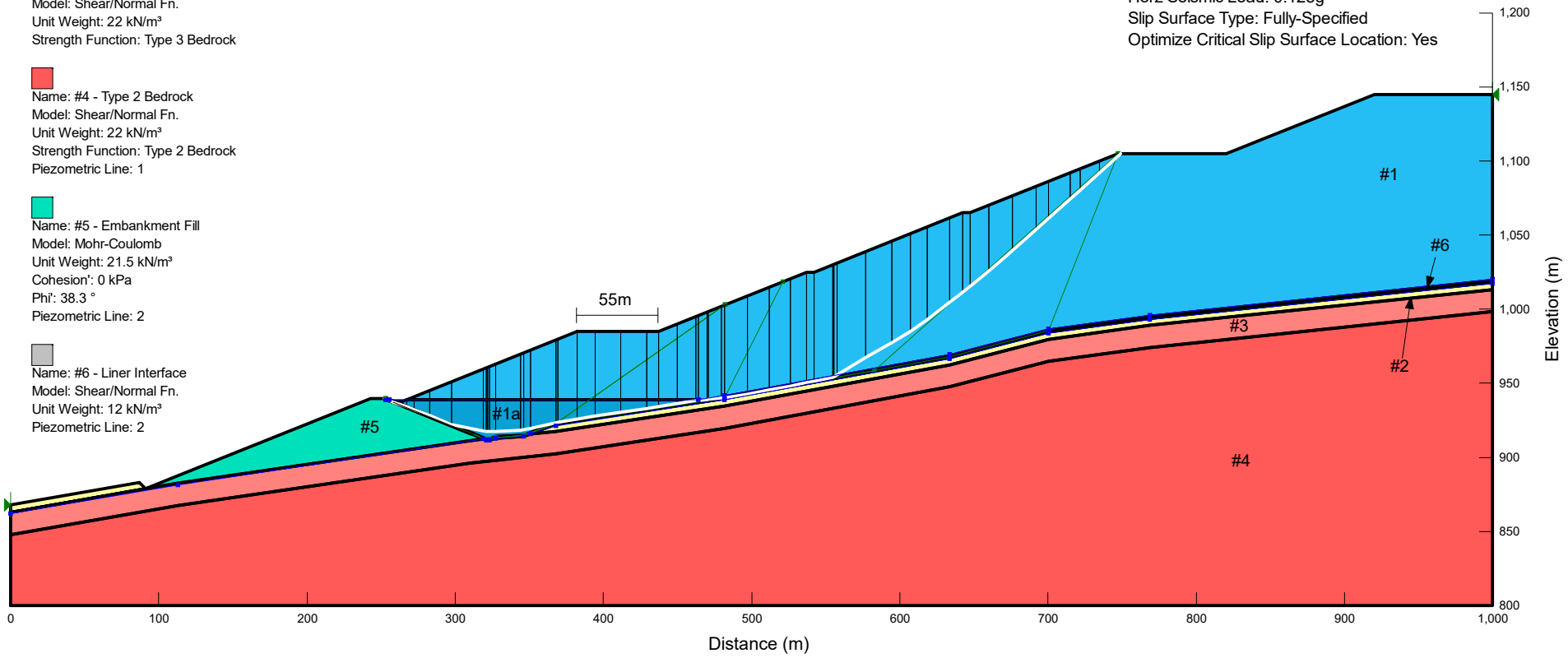
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Fully-Specified
Optimize Critical Slip Surface Location: Yes



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171012.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

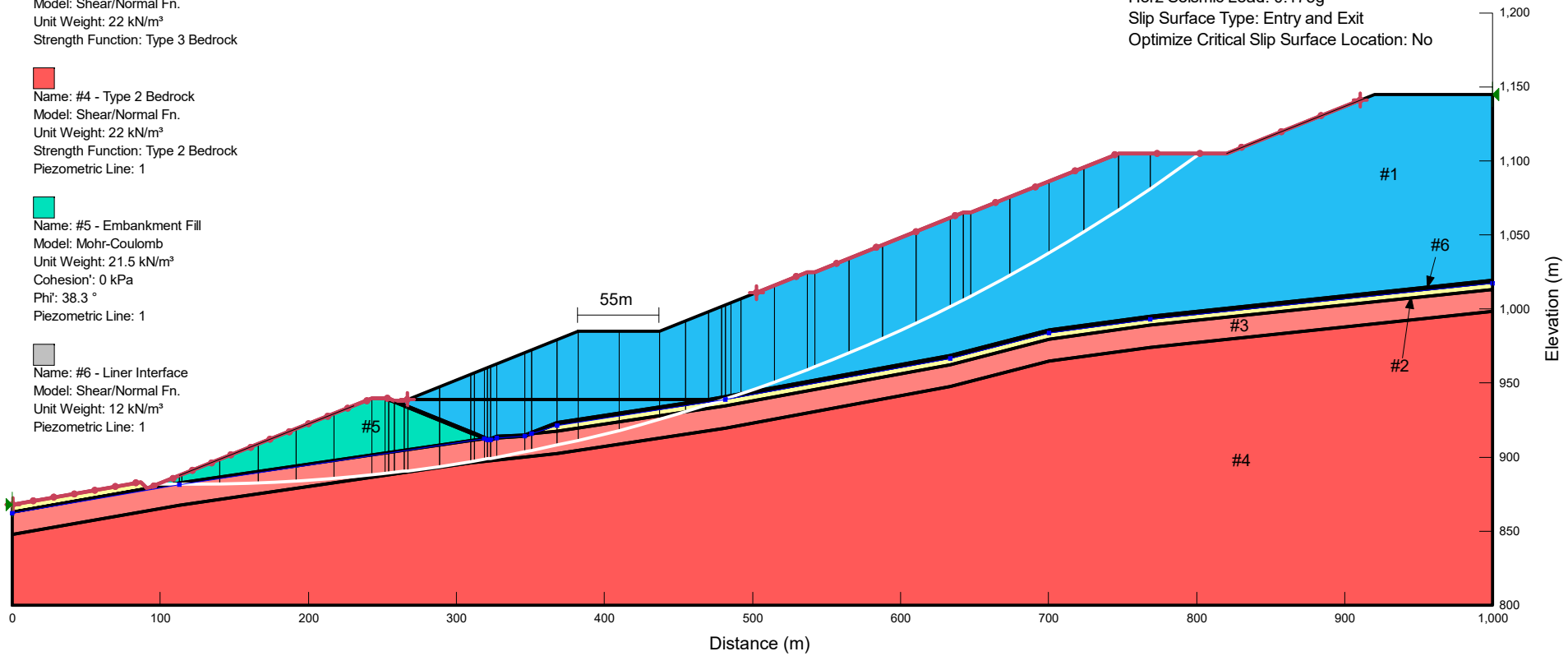
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 1

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³
Piezometric Line: 1

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.175g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

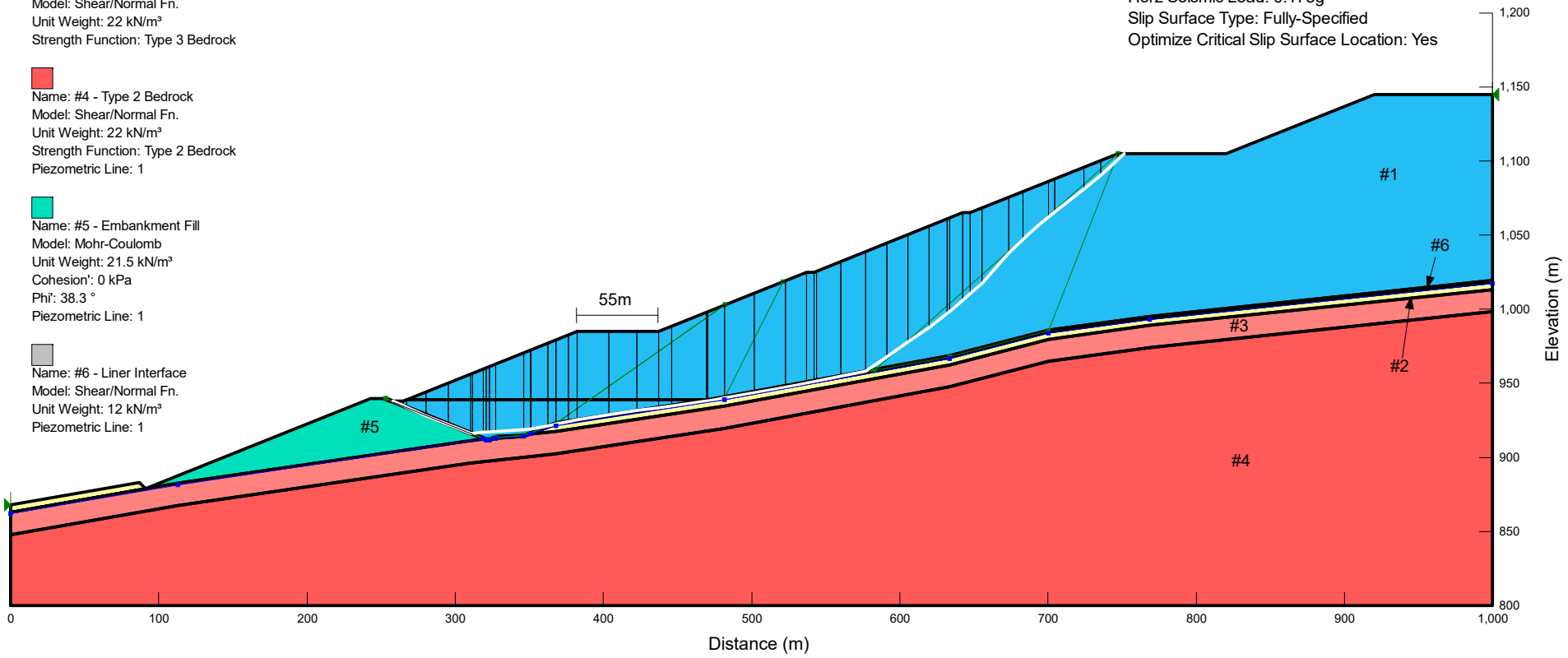
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 1

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³
Piezometric Line: 1

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.175g
Slip Surface Type: Fully-Specified
Optimize Critical Slip Surface Location: Yes



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

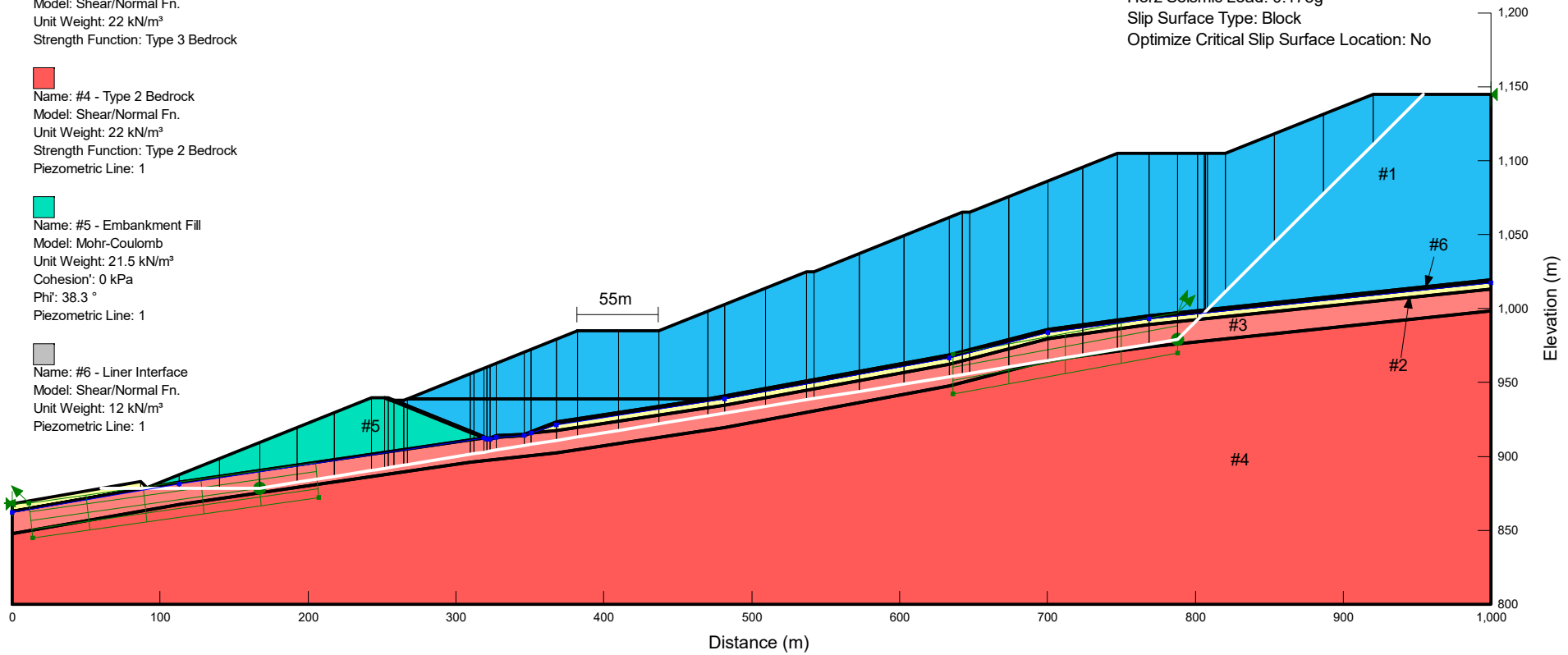
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 1

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³
Piezometric Line: 1

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.175g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

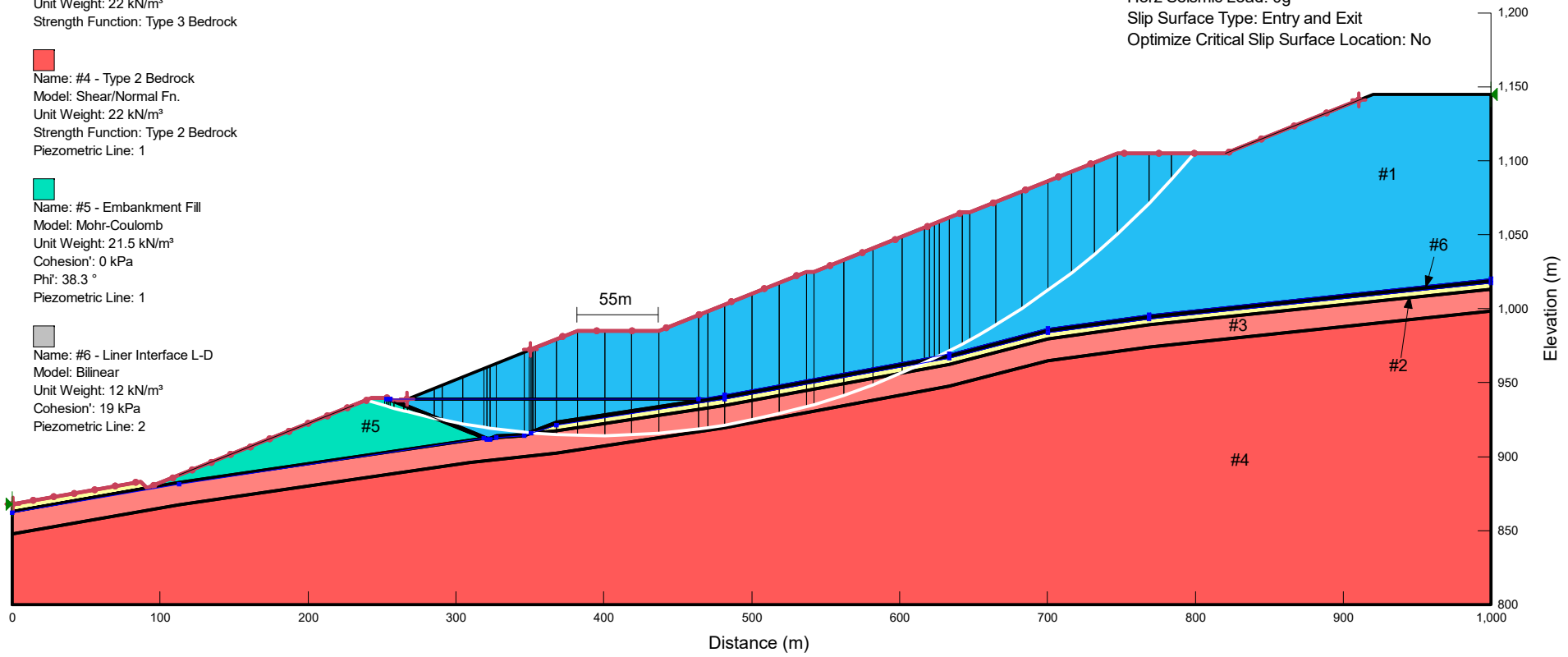
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 1

Name: #6 - Liner Interface L-D
Model: Bilinear
Unit Weight: 12 kN/m³
Cohesion': 19 kPa
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

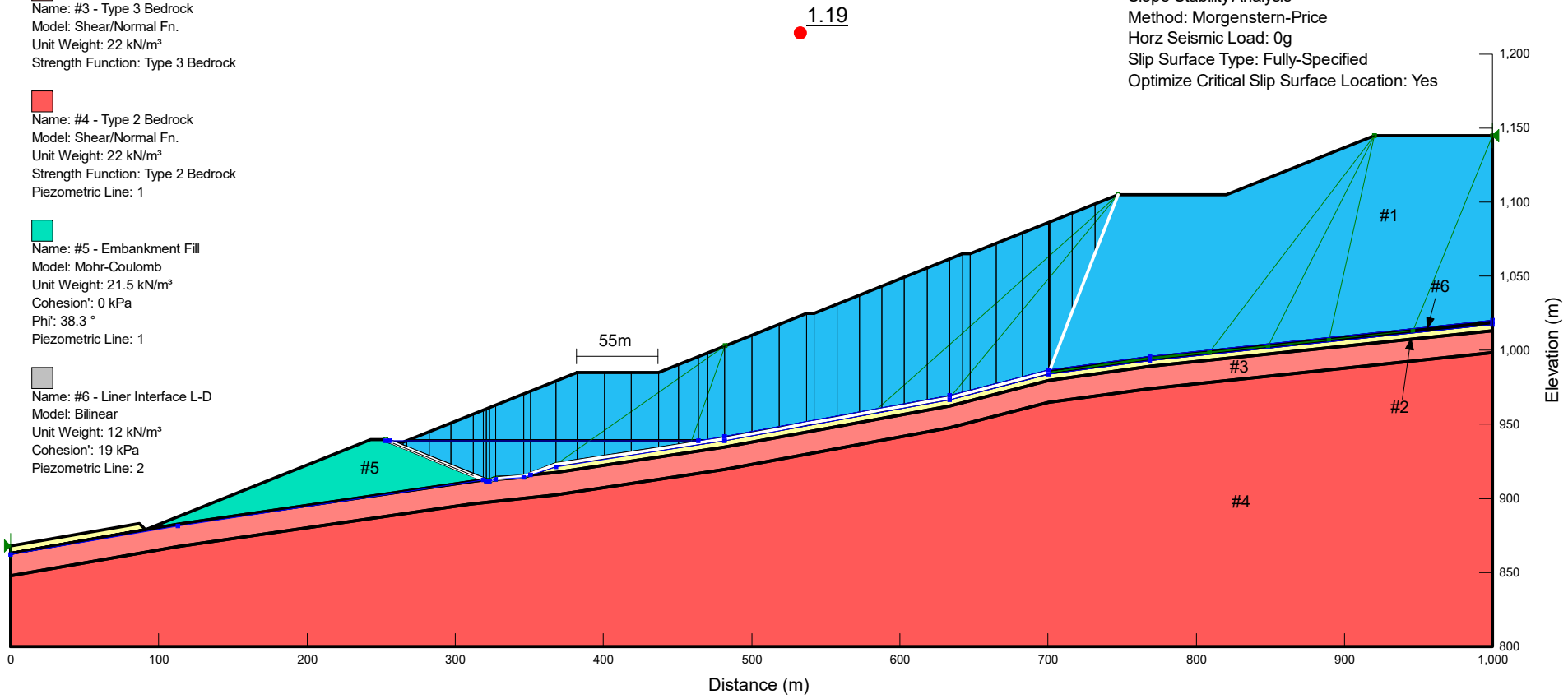
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 1

Name: #6 - Liner Interface L-D
Model: Bilinear
Unit Weight: 12 kN/m³
Cohesion': 19 kPa
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Fully-Specified
Optimize Critical Slip Surface Location: Yes



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

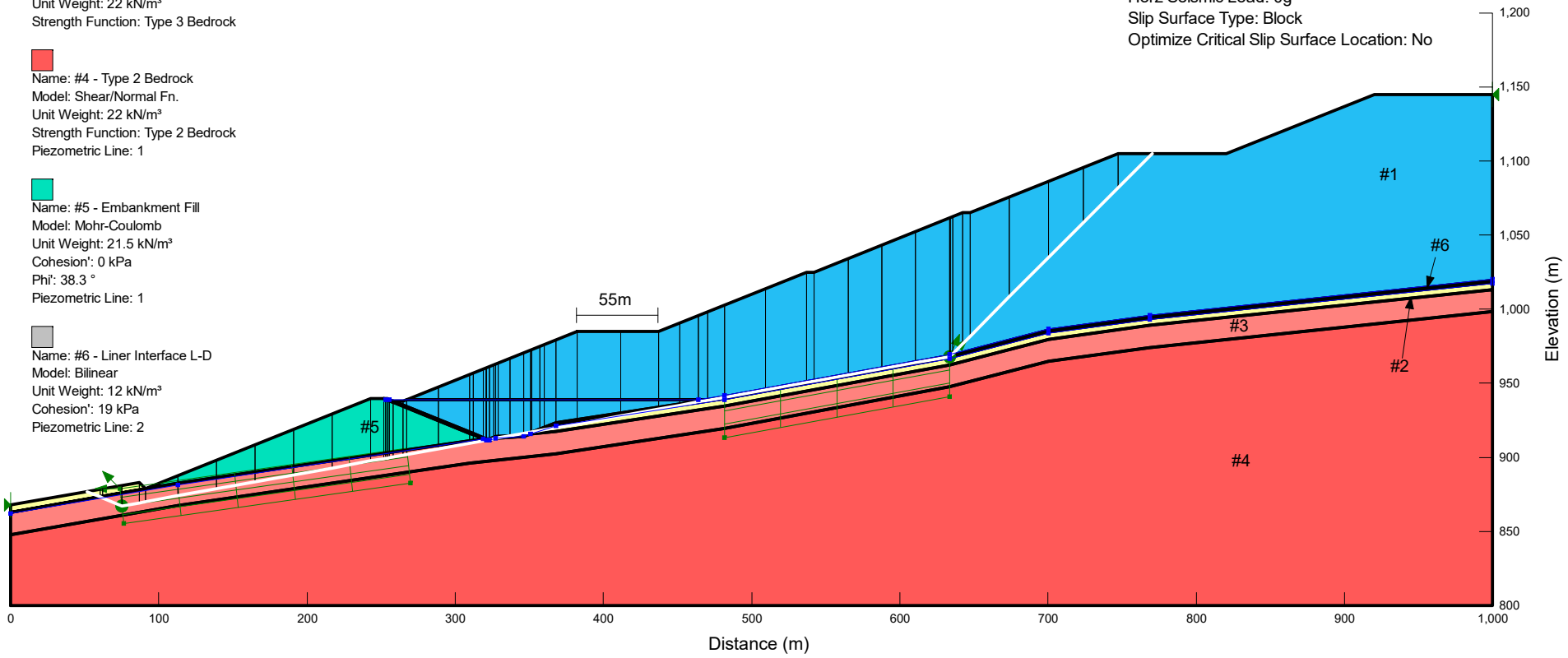
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 1

Name: #6 - Liner Interface L-D
Model: Bilinear
Unit Weight: 12 kN/m³
Cohesion': 19 kPa
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

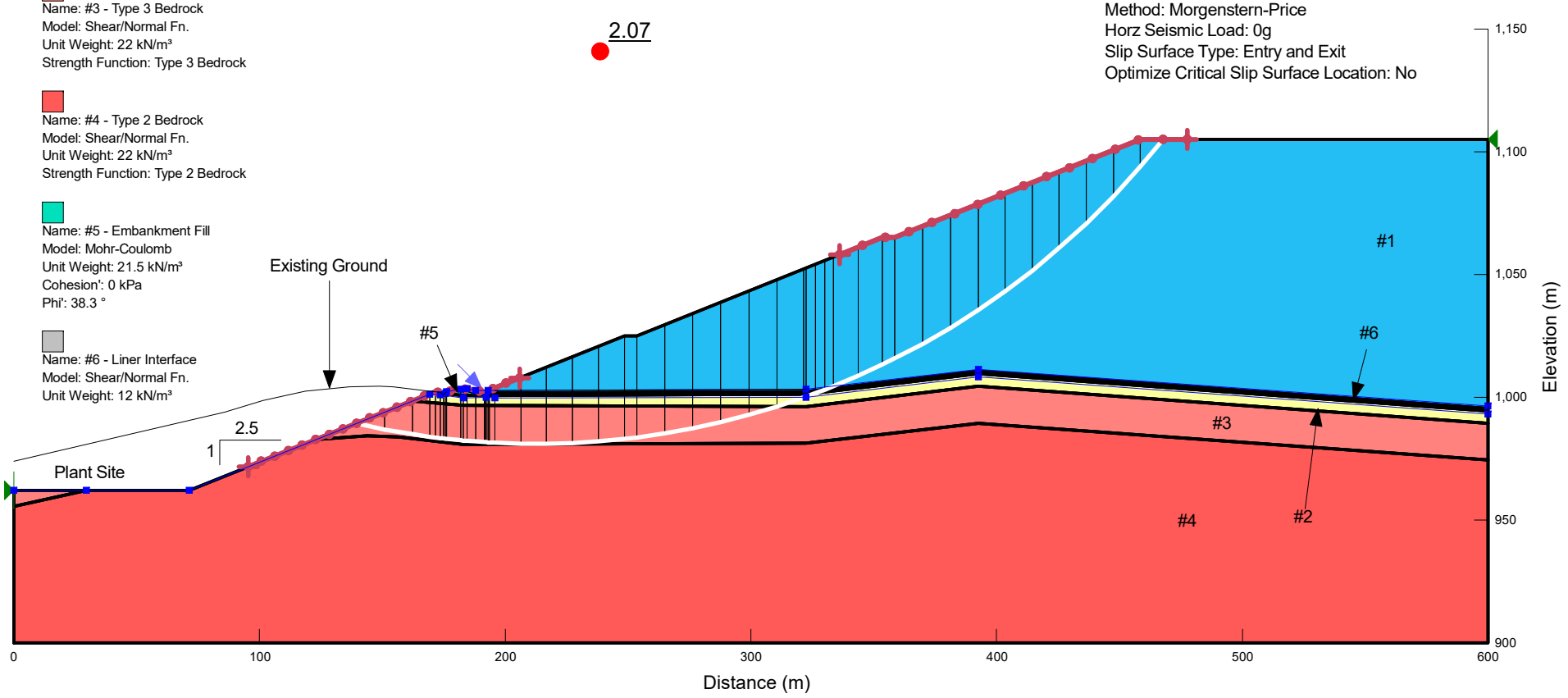
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Fully-Specified
Optimize Critical Slip Surface Location: Yes

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

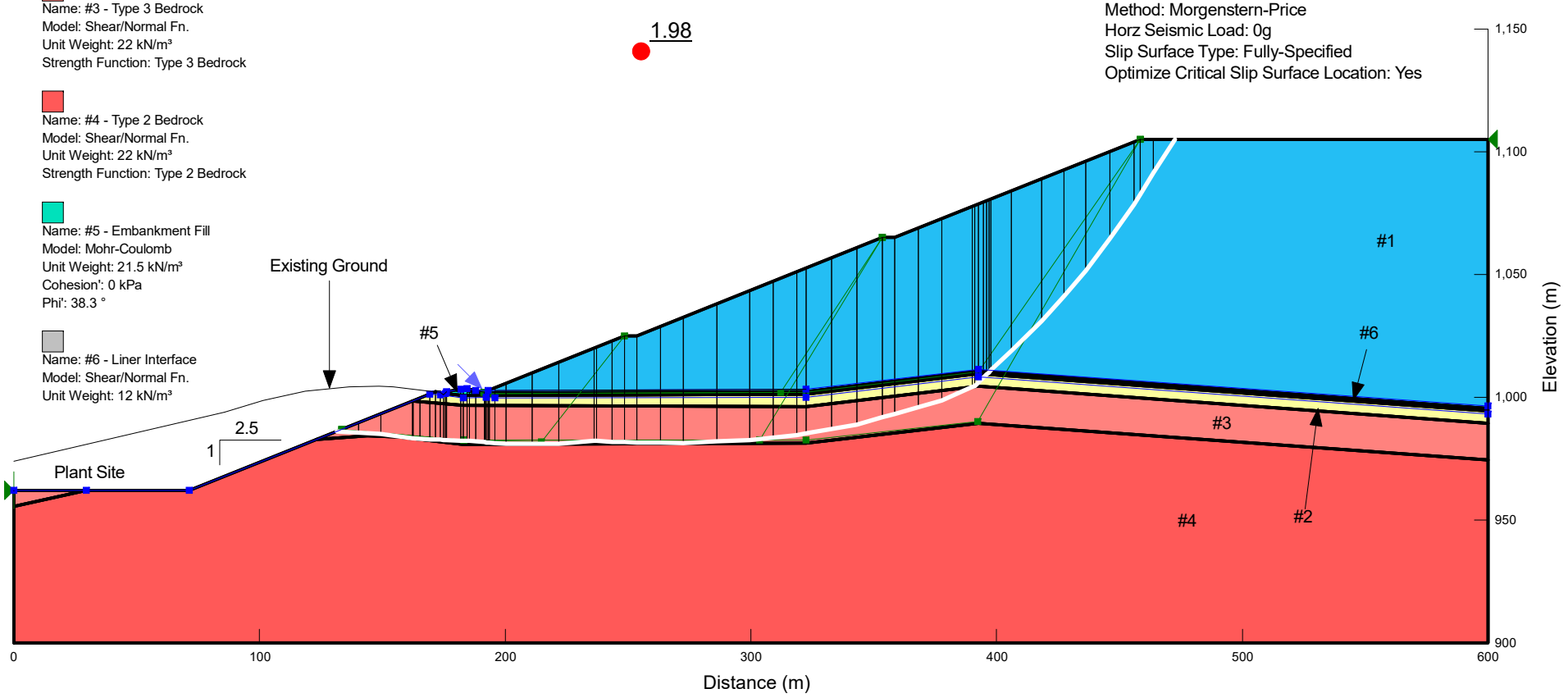
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

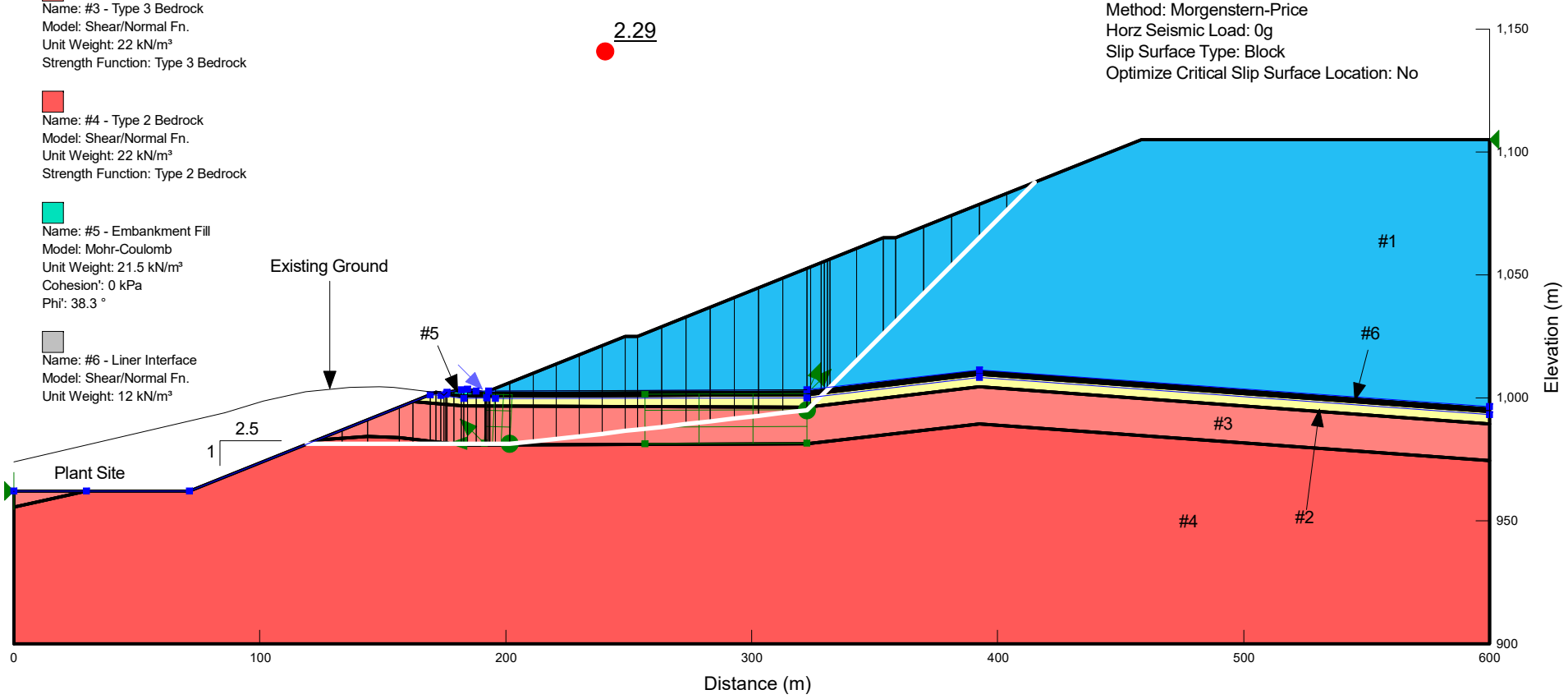
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

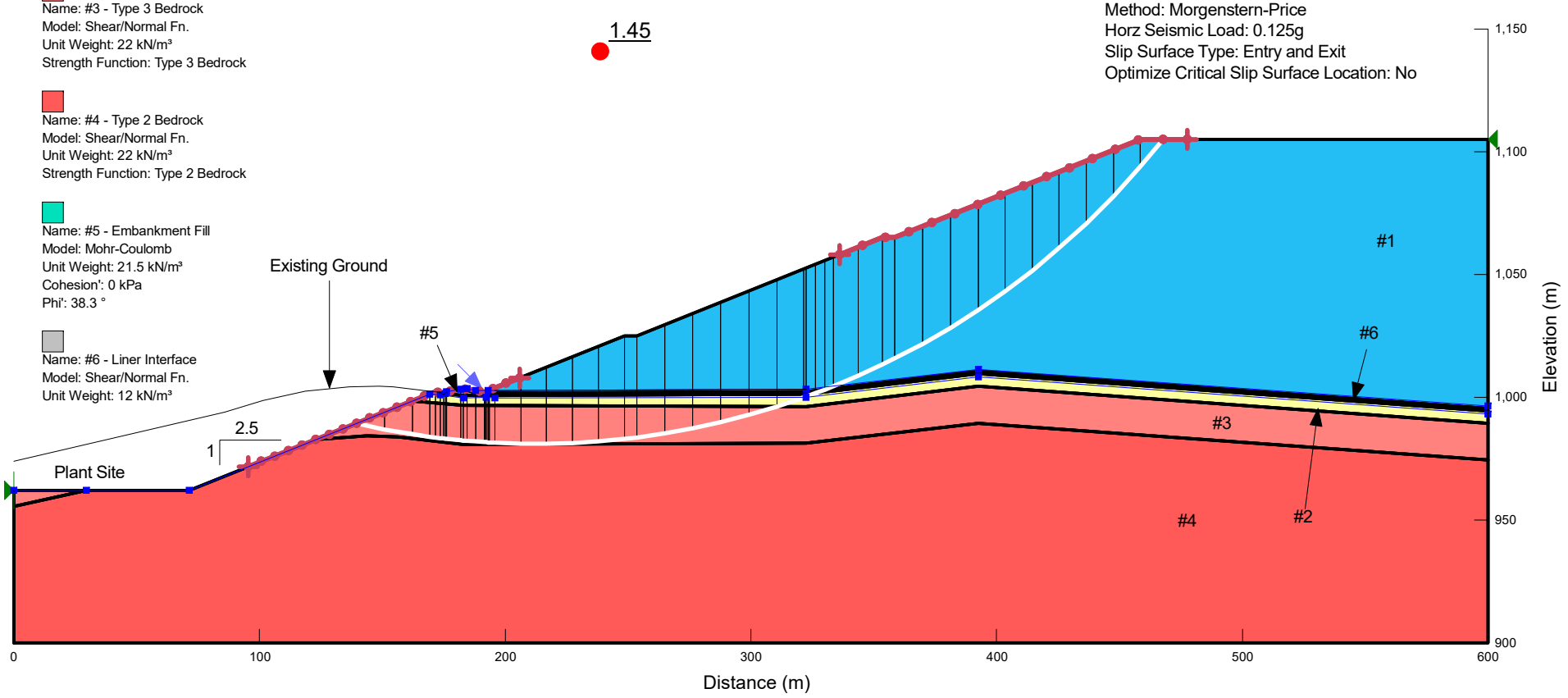
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

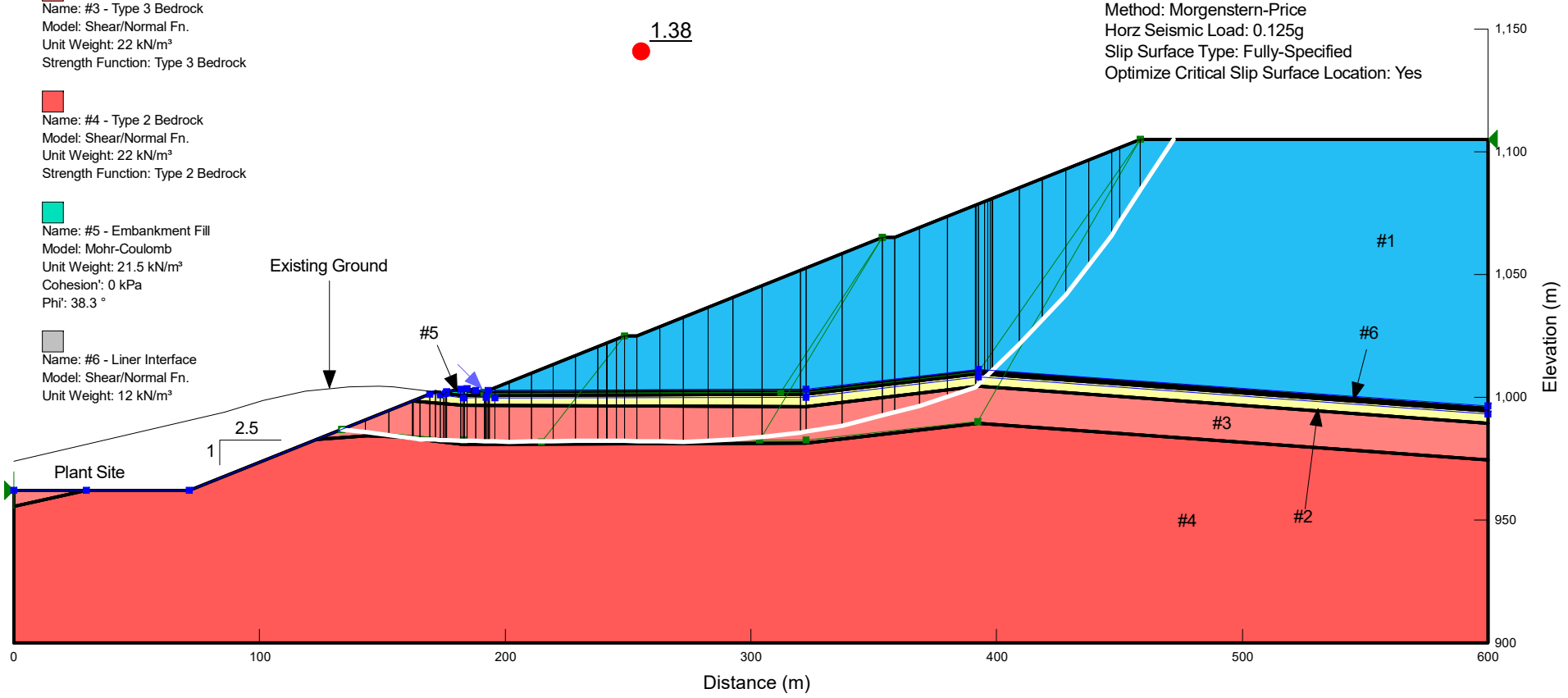
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Fully-Specified
Optimize Critical Slip Surface Location: Yes



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

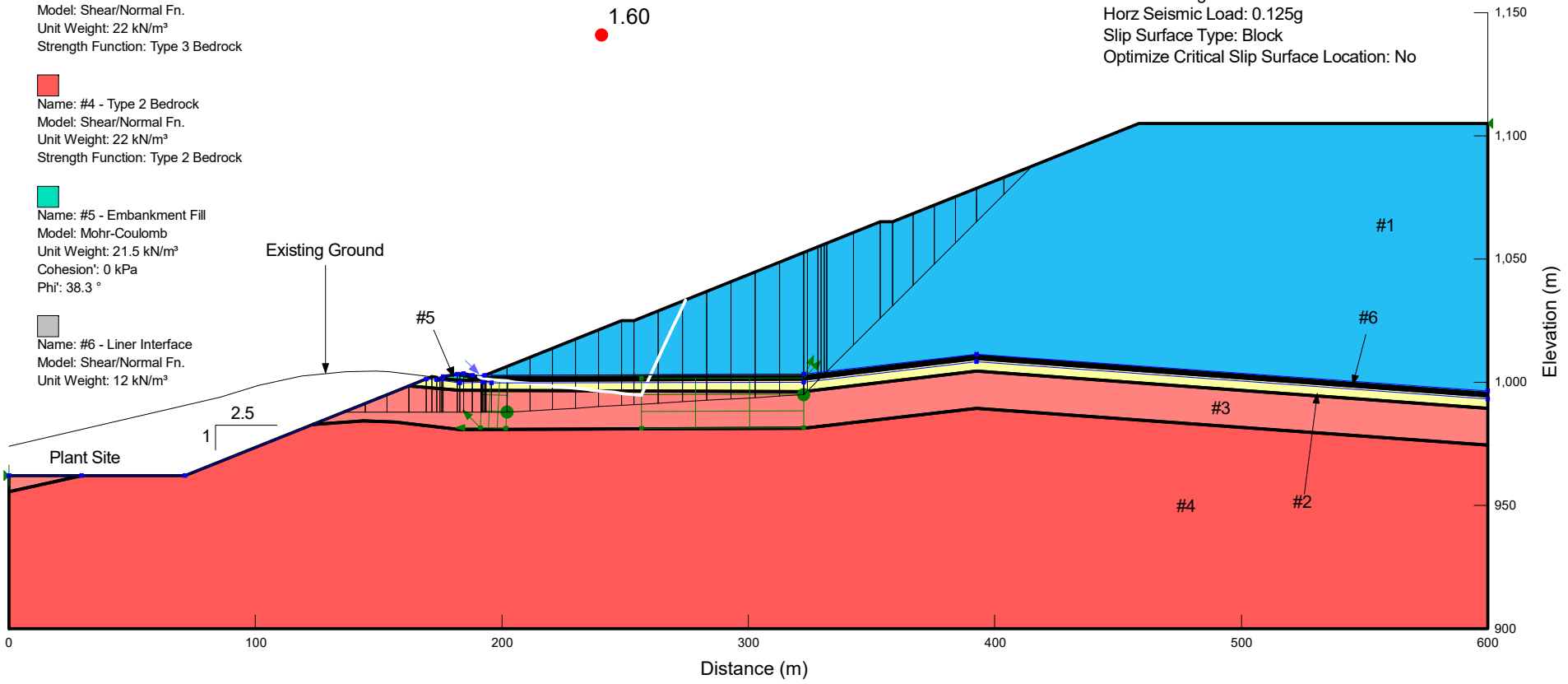
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.175g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

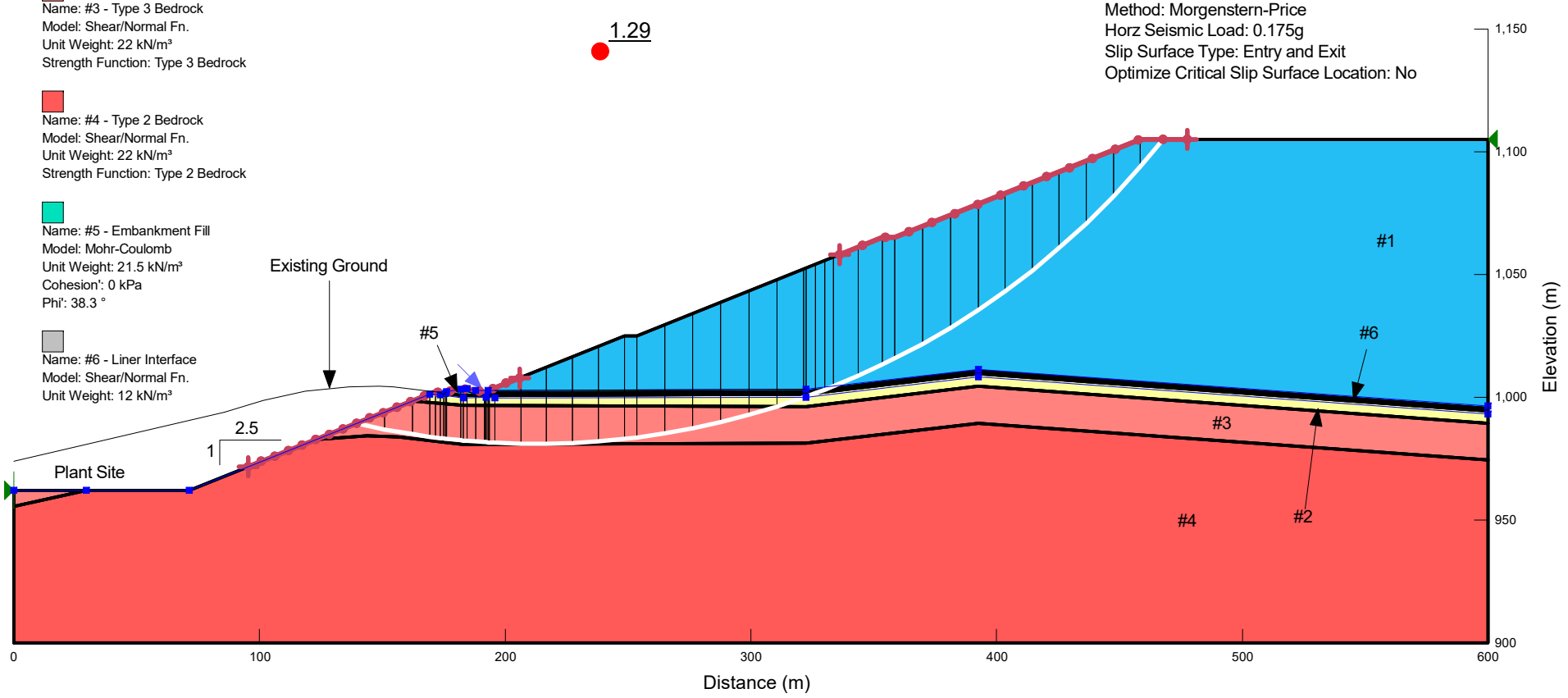
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

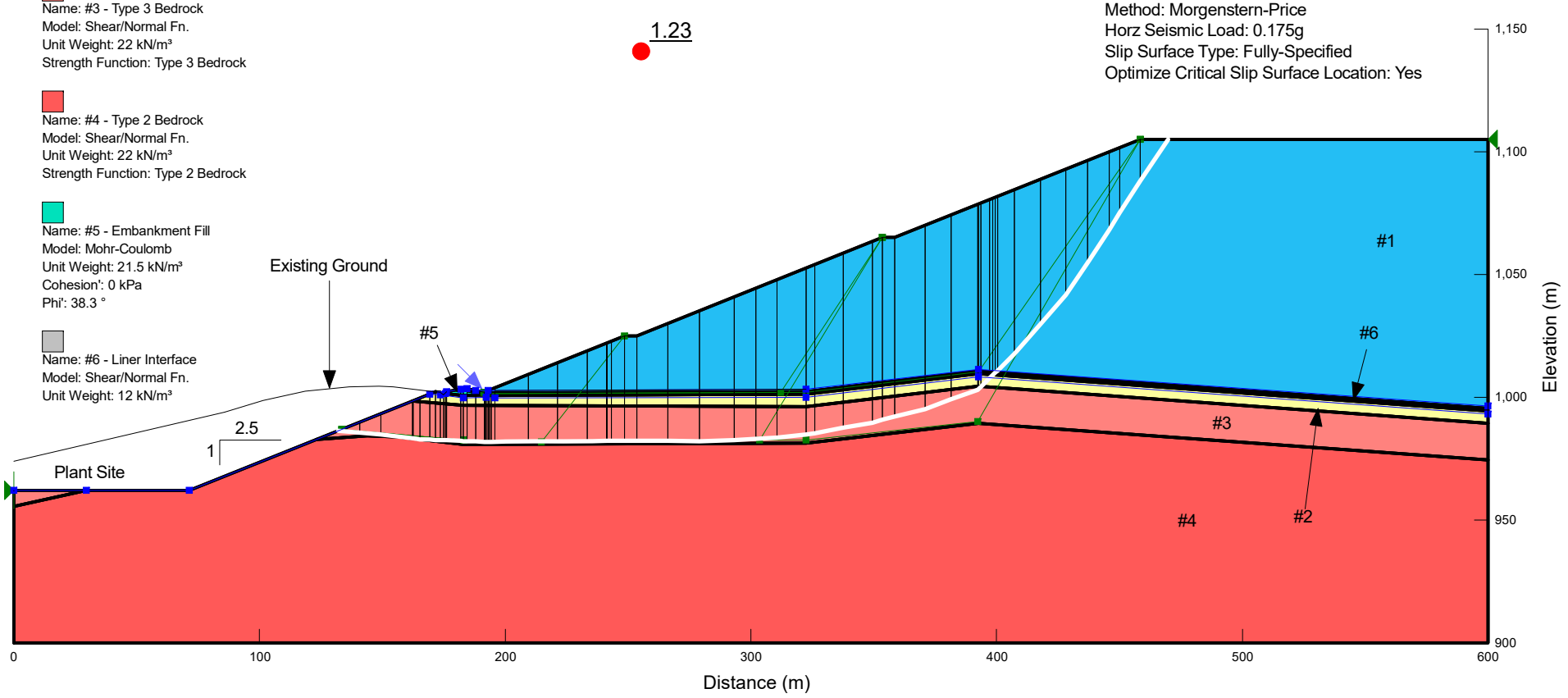
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.175g
Slip Surface Type: Fully-Specified
Optimize Critical Slip Surface Location: Yes



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.175g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

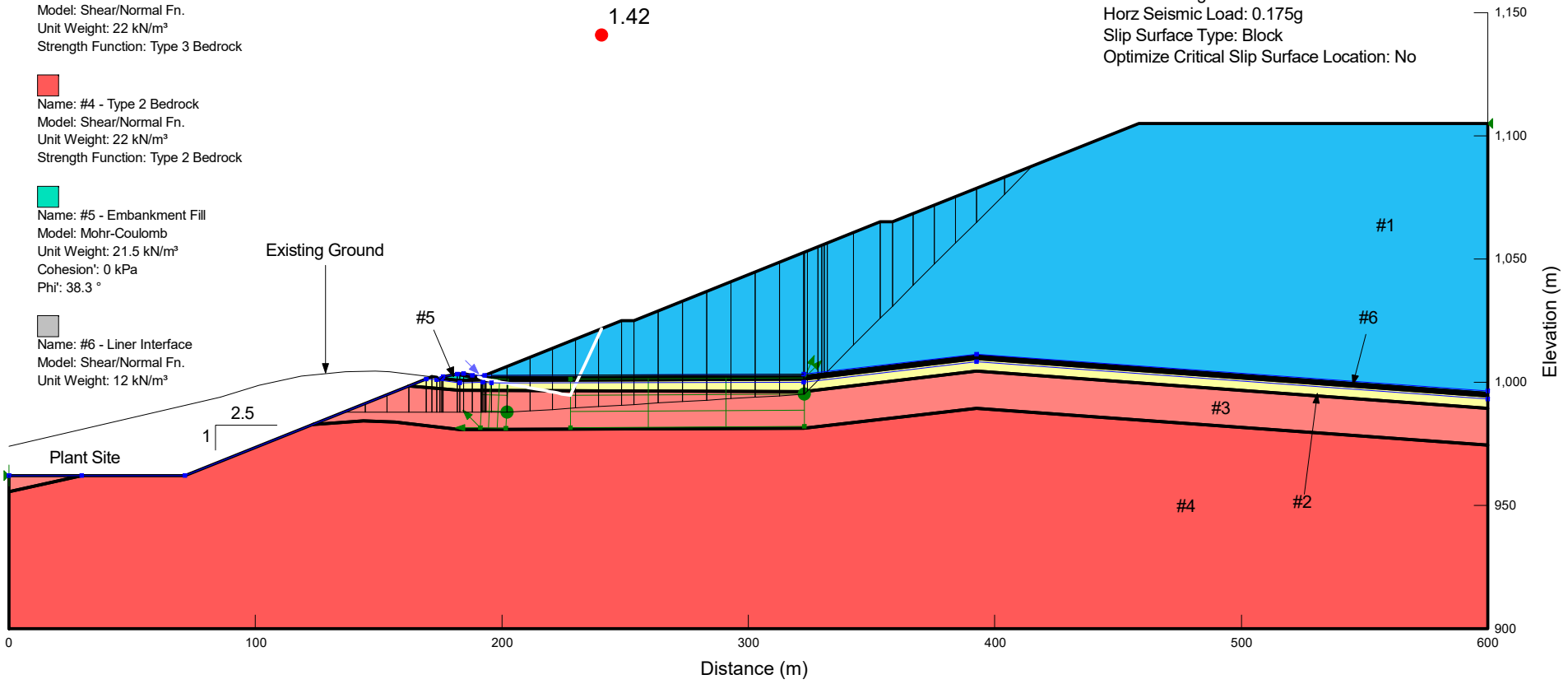
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface
Model: Shear/Normal Fn.
Unit Weight: 12 kN/m³



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

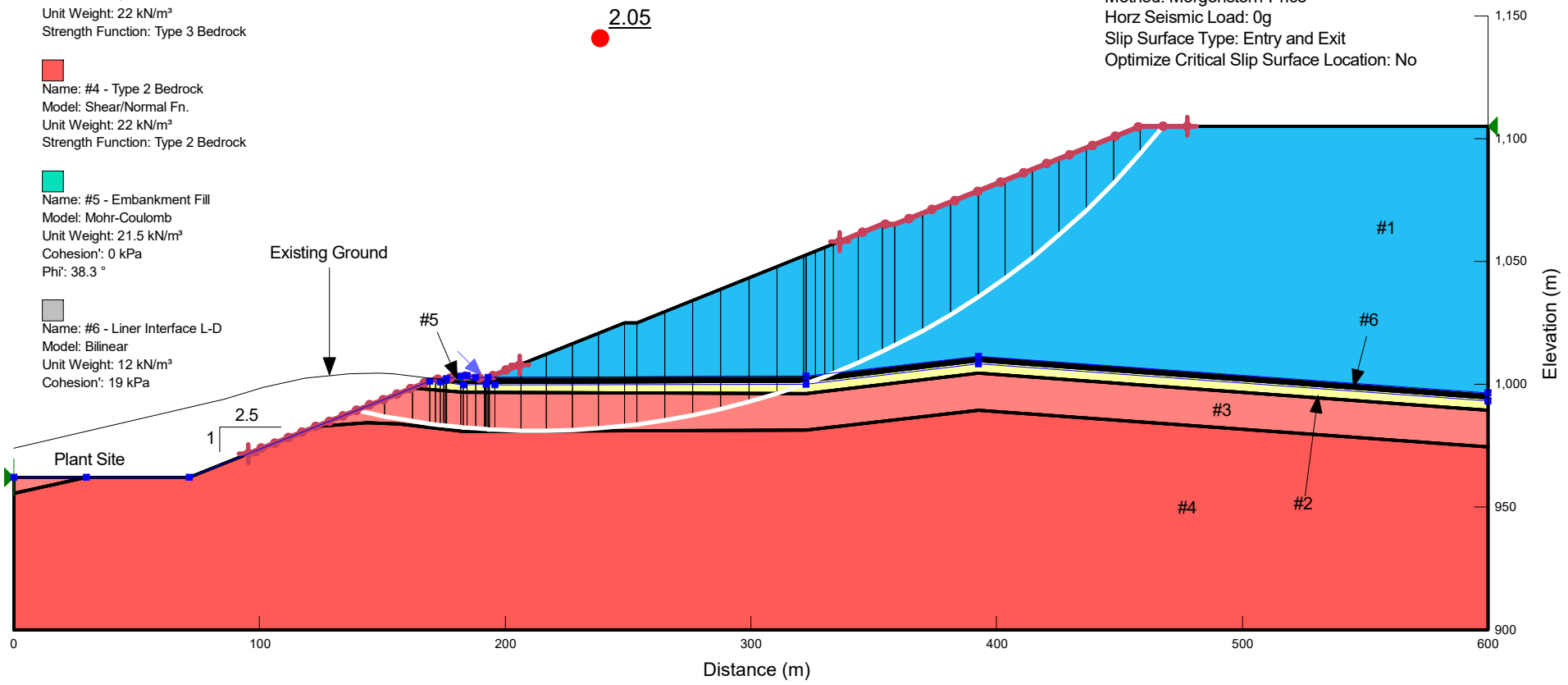
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface L-D
Model: Bilinear
Unit Weight: 12 kN/m³
Cohesion': 19 kPa

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

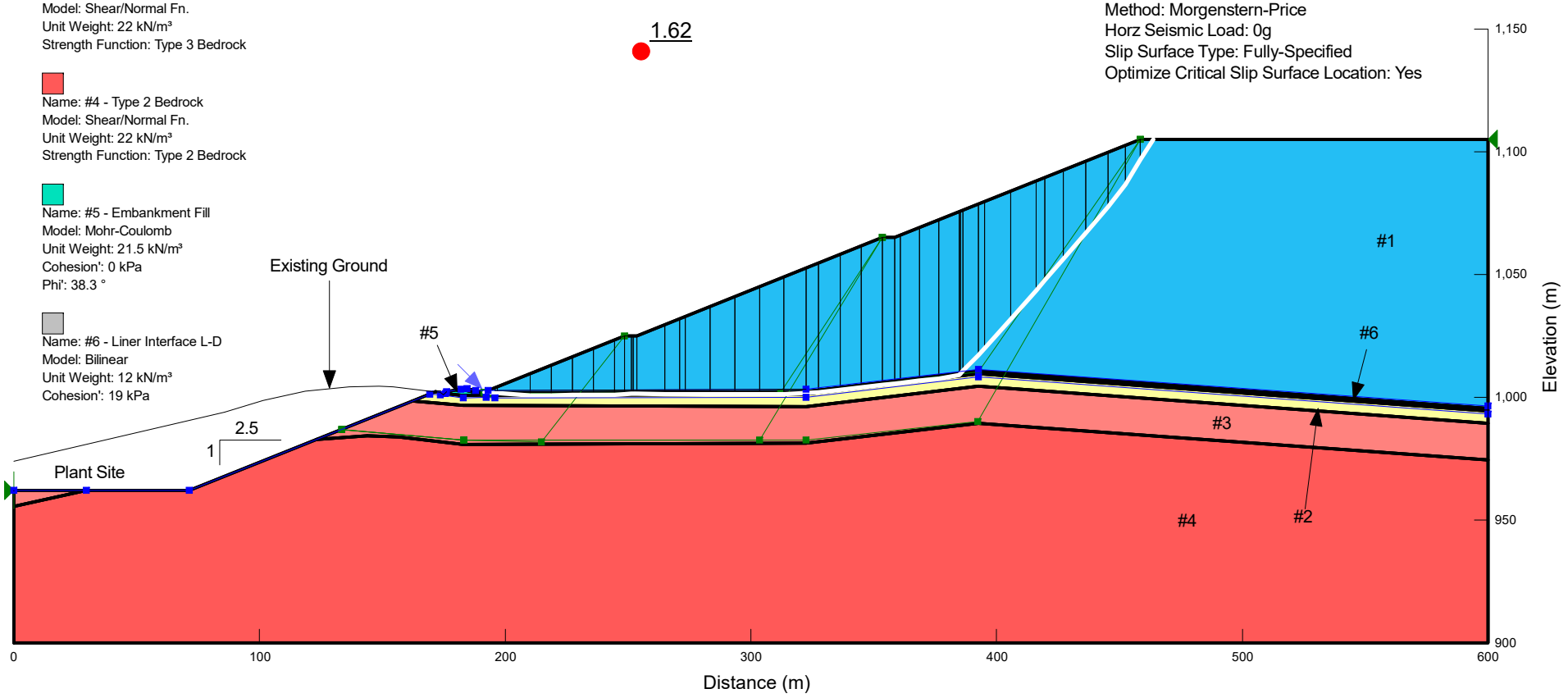
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface L-D
Model: Bilinear
Unit Weight: 12 kN/m³
Cohesion': 19 kPa

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Fully-Specified
Optimize Critical Slip Surface Location: Yes



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock

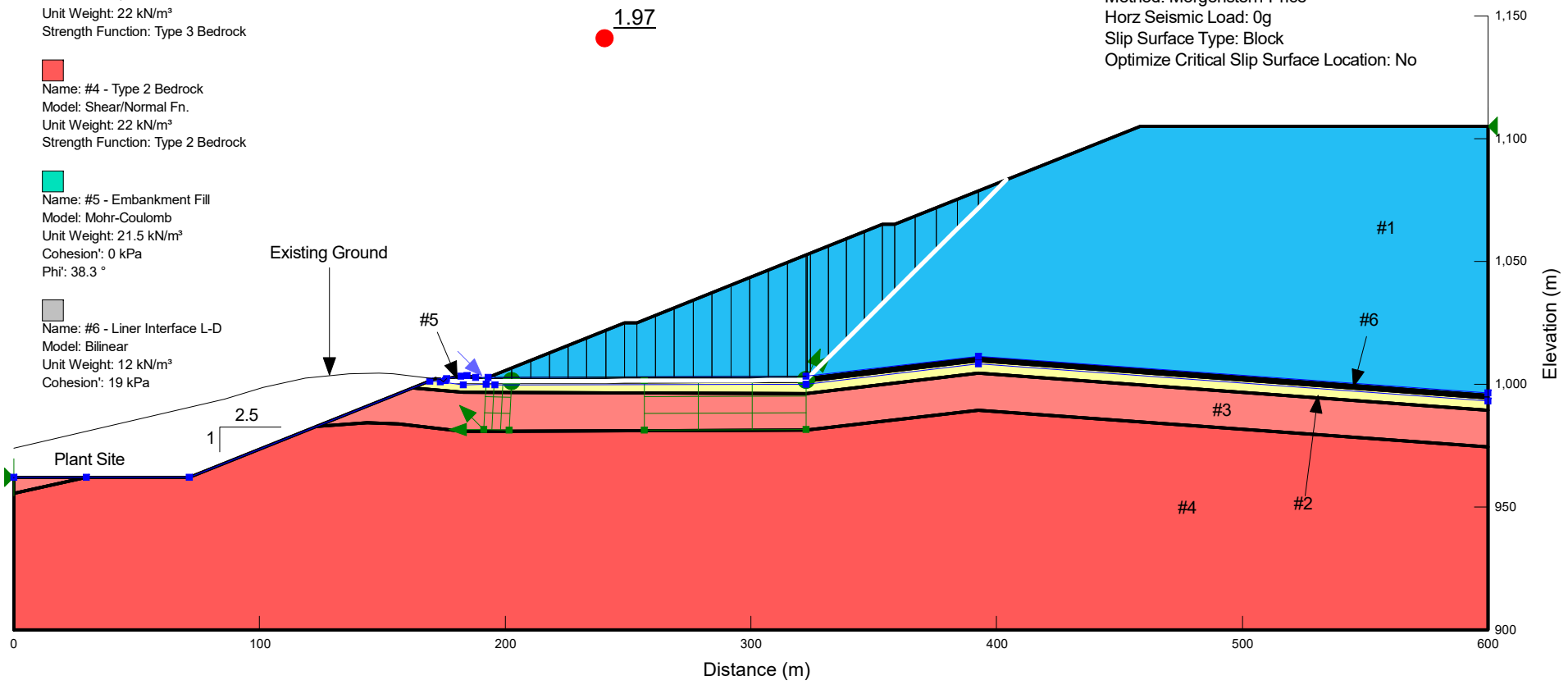
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °

Name: #6 - Liner Interface L-D
Model: Bilinear
Unit Weight: 12 kN/m³
Cohesion': 19 kPa

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section B

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_B_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section C

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No

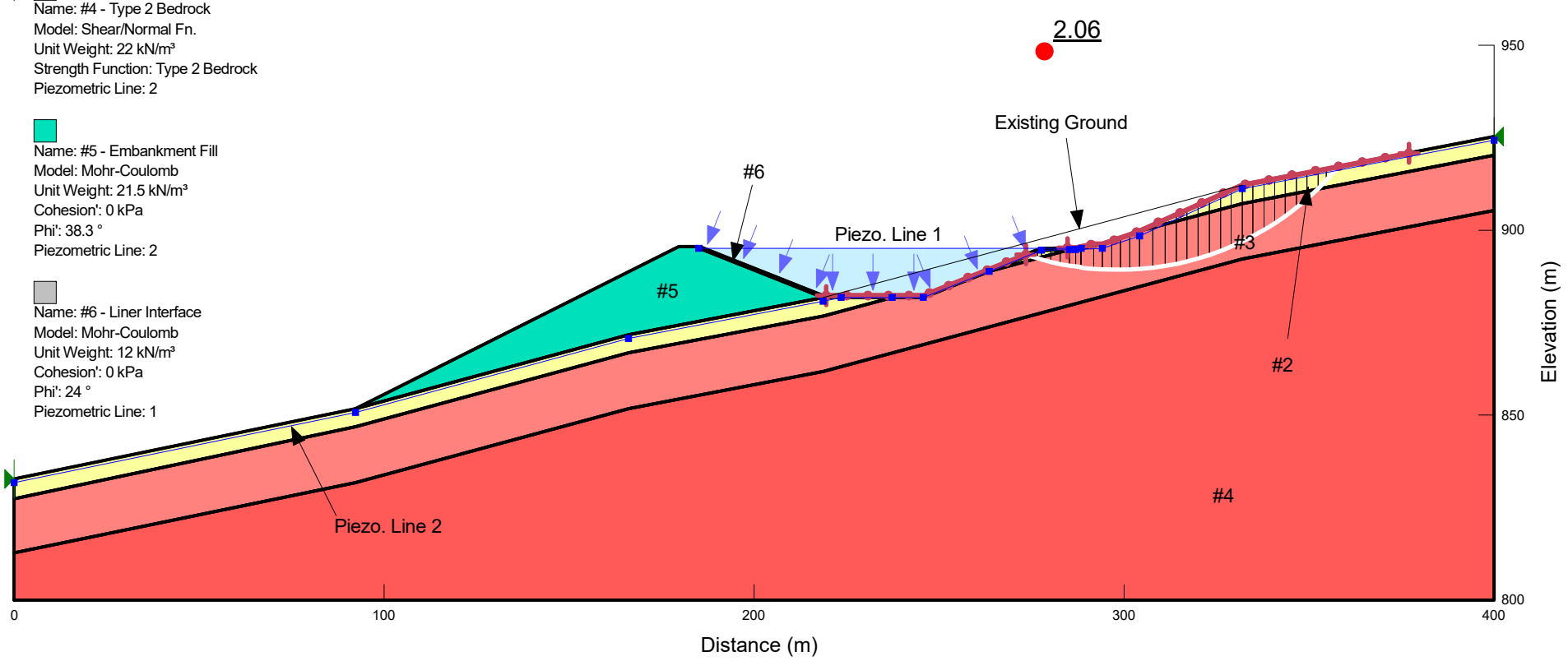
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °
Piezometric Line: 2

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock
Piezometric Line: 2

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 2

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Mohr-Coulomb
Unit Weight: 12 kN/m³
Cohesion': 0 kPa
Phi': 24 °
Piezometric Line: 1



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_C_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section C

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No

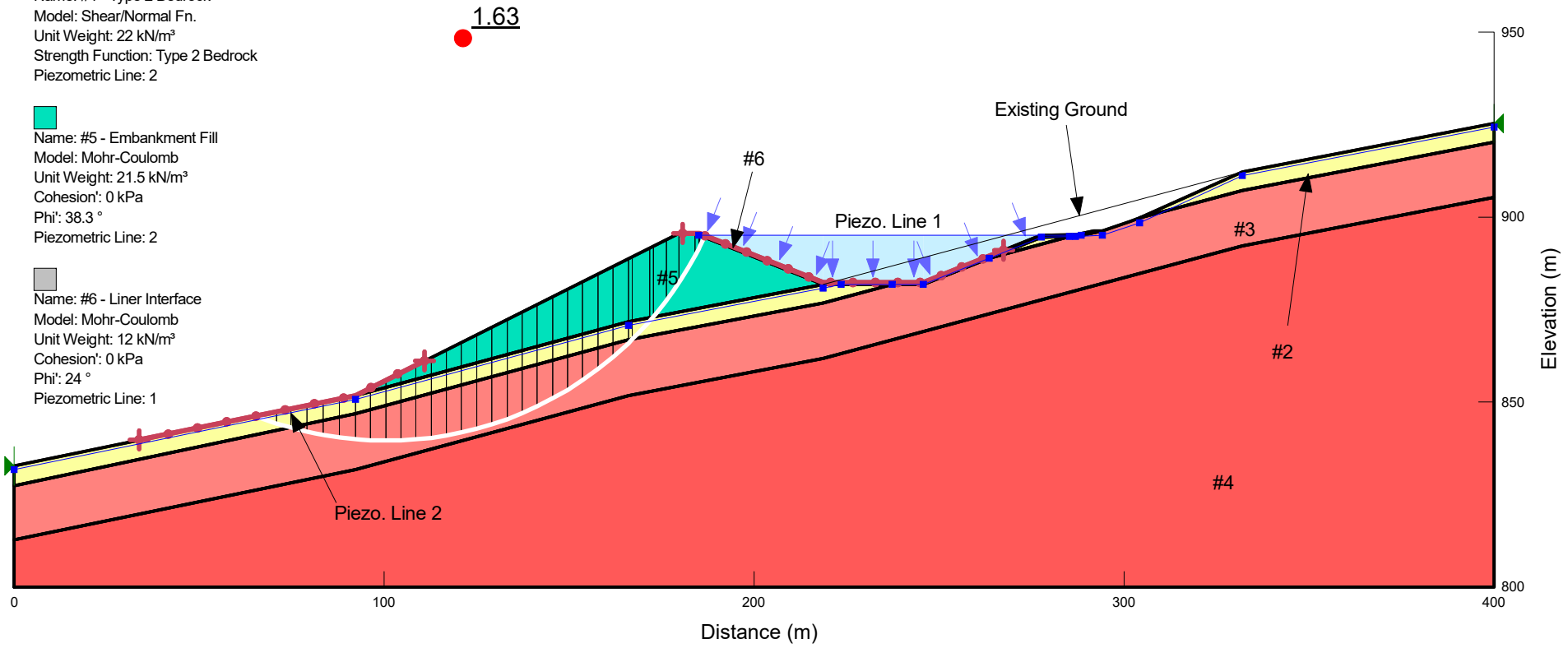
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °
Piezometric Line: 2

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock
Piezometric Line: 2

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 2

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Mohr-Coulomb
Unit Weight: 12 kN/m³
Cohesion': 0 kPa
Phi': 24 °
Piezometric Line: 1



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_C_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section C

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No

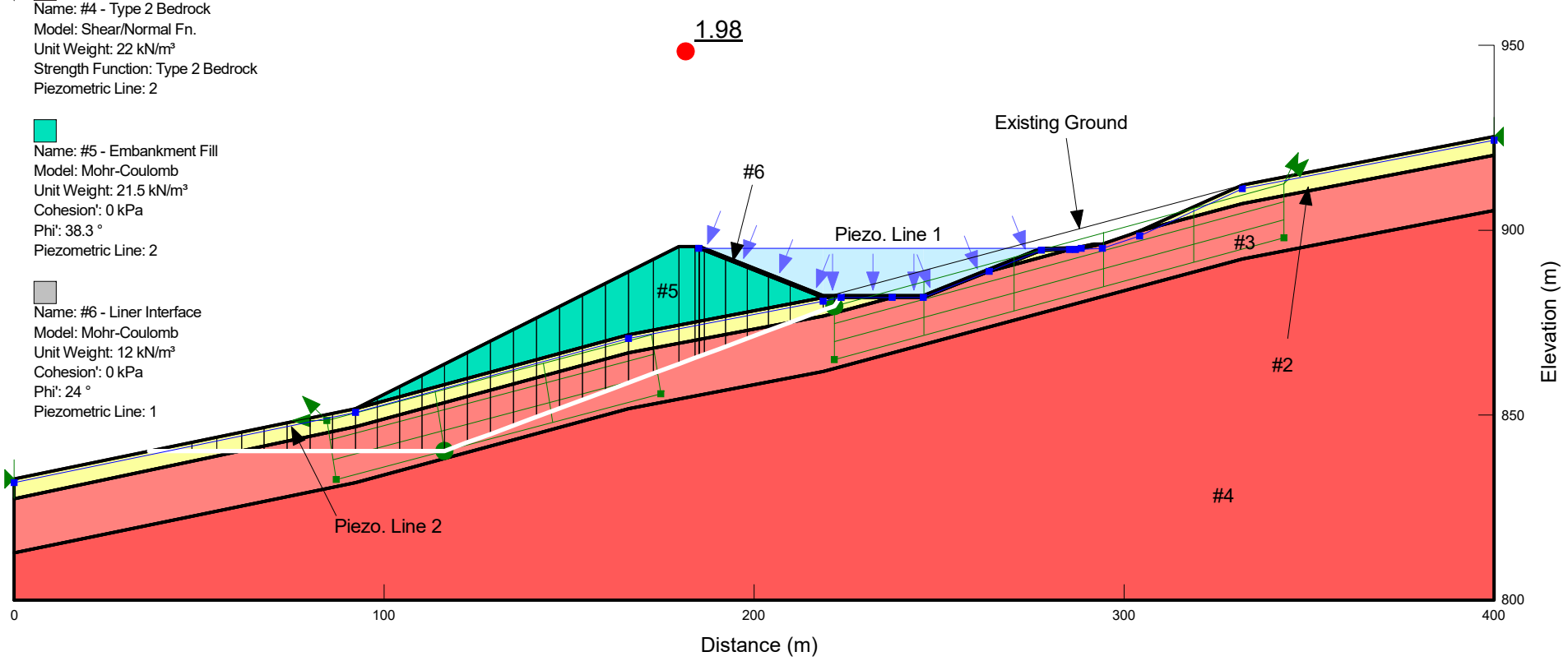
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °
Piezometric Line: 2

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock
Piezometric Line: 2

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 2

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Mohr-Coulomb
Unit Weight: 12 kN/m³
Cohesion': 0 kPa
Phi': 24 °
Piezometric Line: 1



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_C_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section C

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No

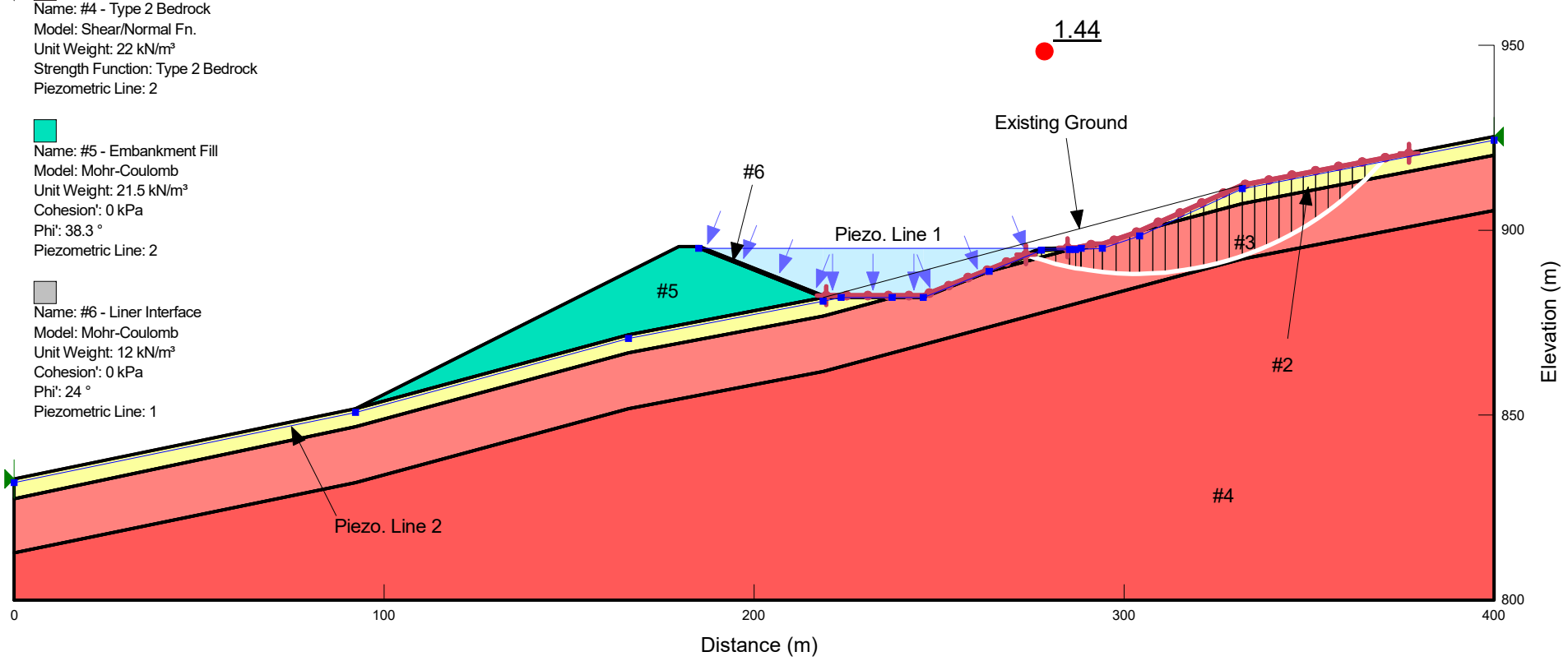
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °
Piezometric Line: 2

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock
Piezometric Line: 2

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 2

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Mohr-Coulomb
Unit Weight: 12 kN/m³
Cohesion': 0 kPa
Phi': 24 °
Piezometric Line: 1



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_C_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section C

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No

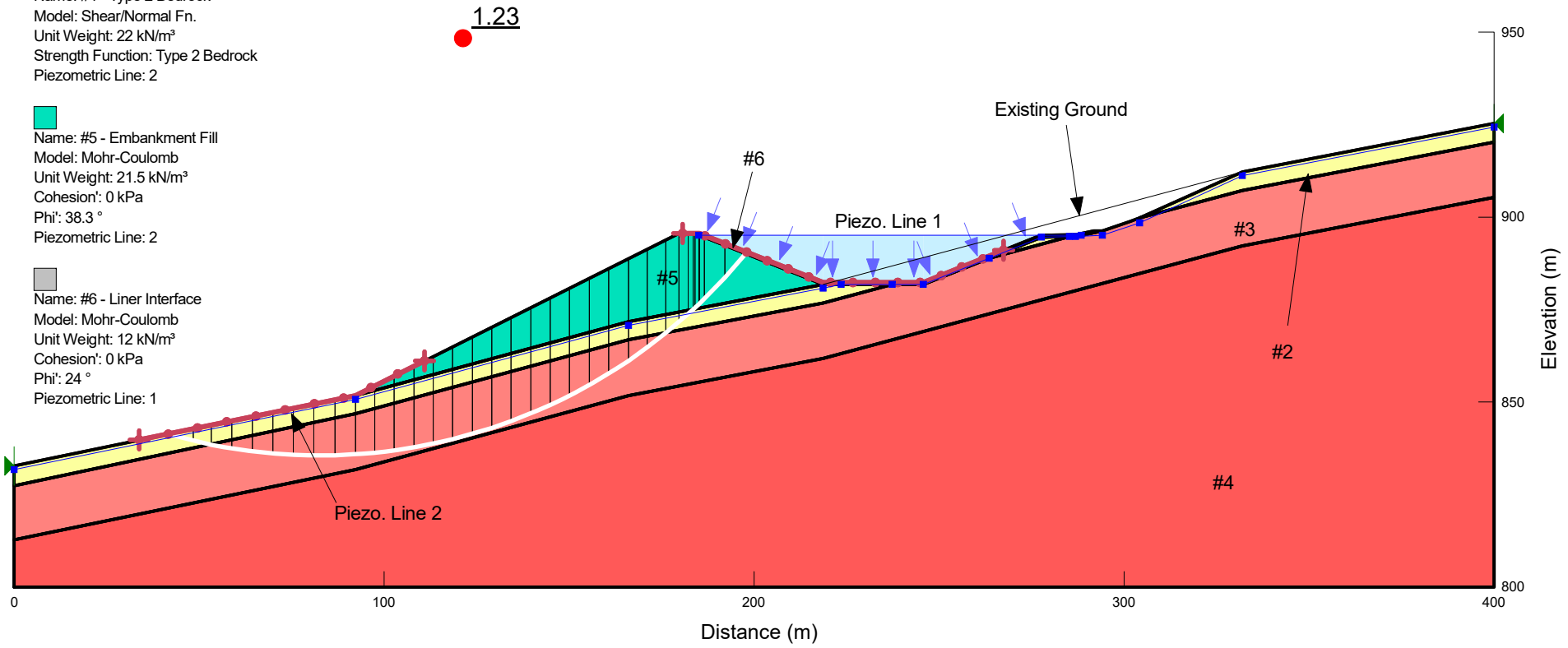
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °
Piezometric Line: 2

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock
Piezometric Line: 2

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 2

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Mohr-Coulomb
Unit Weight: 12 kN/m³
Cohesion': 0 kPa
Phi': 24 °
Piezometric Line: 1



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_C_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section C

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: No

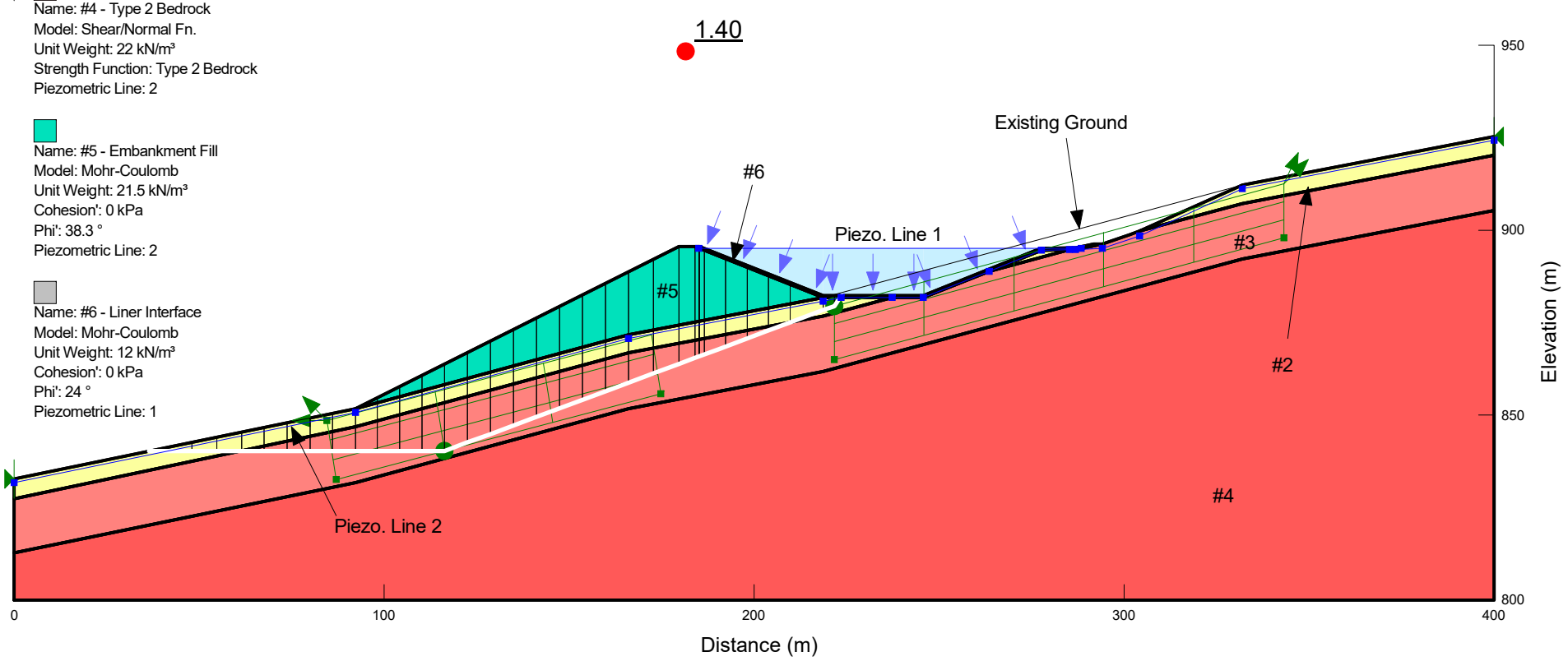
Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °
Piezometric Line: 2

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock
Piezometric Line: 2

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 2

Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38.3 °
Piezometric Line: 2

Name: #6 - Liner Interface
Model: Mohr-Coulomb
Unit Weight: 12 kN/m³
Cohesion': 0 kPa
Phi': 24 °
Piezometric Line: 1



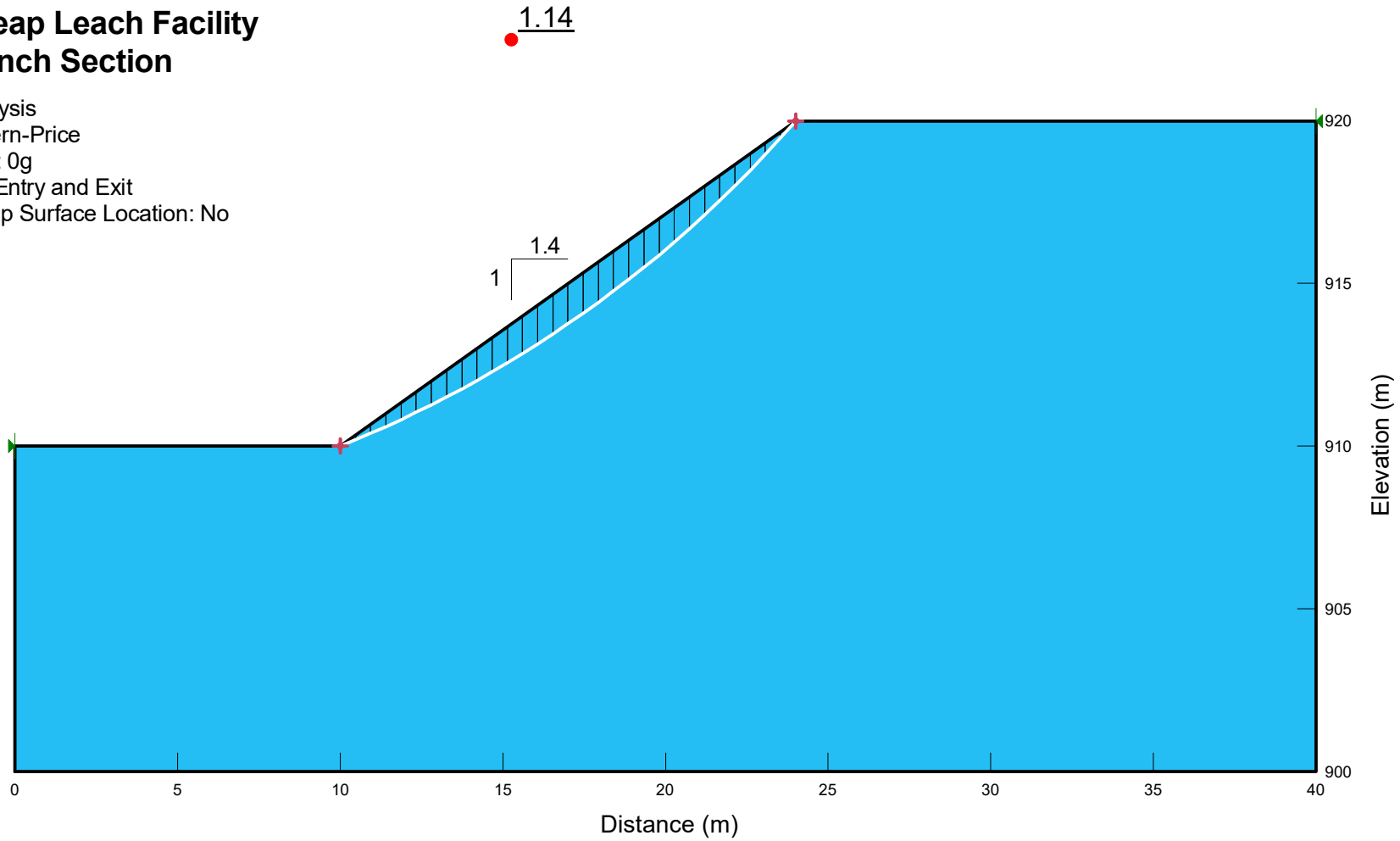
Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_C_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Individual Bench Section

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No



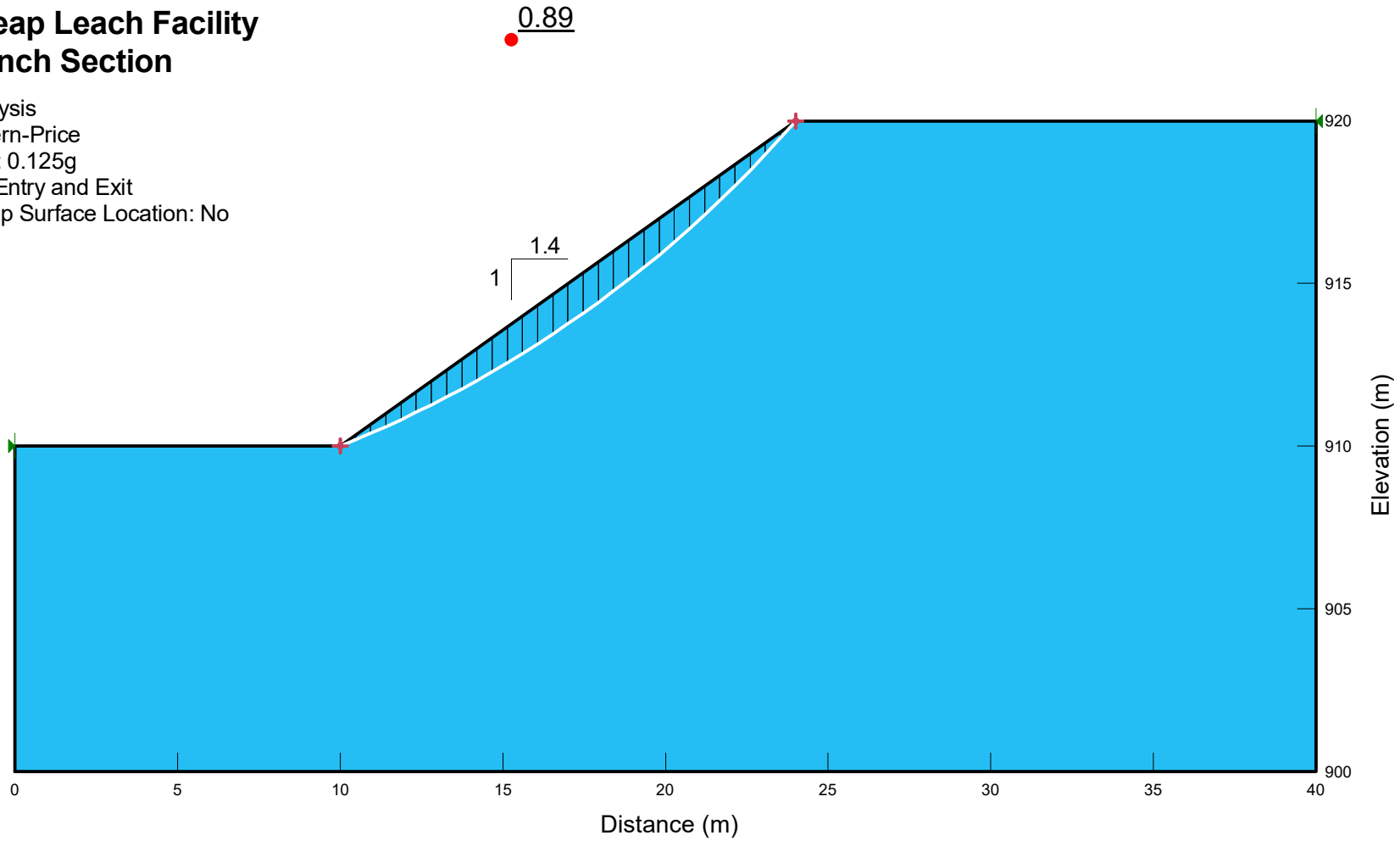
Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_Bench_20171013.gsz

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Individual Bench Section

Slope Stability Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.125g
Slip Surface Type: Entry and Exit
Optimize Critical Slip Surface Location: No



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_Bench_20171013.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

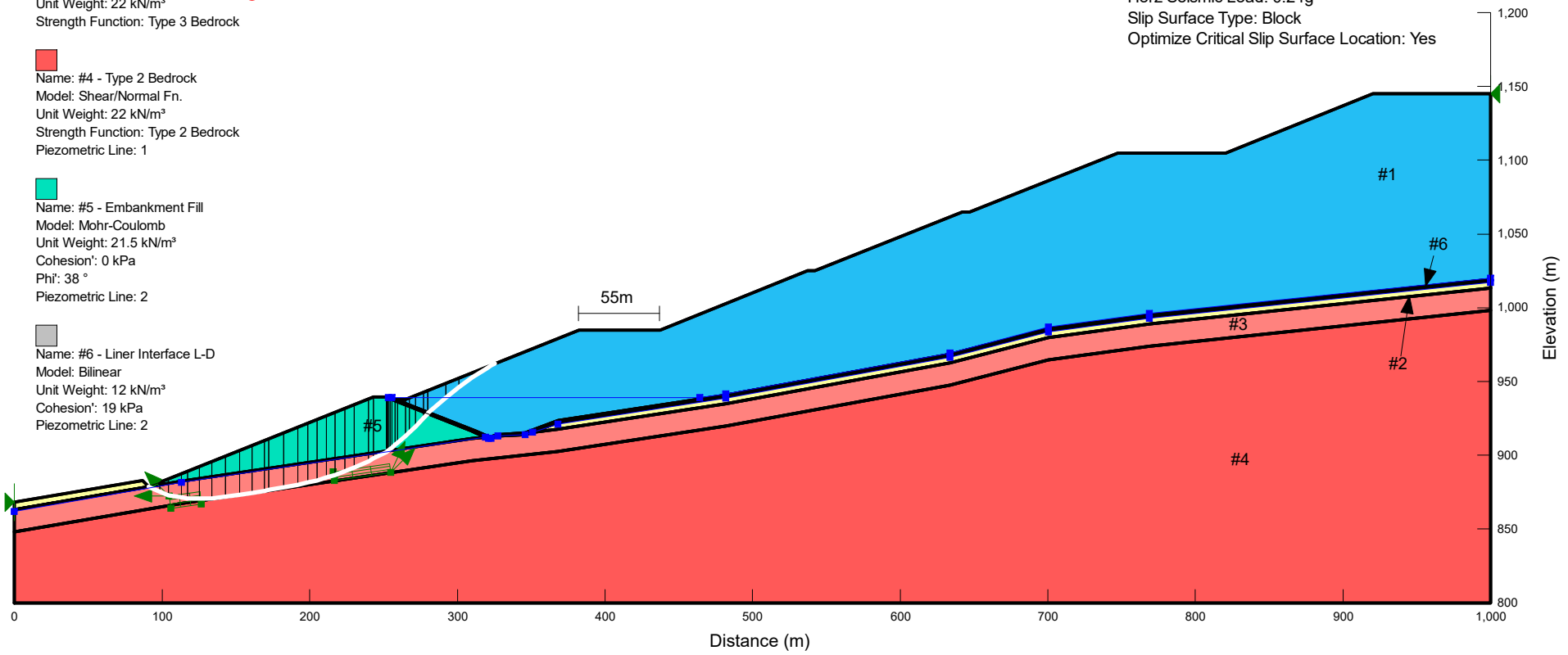
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38 °
Piezometric Line: 2

Name: #6 - Liner Interface L-D
Model: Bilinear
Unit Weight: 12 kN/m³
Cohesion': 19 kPa
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Yield Acceleration Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.24g
Slip Surface Type: Block
Optimize Critical Slip Surface Location: Yes



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013_ky.gsz

Name: #1 - Crushed Ore
Model: Mohr-Coulomb
Unit Weight: 18 kN/m³
Cohesion': 0 kPa
Phi': 38 °

Name: #2 - Colluvium
Model: Mohr-Coulomb
Unit Weight: 22 kN/m³
Cohesion': 0 kPa
Phi': 40 °

Name: #3 - Type 3 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 3 Bedrock

Name: #4 - Type 2 Bedrock
Model: Shear/Normal Fn.
Unit Weight: 22 kN/m³
Strength Function: Type 2 Bedrock
Piezometric Line: 1

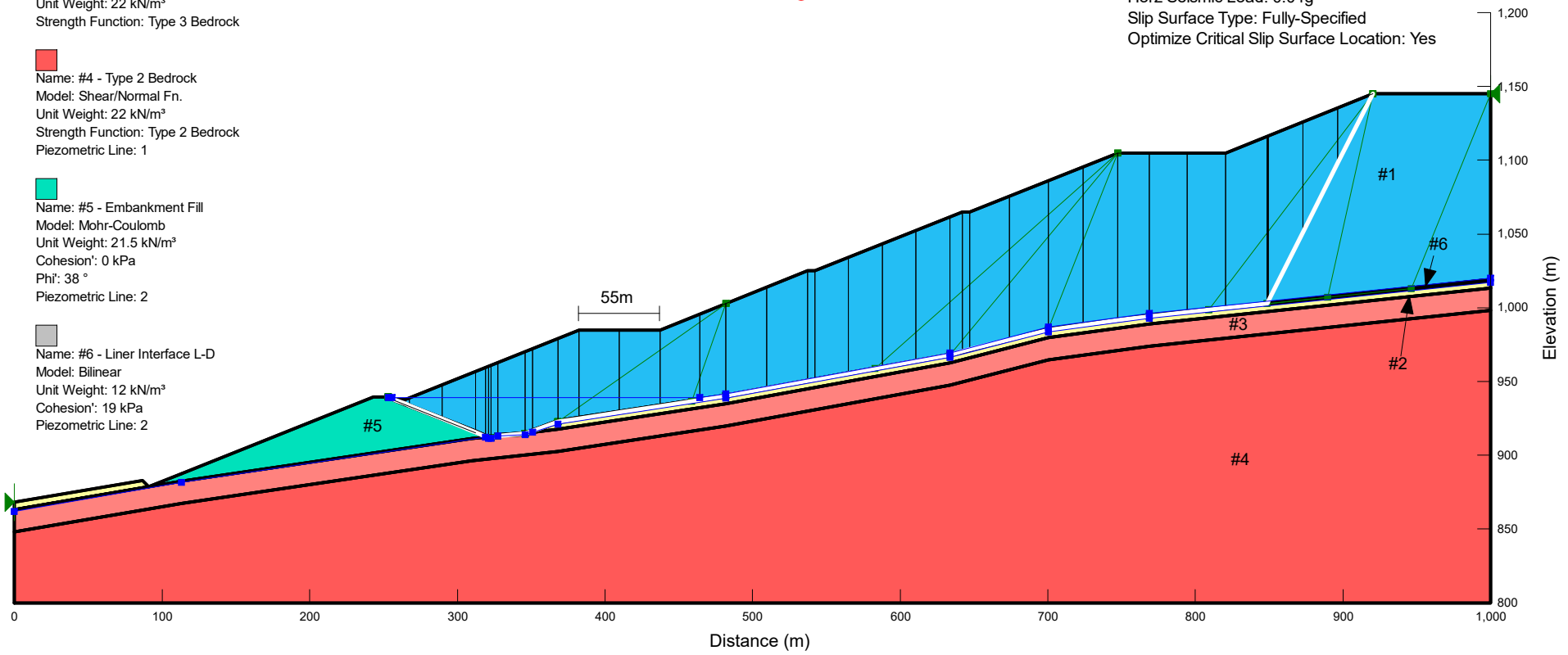
Name: #5 - Embankment Fill
Model: Mohr-Coulomb
Unit Weight: 21.5 kN/m³
Cohesion': 0 kPa
Phi': 38 °
Piezometric Line: 2

Name: #6 - Liner Interface L-D
Model: Bilinear
Unit Weight: 12 kN/m³
Cohesion': 19 kPa
Piezometric Line: 2

BGC ENGINEERING USA INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corp.
Eagle Gold
Ann Gulch Heap Leach Facility
Section A

Yield Acceleration Analysis
Method: Morgenstern-Price
Horz Seismic Load: 0.04g
Slip Surface Type: Fully-Specified
Optimize Critical Slip Surface Location: Yes



Directory: C:\Users\tmonasterio\OneDrive - BGC Engineering Inc\Eagle Gold\01 Slope Stability\To print\AG_A_20171013_ky.gsz

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 500 - 980 Howe Street, Vancouver, BC Canada V6Z 0C8
Telephone (604) 684-5900 Fax (604) 684-5909

Project Memorandum

To:	**File**		
		cc:	**Troy Meyer**
From:	**Tony Monasterio**	**Date:**	**November 9, 2017**
Subject:	**Appendix H – Settlement Analysis**		
Project No.:	**0792018.02**		

1.0 INTRODUCTION

The purpose of this memorandum is to present the methods and results of the settlement analysis completed for the Heap Leach Facility (HLF) at StrataGold Corporation's (SGC) Eagle Gold Project located in Yukon Territory, Canada. SGC is a directly held, wholly owned subsidiary of Victoria Gold Corp.

The Eagle Gold HLF will consist of a 61-meter-high embankment (downstream toe to crest or 24.5 m upstream toe to crest) along Ann Gulch near the confluence with Dublin Gulch. The ore will be stacked behind the embankment within Ann Gulch. The confining embankment is designed to provide safe storage for the required ore tonnages and temporary storage of fluids for pumping to the plant. The embankment creates an In-Heap Pond area for pumping of pregnant solution to the recovery plant.

A two-dimensional settlement analyses was completed to assess strains on the HLF liner and pipework systems under expected loading conditions.

2.0 DESIGN CRITERIA

2.1. Subsurface Conditions

A detailed description of the HLF site is provided in various reports prepared by BGC (2010, 2011a, 2011b, 2012a, 2012b, 2017).

Overburden soils encountered on the sloping ground at the HLF site typically consist of a veneer of organic soils overlying a blanket of colluvium between 0.2 and 7.6 meters thick, which overlies weathered bedrock. The bedrock encountered in the area is generally classified as metamorphosed sedimentary rock, with a variably deep weathering profile. The intact rock strength is variable depending on degree of weathering, with strengths ranging between R0 class (i.e., corresponding to < 1 megapascals (MPa) Unconfined Compressive Strength, UCS) and R4 (50-100 MPa UCS). The average intact strength is estimated to be approximately R2 (5-25 MPa) in the metasedimentary rock, but with significant variability across the site. The design requires the embankments to be founded on weathered bedrock with UCS > 1Mpa. For conservatism, the

bedrock was assumed to be weak and highly to completely weathered (see Section 4 for material properties).

2.2. Phreatic Conditions

2.2.1. Leach Ore Pile

The granular ore heap will be wetted by controlled leaching (irrigation applied to the top of the heap) and will have a gravity drain system above the pad liner draining to the in-heap pond behind the dam. Therefore, the heap will largely remain in an unsaturated state. For conservatism, the water level in the in-heap pond was assumed to be at the embankment spillway invert and a phreatic level of 1 m on the pad liner (upgradient of the in-heap pond) was assumed in the analyses to correspond with the maximum Overliner Drain Fill (ODF) depth.

2.2.2. Embankment and Event Pond

The heap embankment will be lined with a double geomembrane composite liner system with leak detection, designed to limit seepage to the environment. The modeling was completed under the assumption that the liner system was intact, with no phreatic surface in the embankment.

2.2.3. Foundation

Groundwater at the HLF site is generally immediately above the colluvium-weathered bedrock contact, but was observed as shallow as 3 meters below the existing ground surface. A liner underdrain will be used to prevent upward hydraulic pressure on the liner. Although shallow groundwater conditions exist at the site, the combination of the liner underdrain and elimination of infiltration due to placement of the liner system is expected to result in a lower groundwater level during operations and into post-operations. The foundation groundwater level was modeled 1 m below the liner for conservatism.

3.0 METHODS OF ANALYSIS

3.1. Sigma/W

A settlement analysis was performed on a simplified section representative of an area within the heap where thick colluvium was removed and replaced with significantly stiffer embankment fill at a 1H:1V slope, see Figure H-1. This condition may occur near the upstream toe of the embankment or across a required excavation or test pit in the pad areas. The colluvium was assumed to be 8 m deep underlain by 15 m of Type 3 bedrock. Sigma/W, a component of GeoStudio 2016 (v. 8.16, GEO-SLOPE, 2016), was used to evaluate the settlement through the cross section. Sigma/W is a finite-element stress-deformation modelling program which uses the loads applied to the foundation materials to calculate the deformation. The physical boundaries of the model are fixed in terms of stress and strain (designated by the red cones in Figure H-1). The results produced by the settlement analyses were then compared to strain thresholds for the liner and pipework components to confirm acceptable performance of the systems under

expected loading conditions. The purpose of this analysis is to evaluate the strain on the liner and pipework caused by replacing colluvium with a stiff fill.

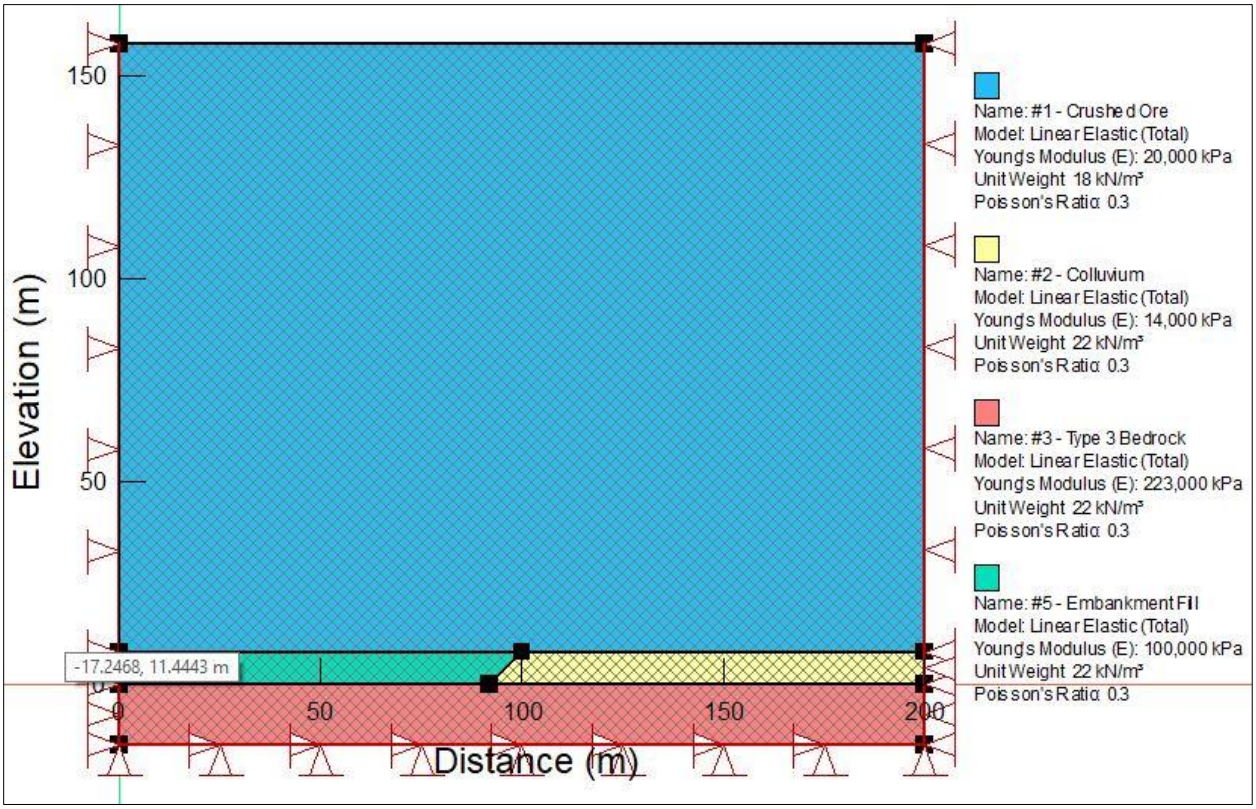


Figure H-1. Simplified section analyzed in Sigma/W.

3.2. Hooke's Law

In addition to the Sigma/W analysis, Hooke's Law was used to calculate settlement at two locations with different colluvium thicknesses to quantify potential differential settlement. The purpose of this calculation is to evaluate strain along the liner and pipework due to natural variation in bedrock depth. A derivation from Hooke's Law is presented below as Equation H-1.

$$S = \frac{1}{E_s}\int_0^H \left(\Delta p_z - \mu_s \Delta p_x - \mu_s \Delta p_y\right) dz \qquad \text{Eq. H-1}$$

Where:

S = Settlement (m)

E_s = Soil modulus (kPa)

H = Thickness of the soil layer (m)

μ_s = Poisson's ratio of the soil

Δp_x, Δp_y, Δp_z = Stress increase due to the net applied foundation load in the x, y, and z directions, respectively (kPa)

Since the heap pad area is much larger than the soil thickness, Δp_x and Δp_y are 0, and Equation H-1 can be simplified to:

$$S = \frac{H\Delta p_z}{E_s} \quad \text{Eq. H-2}$$

The location in the HLF footprint which presents the highest probability of differential settlement occurring is between BH-BGC16-087, in which bedrock was encountered at 7.6 m below ground surface and BH-BGC16-086 which encountered bedrock 1.2 m below ground surface. Refer to the 2016 Site Investigation Report (BGC, 2017) for the borehole logs and location details.

Strain can be calculated from the distance between the two boreholes. These locations are approximately 85 m apart, but assuming the geomorphology of the gulch is consistent and the deep bedrock of BH-BGC16-087 occurs consistently near the water channel, the transition between these two profiles could plausibly occur over a distance as small as 30 meters.

4.0 MATERIAL PROPERTIES

The settlement analysis used the unit weights presented in the stability analysis memorandum, Appendix G. The soil modulus (E_s, also referred to as Young's Modulus), which relates the amount of strain in reaction to an applied stress, was estimated for the ore, and embankment fill using engineering judgement to be 20 MPa and 100 MPa, respectively. The soil modulus for the colluvium was established using correlation with field and/or laboratory testing in similar materials elsewhere on site. The Bowles correlation is presented below as Equation H-3.

$$E_s = 750 + 80N \quad \text{Eq. H-3}$$

Where:

E_s = Soil modulus in tonnes per square meter (t/m^2)

N = Blow count from SPT

SPTs were not performed in the colluvium underlying the HLF site. However, based on site experience and engineering judgement, BGC considers an SPT N value of 8 to be conservatively low for the colluvium. Therefore, a soil modulus of 1,400 t/m^2 or about 14 MPa was calculated and assigned to the colluvium. Calculations are included in Attachment H-1.

The rock modulus relationship established by the Hoek and Brown relationship described by Hoek et al (2002), Equation H-4, was used to estimate the modulus of the weak bedrock, called Type 3 (highly weathered, very weak). The bottom of the Type 3 bedrock was assigned a zero-displacement boundary condition to simulate stronger bedrock beneath.

$$E = \sqrt{\frac{UCS}{100}} \times 1000 \times 10^{\frac{(GSI-10)}{40}} \quad \text{Eq. H-4}$$

Where

E = Modulus of deformation, MPa

UCS = Uniaxial Compressive Strength of intact rock pieces, MPa

GSI = Geologic Strength Index

The UCS and GSI values used in the settlement analysis are the same as those described in the stability analyses in Appendix G, and are presented in Table H-1 along with the calculated modulus. Calculations are included in Attachment H-1.

Table H-1. UCS and GSI inputs and calculated bedrock moduli.

Bedrock Type	UCS (MPa)	GSI (-)	Rock Modulus (E) (MPa)
Type 3	2.8	15	223

The finite element mesh used was composed of 2-meter quadrilateral and triangular elements with secondary nodes. Boundary conditions include fixed stress/strain along the border.

Three sequential timesteps were used in the Sigma/W model. The first is the initial stage, modeling conditions prior to construction (colluvium on top of bedrock). The second step is after removal of the portion of colluvium and replacement with structural fill. The third step is after 150 m of ore placement has been completed.

5.0 RESULTS

5.1. Sigma/W

The Sigma/W model output of interest is the strain, in the x-direction, along the bottom of the ore (the location of the liner and pipework systems). The calculated strain is plotted against the model's x-coordinates in Figure H-2.

The maximum strain calculated for the deformation profile in figure H-2 is 2%, which occurs at the modeled material discontinuity (embankment fill/colluvium), and as discussed in Section 5.3 below, is considered acceptable.

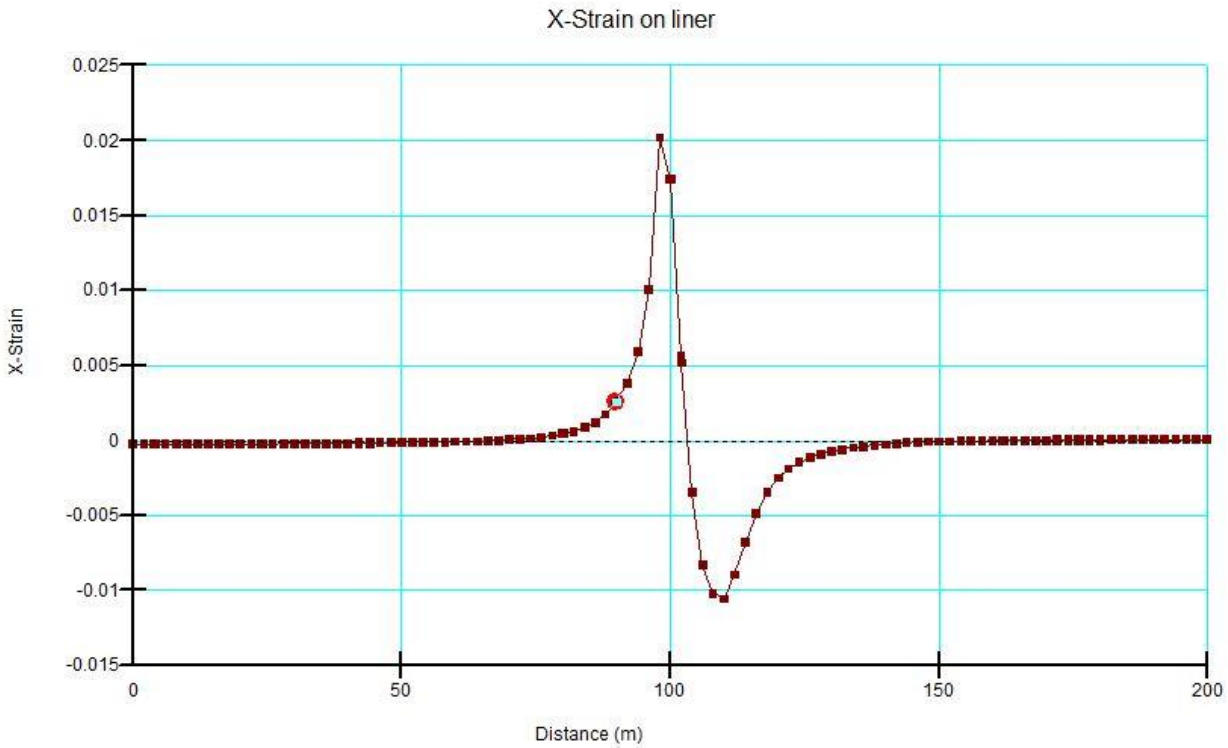


Figure H-2. Strain profile along the simplified section shown in Figure H-1.

5.2. Hooke's Law

The expected settlement at BH-BGC16-087 is 1.4 m and the settlement expected at BH-BGC16-086 is 0.22 m. This differential settlement results in a strain of approximately 0.1% over a distance of 30 m. The calculation results are included in Attachment H-1.

5.3. Evaluation of Acceptable Strain

The maximum allowable strain on the composite liner system is 8%, which represents the recommended value for the textured LLDPE geomembrane (Peggs, 2005). While the Geosynthetic Clay Liner (GCL) yield strain is estimated to be more than 50%, in practice the maximum allowable strain would be less than 10% to limit the thinning of bentonite which could affect the performance of the GCL (LaGatta, 1997). The results of the differential settlement analyses presented herein predicted a maximum value of 2%, which indicates a factor of safety of about 5 for the GCL and 4 for the geomembrane.

HDPE pipe can withstand an axial strain approaching 10% without permanent damage (Chevron, 2016). For conservatism and to account for pipe joint separation, a maximum allowable strain of 5% was used for the proposed HDPE solution collection pipes. The analyses indicate a factor of safety of 2.5 for the HDPE drainage pipework.

6.0 CLOSURE

BGC Engineering Inc. (BGC) prepared this document for the account of StrataGold Corporation. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves all documents and drawings are submitted for the confidential information of our client for a specific project. A record copy of this document is on file at BGC. That copy takes precedence over any other copy or reproduction of this document.

Yours sincerely,

BGC ENGINEERING INC.
per:

Tony Monasterio, PE
Geological Engineer

Reviewed by:

Troy Meyer, PE, P.Eng.
Principal Geological Engineer

Engineers Yukon Permit to Practice:
PP092 BGC Engineering Inc.

TLM/CW/rm/mm

REFERENCES

BGC Engineering, Inc. March 5, 2010. Site facilities geotechnical investigation, factual data report. *Report prepared for* Victoria Gold Corporation.

BGC Engineering, Inc. April 21, 2011a. Eagle Gold – Borrow evaluation report. *Memo prepared for* Victoria Gold.

BGC Engineering, Inc. November 17, 2011b. 2010 geotechnical investigation for mine site infrastructure, factual data report. *Report prepared for* Victoria Gold Corporation.

BGC Engineering, Inc. January 20, 2012a. 2011 geotechnical investigation for mine site infrastructure, factual data report. *Report prepared for* Victoria Gold Corporation.

BGC Engineering, Inc. November 30, 2012b. 2012 geotechnical investigation for mine site infrastructure, factual data report. *Report prepared for* Victoria Gold Corporation.

BGC Engineering, Inc. June 20, 2017. 2016 heap leach facility geotechnical investigation. *Report prepared for* Victoria Gold Corporation.

Chevron Phillips Chemical Company LP., 2016, Technical Note PP-840-TN Polyethylene (PE) Pipes for Seismic Protection

GEO-SLOPE International Ltd. 2016. GeoStudio 2016 [computer program]. Version 8.16. GEO-SLOPE International Ltd., Calgary, AB.

Hoek, E., Carranza-Torres, C.T., and Corkum, B. 2002. Hoek-Brown failure criterion, 2002 edition. In Proceedings of the Fifth North American Rock Mechanics Symposium, Toronto, ON., July 7-10, 2002. Edited by Hammah, R., Bawden, W., Curran, J., and Telesnicki, M. University of Toronto Press. Toronto, ON. pp. 267-273.

LaGatta, M. D., Boardman, B. T., Cooley, B. H. and Daniel, D. E. (1997), Geosynthetic Clay Liners Subjected to Differential Settlement. J. Geotech. Geoenv. Eng. 123(5), pp 402-411.

Peggs, I.D., Schmucker, B., and Carey, P. (2005), “Assessment of Maximum Allowable Strains in Polyethylene and Polypropylene Geomembranes,” Proceedings of GeoFrontiers 2015: Waste Containment and Remediation, Geotechnical Special 51 Publication 142, ASCE, DOI: http://dx.doi.org.ezproxy1.lib.asu.edu/10.1061/40789(168)23

ATTACHMENT H-1

SETTLEMENT CALCULATIONS

Project Number:	0792018
Client Name:	Victoria Gold Corp
Project Name:	Eagle Gold
Deliverable Name:	Settlement Calculations
Calculation Sheet Name:	Inputs
Created By:	Tony Monasterio
Reviewed By:	Troy Meyer

Input	Symbol	Value	Units	Source	Notes
Colluvium blow count	Nc	8	-	TM Estimate	
Gravity	g	9.81	m/s^2	definition	
UCS, Type 3 bedrock	UCS_3	2.8	Mpa	lab testing	UCS tests average minus one standard dev.
UCS, Type 2 bedrock	UCS_2	15.8	MPa	lab testing	UCS tests average
GSI, Type 3 bedrock	GSI_3	15	-	BGC estimate	from BGC 2011a
GSI, Type 2 bedrock	GSI_2	20	-	BGC estimate	from BGC 2011a
Ore density	po	18	kN/m^3	lab testing	KCA, 2010
Ore height	ho	140	m	drawings	maximum ore thickness
Soil thickness at BH-BGC16-087	H_87	7.6	m	2016 site investigation	
Soil thickness at BH-BGC16-086	H_86	1.2	m	2016 site investigation	
Distance between boreholes	D	30	m	lowest plausible	

Project Number:	0792018
Client Name:	Victoria Gold Corp
Project Name:	Eagle Gold
Deliverable Name:	Settlement Calculations
Calculation Sheet Name:	Results
Created By:	Tony Monasterio
Reviewed By:	Troy Meyer

Calculation	Symbol	Result	Units	Formula	Notes
Modulus, colluvium	Esc_tpm	1,390	t/m^2	=750+80*Nc	Bowles correlation
Modulus, colluvium	Esc	13,636	kPa	=Esc_tpm*g	
Modulus, Type 3 bedrock	E_3	223.1	Mpa	=SQRT(UCS_3/100)*1000*10^((GSI_3-10)/4	Hoek and Brown
Modulus, Type 2 bedrock	E_2	706.9	Mpa	=SQRT(UCS_2/100)*1000*10^((GSI_2-10)/4	Hoek and Brown
Stress increase due to ore load	pz	2,520	kPa	=po*ho	
Settlement at BH-BGC16-087	S_87	1.40	m	=H_87*pz/Esc	Hooke's Law
Settlement at BH-BGC16-086	S_86	0.22	m	=H_86*pz/Esc	Hooke's Law
Strain due to differential settlement	str	0.078	%	=(SQRT(D^2+(S_87-S_86)^2)-D)/D*100	definition of strain

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 500 - 980 Howe Street, Vancouver, BC Canada V6Z 0C8
Telephone (604) 684-5900 Fax (604) 684-5909

Project Memorandum

To:	**File**		
		cc:	**Troy Meyer**
From:	**Tony Monasterio**	**Date:**	**October 13, 2017**
Subject:	**Appendix I – Event Pond Liner Ballast Design – FINAL**		
Project No.:	**0792018.02**		

1.0 INTRODUCTION

The purpose of this memorandum is to present the methods and results of the wind uplift calculations completed for the Event Pond liner at the proposed Heap Leach Facility (HLF) at StrataGold Corporation's (SGC) Eagle Gold Project located in Yukon Territory, Canada. SGC is a directly held, wholly owned subsidiary of Victoria Gold Corp.

Exposed geomembrane liners can be uplifted by wind, which can sometimes cause damage to the liner. Uplift can be prevented by placing a counterweight material on the liner surface, called 'ballast'. Equations reported by Giroud et al. (1995) were used to calculate the required mass per area for the Event Pond liner ballast.

2.0 PROPOSED BALLAST SYSTEM

Flexible fabric formed concrete is specified for use elsewhere on the project as spillway armoring, and is therefore also proposed for use as liner ballast. In this application, the fabric form is shipped to site, unrolled by the installer and concrete is pumped into the form from the pond crest. This system has many advantages over the alternatives, such as: superior erosion resistance; ease of installation; and no need for heavy equipment to traffic over the completed liner. Figure I-1 illustrates the installation of a similar system (sourced from the website of a manufacturer, Synthetex).

This memorandum does not specify a particular fabric formed concrete size or spacing because fabric formed concrete is manufactured specifically for individual projects; there are no standard sizes. Therefore there are many different options for ballast size and spacing which could be acceptable for design purposes. Instead, the results of the wind uplift calculations included are the required minimum ballast load per area, and the maximum allowable spacing between ballast forms. An example fabric formed concrete ballast design is also presented.

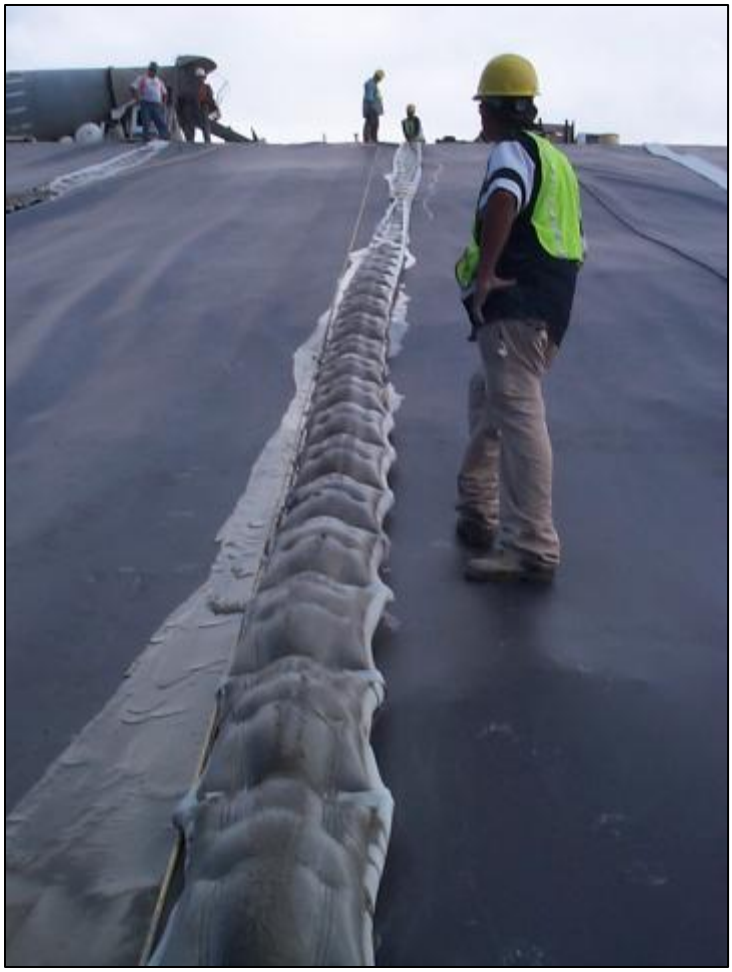


Figure I-1. Example fabric formed concrete ballast on geomembrane.

3.0 WIND UPLIFT CALCULATION METHODS

The geomembrane liner used at the HLF Event Pond is manufactured from high-density polyethylene (HDPE) and is 2.0 millimeters (mm) thick. Giroud et al. (1995) presented a method to evaluate the uplift caused by wind over a geomembrane-lined reservoir. When wind blows over an uneven surface, the differing wind speeds cause suction in some places due to the Bernoulli effect. When the uplift force exceeds the weights of the geomembrane and the air over the geomembrane, the geomembrane is likely to be uplifted. Giroud et al. (1995) showed that the uplift pressure induced by a wind, called the 'effective suction', can be calculated using Equation I-1:

$$S_e = \frac{\lambda \cdot \rho_0 \cdot V^2}{2} \cdot e^{-\rho_0 \cdot g \cdot z / P_0} - \mu_{GM} \cdot g \qquad \text{Eq. I-1}$$

Where:

S_e = Effective suction (pascals, Pa)

λ = Suction factor, 0.85 for the top third of a slope, 0.4 for the pond bottom (unitless, Giroud et al. 1995)

ρ_0 = Air density (dry) at sea level, 1.293 kilograms per cubic meter (kg/m^3)

V = Wind velocity (m/s), 70 km/h was used in this case (Hong et al. 2014)

g = Acceleration due to gravity, 9.81 m/s^2

z = Elevation above sea level, 880 m in this case

P_0 = Atmospheric pressure at sea level, 101,325 Pa

μ_{GM} = Mass per unit area of the geomembrane, 1.88 kg/m^2 for 2.0 mm HDPE (Giroud et al. 1995)

The mass of ballast per unit area of geomembrane required to provide sufficient downward pressure to resist the effective suction is calculated using Equation I-2:

$$M = \left({S_e}/{g}\right) \cdot FoS \qquad \text{Eq. I-2}$$

Where:

M = Ballast mass per unit area (kg/m^2)

FoS = Design factor of safety, 2.0 in this case

Even if the above mass per unit area requirement is met, the geomembrane sections between the ballast lines could still experience uplift. If the spacing between ballast lines is too large, the tension in the liner caused by the uplift could exceed the yield strength. The maximum allowable spacing between ballast lines with respect to yield tension is calculated using Equation I-3, based on Equation 48 in Giroud et al. (1995).

$$L_{max} = \frac{T_y}{S_e \cdot T_n} \qquad \text{Eq. I-3}$$

Where:

L_{max} = Maximum allowable distance between ballast lines (m)

T_y = Tension at yield, 29,000 newtons per m (N/m) for 2.0 mm HDPE (GSE 2014)

T_n = Normalized tension, read from Table 2 in Giroud et al. (1995) to be 0.69 for a strain of 12%, which is the strain at yield for 2.0 mm HDPE (GSE 2014)

4.0 WIND UPLIFT CALCULATION RESULTS AND DISCUSSION

The complete liner ballast calculations are included as Attachment I-1. The required ballast mass per unit area for the pond bottom and side slopes is 14.1 and 34.2 kg/m^2, respectively. The side slopes of the pond experience higher suction than the bottom as discussed in Giroud et al. (1995), and therefore require significantly more ballast.

The maximum allowable spacing between ballast lines on the pond bottom and side slopes to prevent wind uplift is approximately 600 and 250 m, respectively. The calculated spacing is large because the liner strength is high and the design wind velocity is relatively low; however, the liner strength is dependent on temperature, and could be considerably lower, up to half its prior strength, during the hours of peak solar intensity when the black liner surface temperatures could exceed 60° C. To prevent high strains on the geomembrane from the weight of the ballast, the concrete ballast should not be concentrated in one location. A maximum spacing between ballast lines of 15 m is recommended.

BGC expects the contractor to purchase the most cost-effective fabric formed concrete sizes and spacing between ballast lines which meet the calculated criteria presented in this memorandum.

5.0 CLOSURE

BGC Engineering Inc. (BGC) prepared this document for the account of StrataGold Corporation, a directly held, wholly owned subsidiary of Victoria Gold Corp. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves all documents and drawings are submitted for the confidential information of our client for a specific project. A record copy of this document is on file at BGC. That copy takes precedence over any other copy or reproduction of this document.

Yours sincerely,

BGC ENGINEERING INC.
per:

Tony Monasterio, PE
Geological Engineer

Reviewed by:

Troy Meyer, PE, P.Eng.
Principal Geological Engineer

Engineers Yukon Permit to Practice:
PP092 BGC Engineering Inc.

TLM/MH/rm/mm

REFERENCES

Giroud, J.P., Pelte, T., and Bathurst, R.J. 1995. Uplift of geomembranes by wind. Geosynthetics International, 2(6): pp. 897-952.

GSE Environmental. 2014. GSE HD Textured Geomembrane product data sheet, Revision December 04, 2014 [online]. Available from http://www.gseworld.com/content/documents/datasheets/membranes/North_America/HD_Textured_Geomem_METRIC_ DS.pdf [accessed August 2, 2017]

Hong, H.P., Mara, T.G., Morris, R., Li, S.H., and Ye, W. 2014. Basis for recommending an update of wind velocity pressures in Canadian design codes. Canadian Journal of Civil Engineering, 41(3): pp. 206-221.

ATTACHMENT I-1

EVENT POND LINER BALLAST CALCULATIONS

Project Number: 0792018
Client Name: Victoria Gold Corp
Project Name: Eagle Gold
Deliverable Name: Event Pond Liner Ballast Calculations
Calculation Sheet Name: Inputs
Created By: Tony Monasterio
Reviewed By: Derek Hrubes, Troy Meyer

Input	Symbol	Value	Units	Source	Notes
Event Pond Elevation above sea level	z	880	m	drawings	
Design Wind Velocity	Vkph	70	km/h	Hong et al., 2014	
Geomembrane Density	mu	1.88	kg/m^2	Giroud et al., 1995	2.0 mm HDPE
Acceleration due to Gravity	g	9.81	m/s^2	definition	
Suction Factor for pond bottom	lam_bot	0.4	-	Giroud et al., 1995	
Suction Factor for pond sides	lam_sid	0.85	-	Giroud et al., 1995	
Air Density @ sea level	pa	1.293	kg/m^3	Giroud et al., 1995	
Atmospheric Pressure @ sea level	Patm	101,325	Pa	Giroud et al., 1995	
seconds per hour	sph	3600	s/h	definition	
meters per km	mpkm	1000	m/km	definition	
Geomembrane Strain @ yield	Ey	0.12	-	GSE, 2017	
Geomembrane Tension @ yield	Tall	29,000	N/m	GSE, 2017	Allowable tension is assumed to be equal to tension @ yield
Normalized Tension	TSeL	0.69	-	Giroud et al., 1995	Read from Table 2, based on Geomembrane Strain @ yeild
Factor of Safety against uplift	FoS	2.0	-	TM assumption	
Concrete Density	pcon	2400	kg/m^3	TM assumption	
Example Ballast Diameter	Bdia	0.3	m		

Project Number:	0792018
Client Name:	Victoria Gold Corp
Project Name:	Eagle Gold
Deliverable Name:	Event Pond Liner Ballast Calculations
Calculation Sheet Name:	Results
Created By:	Tony Monasterio
Reviewed By:	Derek Hrubes, Troy Meyer

Calculation	Symbol	Result	Units	Formula	Notes
Design Wind Velocity	V	19.4	m/s	=Vkph*mpkm/sph	
Effective Suction on pond bottom	Se_bot	69.1	Pa	=lam_bot*pa*(V^2/2)*EXP(-pa*g*z/Patm)-mu	Equation 37 from Giroud et al., 1995
Effective Suction on pond sides	Se_sid	167.7	Pa	=lam_sid*pa*(V^2/2)*EXP(-pa*g*z/Patm)-mu	Equation 37 from Giroud et al., 1995
Required Mass on pond bottom, per area	M_bot	14.1	kg/m^2	=MpA_bot*FoS	
Required Mass on pond sides, per area	M_sid	34.2	kg/m^2	=MpA_sid*FoS	
Max. ballast spacing with respect to Yield Tension, pond bot	L_bot	608.0	m	=Tall/(Se_bot*TSeL)	
Max. ballast spacing with respect to Yield Tension, pond sid	L_sid	250.7	m	=Tall/(Se_sid*TSeL)	
Supposed ballast mass per meter	mbal	169.6	kg/m	=PI()*(Bdia/2)^2*pcon	
Max. spacing on pond bottom for supposed ballast	d_bot	12.0	m	=mbal/M_bot	
Max. spacing on pond sides for supposed ballast	d_sid	5.0	m	=mbal/M_sid	

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

StrataGold Corporation

STRATAGOLD CORPORATION

EAGLE GOLD PROJECT

TECHNICAL SPECIFICATIONS - HEAP LEACH FACILITY

PROJECT NO.: 0792-018 DATE: October 16, 2017

TABLE OF CONTENTS

TABLE OF CONTENTS i
LIST OF TABLES iii
1.0 SCOPE AND REQUIREMENTS 1
1.1. Definition of Terms 1
1.2. Work Scope 1
1.3. General Technical Requirements 2
1.4. Submittals 2
2.0 MOBILIZATION AND DEMOBILIZATION 3
2.1. Mobilization 3
2.2. Construction Roads 3
2.3. Drainage 3
2.4. Demobilization 3
3.0 CLEARING, GRUBBING, STRIPPING AND STOCKPILING 4
3.1. Excavation and Foundation Preparation 4
3.2. Subgrade Preparation 9
3.3. Borrow Development 10
3.4. General Fill Placement Procedures 11
3.4.1. Compaction Equipment 12
3.4.2. Smooth Steel Drum Vibratory Roller 13
3.4.3. Tamping Foot Roller 13
3.4.4. Special Compactors 13
3.4.5. Test Fills 13
3.5. Site Grading Fill 14
3.5.1. Material Requirement 14
3.5.2. Placement 15
3.6. Select Fill 16
3.6.1. Material Requirement 16
3.6.2. Placement 17
3.7. Structural Fill 17
3.8. Granular Fill 17
3.8.1. Drain Fill 17
3.8.1.1. Material Requirement 17
3.8.1.2. Placement 18
3.8.2. Compacted Rock Fill 18
3.8.2.1. Material Requirement 19
3.8.2.2. Placement 19
3.8.3. Anchor Trench Backfill 19
3.8.3.1. Material Requirement 19
3.8.3.2. Placement 19
3.8.4. Road Wearing Course 20

3.8.4.1. Material Requirement 20
3.8.4.2. Placement 20
3.8.5. Riprap 20
3.8.5.1. Material Requirement 20
3.8.5.2. Placement 21
3.9. QA/QC Testing 22
3.9.1. General 22
3.9.2. Tests 22
3.9.3. QA/QC Plan 23
3.9.4. Testing Frequency 23
4.0 GEOSYNTHETICS 26
4.1. Geomembrane 26
4.1.1. General 26
4.1.2. Manufacturer's Experience 26
4.1.3. Submittal of Engineering Data 26
4.1.4. Delivery, Storage and Handling of the Geomembrane 27
4.1.5. Material Requirement 28
4.1.6. Conformance Testing 29
4.1.7. Installation 29
4.1.7.1. Placement 30
4.1.7.2. Seaming 31
4.1.7.3. Seaming Equipment 32
4.1.8. Field Quality Control 32
4.1.8.1. Non-Destructive Testing 33
4.1.8.2. Destructive Testing 33
4.1.9. Repairs 34
4.1.10. Quality Assurance and Acceptance 35
4.2. Geocomposite 35
4.2.1. Material Requirement 35
4.3. Nonwoven Geotextile 36
4.3.1. Material Requirement 36
4.3.2. Installation 37
4.4. Geosynthetic Clay Liner 38
4.4.1. Material Requirement 38
4.4.2. Installation 39
4.5. Pipework 40
4.5.1. Corrugated PE Pipe 40
4.5.2. HDPE Pipe 40
4.5.3. Installation 41
4.6. Fabric-Formed Concrete Liner 42
4.6.1. Material Requirement 42
4.6.2. Installation 44
LIMITATIONS 45

LIST OF TABLES

Table 3-1. Frozen material management. 6
Table 3-2. Select Fill material gradation. 16
Table 3-3. Wearing course material gradation. 20
Table 3-4. Riprap gradation. 21
Table 3-5. Site grading fill. 23
Table 3-6. Select fill. 24
Table 3-7. Overliner drain fill, Select drain fill and Trench drain fill. 24
Table 3-8. Anchor trench backfill. 24
Table 4-1. Geomembrane properties. 28
Table 4-2. HDPE seam strength properties. 31
Table 4-3. LLDPE seam strength properties. 31
Table 4-4. Geonet standards. 36
Table 4-5. Minimum average roll values for non-woven geotextile. 37
Table 4-6. GCL material standards. 38
Table 4-7. Filter and fabric specifications. 43

1.0 SCOPE AND REQUIREMENTS

1.1. Definition of Terms

“Owner” is defined as an authorized representative of StrataGold Corporation.

“Engineer” is defined as representative appointed and authorized by the Owner. The Engineer shall be a registered professional engineer or a designated site representative under the supervision of a registered professional engineer.

“Contractor” is defined as the party which has executed a contract agreement with the Owner for the specified Work.

“Technical Specifications” is defined as this document, prepared by BGC Engineering Inc. (BGC) and all supplemental addenda.

“Drawings” are defined as the Drawings, in conjunction with these Technical Specifications, entitled “Final Design Drawings, Heap Leach Pad Facility, Eagle Gold Project” prepared by BGC and dated July 2017.

“Work” is defined as the entire completed construction or the various separately identifiable parts thereof, required to be furnished under the Contract Documents.

“Site” is defined as the project area where the Work is to be performed.

“Contract Documents” are defined as the Agreement, Addenda, Contractor's Bid (when attached as an Exhibit to the Agreement), Bonds, General Conditions, Special Conditions, Technical Specifications, Drawings and all modifications issued after execution of the Agreement.

“Modifications” are defined as changes made to the Technical Specifications or the Drawings that are approved by the Owner and Engineer in writing after the Technical Specifications and Drawings have been finalized.

1.2. Work Scope

The work scope of these Technical Specifications is to set out the requirements and procedures necessary to complete the construction of earthwork, geosynthetics and pipework for the Eagle Gold Heap Leach Facility (HLF). Any alternatives or exceptions to these specifications shall be submitted in writing to the Owner and shall require approval in writing from the Owner prior to implementation of the Work.

The work scope generally includes the following: site preparation, fill placement, geosynthetics installation and pipework installation. The process solution pumps and facilities, ore delivery and heap stacking equipment and their associated structures are not part of these Technical Specifications. Specific features of the work scope include, but are not limited to the following:

a. Mobilization/demobilization of all equipment and material required for the work
b. Installation of temporary and permanent diversions for surface water control
c. Clearing, grubbing and stripping in required areas

d. Excavation in required areas
e. Development of borrow areas within and outside the HLF limits
f. Construction of temporary and permanent access roads
g. Foundation preparation for site grading fill and liner placement
h. Fill placement and compaction
i. Installation of geosynthetic materials for liner, drainage and leak detection systems
j. Installation of leach pad gravity flow drain pipework (solution collection piping)
k. Placement of overliner drain fill
l. Installation of required instrumentation
m. Furnishing and installing all materials and constructing all items appurtenant and incidental to the above.

The construction plans and the quality of the constructed leach pad and collection ponds are important aspects of this project. All earthwork and geosynthetic construction Quality Assurance/Quality Control (QA/QC) test locations and results shall be summarized in an as-built report, a copy of which shall be kept in the Owner's files at the completion of each phase of the HLF.

1.3. General Technical Requirements

The general technical requirements specified herein shall apply to all activities and operations relating to carrying out the Work or as required by the Engineer or the Owner.

In the event of a contradiction in the Technical Specifications and Drawings, the Contractor shall refer all questions to the Engineer for final decision. Work that concerns the contradiction shall not be performed until the contradiction is remedied or explained by the Engineer. In all events, the decision of the Engineer is final.

1.4. Submittals

Any alternatives or exceptions to these Technical Specifications shall be submitted in writing with the Contractor's bid.

The Contractor shall provide the Owner and Engineer with the procedures and equipment to be used for surveying and construction and the material specifications. This is required for review and approval prior to the Work being allowed to commence and the materials brought to the Site.

2.0 MOBILIZATION AND DEMOBILIZATION

2.1. Mobilization

The Contractor shall mobilize to the Site sufficient labor, materials and equipment to allow commencement of the Work. The Contractor shall bring onto the Site, as and when necessary, any additional equipment, labor and materials which may be required to complete the remainder of the Work in the time specified in the General Terms and Conditions.

2.2. Construction Roads

All temporary construction roads, which the Contractor may require to complete the Work, shall be constructed at the Contractor's expense. The location of any temporary roads or portions thereof, on the Site shall be subject to the Owner's and Engineer's approval prior to construction. Unless otherwise approved by the Owner, all temporary roads shall be reclaimed at the Contractor's expense upon completion of the Work.

2.3. Drainage

Adequate drainage facilities in the form of ditches, culverts or other conduits shall be installed as necessary to protect the Work and to maintain temporary construction or access roads. These temporary drainage facilities shall be constructed to the satisfaction of the Engineer and Owner.

2.4. Demobilization

Upon completion of the Work, the Contractor shall remove all the Contractor's equipment and materials from the Site. The Site shall be left in a clean and tidy state to the satisfaction of the Engineer and Owner. All waste and refuse shall be disposed of in a manner acceptable to the Owner.

3.0 CLEARING, GRUBBING, STRIPPING AND STOCKPILING

The natural ground surface shall be cleared, grubbed and stripped of all organic and objectionable materials by the Earthwork Contractor to the limits shown on the Drawings or as required by the Owner. The limits of stripping shall generally be 3 m outside of the Work activity areas or as shown on the Drawings. All usable topsoil, as determined by the Owner, shall be properly stockpiled in locations shown on the Drawings or designated by the Owner.

Clearing shall mean the removal of vegetation. Stripping shall mean the removal of topsoil, which shall be defined as soil of any gradation or degree of plasticity that contains significant quantities of visually identifiable vegetable matter, sod, roots or humus as determined by the Engineer or that can be used as growth medium. The depth of topsoil to be removed will be determined by the Engineer based on the character and thickness of material encountered. Clearing and grubbing may generally be conducted as a single operation together with stripping.

Stripping shall be carried out using whatever method deemed necessary providing it is consistent with producing an acceptable end result as determined by the Owner. Stripped material will be brought to and stored at approved topsoil stockpile. Any stripping beyond the limits shown on the Drawings or as required by the Owner, shall be subject to the approval of the Owner. Unapproved stripping will be subject to remediation at the sole expense of the Earthwork Contractor.

After stripping of the required area, the ground surface shall be treated as specified on the Drawings or in these Technical Specifications. This activity can involve trimming and shaping the surface, scarifying, moisture conditioning and compacting fill material. Prior to any surface treatment on a stripped area, the Engineer shall be notified to inspect the stripped area and designate the method of treatment.

3.1. Excavation and Foundation Preparation

Excavation shall consist of excavating to the lines and grades shown on the Drawings and hauling materials to designated fill, stockpile or waste areas. Excavation methods, techniques and procedures shall be developed by the Earthwork Contractor with due consideration of the nature of the materials to be excavated and shall include all precautions that are necessary to preserve, in an undisturbed condition, all areas outside the lines and grades shown on the Drawings or required by the Owner.

No excavation beyond the lines and grades shown on the Drawings or as required by the Engineer, shall be done without the prior written approval of the Owner. If such additional excavation is done without the prior written approval of the Owner and, in the opinion of the Engineer, requires backfilling in order to satisfactorily complete the Work, such backfilling shall be completed at the Contractor's expense. All such backfilling will be subject to approval by the Engineer.

Pockets of unsuitable materials within the limits of an excavation shall be removed and disposed of as directed by the Owner and Engineer. Unsuitable materials may include, but not be limited

to, ice-rich materials, ash, boulder or gravel zones, soft saturated zones, highly organic zones, drilling mud pits and other deleterious material.

The Heap Leach Facility Foundation Improvement Plan provides a review of the characteristics and the estimated spatial extent of the ground ice under the HLF, and highlights the characteristics of the ground ice encountered during site investigations, and includes a definition and discussion of ice-rich soils. The report discusses how ice-rich soil can be identified during construction and reviews ground ice removal measures, as well as potential techniques to thaw ice-rich soils. The Earthwork Contractor shall prepare and submit a detailed excavation plan for the work for review by the Engineer. The plan shall comply with the requirements and follow the guidance of the Frozen Materials Management Plan (FMMP) and the Heap Leach Facility Foundation Improvement Plan. Removal of ice-rich materials and replacement (as necessary) with compacted fill shall be performed to the satisfaction of the Engineer. The general approach for excavation and identification and removal of ice-rich materials is provided below:

I*dentify and Remove Topsoil and Loose or Unsuitable Materials* - The natural ground surface will be cleared, grubbed and stripped or all organic and unsuitable materials generally 3m outside of the limits of the HLF. Clearing and grubbing will include the removal of vegetation and roots and stripping includes the removal of topsoil, defined as soil of any gradation or degree of plasticity that contains significant quantities of visually identifiable organics (e.g., vegetable matter, sod, roots, or humus) as determined by the Engineer. The thickness of organics (in most cases equal to the depth of the topsoil) to be removed will vary across the site and will be determined by the Engineer based on the character and thickness of material encountered. Clearing, grubbing and stripping will generally be conducted as a single operation.

Excavation to Type 3 Bedrock - In the area of the HLF embankment, excavation to Type 3 bedrock (or better) will be completed. Bedrock at the Project site is subdivided into three broad categories - Type 1, Type 2 and Type 3. Type 3 bedrock consists of highly weathered metasedimentary rock that has a confined compressive strength of 1 to 5 MPa. Type 3 bedrock is the lowest quality rock mass that is considered to behave as rock (rather than as a soil) and can be recognized on the basis of evident preserved fabric of the parent rock within the highly weathered rock mass and requires moderate effort to excavate with heavy excavators. Identification of Type 3 bedrock will be identified by suitable qualified construction personnel under the supervision of the Engineer.

Identify and Remove Ice-Rich Soils - Ice-rich soils in permafrost, when thawed and generating excess pore pressures, can result in soil instabilities and therefore, it is critical to identify and remove any ice-rich soils in the foundation of the HLF prior to liner construction and stacking. On the other hand, if the frozen ground does not contain excess ice (no ice-rich soils) and is thaw stable, there is negligible impact on the stability of the ground upon thaw.

For preparation of the HLF foundation subgrade, all organic soils will be removed, exposing the underlying colluvium. Removal of loose native colluvium and weathered bedrock will be required to provide a suitable subgrade for the placement of the liner and the ore in areas beyond the HLF embankment.

A primary goal of the HLF foundation preparation work will be to identify whether ice-rich soils exist in the foundation subgrade, and then if it does, since all ice-rich soil shall be removed from the footprint of the HLF, further classify it into the appropriate frozen soil type so it can be removed from the HLF footprint and managed accordingly. The identification and management of ice-rich soils can involve up to four steps that would include, in order:

1) Visual observations

2) Test pit excavations, where no visible ice was identified

3) Shallow auger drilling where test pitting was not conclusive

4) Increased density of test pitting and/or drilling

After completing the first two steps, the ground will then be inspected for the presence of ice and classification of the material (following the system described in Table 3-1), to determine if additional excavation may be necessary. The first observations in the field will be made using surficial grab-samples approximately every 25 m immediately upon excavation and exposure of the layer.

Table 3-1. Frozen material management.

Material Classification Type	Frozen Material Type	Strategy	Management Description
I	Fine and/or coarse-grained colluvial/alluvial soils or weathered bedrock with little or no ice content	Used as fill or stockpiled for closure	Used as general fill or if excess to a local fill requirement stored for reclamation.
II	Coarse-grained sands and gravels with zones of variable ice content	Used as fill	Exposed and readily thawed and drained, and then used as general fill within embankments and platforms.
III	Fine-grained soils with relatively thin zones (lenses) of low proportions of “excess ice”	Stockpiled for closure	Separated and co-disposed with other nonfrozen soils within stockpiles to be used for reclamation.
IV	Fine-grained silty and clayey soils with relatively thick lenses of highly visible “excess ice”	To IROSA*	Segregated at excavation site based on prior field data/ information, and additional observations during excavations. Excavated and hauled to IROSA located in the Haggart Creek valley.
V	Small quantities of ice-rich soils (fine or coarse)	Locally stored	Disposed of adjacent to excavation sites where thawing and drainage can be managed locally rather than hauled to the IROSA.

* IROSA: ice-rich overburden storage area

If ground ice is visible, and the soil is predominantly fine-grained with visible ice laterally continuous between observation points and the ice lensing is greater than 1mm, and/or the volumetric ice content is estimated to be more than 10%, the material is classified as Type IV. This material is considered to be ice rich soil and shall be excavated and hauled to the IROSA.

If ground ice is visible, the soil is fine or coarse grained with isolated pockets between observation points with ice lensing less than 1mm, and/or the volumetric ice content is estimated to be less than 10%, the material is classified as Type I/II/III. This material, for the purposes of the HLF foundation, is not considered ice rich soil and will only be excavated and hauled to the Reclamation Stockpiles (location per the Owner) if in the opinion of the Engineer it is necessary.

If ground ice is not visible and the soil is predominantly fine-grained, the temperature of the sample shall be taken and the sample manually warmed in the field. If the soil is <0 C and then excess water forms upon warming, the soil is classified as Type III. This material, for the purposes of the HLF foundation, is not considered ice rich soil and will only be excavated and hauled to the Reclamation Stockpiles (location per the Owner) if in the opinion of the Engineer it is necessary.

If ground ice is not visible, the soil is fine or coarse-grained and the sample shows little moisture or remains intact upon warming, it is Type II, and this material, for the purposes of the HLF foundation, is not considered ice rich soil and will remain in-situ and/or can be used as fill within the HLF footprint.

Since the required subgrade excavation depth may be thin, it is possible that the excavation required for foundation preparation does not reach to the permafrost table. Therefore, ice-rich or thaw unstable soil that is not visible on the exposed subgrade cannot be excluded, so additional investigations will be conducted to demonstrate the absence of ice rich soils at depth (i.e., to a depth of 6 m below the initial subgrade). With respect to outside the HLF embankment foundation area, test pits using a large excavator will be excavated to Type 3 bedrock or, if bedrock is not encountered, to a depth of at least 6 m below the initial excavated subgrade. Due to the heterogeneous nature of the ground, investigations at 100 m x 100 m spacing will be completed while foundation preparation is being carried out. Samples will be visibly inspected as described above and classified accordingly. Test pits should be properly backfilled and compacted using approved, non-frost susceptible and ice-free fill material.

Shallow auger drilling, which will only be carried out at locations where test pit excavation is not successful (i.e., did not reach 6 m below the initial excavated subgrade). The locations and density of boreholes in an area will be determined in the field under the supervision of the Engineer, but in general, will be used to supplement and refine the test pitting findings. The ground ice inspection boreholes are expected to reach competent bedrock but also to be not deeper than 6 m.

All observations from site shall be supervised by an engineering professional with experience in ground ice characterization. Where adjacent test pitting and augering show conflicting results, additional test pitting and/or augering will be completed in the intervening zones to resolve any issues related to identifying lateral extent of ice-rich soil.

Excavating ice-rich soils, in particular coarse colluvium, is challenging due to the high strength of the frozen material at temperatures below mainly -1°C, as the amount of unfrozen water in the ground becomes negligible.

The frozen ground can be broken using a ripper tooth attached to a large dozer or an excavator. Once broken, the pieces of ice rich soil can be loaded and hauled with excavator and haul trucks to the reclamation stockpile or hauled to the IROSA. As described above, the goal of excavating will be to excavate to Type 3 bedrock in the area of the embankment, and if ice-rich soil is present, excavate to below the extent of ice-rich soil.

As stripping and excavating of the active layer and the permafrost advances, ground thawing is initiated at the new surfaces. These newly thawed conditions can result in surficial soil sliding and slumping, and cause non-trafficable condition for heavy equipment, necessitating the use of rig mats, or additional fill.

To evaluate the foundation conditions and demonstrate the absence of ice-rich soil in the foundation area, the subgrade will be visually monitored during the thawing season, following stripping, under the supervision of the Engineer. The monitoring will focus on visually identifying signs of subsidence and water surfacing. If ice-rich soil is present under the excavated subgrade and it is exposed to warming during the summer, the ground would start to thaw, settle and water would be visible at the surface. Depending on the time of the year, this would be visible within days following the excavation. The presence of ice rich soil in shallow ground can also be noted if runoff shows a daily pattern. In the absence of snow melt, increase in runoff at the bottom of HLF construction areas towards the end of day can be related to the melting of ground ice.

In addition to ripping ice rich soils, it is also possible to allow the exposed subgrade to thaw naturally during the summer. The thickness of the ground layer that thaws during a summer depends on the surface, ground and climate conditions. The vegetation forms the main insulating layer within the footprint of the HLF. By clearing the vegetation and stripping the active layer, ground ice containing permafrost is exposed to the atmosphere. Judging from the ground temperature data available (see Appendix A2) thaw depths between 2 m and 3 m can be expected for the area in one summer, where ice-rich soil is present. While natural thawing of ice-rich soils is generally not practical during preparation of the HLF subgrade due to time constraints, it may prove useful in some areas where the ice content is low (< 10%) and sporadically located (i.e. non ice rich soils), and the subgrade area can be exposed for the summer prior to development. The steps for natural thawing operations would include as follows:

- Strip vegetation and organic layer prior to summer;
- Expose frozen surface to atmosphere;
- Excavate any thawed ground at the end of the period or by end of summer.

Independent of the thawing method used, controlling surficial melt water runoff, sediment transport and potential soil instabilities that occur upon ground thawing will be necessary. This will be achieved by digging dewatering trenches or installing drainage pipes that provide a controlled drainage system as well as potential sediment transport. Running or standing water on permafrost subgrades will be avoided.

The first excavation pass will then be undertaken to the lines and grades as specified by the Engineer. During final grade preparation, there may still be areas left with pockets of loose or unsuitable materials. Under the direction of the Engineer, these loose or unsuitable materials will be removed. Unsuitable materials may include ash, boulder or gravel zones, soft saturated zones, highly organic zones or drilling mud pits.

The evaluation methods for loose or unsuitable materials will depend on the location and the materials that will be placed over the subgrade. The evaluation methods may include proof-rolling with a loaded dump truck or similar pneumatic-tired equipment to ensure that the surface is firm and smooth. Probing with a metal rod may also be performed.

Soft or yielding areas delineated by the evaluation methods described above that cannot be stabilized by compacting under the supervision of the Engineer will be removed and replaced with site grading fill or structural fill meeting the requirements of these specifications. If deemed necessary by the Engineer, the treated areas will be re-evaluated by test pitting such that the cut face is clearly visible so that they can be examined and logged by the Engineer. After the re-evaluation has been completed, the test pit locations will be backfilled with the excavated material and compacted in layers to the surface to the satisfaction of the Engineer.

Once the foundation area has been managed to mitigate instances of loose or unsuitable materials or ice rich soils, and in the HLF embankment area confirmation that Type 3 bedrock is exposed, the Engineer will be notified and a final inspection will be undertaken to determine the appropriate method of treatment for the ground surface prior to the placement of the embankment and underdrain system. The methods of treatment that will be utilized may include trimming and shaping the surface, scarifying, moisture conditioning, or compacting of any area where fill material was placed.

Topsoil and waste stockpiles shall be leveled, trimmed and shaped as required by the Owner to prevent the occurrence of ponding or concentrations of surface runoff and to provide a neat appearance. Finished slopes of the topsoil stockpiles shall be graded to 2.5H:1V (horizontal: vertical) for interim reclamation. All surface water runoff shall be directed to existing surface water management structures.

3.2. Subgrade Preparation

After clearing, grubbing, stripping and excavating, the exposed subgrade surface shall be inspected and evaluated by the Engineer for the presence of loose or soft areas or unsuitable material prior to fill placement or geomembrane installation. Evaluation methods will depend on the location and the materials that will be placed over the subgrade and on the prevailing field conditions. Evaluation methods may include proof-rolling with a loaded dump truck or similar pneumatic-tired equipment to ensure that the surface is firm and smooth. Probing with a metal rod may also be performed. Soft or yielding areas delineated by the evaluation that cannot be stabilized by compacting shall be removed and replaced with site grading fill. Unsuitable materials shall also be removed and replaced with site grading fill as directed by the Engineer. The subgrade shall be prepared to the satisfaction of the Engineer.

If deemed necessary by the Engineer, evaluation of the subgrade soils may include excavating test pits to allow the Engineer to designate the method of surface treatment, as needed. The Earthwork Contractor shall, under the direction of the Engineer, excavate shallow test pits oriented as directed by the Engineer. The pits may cover the entire Work area and any other area designated by the Engineer and shall be spaced as directed by the Engineer. The pits may be excavated by whatever method the Contractor deems necessary provided it produces a clearly visible cut face in the soils. After the pits have been examined and logged by the Engineer, they are to be backfilled by backfilling the excavated material back into the pits and compacting in layers to the surface to the satisfaction of the Engineer.

Stripped rock subgrade surfaces and rock outcrops in at-grade areas shall be cleared of loose rock fragments greater than 50 mm in size and wetted in preparation for foundation preparation. Foundation preparation shall consist of placing and compacting granular soil fill material in varying thicknesses to suit field conditions to support the leach pad and collection ponds liner systems. The granular fill shall be placed and compacted as specified in the Site Grading Fill Placement Section of these Technical Specifications.

Soil subgrade surface receiving site grading fill shall be scarified to a minimum depth of 150 mm, moisture conditioned if necessary to within plus or minus two (±2) percent of the optimum moisture content as determined by the Standard Proctor test (ASTM D-698) and recompacted to a minimum of 95 percent of the maximum dry density (ASTM D-698).

The Contractor shall modify (smooth) the existing contours such that the finished subgrade surface approximately conforms to the dimensions shown on the Drawings. While exact contours are not required, the Contractor shall maintain positive drainage and ensure that there are no abrupt changes in grade that would prohibit placement of or create stress in, the overlying liner systems. No site-grading fill shall be placed, until the stripped and reworked areas have been inspected and approved by the Engineer.

Soil subgrade surface receiving geosynthetics, including geosynthetic clay liner (GCL), should be rolled with a smooth-drum compactor to remove any wheel ruts, tracks, or other abrupt grade changes greater than 1” (25 mm) in depth. All protrusions extending more than 0.5 inch (12 mm) from the subgrade surface shall be removed. The prepared subgrade surface must be smooth and free of any vegetation, sharp-edged rocks, stones, sticks, construction debris, and other foreign matter that could contact and potentially the geosynthetic material.

3.3. Borrow Development

The majority of the site grading fill will consist of material excavated from the HLF, event pond and plant site areas. The Contractor shall excavate, haul, place and compact site grading cut materials from required excavations within the limits of the HLF including leach pad, interceptor ditch, spillways, event ponds and plant site, as shown on the Drawings. In addition, the Owner will designate borrow areas and limits outside the HLF for the Contractor to excavate, haul, place and compact site grading fill, as needed. The Owner plans to stockpile crushed ore materials

adjacent to the pad limits for the Contractor to haul and place as drain cover fill above the pad liner.

The Contractor may select and use any Owner/Engineer approved borrow area for this construction materials provided the materials meet the Specification requirements for the intended use. Representative tests shall be conducted by the Engineer on the borrow materials in the field or at an offsite laboratory to determine the materials' suitability for use as fill. It shall be the Contractor's responsibility to notify the Engineer of changes in borrow materials in advance of development to allow time for representative testing without unduly interrupting construction activities.

Should a borrow material prove to be unsuitable for fill, a new borrow source shall be designated by the Owner or the Contractor's processing operations shall be adjusted to produce acceptable fill material meeting the Specifications.

The Contractor shall liaise with the Owner, as needed, to schedule and coordinate the production and/or stockpiling of acceptable borrow materials from the mine pit area and other sources onsite and offsite for the execution of the Contractor's work.

Acceptable borrow areas shall be cleared, grubbed and stripped in stages, as approved by the Owner/Engineer, to minimize ground disturbance. Each stage of stripping shall be sufficient in areal extent for the Contractor to operate conventional earthwork equipment for conditioning and excavating materials acceptable for fill placement. Moisture conditioning in preparation for fill placement, if required, shall be done in the borrow areas as much as practical.

The final surfaces of all borrow areas developed by the Contractor shall be left in reasonably smooth, even conditions and graded to drain for long-term stability. Final surface grading shall be by dozer or grader blade operations, as approved by the Engineer. Final cut slopes shall be no steeper than 2H:1V unless approved by the Engineer. The Contractor shall replace stripped topsoil cover over the final borrow cuts, unless otherwise approved by the Owner.

3.4. General Fill Placement Procedures

All materials used for fill shall be loaded and hauled to the placement site, dumped, spread and leveled to the specified layer thickness, moisture conditioned if required and compacted to form a dense integral fill in accordance with these Technical Specifications and to the approval of the Owner and Engineer.

Under most conditions, the fill shall be constructed in near horizontal layers with each layer being completed over the full length and breadth of the zone before placement of subsequent layers. Each zone shall be constructed with materials meeting the specified requirements and shall be free from lenses, pockets and layers of materials that are substantially different in gradation from the surrounding material in the same zone as determined by the Engineer. All fill placed shall be free from organic debris, frozen soil, ice or other unsuitable materials. All oversized material shall be removed from the fill material either prior to it being placed or after it is dumped and spread but prior to compaction.

All particles that have dimensions that will interfere with compaction in the specified layer thickness, as determined by the Engineer, shall be removed from the zone in which they were placed either prior to or during compaction.

As approved by the Engineer, fill may be compacted by routing the hauling and spreading equipment approximately parallel to the long axis of fill. The hauling equipment shall be routed in such a manner that they do not follow the same paths but spread their traveled paths evenly over the surface of the fill.

Moisture conditioning is the operation required to increase or decrease the moisture content of material to within the specified limits. If moisture conditioning is necessary, it shall be carried out by whatever method the Earthwork Contractor deems suitable provided it produces the moisture content specified in these Technical Specifications or designated by the Engineer. The moisture shall be distributed uniformly throughout each layer of material being placed immediately prior to compaction. Measures shall be adopted as necessary to ensure that the designated moisture content is preserved after compaction and until the succeeding layer is placed.

Should the surface of the fill become rutted or uneven subsequent to compaction, it shall be regraded and recompacted before the next layer of fill is placed. To permit suitable bonding with the subsequent layer if necessary, the surface material shall be loosened by scarifying or disk harrowing, as approved by the Engineer and if necessary, it shall be moisture conditioned before an additional layer is placed.

Compaction of each layer of fill shall proceed in a systematic, orderly and continuous manner approved by the Engineer to ensure that each layer receives the compaction specified. The rolling pattern for compaction of all zone boundaries or construction joints shall be such that the full number of roller passes required in one of the adjacent zones or on one side of the construction joint, extends completely across the boundary or joint.

Fill shall not be placed on frozen soil or when air temperatures drop below 0°C unless otherwise approved by the Engineer.

3.4.1. Compaction Equipment

Sufficient compaction equipment shall be provided as necessary for compaction of the various fill materials. Compaction equipment shall be maintained in good working condition at all times to ensure that the amount of compactive effort obtained is a maximum for the equipment. Before commencing Work with the proposed compaction equipment, the Owner and the Engineer shall be provided with a list of each piece of equipment to be used together with the Manufacturer's specifications.

If alternative equipment than initially proposed is to be used, a submittal shall be made to the Engineer for approval of the equipment and the submittal shall give complete details of such equipment and the methods proposed for its use. The Engineer's approval of the use of alternative equipment may be dependent upon completion of suitable test fills, to the satisfaction

of the Engineer, to confirm that the alternative equipment will compact the fill materials to the specified density.

The use of mine haul trucks or scrapers as compaction equipment shall be acceptable provided that test fills confirm the fill materials can be adequately compacted with the proposed equipment.

The following compaction equipment and specifications may be considered.

3.4.2. Smooth Steel Drum Vibratory Roller

Smooth steel drum vibratory rollers shall be equipped with a suitable cleaning device to prevent the accumulation of material on the drum during rolling. Each roller shall have a total static weight of not less than 9,000 kg at the drum when the roller is standing on level ground. The drum shall be not less than 1.5 m in diameter and 2 m in width. The vibration frequency of the roller drum during operation shall be between 1,100 and 1,500 vibrations per minute and the centrifugal force developed by the roller, at 1,250 vibrations per minute, shall not be less than 170 kN. The power of the motor driving the vibrator shall be sufficient to maintain the specified frequency and centrifugal force under the most adverse conditions, which may be encountered during the compaction of the fill.

3.4.3. Tamping Foot Roller

The tamping foot roller shall be a self-propelled, fully ballasted, standard tamping foot design developing 75 kN per linear m of width at rest on level ground or equivalent, as approved by the Engineer.

3.4.4. Special Compactors

Special compactors and compaction measures shall be used to compact materials that, in the opinion of the Engineer, cannot be compacted properly by the specified roller because of location or accessibility. Such special compactors and measures may include hand-held vibratory compactors or other methods approved by the Engineer to compact fill in trenches, around structures and in other confined areas that are not accessible to the larger vibratory roller or tamping foot roller. All compaction shall be to the specified density.

3.4.5. Test Fills

Test fills shall be conducted according to US Army Corps of Engineers standards to establish the specifications for the proper placement and compaction of site grading rockfill having more than 30 percent particles larger than 19 mm. Test fills shall also be conducted if circumstances arise where they are deemed necessary by the Engineer such as in order to determine if greater or lesser lift thicknesses are appropriate for certain soils and to still meet the design intent for site grading fill. The type of compaction equipment, number of passes and maximum particle size and loose lift thickness to be used in the Work will be approved by the Engineer in writing based on the acceptable test fill performance. The Contractor shall outline his proposed procedures for moisture conditioning and fill placement and submit them to the Engineer for review and approval.

The test fill shall be constructed within the limits of the Work to determine the compactive effort required to be applied to a particular material or increased lift thickness. The test fill shall be sufficiently wide to support the compaction equipment. The proposed compaction equipment to be used in actual site grading fill placement shall be routed over the test fill.

In the soil test fill, the number of compaction equipment passes shall be counted and, at certain numbers of passes, in-place density tests shall be performed by the nuclear gauge method (ASTM D-2922) or sand cone method (ASTM D-1556). This process shall be repeated until a curve representing number of passes versus density is generated. This information will allow the Engineer to evaluate the optimum density of the soil and the corresponding number of passes. This will establish a guideline for the compaction procedure required during construction.

For rockfills, the data to be collected from the test fill shall include the following:

- Lift thickness of 0.3, 0.6 and 0.9 m (three test fills to establish optimum lift thickness)
- Amount of settlement after every two passes of compactor to a maximum of 25 passes
- Gradation and moisture content of in-place material
- In-place fill density at completion of the test fill by nuclear gauge method (ASTM D-2922) or sand cone method (ASTM D-1556), as approved by the Engineer.

A curve showing change in rockfill lift settlement versus number of passes shall be produced from the data. The minimum number of passes to achieve acceptable compaction will be the number required to achieve 80 percent of the total settlement obtained after no fewer than ten complete passes of the compaction equipment. The lift thickness and minimum number of passes with compaction equipment shall be approved by the Engineer after review of test fill data.

Upon completion of each test fill, a test fill report shall be generated that must include all appropriate documentation pertinent to the test fill, including but not limited to, field and laboratory test results, graphics displaying the aforementioned curves, photographs and a written narrative of the test fill and results.

3.5. Site Grading Fill

Site grading fill will be placed within the HLF limits to achieve the desired final grades as shown on the Drawings.

3.5.1. Material Requirement

Material for compacted site grading fill may consist of any material which, when compacted, is suitable for use in the various parts of the Work. The site grading fill material will have a wide range of Unified Soil Classifications and may contain significant variations in gradation and compaction properties. Materials that contain or are contaminated by organic matter are not suitable for use as site grading fill. Site grading fill will be placed in areas where the material is not required to be of uniform character and engineering properties. The site grading fill will be obtained from several sources including from required excavation or regrading activities within the HLF limits (leach pad, collection ditch, collection ponds and diversion channels), the plant site and from borrow areas.

Site grading soil fill shall generally include inorganic soils with less than 30 percent particles larger than 19 mm and a maximum 150 mm particle size. Soft, weathered rock that breaks down during the excavation, hauling and processing operations to form essentially a soil and compacts without excessive voids may be used for site grading soil fill, as approved by the Engineer, but may not be used in the HLF confining embankment or event pond embankments. Materials (such as placer tailings) containing large size, sound rock or cobbles and gravels from required excavations may be used as site grading fill subject to the Engineer's approval and provided the rock is reasonably graded such that large void spaces do not result. The maximum particle size in the fill shall be no larger than two-thirds the fill compacted lift thickness, unless otherwise approved by the Engineer. Oversized materials shall be removed from the fill.

3.5.2. Placement

The surface upon which site grading fill is placed shall be prepared as specified in the Subgrade Preparation section of these Technical Specifications.

The site grading soil fill material shall be placed and spread in the fill to form lifts which shall not exceed 0.3 m in loose thickness unless otherwise specified by the Engineer and proven to achieve the specified compaction in a test fill. The actual lift thickness may need to be less than 0.3 m in loose thickness to meet the compaction requirement. Cobbles and boulders that are large enough to interfere with the construction of the designated lift thickness shall be removed and disposed of in areas specified by the Owner.

After spreading, the site grading soil fill material shall be moisture conditioned, if necessary, by sprinkling and disk harrowing until a uniform distribution of moisture is obtained. Material that is too wet may be spread on the fill area and permitted to dry, assisted by disking and harrowing if necessary, until the moisture is reduced to an amount within the specified limits. The Contractor shall utilize all measures necessary to achieve a moisture content for site grading soil fill within plus or minus two (±2) percent of the optimum moisture content as determined by the Standard Proctor test (ASTM D-698), distributed uniformly throughout the lift of material being placed, immediately prior to compaction. The Contractor shall utilize whatever measures necessary to ensure that the designated moisture content is preserved after compaction until the succeeding lift is placed. The Engineer may specify deviation from the moisture content limits provided the required compaction is achieved. Each site grading soil fill lift shall be compacted to a minimum of 95 percent of the maximum dry density (ASTM D-698).

The site grading rockfill material shall also be spread in individual lifts and shall be conditioned, placed and compacted according to the specifications derived from the results of a test fill. The rockfill lifts shall generally not exceed 0.5 m in loose thickness unless otherwise specified by the Engineer and proven to achieve the specified compaction in the test fill. The actual lift thickness may need to be less than 0.5 m in loose thickness to meet the compaction requirement. The test fill procedures are outlined in the following section.

3.6. Select Fill

The intent of the design is to construct a compacted thickness of soil beneath the liner system as shown on the Drawings.

If the in-place material is not suitable to meet the requirement in Section 3.2 – Subgrade Preparation, then suitable material shall be imported from required excavations within the HLF limits and/or from borrow sources. Imported Select Fill material shall be placed in maximum 0.15 m thick lifts (after compaction) and be moisture conditioned if necessary and compacted according to the requirements stated herein. Prior to placing each lift and if necessary, the surface of the first lift shall be scarified to a depth of 50 mm or otherwise roughened to ensure complete bonding between the lifts, as directed by the Engineer.

Moisture conditioning of Select Fill material to adjust the measured moisture content shall occur when the material is in a loose condition such as after scarifying or during placement of imported materials and never after compaction. The Select Fill material shall be scarified, mixed and moisture conditioned, if necessary, by sprinkling and disk harrowing until a uniform distribution of moisture is obtained. Material that is too wet may be spread on the fill area and permitted to dry, assisted by disking and harrowing if necessary, until the moisture content is reduced to within the specified limits.

The Contractor shall adopt removal of oversized or protruding particles at the top of Select Fills as specified in Section 3.2 - Subgrade Preparation section of these specifications.

3.6.1. Material Requirement

In-place or imported fine-grained soil liner material meeting the requirements stated herein shall be acceptable. If suitable in-place soil liner material cannot be found as specified by the Engineer, additional material, which meets the material requirements, shall be imported from excavations within the HLF limits or designated borrow areas. Suitability of soils in this category is dependent on the properties of gradation to provide a suitable foundation for the geosynthetics.

The Engineer will have the authority to approve variations to the compaction and moisture content requirements. The Engineer will determine the suitability of the material for use as Select Ffill material. The Select Fill material shall conform to the following gradation:

Table 3-2. Select Fill material gradation.

ASTM Sieve Size	Percent Passing
75 mm	100
No. 4	60-100
No. 200	35-100

Select Fill material shall be free of organic matter in quantities that would adversely affect the performance of the HLF, as specified by the Engineer.

3.6.2. Placement

Where suitable material exists in-place, the top 0.15 m of the material shall be removed and windrowed to allow access to the lower half of the Select fill layer. The lower 0.15 m of the soil liner shall be scarified by disking or other approved means, moisture conditioned if necessary and compacted to minimum of 95 percent of the maximum dry density at a moisture content between -2 and +1 percent of the optimum, as determined by the Standard Proctor test (ASTM D-698). Once the compaction of the lower layer has been confirmed, the upper 0.15 m of material shall be spread across the surface; moisture conditioned if necessary and compacted according to the requirements stated above.

3.7. Structural Fill

Structural Fill shall consist of glacial till, alluvium, colluvium, and residual highly weathered bedrock obtained from required excavations and site grading or other approved sources. Structural Fill shall consist of material with a minimum of 10 percent passing the No. 200 ASTM sieve size, have less than 30 percent rock particles retained on the 19 mm (3/4 in.) ASTM sieve size and a maximum 150 mm rock size. No gap graded material as determined by the Engineer, shall be acceptable. The structural fill material shall be moisture conditioned to +2/-2 percent of optimum moisture content, placed in 0.3 m maximum loose lifts and compacted to a minimum 95 percent of the Standard Proctor maximum dry density (ASTM D-698).

3.8. Granular Fill

3.8.1. Drain Fill

Drain fill shall be used to construct the leach pad liner cover fill and the pond leak detection sumps, and in pipe trench drains as shown on the Drawings. The drain fill material shall be produced from crushing and/or screening operations of ore and/or mine waste and/or from screening of sand and gravel aggregate from borrow sources. The material shall be free of organic matter and soft, friable particles in quantities objectionable to the Engineer.

3.8.1.1. Material Requirement

The Overliner Drain Fill (ODF) for the leach pad liner cover fill shall consist of free-draining granular material with 38-mm maximum particle size and a maximum of 5 percent fines passing the No. 200 ASTM sieve size (0.075-mm). The ODF shall have an operational permeability of $2x10^{-4}$ m/sec or higher.

Select Drain Fill shall consist of hard and durable free-draining fine gravels with 12.5 mm maximum particle size and a maximum of 3 percent passing the No. 200 ASTM sieve size (0.075-mm). The select drain fill shall have an operational permeability of $1x10^{-4}$ m/sec or higher.

Pipe Trench Backfill shall be AASHTO #57 coarse aggregate stone with 100% passing 1 1/2" (38mm) screen, 95-100% passing 1" (25mm) screen, 25-60% passing 1/2" (12.5mm) screen, 0-10% passing #4 screen, and 0-5% passing #8 (4.76mm) screen.

3.8.1.2. Placement

The drain fill material shall be placed in such a manner as to reduce segregation and construct the zones in accordance with the details and to the lines and grades shown on the Drawings or as specified by the Engineer. Methods shall be developed on site for placing the material in a manner that will protect the drain pipework from damage and keep compaction of the material to a minimum. Any drain fill material that has received too much compaction shall be scarified to a loose condition without damage to the underlying geomembrane and pipework.

The ODF above the geomembrane shall be placed in a single 0.6 m minimum lift thickness by suitable dozer and truck equipment, as approved by the Engineer. A thicker layer, a minimum of twice the pipe diameter, shall be placed above the larger diameter primary collection drain pipes as detailed on the Drawings. A 1 m thick layer shall be placed over all double-lined areas, such as the PLS sump area. A thicker layer, a minimum of twice the pipe diameter, shall be placed above the larger diameter primary collection drain pipes as detailed on the Drawings. No moisture conditioning or compaction is required. Haul truck speeds, braking and turning during drain cover fill placement shall be strictly controlled by the Contractor to prevent damage to the underlying geomembrane and pipework. The cover fill thickness shall also be increased in concentrated traffic areas or across collection pipes, as required, to prevent damage to the geomembrane and pipework. Haul traffic on the cover fill surface shall be spread out as much as practical to prevent over-compaction of the cover fill in localized areas. A test fill shall be constructed by the contractor prior to placement of overliner drain fill on the pad to demonstrate the protection of the liner system upon trafficking and placement with proposed equipment. The Engineer shall oversee and evaluate the test pad and make final recommendations for thickness and crush size.

Select drain fill to construct the process pond leak detection sump shall be placed in a single lift thickness with no moisture conditioning or compaction. The top surface of the select drain fill shall be hand leveled in preparation for geotextile placement. Any loose particles spilled outside of the backfilled sump area shall be removed from the pond's bottom geomembrane surface to prevent geomembrane puncture.

Select drain fill to backfill around pipes should be carefully placed and spread in uniform layers. and should be placed to approximately the same elevation on both sides of the pipe to prevent unequal loading and displacement of the pipe. Backfilling procedures shall generally follow guidance from "Plastic Pipe Used in Embankment Dams Best Practices for Design, Construction, Problem Identification and Evaluation, Inspection, Maintenance, Renovation, and Repair Federal Emergency Management Agency, November 2007". The backfill in all areas shall be compacted by vibrating, tamping, or a combination thereof to seventy five percent (75%) relative density for Select drain fill as determined by the relative density of cohesionless soils test, ASTM D4253. Bedding shall be distributed in 150mm maximum lifts over the full width of the trench.

3.8.2. Compacted Rock Fill

Compacted Rock Fill shall be used for structural fills in the HLF as shown on the drawings. The rock fill will have more than 30 percent particles larger than 19 mm and the maximum rock particle

size shall be no more than two thirds the loose thickness of the fill lift. The rockfill shall generally have 300 mm maximum rock particle size and oversized rocks larger than 300 mm shall be removed to the exterior fill slopes. Rocks larger than 300 mm may be incorporated in thicker fill lifts provided the rocks do not protrude from the lift surfaces after compaction and the required compaction of the lifts is proven achievable by a test fill.

3.8.2.1. Material Requirement

Compacted rock fill shall consist of rock from required excavations and from mine pre-stripping operations that generate relatively high strength, durable and relatively clean rock resistant to weathering and to water action and free of potentially acid-generating rock, shale, soil, organic, deleterious or other objectionable material. Rounded rock, in general, is not desirable. The quality of the material must be approved by the Engineer prior to removal from the processed stockpile.

The maximum particle size for the compacted rock fill shall be no greater than 2/3 the fill loose lift thickness as determined in test fills and all rock fill material shall contain more than 30 percent particles larger than 19 mm.

Rock fill shall be competent material with a minimum strength rating determined by International Society for Rock Mechanics (ISRM) methods of R3, medium strong rock.

3.8.2.2. Placement

The Contractor shall place the rock fill in maximum loose lifts and compact in accordance with specifications derived from results of test fills.

3.8.3. Anchor Trench Backfill

3.8.3.1. Material Requirement

Geomembrane anchor trenches shall be backfilled with inorganic material meeting the site grading fill material requirement.

3.8.3.2. Placement

The anchor trenches shall be excavated to the lines and grades shown on the Drawings. Particles greater than 138 mm size and any other protrusions shall be removed from the trench bottom and sides to protect the geomembrane from puncture. The backfill material shall be placed in nominal 150 mm thick lifts and compacted to a minimum of 85 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698). Moisture conditioning will not be critical, as determined by the Engineer. Compaction shall be accomplished by the use of hand-operated compactors. Care shall be exercised to avoid damage to the geomembrane. The final backfill surface shall be rolled by a rubber-tired front-end loader with loaded bucket or equivalent equipment approved by the Engineer. The final backfill surface shall be graded to drain.

3.8.4. Road Wearing Course

The road wearing course material shall be selected and placed as specified by the Owner. The following should be considered as guidelines.

3.8.4.1. Material Requirement

Generally, the road wearing course material shall be produced from crushing and/or screening operations of mine waste or borrow sources and shall consist of well-graded sandy gravel. The wearing course material shall conform to the following gradation:

Table 3-3. Wearing course material gradation.

ASTM Sieve Size	Percent Passing
50 mm	100
38 mm	95-100
19 mm	65-95
No. 4	35-55
No. 16	15-45
No. 200	4-15

3.8.4.2. Placement

The wearing course shall be placed and compacted to a compacted thickness of no less than 0.15 m to the lines and grades shown on the Drawings or as required by the Owner. The layer shall be graded to form a relatively smooth surface, free of rock pockets or protrusions of rock fragments. The wearing course shall be compacted by a minimum of three passes with a smooth drum roller to achieve a minimum 95 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698). The wearing course shall contain enough moisture to produce a homogeneous, smooth and compacted layer. To achieve this, the Contractor may be required to moisture condition the material in the processing operation before placement or after spreading but before compaction.

3.8.5. Riprap

Riprap is required to line portions of the interceptor ditches and may be required at channel or pipe discharge points for protection against erosion.

3.8.5.1. Material Requirement

The preferred riprap shall be hard, angular, durable and reasonably well-graded rock resistant to weathering and to water action and free of potentially acid-generating rock, shale, soil, organic, deleterious or other objectionable material. Rounded rock, in general, is not desirable. The more competent and durable rock encountered on site during required excavations and mine

overburden stripping shall be selected for use as riprap. The quality of the material must be approved by the Engineer prior to removal from the processed stockpile.

The maximum particle size for the different size riprap shall be equal to the layer thickness and all riprap material shall, in general, contain no fines passing the No. 200 ASTM sieve size (0.075 mm), as determined by visual observation by the Engineer or by ASTM D-422. The D_{50} designation for riprap material refers to the average rock size. Processing may be required to produce the specified material. Los Angeles abrasion tests may be specified by the Engineer on proposed riprap material if the quality of the riprap material is questionable. The minimum abrasion number for riprap material shall be 40 percent.

In general, the riprap shall conform to the following gradation requirements; however, minor deviation from these requirements may be acceptable for specific cases, subject to the Engineer's approval.

Table 3-4. Riprap gradation.

Rock Size	D50 = 75 mm (% passing)	D50 = 100 mm (% passing)	D50 = 150 mm (% passing)	D50 = 225 mm (% passing)	D50 = 300 mm (% passing)
600 mm					100
450 mm				100	
300 mm			100		35-55
225 mm				35-55	
200 mm		100			
150 mm	100		35-55		5-20
100 mm		35-55		5-20	
75 mm	35-55		5-20		
50 mm		5-20			
38 mm	5-20				

3.8.5.2. Placement

The Contractor shall haul from the stockpile, spread and level the riprap to the lines and grades specified on the Drawings or as specified by the Engineer or Owner at the time of construction. Riprap shall be placed in a manner that minimizes segregation and produces a reasonably well-graded mass of rocks with a minimal practical percentage of voids, as approved by the Engineer. The material shall be placed and distributed such that there are no large accumulations of either larger or smaller sizes of rock. Hand placing or rearranging of individual stones by mechanical equipment may be required to achieve this result.

3.9. QA/QC Testing

3.9.1. General

The Engineer and thier quality assurance team will be responsible for testing construction materials to assess whether materials and methods comply with these Technical Specifications. All testing performed by the Engineer will be performed in accordance with procedures outlined in the Specifications. The results of the tests carried out by the Engineer will be final and conclusive in determining compliance with the Specifications. The QA/QC test results shall be used to document and verify the quality of work and the extent to which the earthwork and related installations have been completed as set forth in the Drawings, Technical Specifications and permits for the construction and operation of the facilities.

To the extent possible, QA/QC testing shall be conducted so as not to interfere with normal construction operations. However, if required for any reason, the Contractor shall stop work in the area being tested, until the QA/QC testing is complete or approval to proceed has been given by the Engineer or his appointed representative. Each lift of fill will require approval by the Engineer prior to placement of the next lift. Sufficient time shall be allowed by the Contractor for the Engineer to carry out the required test work and interpretation of the test results in order to decide upon the acceptability of each lift. Cooperation shall be given by the Contractor to the Owner and the Engineer for taking samples and making tests and such assistance shall be rendered as is necessary to enable sampling and testing to be carried out expeditiously.

The QA/QC guidelines do not relieve the Contractor of any of his responsibilities to conduct his own daily quality control testing or to complete in a timely manner the Work agreed to under the Contract Documents in accordance with the Specifications.

3.9.2. Tests

Laboratory tests including moisture content (ASTM D-2216), Atterberg limits (ASTM D-4318), gradation (ASTM D-422), moisture/density relationship (ASTM D-1557), permeability (ASTM D-5084) and other tests, where applicable, will be conducted by the Engineer on samples of fill materials taken from cuts within the HLF limits and from borrow areas at frequencies sufficient to assess whether the materials are in compliance with these Technical Specifications. The Engineer will also conduct field density tests (ASTM D-2922/nuclear gauge method and/or ASTM D-1556/sand cone method) and will obtain samples of the compacted fill for related laboratory testing at such frequency as the Engineer considers necessary to assess whether the compacted fill is in full compliance with the Specifications. In-place field density testing on soil fills may also be conducted in accordance with ASTM D-2167 and D-3017, as specified by the Engineer. Rockfill materials exceeding the standard range of soil testing methods shall be tested for acceptable compactive effort as specified in Section 3.5 - Site Grading Fill section of these Specifications.

3.9.3. QA/QC Plan

If the above tests indicate the Work does not meet the specified requirements, the following remedial action shall be performed.

Compaction below specified minimum: apply additional effort or scarify, moisture condition, recompact and retest.

Moisture content outside of specified limits during compaction

- Moisture content below specified minimum: scarify the depth of the lift, moisture condition, mix to achieve uniform moisture content, compact and retest
- Moisture content above specified maximum: scarify the depth of the lift, allow to air dry, mix to achieve uniform moisture content, compact and retest; or remove the wet material. Mixing of dry material to lower the moisture content shall not be allowed without the prior approval of the Engineer and on a case by case basis.

Moisture content outside of specified limits after compaction and approval but prior to covering: determine depth of material outside of specified limits and correct as specified above.

Material not in accordance with the Specification requirements: remove material in its entirety, as directed by the Engineer.

3.9.4. Testing Frequency

The testing frequencies in the following tables are the minimum number of record QC tests to be completed on the various fill materials during the Work. The Engineer may specify additional tests to be carried out, if in the opinion of the Engineer, such additional tests are required due to variability in the soil materials or soil properties that may affect the Work. Control tests shall be performed on the material, as necessary, to determine the suitability of borrow areas. The number of control tests shall satisfy the minimum record test frequency for the volume anticipated to be removed. This may entail performing enough testing to develop “families” of borrow area soils, classified by both gradation and moisture/density relationship. The control test results shall be submitted to the Engineer for approval prior to removing material from borrow areas for fill placement. The results must demonstrate that the borrow materials conform to the Specifications. The control tests conducted for borrow areas are considered essential to understanding how borrow area materials will be placed in the Work. Upon review of the control test data, the Engineer may specify that additional tests be performed prior to approval of a borrow area.

Table 3-5. Site grading fill.

Laboratory/Field Test	Test Frequency
Moisture Content	Minimum 1 per 5,000 m^3
Atterberg Limits	Minimum 1 per soil type or 1 per 5,000 m^3, whichever is more frequent
Gradation	Minimum 1 per soil type or 1 per 5,000 m^3, whichever is more frequent

Laboratory/Field Test	Test Frequency
Moisture/Density Relationship	Minimum 1 per soil type or 1 per 5,000 m^3, whichever is more frequent
In-Place Density and Moisture	Minimum 1 per 1,500 m^3 placed

Table 3-6. Select fill.

Laboratory/Field Test	Test Frequency
Moisture Content	Minimum 1 per 3,000 m^3
Atterberg Limits	Minimum 1 per soil type or 1 per 3,000 m^3, whichever is more frequent
Gradation	Minimum 1 per soil type or 1 per 3,000 m^3, whichever is more frequent
Moisture/Density Relationship	Minimum 1 per soil type or 1 per 3,000 m^3, whichever is more frequent
In-Place Density and Moisture	Minimum 1 per lift per 1,500 m^2
Laboratory Permeability	Minimum 1 per lift per 75,000 m^2

Table 3-7. Overliner drain fill, Select drain fill and Trench drain fill.

Laboratory/Field Test	Test Frequency
Gradation	Minimum 1 per 5,000 m^3

Table 3-8. Anchor trench backfill.

Laboratory/Field Test	Test Frequency
Moisture Content	Minimum 1 per 5,000 m^3
Atterberg Limits	Minimum 1 per soil type or 1 per 5,000 m^3, whichever is more frequent
Gradation	Minimum 1 per soil type or 1 per 5,000 m^3, whichever is more frequent
Moisture/Density Relationship	Minimum 1 per soil type or 1 per 5,000 m^3, whichever is more frequent
In-Place Density and Moisture	Minimum 1 per 150 linear m of trench length

Gradation testing of the rock fill shall not be required. The Engineer will visually inspect the rock fill in conjunction with measurement of the size of select stones to determine its compliance with the gradation requirements.

Tests may be conducted more frequently at the direction of the Engineer. More frequent testing shall be performed, where indicated by the following guidelines:

- Areas where special compaction equipment or methods are used

- Areas where the height of fill rises quickly versus the quantity of fill placed, specifically in areas of slope reduction fill
- Areas where compaction control is particularly important such as around appurtenant structures
- Areas where doubtful construction procedures are being used
- Areas where the required compaction may not have been achieved based upon visual observations
- Areas where unacceptable material may have been placed.

4.0 GEOSYNTHETICS

4.1. Geomembrane

4.1.1. General

The intent of the design is to provide linear low density polyethylene (LLDPE) geomembrane for the leach pad. The geomembrane shall be manufactured in the largest widths and lengths possible to minimize the number of field seams. The Geomembrane Installer shall install geomembrane materials and miscellaneous materials incident thereto in accordance with the Manufacturer's recommendations. Alignments, lengths and areas are shown on the Drawings. Exact locations and lengths may vary to suit field conditions, as approved by the Engineer.

Direct vehicular contact with the geomembrane shall not be allowed to prevent geomembrane damage. Ultra-violet (UV) sensitive geomembrane shall be protected from exposure to sunlight until placement. After placement, the geomembrane shall be covered within three months of placement, unless otherwise approved by the Owner and warranted by the Manufacturer.

The Installer shall notify the Engineer for written acceptance of the completed geomembrane installation prior to covering the leach pad's geomembrane with drain fill and prior to covering the PLS sump area's bottom geomembrane with geocomposite.

The geomembrane materials, installation and testing shall be in accordance with the following sections and shall generally conform to the Geosynthetic Research Institute (GRI) standards GM-13, GM-17 and GM-19 or Engineer approved equivalent.

4.1.2. Manufacturer's Experience

The Manufacturer of the geomembrane shall have previously demonstrated the ability to produce the specified geomembrane by having successfully manufactured a minimum of 500 acres of similar geomembrane for hydraulic lining installations. A list of similar containment projects completed in which the manufactured material has been successfully used shall be submitted and is subject to approval by the Engineer.

4.1.3. Submittal of Engineering Data

The Installer is responsible for supplying engineering data and results of QC testing of the geomembrane materials. The Manufacturer shall allow sufficient time in his production schedule to perform the specified QC testing for the project. The results of all required testing shall be supplied at least seven days prior to shipment of the materials to the site. The Installer shall furnish the following engineering data prior to construction:

- Shop drawings with panel layouts and appropriate details along with a time schedule for the installation of the geomembrane.
- An instruction manual which includes the proper storage, handling, deployment and seaming of the geomembrane. This manual shall be in compliance with these Technical Specifications and any conditions of warranty.

- QC certificates on the resin used to manufacture the geomembrane. The data submitted on the resin shall include production dates and the results of conformance tests. The submittals for the resin shall also include a statement that no reclaimed polymer was used. The edges of geomembrane that are trimmed during the manufacturing process are not considered reclaimed polymer. All resin shall be of the same type and quality.
- QC certificates on each geomembrane roll. Each certificate shall be customized for the project and shall include but not be limited to: the roll and resin batch numbers, production date of the roll, a listing of the QC tests, test method numbers, values specified for the project and the QC test results. All tests shall be performed prior to submittal of the QC certificates to the Engineer. Test results for each property specified shall be provided on the QC certificate.
- Certification that the geomembrane and extrudate rod or beads are made from the same resin type and have the same properties.

4.1.4. Delivery, Storage and Handling of the Geomembrane

The Installer shall be responsible for transporting, unloading and storing the geomembrane. At the discretion of the Owner, conformance testing and a plant audit may be performed by the Engineer and/or Owner prior to shipment. In the event that conformance testing is to be performed, the Manufacturer shall not arrange for transport of the geomembrane until such testing is complete. The Installer or Manufacturer shall provide the Engineer and Owner a schedule for manufacturing the materials for the project at least 14 days prior to manufacturing so that testing and travel arrangements can be properly arranged. This schedule shall remain firm throughout the duration of the project. Any proposed changes to the production schedule shall be approved by the Owner. The Engineer shall notify the Manufacturer at least seven days prior to performing the testing or plant audit of his intentions to perform these tasks.

The geomembrane shall be shipped such that it is not damaged in transport and shall be offloaded in the presence of the Owner. Any damage to the geomembrane during the offloading process will be documented by the Owner. All damaged rolls shall be separated from undamaged material. The final disposition of the damaged rolls shall be determined by the Owner with input from the Engineer. The Installer shall be responsible for replacing any geomembrane determined to be unacceptable at no additional cost to the Owner.

Once the geomembrane rolls have been offloaded, they shall be stacked on a prepared surface no more than three rolls high. The surface shall be prepared such that the geomembrane is not subjected to rocks or sharp objects, water, oil or other deleterious conditions. The geomembrane rolls shall not be placed on pallets.

The Installer shall use appropriate equipment to transport the geomembrane from the storage area and deploy it. This equipment may include a spreader and roll bars and shall not damage the geomembrane or subgrade. Any damage shall be repaired by the Installer to the satisfaction of the Engineer.

4.1.5. Material Requirement

The geomembrane shall be composed of new, first quality material designed and manufactured specifically for the purpose of liquid containment. The geomembrane shall be produced in rolls and shall be free of holes, blisters, undispersed raw material, cuts, folds or any sign of foreign matter. Each roll of geomembrane shall be identified with a label that provides the thickness, length, width, roll number and plant location.

The total combined percentage of all additives including carbon black, antioxidants and processing aids shall be less than 3.5 percent by weight of the geomembrane. Of the 3.5 percent, no more than 1 percent shall be additives other than carbon black. All additives shall be evenly dispersed throughout the geomembrane.

The material shall be warranted against Manufacturer's defects as well as degradation due to UV light for exposed geomembrane for a minimum of 20 years from the date of installation or as mutually agreed upon in writing prior to award of the contract between the Owner and the Manufacturer. This warranty shall cover the cost of material, shipping and handling, labor and equipment to replace the defective or failed material.

The materials provided for the leach pad, Event Pond and any other process component liners shall conform to the standards in Table 4.1. The In-Heap Pond liner shall be High Performance GSE UltraFlex Leak Location Textured (or approved equal) for post-installation damage utilizing spark testing technology per ASTM D 7240 and utilizing electrical resistivity testing per ASTM D 7002 on exposed geomembranes and ASTM D 7007 after water or cover soil placement.

Table 4-1. Geomembrane properties.

Tested Property	Test Method	Frequency	Minimum Average Value			
			1.50 mm HDPE Textured	**2.0 mm HDPE Textured**	**1.50 mm LLDPE Textured**	**2.0 mm LLDPE Textured**
Thickness, (minimum average), mm Lowest individual reading	ASTM D 5994	every roll	1.50 1.28	2.00 1.70	1.50 1.28	2.00 1.70
Density, g/cm^3 (min.)	ASTM D 1505	90,000 kg	0.940	0.940	0.939	0.939
Tensile Properties (each direction) Strength at Break, N/mm Strength at Yield, N/mm Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 50 mm/min G.L.=50mm G.L.= 33 mm	9,000 kg	 23.1 23.1 350 13	 30.8 30.8 350 13	 29.4 400	 39.2 400

Tested Property	Test Method	Frequency	Minimum Average Value			
Tear Resistance, N	ASTM D 1004	20,000 kg	200	267	160	222
Puncture Resistance, N	ASTM D 4833	20,000 kg	534	667	310	400
Carbon Black Content, % (Range)	ASTM D 1603*/4218	9,000 kg	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	20,000 kg	Note	Note	Note	Note
Asperity Height, mm	ASTM D 7466	second roll	0.51	0.46	0.51	0.46
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	90,000 kg	>140	>140	>140	>140

The above properties shall be evaluated by the Manufacturer at a minimum frequency of one test every 0.5 hectares of geomembrane. In the event that the Manufacturer performs any given test at a frequency greater than specified herein, the results of such testing shall be reported to the Engineer and Owner. The testing shall be performed and the results submitted to the Owner and Engineer prior to arranging shipment of the materials to the project site.

4.1.6. Conformance Testing

Prior to or upon delivery to the site, samples of the geomembrane shall be removed by the Owner or Engineer and sent to a laboratory selected by the Owner for testing to ensure conformance to the requirements of these Technical Specifications. Conformance sampling may be performed at the Manufacturer's plant or in the field at the site. Unless testing is performed prior to shipment, the Installer shall deliver the geomembrane to the site an adequate period of time prior to installation to allow for sufficient time for sampling and testing, as specified by the Owner or Engineer.

Samples shall be taken at the rate of one sample per batch or one sample per 6 acres, whichever is less. Samples shall be taken from across the entire width of the geomembrane roll and shall be at least 1 m long unless otherwise approved by the Engineer. The samples shall not include the first 1 m of the roll. The Engineer may increase the frequency of sampling in the event that test results do not comply with these Specifications. Any material that is not certified in accordance with the Specifications shall be rejected and replaced with new material.

4.1.7. Installation

Installation of the geomembrane shall be performed by the geomembrane Manufacturer or an Installer trained and certified by the Manufacturer. The purpose of these Specifications is to achieve a lined system as free of defects as current installation and inspection techniques will allow.

Surfaces to receive geomembrane shall be prepared as specified in Section 3.2 - Subgrade Preparation section of these Technical Specifications. The surfaces shall be smooth and free of all rocks, stones, sticks, roots, sharp objects or debris of any kind. The surface shall provide a firm, unyielding foundation for the geomembrane with no sudden, sharp or abrupt changes in grade. No standing water or excessive moisture shall be allowed. The Installer shall certify in writing that the surface on which the geomembrane is to be installed is acceptable before commencing work.

Once the subgrade is acceptable, it shall be maintained until the geomembrane has been installed and accepted. Any rough areas or damage caused by the installation shall be repaired by the Installer. The leading edge of the anchor trench shall be rounded to avoid a sharp bend in the geomembrane.

4.1.7.1. Placement

To the maximum extent possible, the geomembrane panels shall be oriented such that they are perpendicular to the natural contours (parallel to the maximum slope). Unless otherwise approved in writing by the Engineer, no horizontal seams will be allowed on slopes steeper than 3H:1V. All seams shall be oriented such that they are shingled in a down-slope direction. If cross seams are required on a steep slope, the end of each panel shall be cut at a diagonal of 45 degrees and seamed to prevent installation of a horizontal seam. The geomembrane shall be placed according to the panel layout drawing submitted by the Installer and approved by the Engineer.

Each geomembrane panel shall be labeled with a unique identification number or code which is agreed to by all parties. The geomembrane shall be placed using methods and equipment that do not damage it or the subgrade. Installation personnel working on the geomembrane shall not smoke, wear shoes that could damage the geomembrane or engage in potentially damaging activities.

The Installer shall use appropriate means to protect the geomembrane from uplift from the wind. Edges of panels shall have continuous ballast to lessen the chance of wind flow under the panels. The material used to hold down the geomembrane shall not cause damage to it. No vehicles shall be allowed to drive over exposed geomembrane.

As the geomembrane material is deployed, it shall be visually inspected and any defects marked for repair. If a significant number of defects are identified as determined by the Engineer, the material shall be removed and replaced at no expense to the Owner. No geomembrane deployment shall be allowed during periods of wet or extremely windy weather or in the presence of ponded water.

The Installer shall provide sufficient slack in the geomembrane to allow for contraction due to cold temperatures. Prior to the start of construction, the Installer shall submit calculations and a resultant table showing the amount of extra material required per 30 m of geomembrane in place, for a given temperature.

4.1.7.2. Seaming

Prior to installation, the Installer shall submit the resumes of seaming personnel who will be used on the project. At least one seaming supervisor shall be present who has the experience of a minimum of 0.5 hectares of geomembrane installation using the seaming device proposed for use at the project site.

The Installer shall weld the geomembrane, where possible, using the double-wedge fusion welding method. No seaming shall begin until each welding technician and apparatus used in the field has passed a test weld. Scrap pieces of geomembrane material at least 1 m long and 0.3 m wide shall be seamed together under the same conditions as those in the area to be lined. A minimum of four 25 mm wide coupons shall be cut from the test weld and quantitatively tested for shear and peel with a field tensiometer in accordance with ASTM D-6392. A test weld passes when the break is ductile and a film tearing bond (FTB); and the following minimum values are met:

Table 4-2. HDPE seam strength properties.

Material (mil)	Shear Strength (PPI)	Fusion Peel (PPI)	Extrusion Peel (PPI)
60	120	91	78
80	160	121	104

Table 4-3. LLDPE seam strength properties.

Material (mil)	Shear Strength (PPI)	Fusion Peel (PPI)	Extrusion Peel (PPI)
60	90	75	66
80	120	100	88

A test weld is considered passing when all coupons pass the above requirements. If repeated test welds fail, the welding technician or apparatus may not be used until the reason for the failing values is identified. Once the test welds have passed and are approved by the Engineer, seaming of the geomembrane may begin.

The geomembrane panels shall overlap a minimum of 75 mm for extrusion welding and 100 mm for fusion welding. Any fishmouths or wrinkles at seam overlaps shall be cut out and removed. If the overlap after cutting is less than 75 mm, the area shall be patched. As seaming progresses, the Installer shall log the temperature measured at 150 mm above the geomembrane, the operating temperature, pressure and speed of the wedge welder and the extrudate temperatures in the barrel and at the nozzle of the extrusion welder.

If a hot wedge welding device is used by the Installer, it shall be self-propelled and equipped with gauges that monitor the temperature and speed of the apparatus. The wedge welder shall not be placed directly on the geomembrane when not in use. The Installer shall make sure that there is no dirt or moisture build-up between the geomembrane sheets.

When using an extrusion welder, the Installer shall tack bond the geomembrane sheets together in a manner that does not damage the geomembrane. The Installer shall thoroughly clean and dry the seam area immediately before tack bonding (lystering) and wedge welding. Prior to welding and after any work stoppages of more than three minutes, the welding apparatus shall be purged of heat-degraded extrudate. The top edges of the geomembrane shall be beveled prior to welding and the oxidation on the geomembrane surface shall be removed by a disc grinder no more than a half hour before welding. On seams that are more than five minutes old, the end of the seam shall be ground prior to continuing the weld. All grind marks shall not extend more than 6 mm beyond the weld head. The grinder shall be held parallel to the geomembrane edge and any area where grinding removes more than 4 mils shall be patched.

No seaming shall be conducted if the temperature measured at 15 cm above the geomembrane is lower than 5°C or above 38°C, without written acceptance by the Engineer. When the temperature is below 10°C, the Installer shall preheat the weld zone by a hot air device.

4.1.7.3. Seaming Equipment

The approved processes for field seaming are extrusion welding and fusion (hot wedge) welding. The preferred method of seaming is the double-fusion welding. Proposed alternative processes shall be documented and submitted to the Owner or Engineer for approval.

The extrusion welding apparatus shall be equipped with gauges giving the temperature of the apparatus at the nozzle. The fusion-welding apparatus shall be an automated vehicular-mounted device which produces a double seam with an enclosed space. The fusion welding apparatus shall be equipped with gauges giving the applicable temperatures. The Engineer shall verify that:

- Equipment used for seaming is not likely to damage the geomembrane
- The extrusion welder is purged prior to beginning a seam until all heat-degraded extrudate has been removed from the barrel
- The electric generator is placed on a smooth base such that no damage occurs to the geomembrane.

The Installer shall carry on-site spare welders and the necessary spare parts for their repair, such that construction delays do not occur.

4.1.8. Field Quality Control

The Installer shall designate a technician that is responsible for supervising and/or conducting the Installer's field quality control program. Testing of the geomembrane seams shall consist of both destructive and non-destructive testing. All seams shall be 100 percent inspected using non-destructive test methods. Non-destructive and destructive testing procedures are outlined below.

In addition to the field seam testing specified herein, the Installer shall water test the top geomembrane installed in the Event Pond sump area with ponded fresh water to a level of 3 m above the top of the sump. No leaks shall be detected by the pond’s leak detection system over a 48-hour period prior to acceptance by the Owner. If leaks occur in the installed geomembrane, the Installer shall find and repair the leaks and retest as before.

The Installer shall test the In-Heap Pond upper liner for post-installation damage utilizing spark testing technology per ASTM D 7240 and utilizing electrical resistivity testing per ASTM D 7002 on exposed geomembranes and ASTM D 7007 after water or cover soil placement. If leaks are detected in the installed geomembrane, the Installer shall find and repair the leaks and retest as before.

4.1.8.1. Non-Destructive Testing

Vacuum boxes shall be used to non-destructively test extrusion or single wedge fusion welds over their entire length. Prior to using the vacuum box, the weld to be tested shall be wetted with a soapy solution. The vacuum box shall then be placed over the weld and a vacuum of 35 to 56 kN/m^2 (5 to 8 psi) shall be drawn. The entire length of the box shall be observed through the viewing window for the creation of bubbles for a period of at least 15 seconds and shall be tested with a minimum of 75 mm of overlap with the previous section. Any areas that bubbles appear on, shall be identified, repaired and retested.

In areas that cannot be tested with a vacuum box, the seam should be cap-stripped if possible. If the seam can be tested prior to installation, then the Installer shall do so. Seaming and testing in these areas shall be observed by the Engineer.

If the double hot wedge welding system is used, air pressure testing may be conducted instead of vacuum testing. Each continuous length of seam shall be pressurized to 210 kN/m^2 (30 psi) and monitored for a period of 5 minutes. In order to pass, the seam shall stabilize and not lose more than 28 kN/m^2 (4 psi) of pressure. The test method shall include a method to verify that the entire length of the air channel is pressurized. If the wedge weld cannot be air tested because of a blockage in the air channel, the welded seam shall be considered a failure. Any failed seams shall be repaired and retested. The repair may include running an extrusion weld along the wedge weld.

4.1.8.2. Destructive Testing

The location of all destructive tests shall be determined by the Engineer. A minimum of one sample per 500 m of seam shall be obtained. The frequency of testing may be increased by the Engineer to suit the field conditions. The Installer shall repair any suspicious looking welds before release of a seam for destructive sampling. Destructive samples shall be cut as the installation progresses and not at the completion of the project. All destructive samples shall be marked with consecutive numbers along with the seam number. A log shall be kept with the date, time, location, seaming technician, apparatus, temperature and pass or fail criteria. All destructive sample holes shall be repaired immediately. The destructive samples shall be a minimum of 0.3 m wide by 1m long with the seam centered lengthwise.

The destructive samples shall be cut into three total samples, two which are 0.3 m by 0.3 m (one each for the Installer and Owner) and one which is 0.3 m by 1.0 m (for the Engineer). Prior to removing a destructive sample, two 25 mm coupons shall be cut off of each end of the designated destructive sample location and tested in the field using a field tensiometer. These coupons shall

pass the specified requirements for shear and peel. If a coupon sample fails, the Installer shall go a minimum of 3 m in each direction and obtain additional samples for retesting. These samples shall also be given to the Engineer for testing using a field tensiometer. This procedure shall continue until the coupons on each side of a destructive sample location pass the shear and peel criteria.

Once the sample coupons pass the seam strength requirements, a destructive sample shall be obtained and divided as specified above. No destructive sample need be obtained between failing coupon tests. The destructive samples shall be tested in the field by the Engineer or the testing may be conducted offsite with the consent of the Owner.

For each destructive test, a minimum of five samples in shear and five samples in peel shall be tested according to ASTM D-6392. In order to have passing results, a minimum of four out of five samples shall meet the specified test values. In order for one failed test out of five to be acceptable, the failure shall be ductile, a film tearing bond and shall be within 80 percent of the required specifications.

The seam must exhibit film tear bond (FTB). Welds should have < 25% incursion into the weld. The minimum values in Tables 4-2 and 4-3 must be met.

The Engineer will notify the Installer and Owner of any failing results. Should a destructive sample fail, the Installer shall move 3 m in either direction from the failure and take additional destructive samples. This procedure shall continue until passing results are obtained. The Installer shall repair or cap-strip seams that have failing destructive tests. The Installer shall not cover any seams which have not been tested unless he agrees in writing to uncover any failing seams and make the required repairs.

4.1.9. Repairs

The Installer may repair holes smaller than 6 mm by using an extrusion weld. The surface oxidation surrounding the hole shall be removed a minimum of 125 mm around the hole and then immediately welded. After the hole has been welded, it shall be vacuum tested for leaks. The result of the test, the name of the tester and the date shall be recorded on the geomembrane near the repair.

All destructive sample holes, tears, large holes or areas with blisters or undispersed raw materials shall be patched. Patches shall be round or oval in shape, extend at least 150 mm beyond the defect and made of the same material as the geomembrane. The edge of the patch shall be beveled and welded to the geomembrane according the procedures outlined for extrusion welding. All patches shall be vacuum tested and the results recorded on the geomembrane.

For areas that have very large defects, the material shall be removed and replaced. All folds or large wrinkles shall also be removed. The Engineer shall determine the areas that require removal. Seams that fail destructive testing or cannot be vacuum tested shall be cap-stripped. Bridging or trampolining of the geomembrane shall also be repaired prior to covering. At no time

shall the Installer discard excess geomembrane, packaging materials or other items beneath the geomembrane.

4.1.10. Quality Assurance and Acceptance

Quality Assurance testing will be performed by the Engineer in accordance with these Specifications. The Installer shall be responsible for notifying the Engineer when areas of Work are completed and ready for QA testing. Additionally, the Installer shall allow time for the testing to be performed. Every reasonable effort will be made to expedite the necessary testing; nevertheless, delays occasioned by testing will not be considered grounds for extension of time to complete the contract Work.

The Installer shall be responsible for maintaining the geomembrane until final acceptance by the Engineer. The Engineer will recommend final acceptance when all seams have passed destructive testing, the Installer has supplied all documentation and all field and laboratory testing is complete and satisfactory. As part of the final acceptance, the Installer shall furnish reproducible as-built drawings showing the location of the geomembrane panels, seams, repairs, patches and destructive samples. The drawings shall be prepared on 24 by 32-inch size sheets to a scale approved by the Engineer. They shall be submitted in final form to the Owner within two weeks after completion of each phase of construction.

4.2. Geocomposite

A geocomposite will be installed between the geomembranes of the PLS in-heap pond and sump area to serve as a leak detection layer connected to the pond's leak detection sump. The geocomposite will consist of a GSE Minedrain (or approved equivalent) 8.4 mm geonet heat-laminated on both sides with 200 gr/sq m nonwoven geotextile.

A geocomposite will be installed between the geomembranes of the Events Pond to serve as a leak detection layer connected to the pond's leak detection sump. The geocomposite will consist of 5-mm (200-mil) geonet heat-laminated on both sides with 270 gr/sq m (8 oz/sq yd) nonwoven geotextile.

4.2.1. Material Requirement

The geonet shall be a high flow capacity polyethylene grid comprised of a tri-planar structure consisting of middle ribs that provide direct channelized flow, with diagonally placed top and bottom ribs. The geonet shall conform to the following standards:

Table 4-4. Geonet standards.

Geonet Property	ASTM Test Method	Value	
		In-Heap Pond	Event Pond
Transmissivity, m^2/sec	D-4716	6×10^{-3}	1×10^{-3}
Thickness, mm	D-5199	8.4	5
Density, g/cm^3	D-1505	0.94	0.94
Tensile Strength, N/mm	D-7179	17.5	7.9
Carbon Black Content, %	D-4218	2	2

The material requirement for the nonwoven geotextile component of the geocomposite is covered in the following section.

The Contractor shall provide a written material guarantee covering the geocomposite material for a minimum warranty period of one year. The material warranty shall cover the cost of any material required to replace failed material. A minimum one-year installation warranty shall also be provided and shall cover the cost of labor and equipment to replace the failed material.

In constructing the process pond liner, each geocomposite roll shall be placed over the pond's bottom geomembrane taking precautions to prevent damage to the geomembrane. The geocomposite shall not be welded or bonded to either the bottom or top geomembrane. Each roll sheet shall be connected to the adjacent sheet with bands, as recommended by the Manufacturer to prevent damage to the geomembranes. The Installer shall notify the Engineer of the completed geocomposite installation for written acceptance prior to covering with the pond's top geomembrane.

4.3. Nonwoven Geotextile

A 270 gr/sq m (8 oz/sq yd) nonwoven geotextile will be used in manufacturing the PLS sump area geocomposite. A 405 gr/sq m (12 oz/sq yd) nonwoven geotextile will be used as specified on the Drawings.

4.3.1. Material Requirement

The nonwoven geotextile shall be of new, first-quality (needle-punched) material having polymer of 100 percent polyethylene, 100 percent polypropylene or polyester/polypropylene blend designed and manufactured specifically for the purpose of separation, tensile reinforcement, planar flow and filtration. The geotextile material shall be produced such that it is free of holes, undispersed raw materials, broken needles or any sign of contamination by foreign matter. The

geotextile shall be uniform in color, thickness, size and texture and all rolls shall be properly tagged and identified by the Manufacturer.

The non-woven geotextile shall conform to the following minimum average roll values (MARV) unless otherwise specified.

Table 4-5. Minimum average roll values for non-woven geotextile.

Nonwoven Geotextile Property	ASTM Test Method	Value[1]	
		270 gr/sq m (8 oz/sq yd)	405 gr/sq m (12 oz/sq yd)
Grab Tensile Strength, N (lb)	D-4632	930 (210)	1,420 (320)
Grab Elongation, %	D-4632	50	50
Puncture Strength, N (lb)	D-4833	600 (135)	930 (210)
Mullen Burst, kPa (psi)	D-3786	2,895 (420)	4,270 (620)
Trapezoidal Tear Strength, N (lb)	D-4533	420 (95)	555 (125)
Apparent Opening Size, US Sieve No. (mm)	D-4751	80 (0.180)	100 (0.150)
Permeability, cm/sec	D-4491	0.38	0.29
Water Flow Rate, lpm/m^2 (gpm/ft^2)	D-4491	4,480 (110)	2,440 (60)
UV Resistance (retained after 500 hours), %	D-4355	70	70

Note:
1. All values are MARV except apparent opening size; it is the maximum average value per roll and the UV resistance is the minimum value.

4.3.2. Installation

The nonwoven geotextile fabric sheets shall be placed as shown on the Drawings or as directed by the Engineer. All joints shall have a 0.15 m minimum overlap and shall be heat fused or sewn. The integrity of each seam is important. As a means of regulating the fusion machines, frequent samples of seams will be tested for grab strength. Minimum grab strength of 80 percent of the fabric strength, as defined above, will be required. Any machine that produces failing samples shall be repaired or removed from the Work.

On slopes steeper than 10H:1V, all seams shall be oriented parallel to the slope direction. Seams constructed perpendicular or transverse to the direction of the slope will not be accepted, unless approved by the Engineer.

Seams shall be sewn using a Type 401 stitch. One or two rows of stitching may be used. Each row of stitching shall consist of four to seven stitches per 25 mm. The minimum seam allowance (minimum distance from the geotextile edge to the stitch line nearest that edge) shall be 38 mm if a Type SSa (prayer or flat) seam is used. The minimum seam allowance for all other seam

types shall be 25 mm. The Engineer shall have final approval of all seams. The Installer shall ensure that no soil materials are present within seams or overlaps.

All seams will be inspected for continuity and the Installer shall repair any gaps or seams that are flawed. Costs for repairing the geotextile shall be borne by the Installer.

Sandbags shall be provided as ballast to hold the various layers of geotextile in place prior to the next operation. If permanently left in place to ensure that wind damage does not occur during the expected exposure life, sufficient ultraviolet-resistant sandbags shall be used.

4.4. Geosynthetic Clay Liner

A geosynthetic clay liner (GCL) will be used in the leach pad liner system instead of the low-permeability clay soil liner for the HLF and ponds, as shown on the Drawings.

4.4.1. Material Requirement

The GCL shall be reinforced consisting of a layer of sodium bentonite between two nonwoven geotextiles, which are needle-punched together (similar to Cetco Bentomat DN or equivalent). The geotextile shall conform to the standards in the previous section of these Specifications. The GCL material shall be warranted against Manufacturer's defects for a period mutually agreed upon in writing prior to award of the contract between the Owner and the Manufacturer. This warranty shall cover the cost of material, shipping and handling, labor and equipment to replace the defective or failed material.

The GCL material shall conform to the following standards and shall be free of tears, holes or other defects that may affect its serviceability.

Table 4-6. GCL material standards.

GCL Property	ASTM Test Method	Required Value
Bentonite Swell Index	D-5890	24 mL/2 g min.
Bentonite Fluid Loss	D-5891	18 mL max.
Bentonite Mass/Area[1]	D-5993	3.6 kg/m^2 (0.75 lb/ft^2) min.
GCL Grab Strength[2]	D-4632 D-6768	660 N (150 lbs) MARV 88 N/cm (50 lbs/in) MARV
GCL Peel Strength[2]	D-4632 D-6496	65 N (15 lbs) min. 6.1 N/cm (3.5 lbs/in) min.
GCL Hydraulic Conductivity	D-5887	5 x 10^{-9} m/sec max.
GCL Hydrated Internal Shear Strength[3]	D-5321 D-6243	24 kPa (500 psf) typ.

Notes:

1. At 0 percent moisture content.
2. Testing is performed in the machine direction using 100-mm grips. Results are reported as minimum average roll values (MARV) unless otherwise indicated.
3. Peak values measured at 10 kPa (200 psf) normal stress for a specimen hydrated for 48 hours.

The GCL material shall be sampled and tested in accordance with the Manufacturer's approved QC Manual.

4.4.2. Installation

In general, the GCL material shall be installed in accordance with the procedures provided in the Manufacturer's QC Manual and approved by the Engineer. In particular, the following procedures shall be followed.

The GCL rolls shall be protected from damage during shipping and exposure to the elements until time of deployment. Rolls damaged during shipping, storing and deploying or from climate exposure, in ways that affect the quality of the GCL as an effective seepage barrier, shall be rejected as determined by the Engineer and replaced with acceptable rolls.

The subgrade shall be prepared in accordance with the Subgrade Preparation Section of these Technical Specifications prior to GCL installation. The GCL shall be installed in advance of the geomembrane installation, provided the GCL panels can be covered with seamed geomembrane within each day of deployment. Only those GCL panels that can be covered in the same day shall be unpackaged and installed. If exposed GCL cannot be permanently covered before the end of the work day, it shall be temporarily covered with plastic or other waterproof material to prevent hydration.

The GCL panels shall be placed with seams oriented parallel to the line of maximum slope and shall be free of tension or stress upon completion of the installation. Panels shall be positioned with the seam overlap not less than 250 mm (12 in) for longitudinal seams and 500 mm (24 in) for end-of-panel seams. Dirt or other foreign matter shall be removed from the overlap area immediately prior to seaming. Granular sodium bentonite of the same type as the bentonite used in the GCL shall be placed along the entire seam overlap at minimum widths of 75 mm (3 in) and 250 mm (12 in) from the edge of the underlying panel for longitudinal and end-of-panel seams, respectively. The minimum application rate of the granular sodium bentonite shall be 0.27 lb/ft. End-of-panel overlapped seams shall be constructed such that they are shingled in the direction of the grade to prevent runoff from entering the overlap zone.

Holes or tears in the GCL shall be repaired by placing a patch of GCL extending a minimum of 250 mm (12 in) beyond the edges of the hole or tear on all sides. Granular sodium bentonite or bentonite mastic shall be applied in the overlap area. Patches shall be secured with construction adhesive or other approved methods.

GCL shall not be covered prior to inspection and approval by the Engineer.

4.5. Pipework

4.5.1. Corrugated PE Pipe

This section refers to all corrugated polyethylene (PE) pipework to be used in the project including solution collection and drainage pipes and diversion culvert pipes. Pipe and fittings shall be made of virgin polyethylene compounds, which shall have a minimum cell classification of 324420C for 75 mm through 250 mm diameters or 335420C for 300 mm through 1,500 mm diameters as defined in ATSM D-3350. Pipe and fittings shall be manufactured and comply with AASHTO Standard Specifications M-252, M-294 and MP-7. All sizes shall conform to the AASHTO classification “Type S” for dual wall smooth interior solid pipe, “Type SP” for dual wall smooth interior perforated pipe, and “type CP” for single wall perforated pipe, or “Type D” for diameters greater than 1,050 mm. Sealed couplers shall conform to ASTM D-3212.

Dual wall pipe shall have minimum pipe stiffness at 5 percent deflection when tested in accordance with ASTM D-2412. Where perforations are specified, they shall conform to the requirements as follows:

- ASTM F-667 for 75 mm diameter pipe
- AASHTO M-252 “Class 2” for 100 mm to 250 mm diameter pipe
- AASHTO M-294 “Class 2” for 300 mm to 1,200 mm diameter pipe
- AASHTO MP-7 “Class 2” for 1,500 mm diameter pipe

Slots shall be cut circumferentially unless specified otherwise.

Couplings shall be corrugated to match the pipe corrugations and shall provide sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joints. Couplings, unless watertight connections are specified, shall be split collar and shall engage at least two full corrugations on each pipe section.

4.5.2. HDPE Pipe

Materials used for the manufacture of high density polyethylene (HDPE) pipe and fittings shall not contain any recycled compounds other than those generated in the Manufacturer’s plant from the resin of the same specification and from the same raw material supplier. The material shall be very high molecular weight, high-density ethylene/hexene copolymer polyethylene resin, having a material designation of PE 3408. The material classification shall be Type III, PE 34 and the minimum Cell Classification shall be 345464C as per ASTM D-3350.

Dimensions and workmanship for HDPE pipe shall be as specified by ASTM F-714, D-2513 and D-3035, and pipe diameters shall be as specified on the Drawings. Slots in slotted pipe shall be as specified on the Drawings.

HDPE pipe lengths shall be joined by thermal butt fusion in strict accordance with the pipe Manufacturer’s recommendations, unless flanged end pipes are specified on the Drawings. The

butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe Manufacturer. Stub ends and pipe fittings for butt fusion shall be of at least the same wall thickness and pressure rating and the same resin type, grade, and cell classification and Manufacturer as the pipe to be joined, unless otherwise recommended by the Manufacturer. Thermal butt fusion of HDPE pipe shall be carried out by qualified technicians.

Backup rings for flanged joints shall be the convoluted type of ductile iron material (ASTM 536-80 Grade Range from 60/40/18 to 64/45/12), drilled to ANSI bolt circles, and have a pressure rating of 1,030 kPa (150 psi), unless otherwise specified. Backup flanges and bolts shall be as approved or supplied by the pipe Manufacturer.

4.5.3. Installation

The Contractor shall furnish and install the pipework and miscellaneous materials incident thereto, in accordance with the Manufacturer's instructions and recommendations. The pipework shall be installed to the lines and grades and generally in the manner shown on the Drawings. Where specific lines and grades are not indicated on the Drawings, the lines and grades will be specified by the Engineer in the field to suit the existing ground conditions. The pipe shall be installed using equipment and methods described in these Specifications and in accordance with the pipe Manufacturer’s recommendations for handling and placement of the pipe and fittings.

The pipework shall be installed in accordance with good piping practices, whether such practices are specifically detailed on the Drawings or not. The general layout as shown on the Drawings shall be maintained. Where interference is encountered during installation or relocation of pipework is deemed necessary, the Engineer shall be consulted and shall approve the revised plan before any changes are made.

All pipework shall be erected to preserve accurate alignment. Care shall be taken during the installation of pipeline runs where drainage is required to ensure that the pipeline has a continuous slope to the point of drainage.

Construction equipment shall not cross over installed pipework unless covered with specified material or protective cover fill approved by the Engineer. If pipework is damaged by the Contractor's method of installation and construction and are deemed not suitable for use in construction, as determined by the Engineer, the damaged pipework shall be replaced by the Contractor at no expense to the Owner.

Prior to installation, each segment of pipe and all fittings shall be inspected for defects and/or damage. Care shall be exercised to prevent foreign matter from entering the pipe while it is being installed. Open ends of the pipe shall be covered by temporary end caps or other approved means when installation is not in progress to prevent foreign matter from entering the pipe.

Pipe bends to form curves either in the horizontal or vertical plane shall not exceed that recommended by the Manufacturer or approved by the Engineer. The cutting of pipe for inserting fittings or closure pieces shall be done in a neat and workmanship like manner without damage to the pipe and so as to leave a smooth end at right angles to the axis of the pipe.

Couplers used to join two sections of corrugated pipe together or to join a pipe section with a fitting (e.g., wye, tee, etc.) shall be of the snap variety for diameters of 250 mm or less and of the split variety for diameters greater than 300 mm. Zip ties used to secure split couplers must be manufactured of the same material as that for the couplers themselves. All unions between pipe sections or specific fittings shall be completed such that the seam in the split coupler (for diameters that require split couplers) shall be rotated to the pipe springline such that the potential ingress of solids is eliminated.

During actual solution collection pipework installation, methods shall be developed to ensure the corrugated pipe is not damaged during installation or backfilling. Sequencing of corrugated pipe placement on the leach pad shall be done such that vehicle traffic is minimized over the completed areas.

4.6. Fabric-Formed Concrete Liner

A fabric-formed concrete liner will be used for erosion protection of the spillways, as shown on the Drawings.

4.6.1. Material Requirement

Fabric-forming material shall consist of double-layer, open-selvage fabric joined in a mat configuration. Fabric shall be woven of 100% hightenacity, continuous multifilament nylon of which at least 50% by weight shall be textured fiber. Polyester, staple, and partially orientated yarn shall not be allowed. Unimat Fabric, designated as 8-inch UMNN on the Drawings, shall be woven in such a manner with nylon spacer cords to provide points of attachment on specific centers. The spacer cords shall serve to control the thickness of the revetment without bursting the fabric during fine aggregate injection. Thickness of the finished revetment shall be measured as described in Section 4.6.2 of these specifications.

Fabric porosity is essential for the successful execution of this work. At the direction of the Engineer, the Contractor shall demonstrate the suitability of fabric design by injecting the proposed grout into 5½" (140 mm) diameter sleeves. The sleeves shall be constructed of a single layer of the same basic fabric material. Test cylinders, 12" (300 mm) long, shall be cut from each specimen and tested in accordance with ASTM C-39. This test will be run once at the start of the project unless otherwise directed by the engineer.

Where groundwater conditions require provision for relief of hydrostatic uplift, 7/8" (22mm) I.D. weep tube assemblies shall be inserted through the fabric. These weep tube assemblies shall be held in place during grout injection by means of a snap on collar attached to the lower end of the weep tube assembly. If the revetment has not been placed over a geotextile filter cloth, the lower end of the weep tube assembly shall be covered with a piece of filter cloth. The weep tube assemblies shall be located as called for on the plans.

The Unimat fabric can be factory sewn into predetermined custom sized panels. The fabric rolls are first cut into the lengths specified on the shop drawings. These fabric pieces are then joined together, top layer to top layer and bottom layer to bottom layer. This will allow for the finished

revetment to have the full mat thickness between the top and bottom seam. A single seam in which all four layers of fabric are joined at one point will not be permitted. All factory seams shall face downwards and shall be made using a double-needled machine utilizing the Standard Type 401 stitch. If required, bulkheads (grout stops) may be installed parallel to and in between individual mill widths at predetermined intervals to regulate the flow of fine aggregate concrete. Grout stops shall be designed as to produce full mat thickness along the full length of the grout stop.

Fine aggregate concrete (grout) shall consist of a mixture of portland cement, fine aggregate, and water so proportioned and mixed as to provide a readily flowable grout. Admixtures and/or a pozzolan may be used with the approval of the Engineer. Use of super plasticizers requires special precautions; silica fume is not recommended. The hardened fine aggregate concrete shall exhibit a compressive strength of 2,500 psi (17 MPa) at 28 days when specimens are made and tested according to the provisions of ASTM C-31 and C-39. The average compressive strength of fabric cast test cylinders, as described in Paragraph C above, shall be at least 20% higher at 7 days than that of companion test cylinders made in accordance with ASTM C-31, and not less than 3,000 psi (21 MPa) at 28 days.

Table 4-7. Filter and fabric specifications.

Property	ASTM Test Method	Unit	Required Value
Composition			Nylon
Weight (both layer)	D-5261	g/m	440
Thickness	D-5199	mm	0.76
Grab Tensile Strength	D-4632	N	1780 WARP 1110 FILL
Grab Tensile Elongation	D-4632	%	30 WARP 30 FILL
Wide Width Strip Tensile Strength	D-4595	kN/m	52.5 WARP 35 FILL
Elongation at Break	D-4595	%	15 WARP 20 FILL
Trapezoidal Tear Strength	D-4533	N	775 WARP 665 FILL
Apparent Opening Size (AOS)	D-4751	mm	0.425
Flow Rate	D-4491	l/min/m	3665

4.6.2. Installation

Immediately following receipt of fabric on the job site, fabric shall be inspected and stored in a clean, dry area where it will not be subject to mechanical damage or exposure to moisture or direct sunlight. Fabric allowed to become wet and then dried before installation will be subject to shrinkage.

The surface to be protected shall be constructed to the line and dimensions as shown on the contract drawings. The area shall be free of all obstruction and organic material, such as rocks and roots. Areas below grade shall be brought to grade using engineered fill or a drainage stone as specified by the Engineer. Anchor and flank trench installation will be in accordance with project plans and specifications.

The Unimat fabric panels shall be positioned, as specified by the Engineer, at their approximate design location. The factory assembled panels shall be joined in the field by means of sewing or zipper closures. Adjacent panels shall be joined top layer to top layer and bottom layer to bottom layer. The contractor must make the appropriate allowance for approximately 4% contraction of the fabric in each direction, which will occur as a result of grout injection. If joining of panels as described above is impractical, adjacent panels may be overlapped a minimum of 3 feet (900 mm), subject to Engineer's approval. In no case will simple butt joints between panels be allowed. However, a modified butt joint where an underlayment of similar fabric is sewn to one panel and overlapped a minimum of 2 feet (600mm) by the adjacent panel is allowed subject to Engineer's approval.

Following placement of the Unimat fabric panels, fine aggregate concrete (grout) shall be injected between the upper and lower layers of fabric through small slits cut in the upper layer of fabric. The injection pipe shall be wrapped tightly at the point of injection with a strip of burlap during pumping. First pump the upper edge of the mat which as been placed in the anchor trench followed by injection into the lower edge, working back up the slope. Avoid over-pressuring of the fabric. After pumping, the burlap shall be pushed into the slit as the injection pipe is withdrawn in order to minimize spillage of grout on the revetment surface. The burlap seal shall be removed prior to the final set of the fine aggregate concrete and the injection area hand-finished. The sequence of grout injection shall be such as to ensure complete filling of the revetment-forming fabric to the thickness specified by the fabric manufacturer.

Foot traffic will not be permitted on the freshly pumped mat when such traffic will cause permanent indentations in the mat surface. Walk boards shall be used where necessary. Excessive grout which has been inadvertently spilled on the mat surface shall be cleaned up with a broom and shovel. Use of a water hose to remove spilled grout from the surface of a freshly pumped mat will not be permitted. During grout injection, the mat thickness may be measured by inserting a short piece of stiff wire through the mat at several locations from the crest to the toe of the slope. Any mat measuring less than 90% of the average of all thickness measurements shall be re-injected until desired average thickness has been attained.

LIMITATIONS

BGC Engineering Inc. (BGC) prepared this document for the account of StrataGold Corporation. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

As a mutual protection to our client, the public, and ourselves all documents and drawings are submitted for the confidential information of our client for a specific project. Authorization for any use and/or publication of this document or any data, statements, conclusions or abstracts from or regarding our documents and drawings, through any form of print or electronic media, including without limitation, posting or reproduction of same on any website, is reserved pending BGC's written approval. A record copy of this document is on file at BGC. That copy takes precedence over any other copy or reproduction of this document.