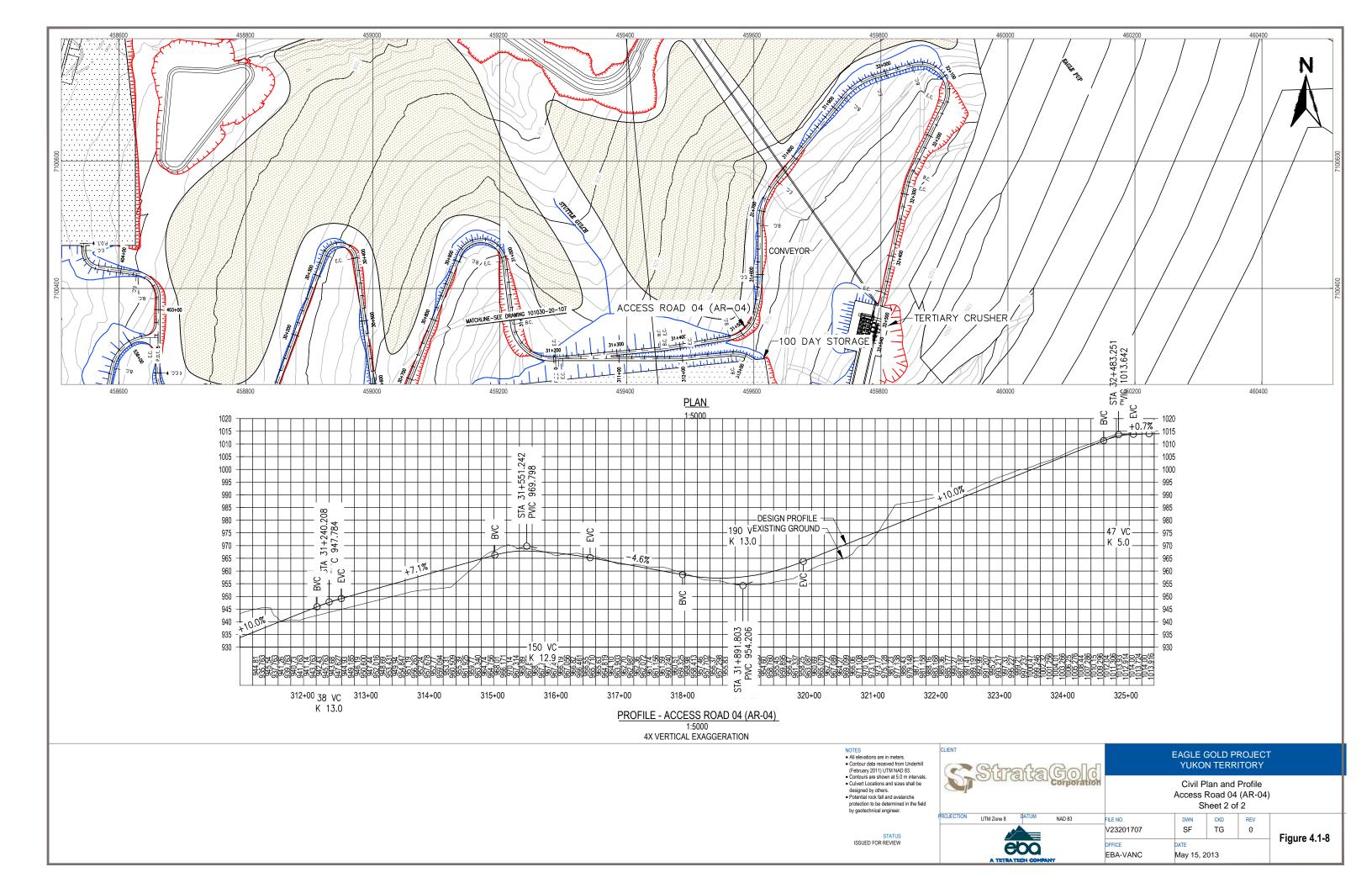
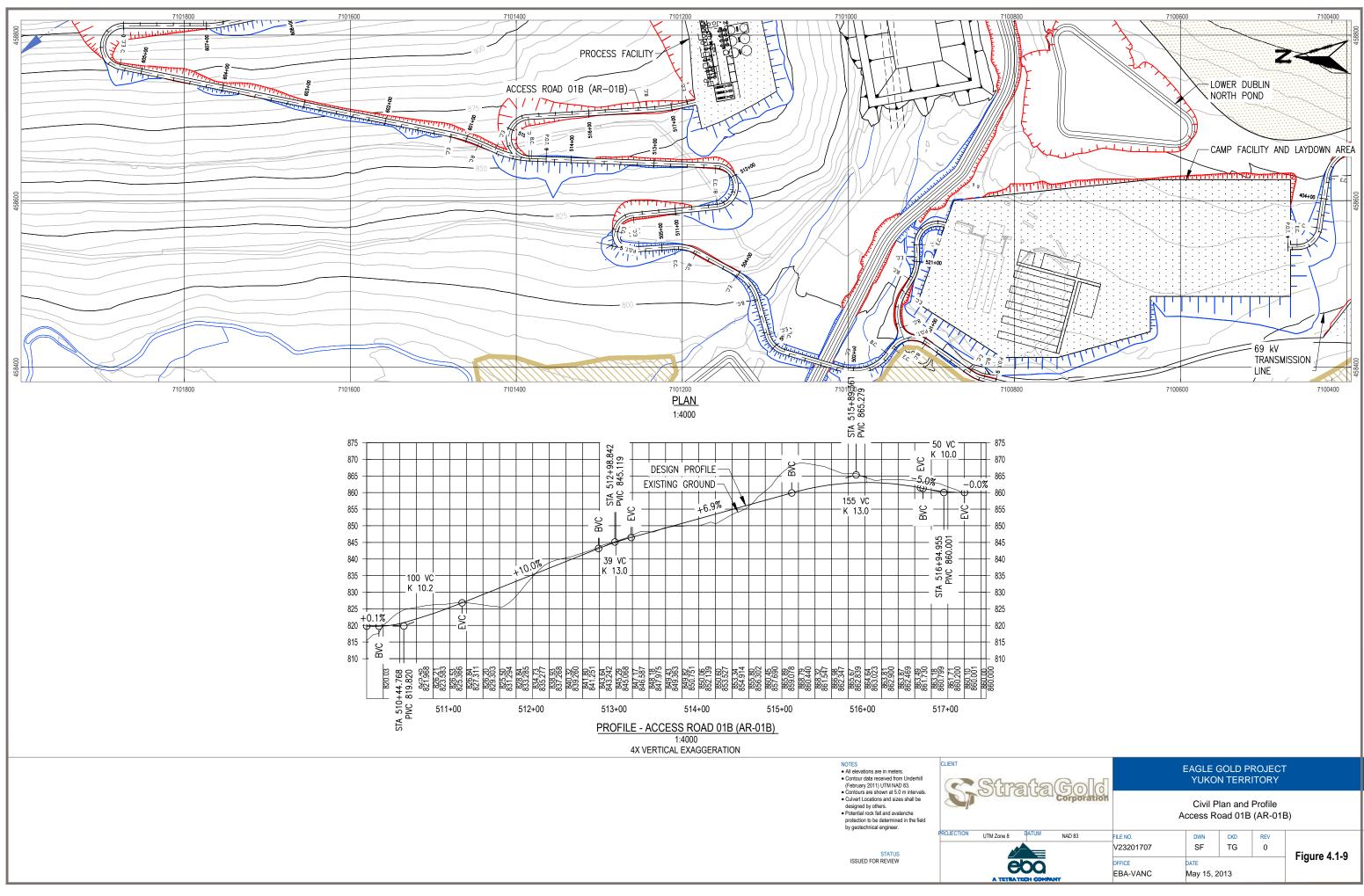
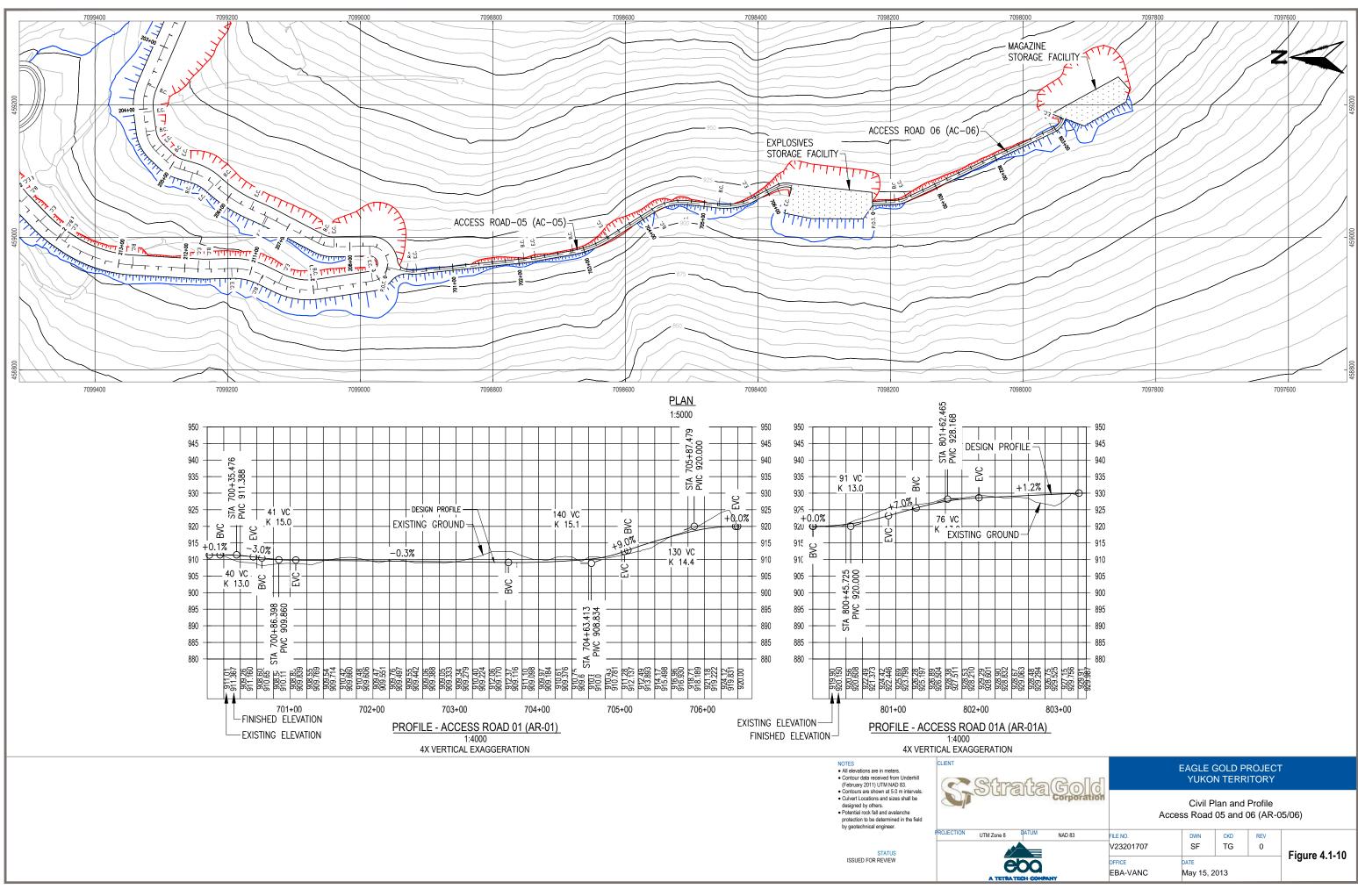


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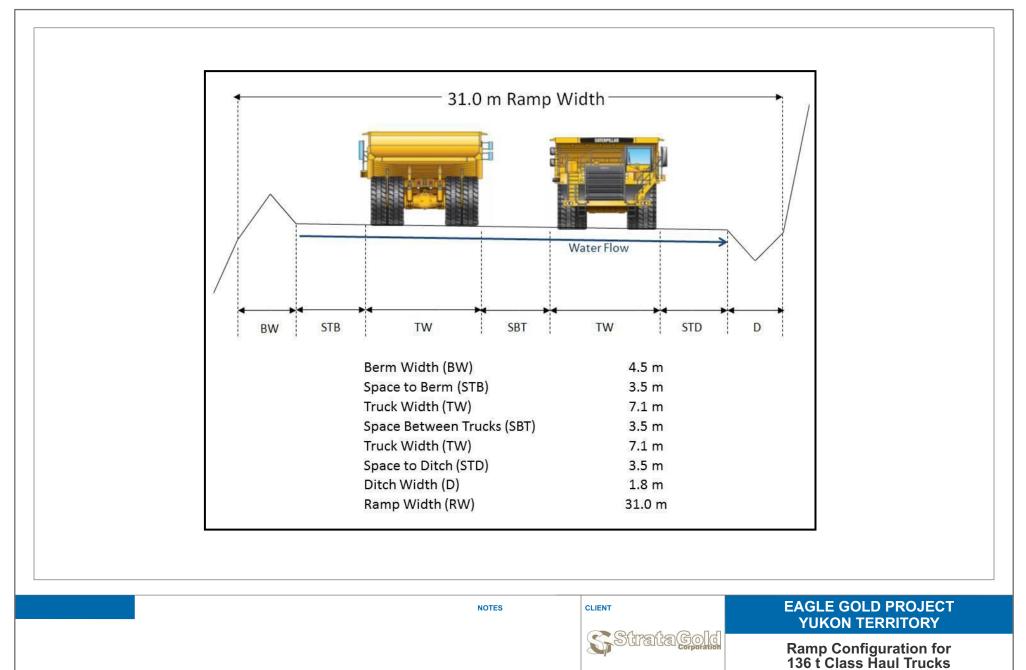




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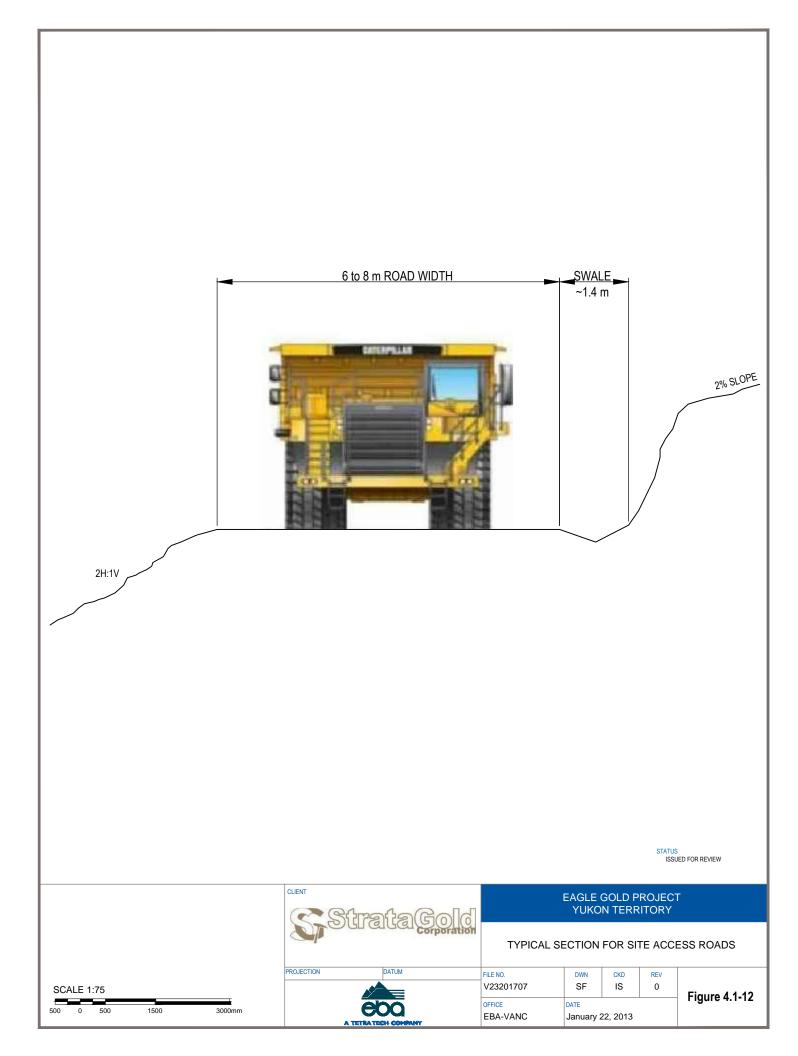
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Corporation	Civil Plan and Profile Access Road 05 and 06 (AR-05/06)						
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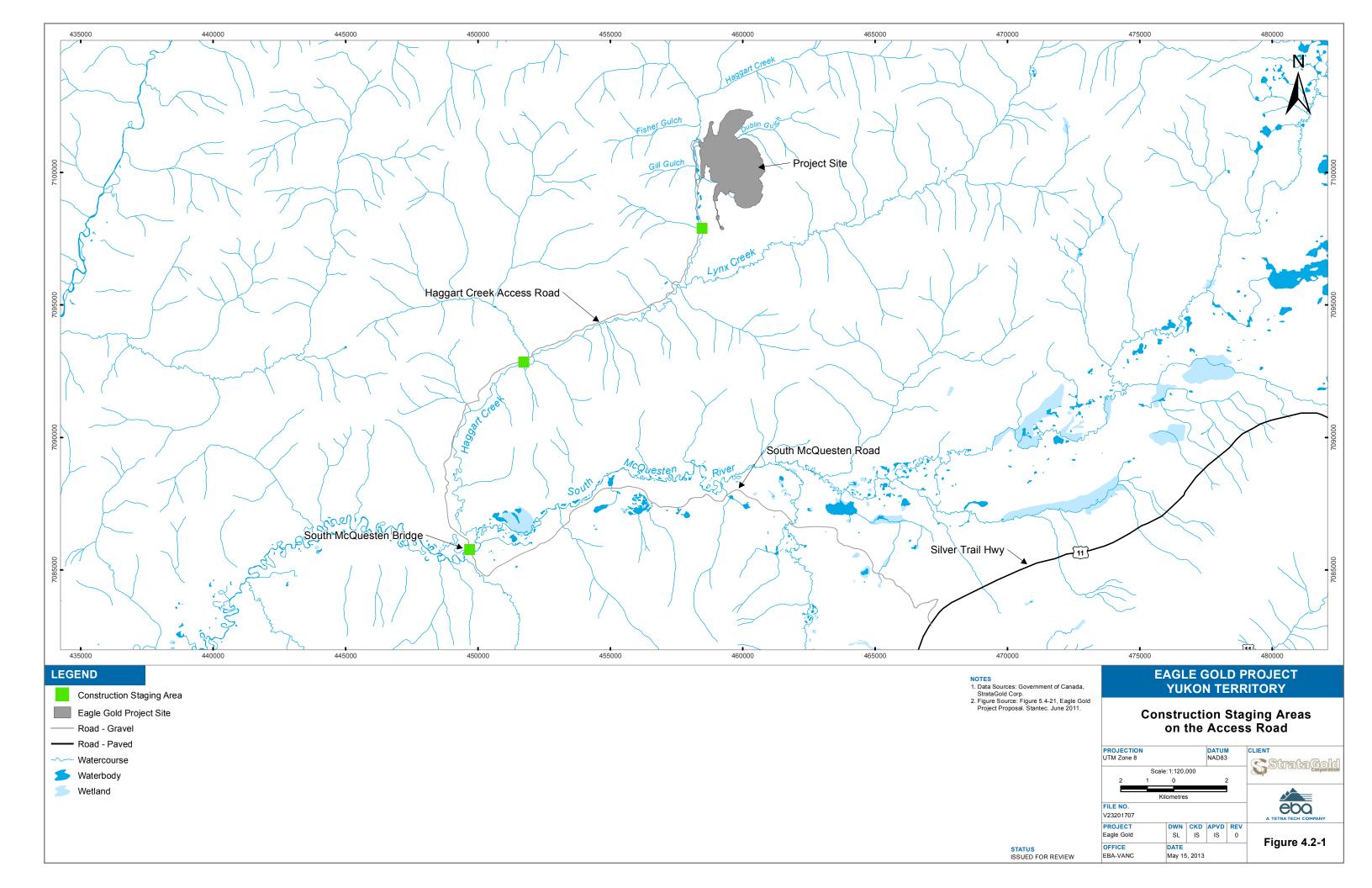


 
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## 5 BORROW SOURCES

#### 5.1 MINE SITE HAUL AND SECONDARY ROADS

All Project site road construction materials (main haul road and general service roads) will utilize local material sources produced in association with the construction of these roads. Where possible, cut-and-fill operations will be undertaken so as to provide an economical and balanced operation.

Several sources of borrow material have been identified, including the reworked materials from the existing placer tailings in the Dublin Gulch and Haggart Creek valley bottoms. These reworked materials are anticipated to provide additional borrow material for the mine site roads if required. It is estimated that approximately 1.85 million m<sup>3</sup> of fill materials are present in the Dublin Gulch and Haggart Creek valley bottoms that are potentially exploitable for use elsewhere as an engineering material. Producing engineered fills for road construction from the placer tailings will require targeted selection combined with crushing, screening and/or washing.

#### 5.2 ACCESS ROAD

Materials needed for upgrading of the HCR will be obtained from ditch cuts and side borrow cuts where these materials are usable, and from borrow pits where the cut materials are waste. Based on geotechnical evaluations conducted on the HCR, three potential borrow sources have been evaluated for the construction of pull-outs, grade improvements and for road surfacing material. The locations of these potential borrow sites are illustrated in Figure 5.1-1.

#### Borrow 1 - Sta. 24+800

The test pits (12289-TP20, -TP21, and TP22) that were excavated as part of the EBA (1996) study and located in the vicinity of Sta. 24+800, identified material considered suitable for the proposed road upgrades. The grubbing of the surficial organic layer and the stripping of underlying fine-grained sand and silt material are required and can be expected to range from 0.3 to 1.2 m in depth. The useable material beneath was found to be clean, well-graded gravel and coarse-grained sand to at least 3.2 m from grade. Combining some of the overlying fine grained soils with the clean gravel and sand was also determined to be acceptable.

#### Borrow 2 - Sta. 36+300

Boreholes BH10, BH11 & BH12 advanced in this area were restricted to the alignment right of way (RoW) due to the limited access available along the north side of the road, which was identified as a possible borrow source. The material encountered in the boreholes, and that of the previously drilled borehole 12289-BH05 (EBA 1996), confirmed useable granular materials for the proposed roadway upgrades. However, it was noted that silt contents ranging from 15 to 30% could potentially be encountered.

#### Borrow 3 – Sta. 37+000

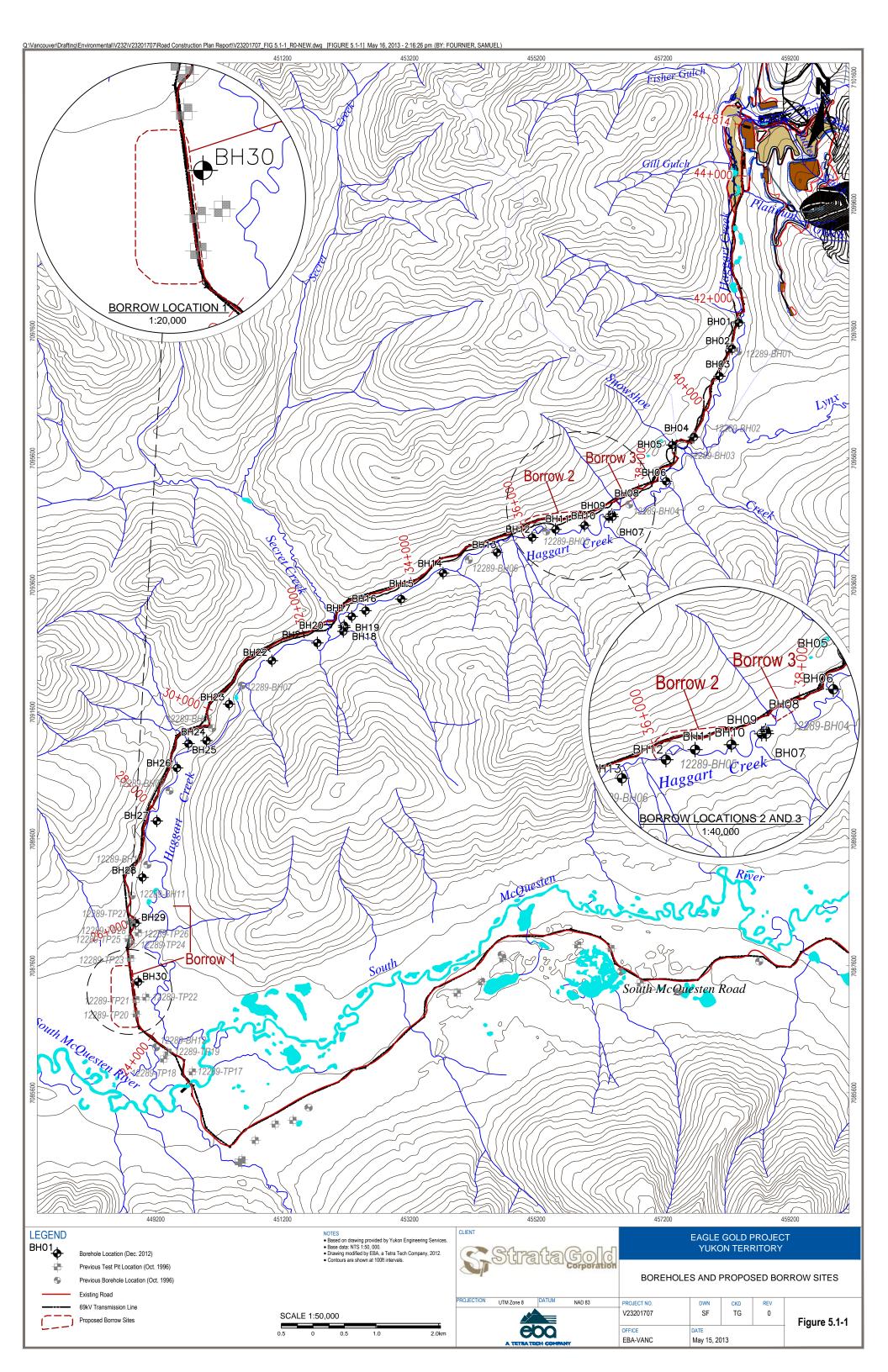
This area was originally identified as a possible borrow source based on borehole 12289-BH04, advanced as part of the EBA (1996) geotechnical study, where sand and gravel with silt contents less than 10% were encountered. Further exploration by means of test pitting with a tracked excavator will need to be completed to confirm subsurface conditions in this area.

The objective of the subgrade design of the HCR is to take advantage of the side-hill terrain as much as possible to minimize the hauling of embankment material and, where possible, to strategically locate sideborrows (ditch widening) and quarries. Borrow material required to complete the construction will include:

- 10,000 m<sup>3</sup> of road base material for general upgrades and grade raising
- 10,000 m<sup>3</sup> of base material for pullouts
- 1,000 m<sup>3</sup> of culvert bedding material for culvert installation
- 16,000 m<sup>3</sup> of road surfacing material

Borrow source requirements for the road are estimated at  $37,000 \text{ m}^3$  for base, bedding and road surfacing material. The identified borrow areas contain more than sufficient materials for the identified road upgrades, with approximately  $350,000 - 800,000 \text{ m}^3$  of undisturbed sand and gravel available among three undisturbed borrow areas, and an additional  $100,000 - 300,000 \text{ m}^3$  of lower quality material available in a deposit of placer tailings at Secret Creek. Some processing (i.e. crushing, screening and/or washing) may be necessary to produce the required materials.

The available borrow material is generally granular. The boulder or cobble material required will be sourced from existing, weathered placer mining spoils and therefore blasting of rock is not anticipated to be required. Geotechnically unsuitable cut material derived during road modification will be placed along the toe of constructed slopes to encourage vegetation, or used to recontour and reclaim exhausted borrow areas. Care will be taken to ensure that creek encroachment as a result of road modifications is avoided.



Section 6 Preliminary Schedule and Quantities

## 6 PRELIMINARY SCHEDULE AND QUANTITIES

Clearing and grubbing activities for the site haul roads is expected to commence in June of Stage 1 Construction, followed by topsoil excavation and haul road construction during the months of July and August.

Roads leading from the truck shop to the primary crusher and into the mine will be developed during the preproduction period. The total length of haul roads is approximately 2.4 km. The mining fleet will help excavate in the primary crusher area and ensure that a roadway around the crusher is developed to provide access to the lower lifts on the Eagle Pup WRSA.

Construction of additional site access roads is planned for June with the exception of the secondary road to the Temporary Ore Storage area. The total length of the site secondary roads is approximately 7.4 km, involving the excavation and placement of approximately 180,000 m<sup>3</sup> of material. Construction of the remaining 0.4 km of site access road to the Temporary Ore Storage area is planned for September involving the excavation and placement of approximately 8,000 m<sup>3</sup> of material.

# 7 GEOCHEMICAL EVALUATION

SGC contracted SRK to characterize the metal leaching and acid rock drainage (ML/ARD) potential of materials that will be used as borrow sources or excavated during construction of site roads and other infrastructure. Details of the methods used to characterize borrow sources are provided in the SRK 2013 Report, *Geochemical Characterization of Proposed Excavation Areas and Borrow Sources from the Eagle Gold Project*, appended to this Stage 1 Construction Plan (Appendix F to the General Site Plan – Stage 1 Construction) which is summarized here.

Samples representing the excavation and borrow areas were selected for testing from a set of samples collected from test pits and drill holes in 2011 by BGC Engineering Inc. as part of the geotechnical investigation for the Project. Additional road and borrow samples were collected by SGC site staff in July 2012. Where possible, road sampling was completed at existing exposures to limit the disturbance of woodland environments. In all cases, the sampling objective was to determine the potential for ML/ARD in materials that may be used for construction purposes in the future.

SRK assessed the acid rock drainage (ARD) potential of the samples using the following criteria:

- Where the total sulphur content was less than 0.02% (corresponding to an acid potential (AP) of 0.6 kg CaCO<sub>3</sub> eq/t), the samples were classified as non-reactive.
- Where the total sulphur content was greater than 0.02%, and the NP/AP ratio or TIC/AP ratio was greater than 3, the samples were classified as non-potentially acid generating (non-PAG).
- Where the total sulphur content was greater than 0.02% and the NP/AP or TIC/AP ratio was between 1 and 3, the samples were classified as having an uncertain potential for ARD.
- Where the total sulphur content was greater than 0.02% and the NP/AP or TIC/AP ratio was less than 1, the samples were classified as potentially acid generating (PAG).

The total sulphur cut-off of 0.02%, used to define non-reactive samples in this classification scheme is considered highly conservative, particularly given that many of these samples were surficial material that have been exposed to air and water throughout their geological history.

Detailed sample descriptions are found in SRK (2013). Table 7.1-1 provides a summary of results according to material type and ARD classification.

		ARD Classification (% of Samples)							
	Number of Samples	Non-Reactive S <0.02%	Non-PAG		Uncertain		PAG		
Group			NP/AP	TIC/AP	NP/AP	TIC/AP	NP/AP	TIC/AP	
Site Roads	34	76%	9%	0%	12%	3%	3%	21%	
Placer Tailings	19	63%	5%	16%	21%	16%	11%	5%	
Excavation Areas (surficial materials)	14	57%	29%	21%	7%	21%	7%	0%	
Excavation Areas (rock)	5	20%	40%	20%	20%	20%	20%	40%	

Table 7.1-1: ARD Classification for Each Group of Samples

In total, 72 samples were collected and analyzed for this study including 34 from the proposed site roads, 19 from placer tailings and alluvium borrow sources and 19 from potential cut and fill (excavation) areas. Most of these samples (n=66) were from surficial materials, five were from meta-sedimentary bedrock, and one was from a granodiorite outcrop.

The paste pH for the samples ranged from 4.6 to 8.6 (median values of 6.6). The samples typically had low sulphur and low NP and TIC levels. This is in contrast to the characterization work from the deposit area that states NP in the form of carbonate minerals was present in modest amounts throughout the deposit area. Based on having a sulphur content of <0.02%, 65% of samples were considered non-reactive. For the remaining samples, based on NP/AP or TIC/AP ratios, 7 to 14% were PAG, 11 to 14% had an uncertain potential for ARD, and 10 to 14% were non-PAG.

The majority of these samples represent surficial materials such as soils, weathered bedrock (colluvium), or gravels (alluvium or placer tailings). These differ from blasted rock from rock quarries or mine workings because their particle surfaces have already been exposed to air and water. Therefore, whether these remain *in situ* or are moved to a new location, they will continue to weather and oxidize at rates comparable to current weathering rates, which are quite slow.

In addition, it is likely the sulphides present in these materials were largely encapsulated within larger gravel to cobble size particles and would be unavailable for reaction. The result of moving these materials and using them for construction is not expected to result in any change relative to their current locations. In other words, while 7 to 14% of samples are PAG, and an additional 11 to 14% are classified as having an uncertain ARD potential, these materials still pose a relatively low risk for ARD potential and are considered suitable for use as construction material.

There were five meta-sedimentary rock samples taken from proposed excavation areas, and one granodiorite sample from one existing site road. Three of the meta-sedimentary samples and the one granodiorite sample were non-reactive or non-PAG, while two of the meta-sedimentary samples were PAG by either or both NP/AP ratios and TIC/AP ratios. Although the volumes of rock that would need to be excavated within construction areas are expected to be relatively small, these results indicate excavations within the meta-sedimentary rock unit will need to be monitored for ARD potential. Monitoring methods are described in the Construction Phase Environmental Monitoring Plan (Appendix K to the General Site Plan – Stage 1 Construction).

Where present, materials with elevated sulphide content will be managed. Because of the low proportion of this type of material, such material can be diluted with construction rock material where excess NP from the majority of the rock material would be sufficient to maintain neutral pH conditions.

Solid-phase metal analyses were also completed on borrow and excavation samples. Metals that showed consistent enrichment across the data set were silver, arsenic, and bismuth. To a lesser extent, enrichment was also seen in lead, gold, cadmium, antimony, potassium, and tungsten. SRK (2011) identifies those same metals, but also indicates elevated concentrations of manganese, uranium, copper, fluoride, molybdenum, nickel, and zinc may also be present in seepage from waste rock storage areas and pit walls. However, elevated concentrations of these last eight metals are not observed in the current sample set, likely reflecting differences in the geology (i.e., predominantly granodiorite versus meta-sedimentary rocks), increased distances from the ore mineralization, and weathering processes already occurred in the surficial materials.

## 8 GEOTECHNICAL TESTING

SGC and predecessor companies involved with development of quartz mining at Dublin Gulch have engaged in numerous and extensive site investigations, which have examined subsurface conditions at the locations of proposed mine site infrastructure using a variety of field and laboratory techniques. Given the presence of discontinuous permafrost in the area, close attention was given to observing and describing frozen ground in all of these investigations, including observations of excess ice where encountered. These investigations have resulted in reasonably accurate volume estimates of borrow sources and ice-rich material throughout the Project site.

Site subsurface conditions observed at the Project site prior to 2012 have been described in several reports as follows:

- 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. 2011. Project Proposal for Executive Committee Review. Pursuant to the Yukon Environmental and Socio-Economic Assessment Act/ Eagle Gold Project, Victoria Gold Corp. June 2011.
- 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, Project Memorandum, April 21, 2011; Appendix 34 in Stantec 2011. 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. 2012 Geotechnical Investigation for Mine Site Infrastructure, Factual Data Report. Eagle Gold Project, prepared for Victoria Gold Corporation, December 2012.

In 2010, BGC developed a geotechnical site investigation program in support of the Feasibility Study 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. In addition, three cut slopes were logged for exposed soil and rock conditions, and core from one condemnation hole drilled by SGC was logged for geotechnical purposes.

Section 8 Geotechnical Testing

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.

This site investigation program was conducted to investigate subsurface conditions at the crushers, the truck shop, the topsoil stockpiles and other ancillary facilities. The investigation program was conducted in June and July 2012 and the field activities involved the excavation of thirty-nine test pits, advancement of five diamond drill 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.

Samples were taken from select test pits and boreholes for index testing of soil and strength testing of rock. Bulk samples of placer tailings were also collected for analysis for potential use as concrete aggregate. A comprehensive range of laboratory testing has been carried out to adequately characterize the engineering properties of the onsite materials.

Section 9: Best Management Practices

# 9 BEST MANAGEMENT PRACTICES

A suite of mitigation measures has been prepared by SGC to minimize or avoid effects on the environment. Principal among these mitigation measures are those incorporated directly into the Project design. These include; minimizing riparian clearing, incorporating fish habitat features into the Dublin Gulch Diversion Channel design, conducting in-stream works during least risk periods, and incorporating a mine water treatment plant capable of meeting water quality guidelines for aquatic life.

In addition, best management practices will be implemented to manage effects and avoid adverse effects on fish habitat. As a final mitigation measure, fish habitat compensation will off-set any loss of habitat that occurs as a result of mine infrastructure construction. Dublin Gulch is the only fish-bearing watercourse that lies within the footprint of the mine. The remaining watercourses inside the perimeter of the mine footprint are non-fish bearing.

# 9.1 SEDIMENT AND EROSION CONTROL

All necessary sediment and erosion control mitigation measures will be in place and operational prior to road construction.

Sediment mobilization and erosion will be minimized by:

- Limiting the extent of land disturbance to the practical minimum
- Reducing water velocities across the ground, particularly on exposed surfaces and in areas where water concentrates
- Progressively rehabilitating disturbed land and constructing drainage controls to improve the stability of rehabilitated land
- Protecting natural drainages and watercourses by constructing appropriate sediment control devices such as collection and diversion ditches, sediment traps, rock energy dissipaters, and sediment basins
- Installing rock riprap, channel lining, sediment filters or other suitable measures in ditches on steep gradients, as required
- Restricting access to rehabilitated areas
- Directing all surface runoff to the appropriate water management pond
- Constructing surface drainage control to intercept surface runoff
- Constructing appropriate measures (e.g., silt fences, hay bales) downslope of disturbed sites (where more permanent sediment control measures are not appropriate, or in combination with more permanent measures)
- Implementing soil bioengineering techniques to contain sediment and enable disturbed surfaces to recover

Installation of temporary erosion and sediment control features or "Best Management Practices" (BMPs) will be the first step towards controlling erosion and sedimentation during construction. All temporary sediment and

erosion control features will require regular maintenance and inspection after each significant rainfall. These temporary features will be reclaimed after achieving soil and sediment stabilization

Additional information is provided by the Construction Phase Sediment and Erosion Control Plan (Appendix C to the General Site Plan – Stage 1 Construction).

### 9.2 DUST CONTROL

Dust control measures for the Project site will be implemented on a case-by-case basis to ensure that mitigation measures are effectively ensuring worker health and safety and minimizing environmental effects. Best management practices and mitigation measures to be implemented will include the following:

- Minimize disturbances and manage all land clearings.
- Construct haul roads with low silt content material.
- Enforce low speed limits for all mobile mine equipment.
- Apply water as a dust suppressant using appropriate equipment (e.g., a tanker truck with spray bars) to open surfaces and heavily used roads (in the summer months). The equipment will be kept on-site during construction and used as needed to maintain moist surfaces and suppress visible dust emissions.
- Water active roads in hot, dry conditions, unless meteorological conditions (e.g., rain, frozen surfaces, etc.) are adequate to suppress dust to a degree that is equivalent to 3-hour periodic watering.
- Conduct visual inspections, as required, to dentify and address potential dust emissions.
- Provide timely response to complaints.
- Ensure procedures are implemented to document the inspections, complaints, responses, and actions taken.
- Record fugitive dust suppression activities daily using a fugitive dust suppression log.
- Make available the fugitive dust suppression log to Yukon regulatory authorities as required.

Dust control details are provided in the Dust Control Plan (Appendix J to the General Site Plan – Stage 1 Construction).

### 9.3 SITE ISOLATION

Prior to roadway construction taking place, SGC staff will flag environmental sensitive areas and wildlife habitat features (e.g., mineral licks, dens, nest trees, snags, rocky outcrops, small ponds/seepages) to determine if they can be maintained. Construction activities adjacent to watercourses will be carried out with brush mowers or chainsaws to minimize environmental damage to the greatest extent possible. In riparian areas, trees within 10 m of the ordinary high water mark will be close cut and the stumps will be left in place to ensure bank stability is retained.

Section 9: Best Management Practices

### 9.4 CULVERT INSTALLATION

Storm water management culverts will be constructed at a number of locations to direct water beneath the roadway between road ditches and will not impact existing stream systems. During the installation of these culverts, silt fencing or other sediment control measures will be installed and properly maintained at the base of slopes for the duration of site preparation, construction, installation of riprap (if required), and revegetation to ensure sedimentation is adequately controlled.

### 9.5 ENVIRONMENTAL MONITORING

SGC has developed a Construction Phase Environmental Monitoring Plan in support of an application for a Quartz Mining License (Appendix K to the General Site Plan – Stage 1 Construction). The plan includes environmental monitoring objectives, work completed to date, and methods for a variety of technical disciplines throughout the construction phase of the Project. The scope of this plan is limited to monitoring during construction and accounts for the transition from *environmental* baseline data collection to monitoring of potential construction related effects. The two primary objectives of this plan are:

- To collect data to detect potential Project related effects to the environment during construction.
- To collect continuous environmental data to augment the existing baseline characterization data set to inform the need and method of adaptive management if required.

Maintaining collection of environmental baseline data prior to and throughout the Project life will provide a continuous dataset that can be used to identify temporal trends, minimize potential uncertainties associated with missing temporal segments, and ensure the variability of baseline is well understood prior to and during the period of compliance monitoring.

This construction monitoring plan will be expanded to a comprehensive Environmental Monitoring and Surveillance Plan and submitted as application for Type A Water Use and Quartz Mining Licenses required prior to operations, closure and reclamation, and the post-closure Project phases

## 9.6 DECOMMISSIONING AND CLOSURE

All roads that will not be required for access post-closure (e.g., during monitoring activities) will be reclaimed. The site will be returned to a landscape that is comparable to surrounding areas for permanent closure at the end of the life of the mine. This will involve re-grading of the road, re-sloping the topography, scarifying disturbed areas, placement of any stockpiled stripping material and re-vegetation of the site. Soil replacement for these disturbances will be to the same depth that was originally salvaged from the disturbance site; the material will be sourced from adjacent windrows or soil stockpiles.

Culverts will be removed and associated fill material will be recontoured as appropriate to re-establish natural drainage patterns and stream flows. Priority areas for reclamation and closure will include those that could result in increased sedimentation into adjacent watercourses, altering both water quality and fish habitat.

Further details on the future decommissioning and closure of roads is provided in the Preliminary Decommissioning and Reclamation Plan (Appendix D to the General Site Plan – Stage 1 Construction).

Section 9 Best Management Practices

Following closure of the HLF and site facilities, the main access road within the Project area, from Haggart Creek (at the confluence with Dublin Gulch) to the process plant site, will be permanently closed and reclaimed. The one exception will be the road that provides access to the Potato Hills as this has been identified as an important area for traditional use. The road will be left in a semi-permanent, deactivated condition, which will allow the road to remain passable and be environmentally stable.

The remaining linear disturbances such as exploration roads, tote roads, trenches and drill sites will be progressively reclaimed during the life of the mine as they become available.