MONITORING, SURVEILLANCE AND REPORTING PLAN

REVISION 2

January 2013

KENO HILL SILVER DISTRICT MINING OPERATIONS

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1 INTRODUCTION

This plan is comprised of the monitoring, surveillance and reporting that will be carried out to ensure that the Keno Hill Silver District (KHSD) Mining Operations are managed in a manner that provides human and environmental protection. The framework of this plan includes monitoring and reporting of:

- The local and receiving environment through scheduled inspections and sample programs;
- Effluent discharge points and treatment system performance;
- Site facilities and incorporated design measures to ensure structural stability and prevention of accidents and malfunctions;
- Remediation success; and
- Adaptive management responses.

If monitoring indicates that physical structures, treatment systems or mitigative measures are not performing, then maintenance or contingency plans can be implemented following an adaptive management approach as discussed in Section 11 (Access Consulting Group, 2012a).

Prior to mine development in the KHSD, a number of monitoring programs and a surveillance network were already in place as per care and maintenance activities (Water Licence QZ06-074), advanced exploration and preliminary development activities at the Bellekeno mine (Water Licence QZ07-078) as well as district-wide closure and new mine permitting studies. These programs include but are not limited to physical inspections, a water quality surveillance network, old mine workings monitoring, aquatic resources monitoring for benthic invertebrate and fisheries populations, sediment monitoring, waste rock and mine wall sampling and the Adaptive Management Plan. Monitoring, surveillance and reporting applicable to Bellekeno, Onek and Lucky Queen mines are presented in this plan.

2 WATER QUALITY SURVEILLANCE NETWORK

Currently water quality monitoring is required under care and maintenance Water Licence QZ06-074, Bellekeno advanced exploration and preliminary development Water Licence QZ07-078, and Bellekeno mine Water Licence QZ09-092. Each Water Licence provides Effluent Quality Standards which dictate maximum concentrations of specific parameters allowed to be discharged at locations where water treatment is being undertaken. In addition to the monitoring of treated effluent discharge and associated adits, background surface water stations upstream of project facilities are also monitored along with the receiving environment. Monitoring wells are used to measure and sample groundwater in the receiving environment and have been established as per Water Licence QZ09-092. Refer to Appendix A for Type A Water Licence QZ09-092, which specifies Effluent Quality Standards (Part D), monitoring and surveillance (Part F and Schedule B) and Reporting (Part G) required for the Bellekeno mine.

A Groundwater Monitoring Plan for the Bellekeno mine has been developed per Water Licence QZ09-092 in February 2011 and was updated in July 2012 to include the Onek and Lucky Queen mines (see Appendix B). This plan outlines monitoring locations and frequency for the Keno District mill and Dry Stack Tailings Facility, the N-AML waste rock disposal areas (Bellekeno and Lucky Queen), and Keno City. Groundwater wells are scheduled for monthly monitoring for both water level and quality for 12 months to establish well conditions, followed by quarterly sampling thereafter, for the duration of the project.

Additional surface water quality stations and monitoring wells are proposed as a result of mining activities at Onek and Lucky Queen. Table 1 outlines the existing and proposed (highlighted in green) sampling stations and schedule for internal and external lab analysis in the area of the Bellekeno, Onek and Lucky Queen mines and in the vicinity of the mill site. Figure 1 and Figure 2 show these existing and proposed surface water and Groundwater monitoring station locations, respectively.

Hydrology monitoring is undertaken on a continuous basis during the open water season at stations on Christal Creek (KV-6 and KV-7) and Lightning Creek (KV-41). It has been recommended that a water level recorder with staff gauge be installed at KV-52 to validate inputs from the natural spring to the Christal Creek catchment. Additional hydrology monitoring stations are planned for the South McQuesten River at KV-1 (upstream of Christal Creek), KV-4 (downstream of Flat Creek) and KV-51 (downstream of Hinton Creek). Instantaneous measurements of flow are also collected during monthly/quarterly sample events at all stations possible.

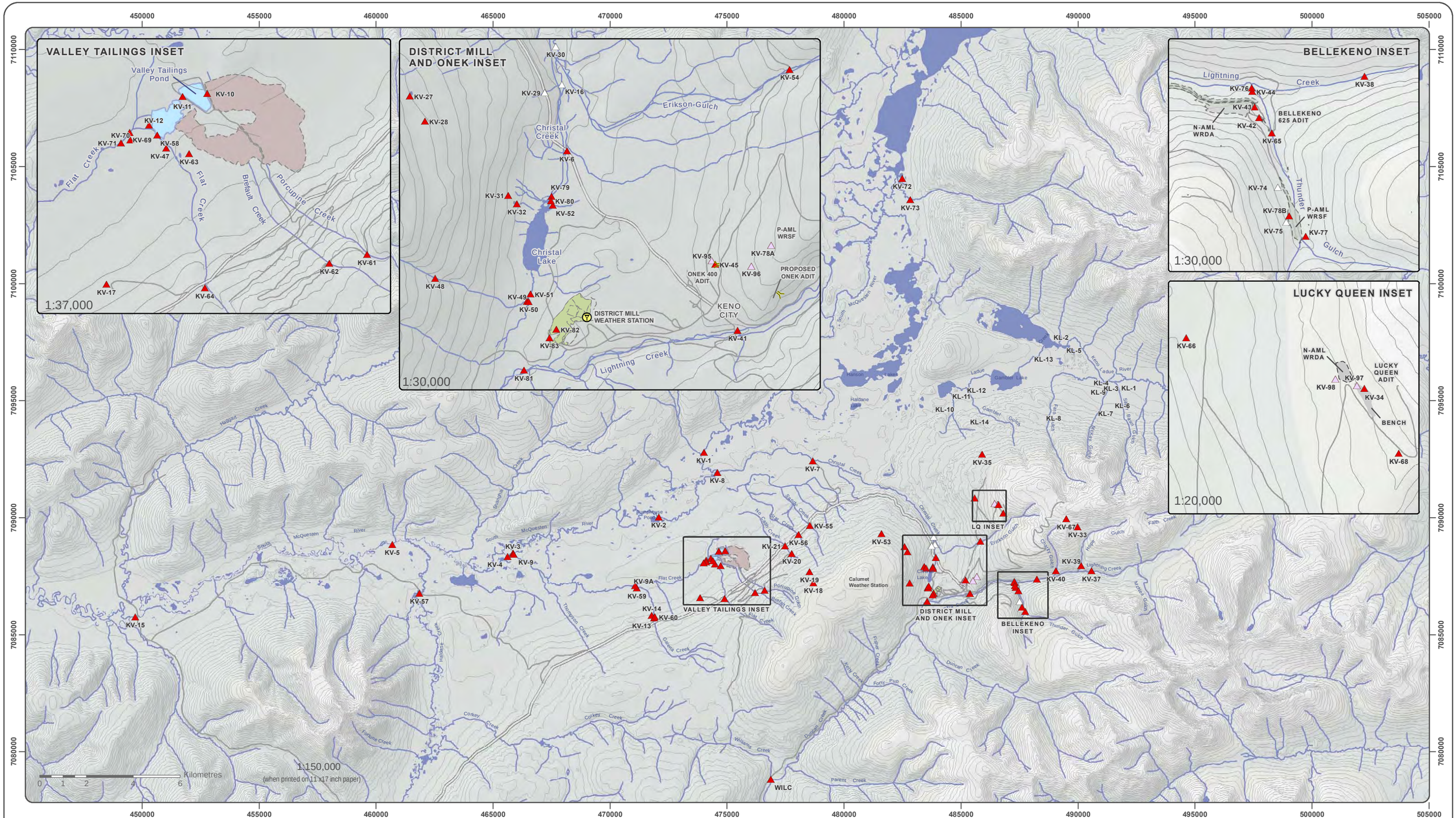
Quality assurance and quality control (QA/QC) protocols have been implemented during collection, storage and shipping of samples. QA/QC procedures conducted by field and laboratory staff including duplicate relative percent difference analysis, analytic matrix spikes, spike blanks, and field, trip and method blanks.

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Table 1 Keno Hill District Mining Operations Water Quality Monitoring Program Summary

SITE	SITE DESCRIPTION	WATER LICENCE	INSITU MEASUREMENTS / INTERNAL ANALYSIS								EXTERNAL LAB ANALYSIS														
		QZ09-092 Existing & Proposed Monitoring	Level	Flow	pH	Temperature	Conductivity	Total Zn	Ammonia	Turbidity	Total Metals	Dissolved Metals	Hardness	pH	Conductivity	TSS	Alkalinity	Sulphate	Nitrate	Nitrite	Ammonia-N	DOC	Total Phosphorous (colourimetric)	Radium 226	Acute Lethality LC50 Rainbow Trout 96 Hour
Mine Treatment / Effluent Discharge Sites																									
KV-42	Bellekeno 625 Adit	Existing	-	C	D	D	D	D	D	D	W	W	W	W	W	W	W	W	W	W	W	M	W	-	-
KV-43	Bellekeno 625 Settling Pond Decant	Existing	-	C	D	D	D	D	D	D	W	W	W	W	W	W	W	W	W	W	W	W	W	Q	M
KV-82	Flame and Moth Mill Site Collection and Sediment Pond	Existing	D	-	D	D	D	D	D	D	M	M	M	M	M	M	M	M	M	M	M	M	M	-	-
KV-83	Flame and Moth Mill Treatment Plant Discharge	Existing	-	C-WD	D-WD	D-WD	D-WD	D-WD	D-WD	D-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	Q-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W/Q	M-WD
KV-45	Onek Adit	Existing - Revised	-	D	D	D	D	D	D	D	W	W	W	W	W	W	W	W	W	W	W	W	W	-	-
KV-78A	Onek P-AML Waste Rock Storage Facility	Existing - Revised	-	-	Ms	Ms	Ms	-	-	-	Q	Q	Q	Q	Q	Q	-	Q	-	-	-	-	-	-	-
KV-96	Onek 990 Settling Pond Decant	Proposed	D-WD	D-WD	D-WD	D-WD	D-WD	D-WD	D-WD	D-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W/Q	M-WD
KV-34	Lucky Queen Adit (underground)	Existing - Revised	-	D	D	D	D	D	D	D	W	W	W	W	W	W	W	W	W	W	W	W	W	-	-
KV-97	Lucky Queen Settling Pond Decant	Proposed	D-WD	D-WD	D-WD	D-WD	D-WD	D-WD	D-WD	D-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W/Q	M-WD
Mine Surface Water Surveillance Sites																									
KV-1	South McQuesten River u/s Christal Creek	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-2	South McQuesten River @ Pumphouse	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-6	Christal Creek @ Keno Highway	Existing	-	C	M	M	M	-	-	-	M	M	M	M	M	M	M	M	M	M	M	M	M	-	-
KV-7	Christal Creek @ Hanson Road	Existing	-	M	M	M	M	-	-	-	M	M	M	M	M	M	M	M	M	M	M	M	M	-	-
KV-8	Christal Creek @ mouth	Existing	-	M	M	M	M	-	-	-	M	M	M	M	M	M	M	M	-	-	-	M	M	-	-
KV-37	Lightning Creek u/s Hope Gulch	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-38	Lightning Creek u/s Thunder Gulch	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-39	Hope Gulch u/s Lightning Creek	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-40	Charity Gulch u/s Lightning Creek	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-41	Lightning Creek u/s Brige @ Keno City	Existing	-	C	M	M	M	-	-	-	M	M	M	M	M	M	M	M	M	M	M	M	M	-	-
KV-44	Bellekeno 625 Seep	Existing	-	Ms	Ms	Ms	Ms	Ms	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	-	Q
KV-49	Hinton Creek u/s Christal Creek	Existing	-	M/Q	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	-	-
KV-50	Christal Creek u/s Hinton Creek	Existing	-	M/Q	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	-	-
KV-51	Christal Creek d/s Hinton Creek	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	-	-
KV-52	Natural spring to Christal Lake @ Old Mackeno Pumphouse	Existing	-	M	M	M	M	-	-	-	M	M	M	M	M	M	M	M	-	-	-	M	M	-	-
KV-65	Thunder Gulch u/s of Bellekeno 625	Existing	-	Q	Q	Q	Q	-	-	-	M	M	M	M	M	M	M	M	-	-	-	M	M	-	-
KV-72	South McQuesten River @ McQuesten Lake	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-76	Thunder Gulch d/s Bellekeno 625	Existing	-	Q	Q	Q	Q	Q		-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	M
KV-77	Thunder Gulch u/s Bellekeno East	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-78B	Bellekeno East Temporary Waste Rock Storage Facility	Existing	Ms	-	Ms	Ms	Ms	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-79	Christal Creek d/s MacKeno Tailings	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-80	Christal Creek u/s Mackeno Tailings	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
KV-81	Lightning Creek Southwest of Mill Site	Existing	-	Q	Q	Q	Q	-	-	-	Q	Q	Q	Q	Q	Q	Q	Q	-	-	-	Q	Q	-	-
Mine Groundwater Monitoring Wells																									
KV-84	Well SW of Onek 400 adit (deep); Keno City Well	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	-	-
KV-85D	Flame and Moth Site Groundwater Well #1 (PH2) Deep	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-85S	Flame and Moth Site Groundwater Well #1 (Shallow)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-86	Flame and Moth Site Groundwater Well #2 (PH5)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-87	Flame and Moth Site Groundwater Well #3 (PH6)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-88D	Flame and Moth Site Groundwater Well #4 (Deep)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-88S	Flame and Moth Site Groundwater Well #4 (Shallow)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-89D	Flame and Moth Site Groundwater Well #5 (Deep)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-89S	Flame and Moth Site Groundwater Well #5 (Shallow)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-91	Bellekeno Waste Rock Disposal Area well #1	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-92	Bellekeno Waste Rock Disposal Area well #2	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-93	Bellekeno Waste Rock Disposal Area well #3	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-94	Bellekeno Waste Rock Disposal Area well #4	Existing	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
ON-MW-1	Onek Monitoring Well	Proposed	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
ON-MW-2	Onek Monitoring Well d/g Project Facilities	Proposed	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
KV-98	Lucky Queen N-AML Waste Rock Dump	Proposed	-	Ms	Ms	Ms	Ms	Ms	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-
LQ-MW-1	Lucky Queen Monitoring Well d/g N-AML WRDA	Proposed	M/Q	-	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q	-	-

C = Continuous
C-WD = Continuous While Discharging
D = Daily
D-WD = Daily While Discharging
W = Weekly
W-WD = Weekly While Discharging
W/Q = Weekly migrating to quarterly to accord with monitoring frequency pursuant to MMER
M = Monthly
Ms = Monthly (May - Oct)
M/Q = Monitoring to occur monthly for first 12 months, reverting to quarterly thereafter.
Q = Quarterly



National Topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000. Cadastral data compiled by Natural Resources Canada. Reproduced underlicense from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved. Mill district inset hydrography derived from 2006 aerial imagery obtained from Aero Geometrics, Calgary Alberta.

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Datum: NAD 83; Map Projection: UTM Zone 8N

- Monitored
- Pending
- Discontinued
- Adit
- Weather Station
- Highway
- Secondary Road
- Watercourse
- Contour (100 feet)
- Waterbody
- Valley Tailings Pond
- Tailings
- Keno District Mill Site

AKHM
ACCESS

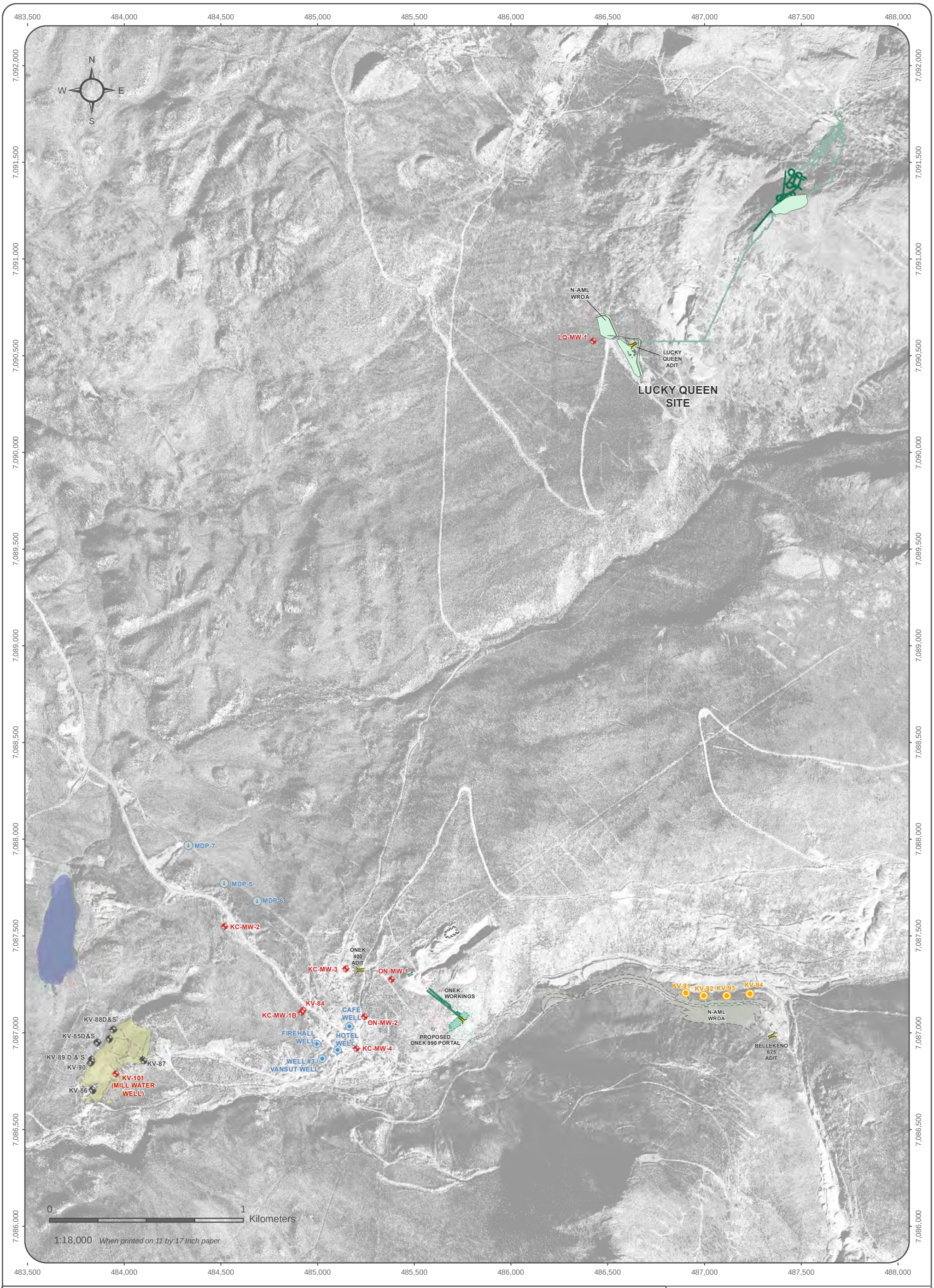
KENO HILL SILVER DISTRICT MINING OPERATIONS

FIGURE

KENO HILL SURFACE WATER QUALITY STATION LOCATIONS

AUGUST 2012

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Proposed Groundwater Well
Groundwater Well
Geotechnical Well
Private Drilled Well
Public Drilled Well
Manual Drive Point
Proposed Footprints
Existing Fooprints
District Mill
Highway
Local

KENO HILL SILVER DISTRICT MINING OPERATIONS

FIGURE 2

KENO HILL SILVER DISTRICT GROUNDWATER MONITORING LOCATIONS

SEPTEMBER 2012

Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13th and 14th 2006. Site hydrography and contours derived from 2006 aerial imagery obtained from Aero Geometrics, Calgary Alberta. Datum: NAD 83; Projection: UTM Zone 8N

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3 ENVIRONMENTAL EFFECTS MONITORING (UNDER MMER)

The KHSD mines are subject to the Metal Mining Effluent Regulations (MMER), administered under the federal Fisheries Act, which apply to mining and milling operations that discharge effluent(s) at a rate greater than 50 m3/day. The MMER outline requirements for routine effluent monitoring, acute lethality testing, Environmental Effects Monitoring (EEM) and provides maximum authorized limits of deleterious substances.

Effluent monitoring under MMER tends to overlap with that required under Water Licence QZ09-092; although, unlike the Water Licence. a reduction or increase in monitoring frequency may be triggered based on analysis results. Maximum authorized concentrations of deleterious substances (MMER Schedule 4, see Table 2 below) in a grab sample are less restrictive than the requirements of Water Licence QZ09-092; however a maximum authorized monthly mean concentration is also identified in the MMER, which is half the concentration allowed in a grab sample. The MMER also requires Daphnia magna monitoring tests at the same time as acute lethality testing.

Table 2 MMER Authorized Limits of Deleterious Substances

Item	Column 1 Deleterious Substance	Column 2 Maximum Authorized Monthly Mean Concentration	Column 3 Maximum Authorized Concentration in a Composite Sample	Column 4 Maximum Authorized Concentration in a Grab Sample
1.	Arsenic	0.50 mg/L	0.75 mg/L	1.00 mg/L
2.	Copper	0.30 mg/L	0.45 mg/L	0.60 mg/L
3.	Cyanide	1.00 mg/L	1.50 mg/L	2.00 mg/L
4.	Lead	0.20 mg/L	0.30 mg/L	0.40 mg/L
5.	Nickel	0.50 mg/L	0.75 mg/L	1.00 mg/L
6.	Zinc	0.50 mg/L	0.75 mg/L	1.00 mg/L
7.	Total Suspended Solids	15.00 mg/L	22.50 mg/L	30.00 mg/L
8.	Radium 226	0.37 Bq/L	0.74 Bq/L	1.11 Bq/L

NOTE: All concentrations are total values.

The objective of EEM is to determine whether mining activity is causing an effect on fish or fish habitat, benthic invertebrate communities and/or the use of fisheries resources. A Bellekeno Mine Cycle 1 Environmental Effects Monitoring Study Design has been developed with Environment Canada (September 2011; see Appendix C). Effluent monitoring, acute lethality testing and EEM Study Designs will also be required under MMER for other mines brought online in the KHSD.

Sampling requirements under the EEM program are as follows:

Part 1. Effluent and Water Quality Monitoring Studies

a) Effluent Characterization: Quarterly sampling from final discharge point includes extra parameters;

b) Water Quality Monitoring: Quarterly sampling of sites within reference and exposure areas:

    a. Reference Area: Water frequented by fish that is not exposed to effluent and that has fish habitat that, as far as is practicable is most similar to the exposure area.

    b. Exposure Area: All fish habitat and waters frequented by fish that are exposed to effluent; and

c) Sublethal Toxicity Testing: Semi-annual sampling required at each final discharge point and analysis of effects on reproduction or growth of a fish species, a plant species, an invertebrate species and an algal species as acceptable to MMER.

Part 2: Biological Monitoring Studies

A number of study cycles that each include:

- A study design;
- Environment Canada and stakeholder review;
- A Field Sampling Program; and
- Submission of an Interpretive Report that indicates whether or not an effect is observed.

Within each cycle, studies are conducted to determine if the effluent is having an effect on the following biological components including:

a) Fish Population: Studies conducted in exposure and reference areas

b) Fish Tissue Studies: Only required if concentrations in effluent is equal to or greater than 0.1 µg/l or ppb – as determined by the effluent characterization program)

c) Benthic Invertebrate Community: Studies conducted in exposure and reference areas and includes sediment sampling for analysis of particle size distribution and total organic carbon content.

The first study cycle (Cycle 1) is 30 months in duration, while subsequent cycles are 24 to 72 months in duration, depending on previous results (i.e. if an effect is indicated). A final cycle is required if notification of mine closure is issued. To avoid redundancy in sampling sites and monitoring programs, final discharge points for MMER will be considered final discharge points under Water Licence QZ09-092.

4 PERMAFROST MONITORING

While the broad region in which the KHSD is located is generally characterized by discontinuous permafrost, Alexco Resource Corp. has not encountered significant permafrost anywhere in the District. Notwithstanding, geotechnical programs have identified areas of permafrost within operational areas; specifically, some permafrost was encountered beneath the Bellekeno mine non-AML Waste Rock Storage Area (WRSA) and in the vicinity of the Dry Stack Tailings Facility (DSTF). Ground temperature and permafrost monitoring is currently in place at these locations. Details on monitoring for the DSTF are included in the DSTF Operation, Maintenance, and Surveillance Manual, which forms a part of the DSTF Development and Operations Plan. Details on permafrost monitoring for the N-AML WRDA and P-AML WRSF are included in the KHSD Mining Operations Mine Development and Operations Plan.

Similarly, permafrost monitoring will be implemented should it be encountered during construction of facilities for new mine development in the District. Since much of the surface development is likely to occur on previously disturbed areas, the likelihood of encountering permafrost at surface is relatively low.

5 PHYSICAL INSPECTION AND REPORTING PLAN

The purpose of physical inspection is to observe and record sufficient information for mine related structures to determine a course of action, repair or rehabilitation if it is required. Physical inspections are conducted under the Physical Inspection and Reporting Plan prepared for Water Licence QZ09-092 in October 2010 (Appendix D). The Physical Inspection and Reporting Plan describes scheduled physical inspections of infrastructure associated with the Bellekeno mine/mill development and operation. Information is collected through use of weekly and monthly checklists and reporting forms. Photo documentation at photo hubs is undertaken on a monthly basis in order to aid in identifying temporal changes and as a record keeping tool.

In the vicinity of the Bellekeno mine, physical inspections include the Bellekeno 625 settling ponds, the Bellekeno East temporary Waste Rock Storage Facility, the non-AML Waste Rock Disposal Area, and the haul road and Lightning Creek Bridge along the Keno City Bypass road. In the vicinity of the mill, physical inspections include the water supply and discharge pipelines and infrastructure, the mill site water collection and diversion structures, the mill site collection and sedimentation pond, and the dry stack tailings facility.

The Physical Inspection and Reporting Plan will be updated in accordance with an amended Water Licence QZ09-092 to include provisions for the Onek and Lucky Queen structures. Such facilities would include settling ponds at Onek and Lucky Queen, a temporary ore stockpile at Lucky Queen, as well as a Lucky Queen N-AML waste rock disposal area, and P-AML waste rock storage facilities.

6 METEOROLOGICAL MONITORING

An automated meteorological station was established on Galena Hill above Hector adit at 1,380 m elevation in June 2007. The station measures air temperature, relative humidity, barometric pressure, rainfall, wind speed and direction, solar radiation, and soil temperature. As a condition of Water Licence QZ09-092, a second metrological station measuring barometric pressure, rainfall, wind speed and direction, and solar radiation, and a snow course have been established at the Keno District Mill site. The locations of the two weather stations are shown on Figure 1. A Yukon Government monitored snow course station located at 1,310 m elevation also exists in the area and has been monitored for about 30 years. Data collected from these stations will be used to update meteorological/hydrological information and water balances.

7 DUST ABATEMENT AND MONITORING

In accordance with Clause 69 of the Decision Document for the assessment of the Bellekeno Mine Project (YESAB File Number 2009-0030), dustfall monitoring was installed at two initial locations near the Keno District mill site in March 2011 and two additional sampling locations were established in August 2011. Bergerhoff dust monitoring gauges (see Figure 3) were initially selected as the appropriate instrumentation to carry out this program. The Bergerhoff deposit dust gauge is designed to measure dust deposition, which can be reported as a weight per unit area over unit time. Total suspended particulates (TSP) monitoring was added at two locations for the purpose of comparison with Yukon Ambient Air Quality Standards in August, 2012.



Figure 3 Bergerhoff Deposit Dust Gauge

7.1 DUST MONITORING

During the YESAA assessment of the Bellekeno Mine Project (YESAB File Number 2009-0030), the issue of dust was highlighted by assessors and reflected in the Yukon Government (YG) Decision Document issued July 10, 2009. Clauses 64 and 65 of the Decision Document call for dust monitoring to be conducted during operations as follows:

64. Monitoring dust conditions is an important step in controlling dust impacts. Simple TSP (dustfall) monitoring is a simple and inexpensive way to determine dust deposition at the sampling locations. This test can be done at the site by the proponent with little cost or training necessary.

65. If warranted by initial dustfall measurements indicating TSP concentrations in excess of 150 micrograms per cubic metre (the BC Air Quality Objectives and Standards Level A criteria) at the fence line, the proponent shall conduct more sophisticated monitoring with high volume samplers and re-evaluate and improve dust suppression techniques to achieve the TSP objective.

It should be noted that TSP (total suspended particulate) monitoring is not the same as dustfall monitoring, which is a passive measurement of dust accumulation over time per unit area. The Decision Document suggests the use of BC Air Quality Objectives and Standards Level A criteria of 150 µg/m^3 as a threshold for triggering the next phase of the monitoring program. However, dustfall measurements (as suggested in the Decision Document for initial monitoring) will yield deposition rates (in mg/dm^2/mo) and will not be comparable to BC Air Quality Objectives and Standards.

The Pollution Control Objectives for the Mining, Smelting and Related Industries of BC (1979), provide reasonable limits for dustfall rates at the edge of the mill site. These parameters, which range from 1.7 to 2.9 mg/(dm^2*d), will be used as points of comparison for dustfall, while TSP results will be compared to ambient standards. Attempts at correlation between dustfall and TSP monitoring results have been successful at other sites and may be undertaken.

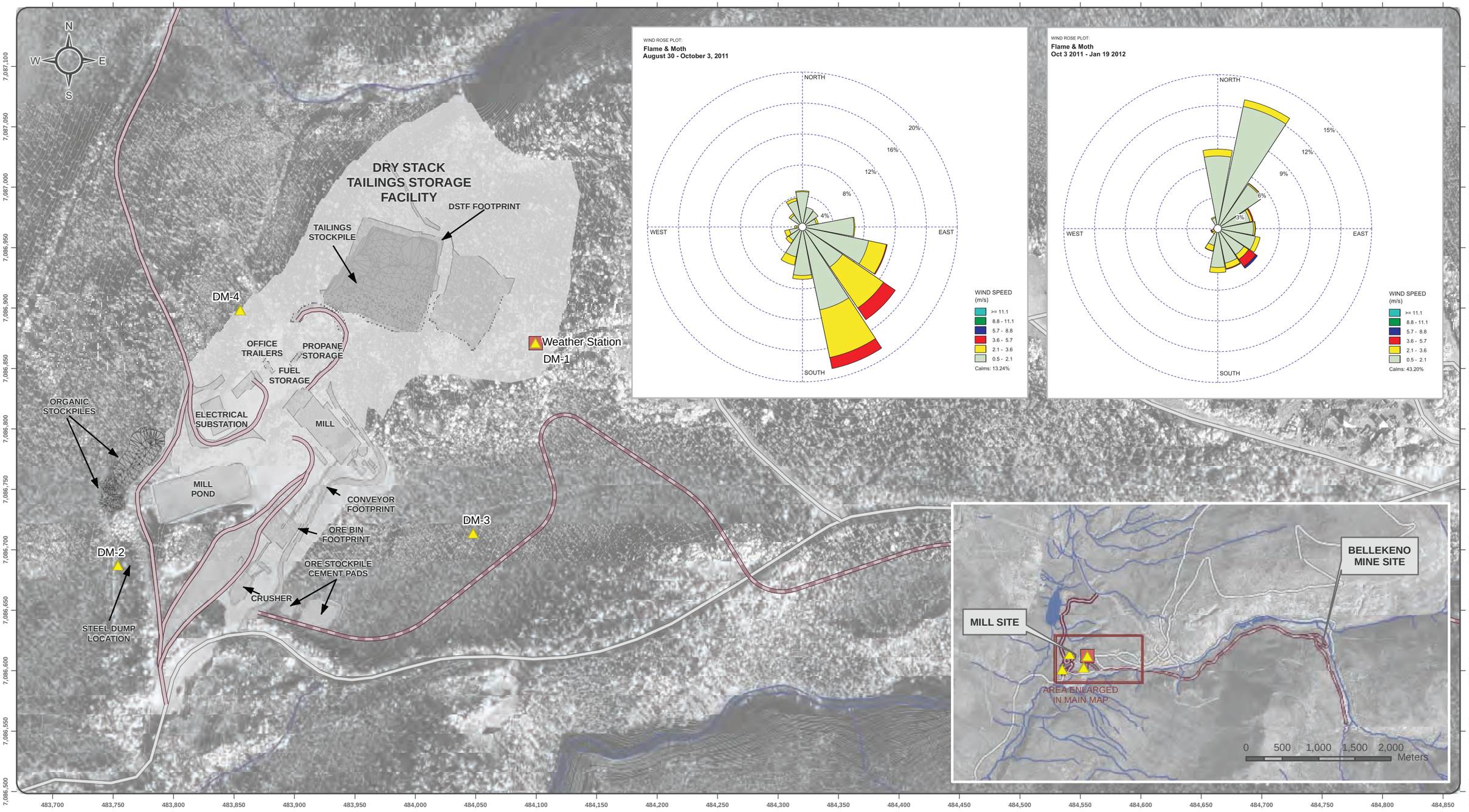
7.2 DUSTFALL MONITORING

Two Bergerhoff gauges were commissioned near the mill site in March 2011. One gauge (DM-1) was installed to the east of the DSTF between the mill site and Keno City. A second Bergerhoff gauge (DM-2) has been installed to the west of the mill facility and crushing facility and is located between the mill site and upper Christal Creek. In a meeting held between Alexco and representatives from YG Environment and YG Environmental Health, additional Bergerhoff gauges were recommended by YG Environment. Two additional dust monitoring gauges were installed by Alexco near the mill site in August, 2011. DM-3 was installed east of the crusher and the mill and DM-4 at the toe of the DSTF. Mill site layout and infrastructure and locations of Bergerhoff dust monitoring gauges currently in place at four locations at the edge of the mill site are shown on Figure 4 below.

The dustfall monitoring station locations were selected based on results of Galena Hill Wind analysis, and the location of the most sensitive receiver (Keno City). Distance from potential dust sources was selected to be consistent with Clause 70 of the Decision Document, which states that TSP standards should be met at “the fence line”. Although there will not be a fence around the perimeter of the project, the locations are consistent with the approximate edge of the extent of the project area. DM-1 may need to be relocated slightly to the east as it lies within the final footprint of the dry stack tailings facility. However, this portion of the dry stack will be constructed as the final part of the pile construction and will not occur for several years.

The monitoring at the four dustfall instruments (Bergerhoff gauges) will be discontinued based on the recommendation (# 37) made by YESAB (project#2011-0315) and TSP monitoring will be undertaken as outlined in section 7.3.

37. Any dust measurement conducted by the proponent needs to be comparable to the Yukon Ambient Air Quality Standards. The “simple TSP (dustfall) monitoring” that is mentioned does not allow for this direct comparison of results.



Aerial photography flight date: July 13th 2006. Ortho-rectification produced by Challenger Geomatics Ltd. Data obtained from EBA: "As built" spatial data: Mill pond (Y.E.S.), Mill structure, and current DSTF footprints, Roads (In House survey December 11th 2011). Design spatial data: Conveyance and water collection, diversion ditches and berm.

Datum: NAD 83; Projection: UTM Zone 8N

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Main Map: 1:3,000 Inset Map: 1:50,000
(when printed on 11 x17 inch paper)

0 50 100 150 200 Meters

- Dry Stack Tailings
- Design PU
- AsBuilt; As Built
- Mill Access Road
- Haul Road
- Local Road

AKHM
ACCESS

ALEXCO KENO HILL MINING CORP.

FIGURE 4
DUST MONITORING LOCATIONS

Drawn By JP	MARCH 2012	Verified by VB

I:\ALEX-05-01\Bellekeno\GIS\mxd\Annual_Reports\2011\Dust_Monitoring_Stns_20120326.mxd

7.3 TSP MONITORING

After discussions with Yukon Government Department of Environment and Environmental Health Services in March 2012, TSP monitoring was voluntarily initiated by Alexco in order to enable better comparison with Ambient Air Quality Standards. Additional TSP sampling equipment will consist of two BGI Omni gravimetric samplers, which will measure ambient concentrations (in $\mu g/m^3$). The objectives recommended during the assessment to which results from a continuous sampler were to be compared include: the BC Air Quality Objectives and Standards Level A criteria of 150 $\mu g/m^3$ averaged over 24 hours, or 60 $\mu g/m^3$ for the annual geometric mean. Alexco is aware that Environment Yukon has recently set Ambient Air Quality Standards under the Environment Act. These standards for TSP are set at 120 $\mu g/m^3$ for a 24-hour average, and 60 $\mu g/m^3$ as an annual geometric mean. Results from TSP monitoring will be compared to the Ambient Air Quality Standards under the Environment Act. If these mass per volume standards are exceeded then chemical analyses shall be carried out on the sampled dust provided there is enough of the sample as required for testing.

Two TSP instruments were installed near stations DM-3 and DM-4 (Figure 4) on August 13, 2012 which are respectively located upwind and downwind from the mill site, based on observed dominant winds. The TSP instruments will be portable and it will therefore be possible to later move them to other sampling locations to obtain a more complete picture of ambient air quality.

In addition to TSP monitoring, continuation of pre-emptive and reactive dust control procedures as outlined in the DSTF Construction and Operation Plan, Traffic Management Plan, and Monitoring, Surveillance and Reporting Plan will ensure that fugitive dusting does not become an issue.

7.4 MONITORING SCHEDULE

TSP monitoring will continue at approximately monthly intervals, although the sampling interval can be longer for the summer months (based on results obtained to date). The TSP sampling will be conducted for 24-hour periods, after which filters will be removed and sent to a certified laboratory for analysis. This will ensure that results are comparable to the Ambient Air Quality Standards for a 24-hour period. Sampling will be conducted seasonally, in order to capture the different weather conditions that may affect dust sources and transport. Seven to ten days of data per sampling period should be sufficient to capture day-to-day variability in the weather (Postma, 2012). The following sampling periods were recommended by J.Postma (2012) for an Ambient Air Quality Monitoring Program for Keno City, Yukon, and are deemed appropriate for Alexco's TSP monitoring schedule.

Table 3 Recommended TSP Monitoring Periods

Months	Rationale
March/April	Highest mean wind speeds, moisture content of haul road high due to snowmelt
May/June	High wind speeds, generally drier than early spring, pollen in the air
July/August	Highest mean temperatures lead to increased susceptibility of erosion (i.e. stronger PM sources), low wind speeds
September/October	Higher wind speeds, generally dry
December/January	Lower wind speeds, snow cover, coldest temperature

7.5 METHOD OF ANALYSIS

TSP samples taken are subjected to the following procedure upon receipt by the laboratory:

- For TSP gravimetric analysis, after PM has been collected on pre-weighed filters for a 24-hour period, filters are sent back to the lab where they will be weighed again using a microbalance. The difference in masses gives the PM load which, when combined with the flow rate and the length of the sampling period, provides a PM mass concentration. Additionally, chemical anylsis testing will be completed should the total dust per volume of air exceed health based mass per volume benchmarks (YESAB recommendation # 36, 2011-0315).

36. The proponent shall amend their dustfall monitoring program to include measurement of total particulate per volume of air for selected size fractions and undertake chemical analyses should the total dust per volume of air exceed health based mass per volume benchmarks.

8 NOISE IMPACTS AND SOUND MONITORING

Between May and July 2009, periodic sound measurements were taken at four locations near Keno City including Onek 400, the Campground, and Residence (west), and Fire Hall by an Alexco representative. In addition to a continuation of the four original monitoring locations, commencing in March 2010, four additional locations were added to routine monitoring including Onek Pit, Residence (north), Keno City Dump, and the Mill Site. Monitoring is conducted on a quarterly basis with results provided to residents, YG tourism and Culture Branch, and YESAB. The noise monitoring locations were updated with the addition of Onek and Lucky Queen mines and noise impacts and sound monitoring are further discussed in the Noise Management Plan submitted under QML-0009(Access Consulting, 2013). The Plan has been prepared to include the requirements outlined in the YESAB recommendation #45 (Project#2011-0315).

45. As per Section 110 of the YESAA, the proponent shall conduct effects monitoring of noise emissions in relation to impacts to local businesses. Noise monitoring shall be undertaken quarterly with results provided to residents, YG Tourism and Culture Branch, and YESAB. Results of monitoring will be compared to the baseline established for a similar sized community without industry, from the Comprehensive Sound Study for Keno City2012. Based on the results of the monitoring and in discussion with the above-listed parties, additional mitigation measures, or adaptive management strategies shall be identified and implemented Note: The results of the monitoring shall be reported to the decision body

Results of monitoring will be compared to the baseline established for a similar sized community without industry, from the Comprehensive Sound Study for Keno City 2012. Based on the results of the monitoring and in discussion with the above-listed parties, additional mitigation measures, or adaptive management strategies shall be identified and implemented if necessary.

9 WASTE ROCK MONITORING

All waste rock management facilities are subject to monitoring for physical and geochemical stability (acid rock drainage and/or metal leaching) including seep surveys. A complete Waste Rock Management Plan was prepared in 2009 and includes detailed descriptions of waste rock monitoring and mine wall testing. The Waste Rock Management Plan was updated in July 2012 to include the Onek and Lucky Queen deposits (Access Consulting, 2012b).

10 SPILL CONTINGENCY PLAN

The Spill Contingency Plan specifies that:

> "The Licencee shall immediately contact the 24-hour Yukon Spill Report Centre, (867) 667-7244, and implement the Spill Contingency Plan should a spill or an unauthorized discharge occur. A detailed written report on any such event including, but not limited to, dates, quantities, parameters, causes and other relevant details and explanations, shall be submitted to the board not later than 10 days after the occurrence";
>
> "All personnel shall be trained in procedures to be followed and the equipment to be used in the containment of a spill"; and
>
> "The Spill Contingency Plan shall be posted on site for the term of the Licence".

For more details, see the Spill Contingency Plan and the Emergency Response Plan submitted for QML-0009 updated for Onek and Lucky Queen (July 2012). All incident reports including the occurrence of a spill, should it occur, will be forwarded to the First Nations of Na-Cho Nyak Dun (FNNND).

11 ADAPTIVE MANAGEMENT PLAN (AMP)

The updated Bellekeno Adaptive Management Plan (AMP) was prepared in April 2011 to fulfill Water Licence QZ09-092 conditions. A conceptual Adaptive Management Plan inclusive of the proposed activities at Onek and Lucky Queen was prepared in March 2012 as part of the assessment of the new mines. The AMP with respect to Onek and Lucky Queen is conceptual at this time and it is anticipated that recommendations made by the Yukon Environmental and Socio-Economic Assessment Board will inform the additional development of the Keno Hill Silver District Mining Operations Bellekeno, Onek and Lucky Queen AMP.

In the interim, the Conceptual Keno Hill Silver District Mining Operations Adaptive Management Plan was updated in July 2012 (Access Consulting Group, 2012a).

12 RECLAMATION EFFECTIVENESS MONITORING PROGRAM

With the cessation of mining, the monitoring and surveillance programs will be tailored to assess closure measures and continue as necessary. At closure, Water Licence QZ09-092 will undergo amendment to regulate activities around reclamation and reclamation monitoring. Post closure reclamation benchmarks should be well defined, measurable and documented. A thorough effectiveness monitoring program will allow for recognition of restoration successes and needed improvements.

The Conceptual Reclamation and Closure Plan for Bellekeno, Onek and Lucky Queen Production Unit Areas (Revision 1 – April 2012) states:

> *"Monitoring activity will be required to determine the on-going and continued success of closure measures in meeting the closure objectives for a period of 10 years. The adaptive management approach will be used to determine thresholds identifying when remedial action have been triggered, and then the success of the remedial measures will need to be incorporated into the monitoring and surveillance regime."*

Proposed closure monitoring activities include:

- Water quality monitoring at some of the stations identified in the Water Licence;
- Monitoring of road bank and drainage along access road;
- Physical inspection of the passive water treatment systems;
- Physical stability of all waste rock disposal areas;
- Success of revegetation measures (principally portal area and mill pad area);
- Monitoring of cover system integrity (P-AML WRSFs and DSTF); and
- Physical inspection of impacted earthen surfaces for evidence of erosion, gullying or sediment transport to watercourses.

Permafrost beneath the waste rock disposal areas will be monitored at least 10 years post closure, after which time the necessity of the requirement will be reviewed. An annual geotechnical inspection should be conducted on the waste rock disposal areas for at least 5 years post closure, after which time the necessity of this requirement will also be re-evaluated. Success of implementation of final reclamation will be measured by the ability to achieve stated closure objectives in the Detailed Reclamation and Closure Plan. The Reclamation and Closure Plan is currently being updated to include the Onek and Lucky Queen Mines.

13 REPORTING

Reporting on water quality monitoring and management issues will be directed to the Yukon Water Board (YWB) and YG Energy, Mines and Resources in accordance with the requirements of the Water Licence (Part G) and Quartz Mining Licence (Condition 14). Monthly and annual reporting will be carried out during mine development activities and through the implementation of site decommissioning until it can be demonstrated through the monitoring results that the final closure objectives have been achieved.

Alexco also continues to liaise with the regulatory agencies, FNNND, the Mayo Renewable Resource Council and the local communities on environmental issues relating to KHSD mining operations; all monthly and annual reports are provided to FNNND.

14 REFERENCES

Access Consulting Group. 2013 Noise Management Plan Keno Hill Silver District Mining Operations

Access Consulting Group. 2012a Conceptual Adaptive Management Plan Keno Hill Silver District Mining Operations

Access Consulting Group. 2012b Waste Rock Management Plan Keno Hill Silver District Mining Operations

British Columbia. Ministry of Environment. 2009. Air Quality Objectives and Standards.

British Columbia. Ministry of Environment. 1979. Pollution Control Objectives for Mining, Smelting, and Related Industries of British Columbia.

Code of Federal Regulations. Title 40 –Protection of Environment, Chapter I – Environmental Protection Agency, Subchapter C – Air Programs, Part 51 – Requirements for Preparation, Adoption, and Submittal of Implementation Plans.

Environmental Protection Agency, 1995a. User's guide for the Industrial Source Complex (ISC3) Dispersion Models – Volume 1 – User Instructions, Office of Air Quality Planning and Standards Emissions, Monitoring, and Analysis Division Research Triangle Park, North Carolina 27711.

Environmental Protection Agency, 1995b. User's guide for the Industrial Source Complex (ISC3) Dispersion Models – Volume 2 – Description of Model Algorithms, Office of Air Quality Planning and Standards Emissions, Monitoring, and Analysis Division Research Triangle Park, North Carolina

Pacwill Environmental. 2008. Original Dry Foam Frisbee-Type Deposit Dust Gauge.

Reed, W.R. 2005. Significant Dust Dispersion Models for Mining Operations, Information Circular 9478, Department of Health and Human Services, Center for Disease Control and Prevention, National Institute for Occupational Safety and Health, USA.

APPENDIX A

TYPE A WATER LICENCE QZ09-092 FOR QUARTZ MINING UNDERTAKING AT BELLEKENO

YUKON WATER BOARD

Pursuant to *Waters Act and Waters Regulation*, the Yukon Water Board hereby grants a Type A water use licence for a quartz mining undertaking to:

Alexco Keno Hill Mining Corporation
Suite 1150-200 Granville Street
Vancouver, BC V6C 1S4

LICENCE NUMBER: QZ09-092

LICENCE TYPE: A **UNDERTAKING:** QUARTZ MINING

LOCATION: Bellekeno Undertaking claims, near Keno City, Yukon

WATER SOURCES: Bellekeno Mine: Bellekeno Mine pool, Bellekeno water treatment plant discharge, Lightning Creek, and Thunder Gulch.

Flame and Moth Site: Mill Site and dry stack tailings facility collection and sedimentation pond, Galkeno 900, Christal Creek, and Christal Lake.

Flat Creek Camp: Flat Creek and proposed groundwater supply well.

MAP COORDINATES:

Minimum Northing:	7082597	Maximum Northing:	7098060
Minimum Easting:	462845	Maximum Easting:	495302
Centre Northing:	7090328	Centre Easting:	479073

PURPOSE: To obtain water, store water, and to deposit Waste for the purpose of quartz mining at the Bellekeno Mine, processing Bellekeno Mine ore at the Flame and Moth Site, and operating a domestic water supply and sewage treatment and disposal systems at the Flat Creek Camp and sewage treatment and disposal systems at the Flame and Moth Site, and the Bellekeno Mine.

EFFECTIVE DATE: The effective date of this Licence shall be the date on which the signature of the Chairperson of the Yukon Water Board is affixed.

EXPIRY DATE: August 1, 2020

Approved this 19th day of August, 2010

Witness

Minister, Executive Council Office
Government of Yukon

Issued this 20th day of

August, 2010

Witness

Chairperson
Yukon Water Board

PART A – DEFINITIONS

"Act" means *Waters Act* and any amendments thereto.

"AMP" means Adaptive Management Plan.

"Application" collectively means Water Use Application QZ09-092, and any additional submissions and/or revisions submitted to the Board by the Licensee up to the date of the Board's decision to issue this licence.

"Bellekeno Mine" includes the underground workings and all related mine infrastructure, as described in the Application. This includes the Waste Rock Disposal Area, the Bellekeno 625 adit treatment plant, the roads connecting underground workings and surface support infrastructure, such as fuel tanks, repair and maintenance shops, explosives storage buildings, backfill and ventilation facilities.

"Bellekeno Undertaking" means all quartz mining and supporting activities, occurring on the mineral claims identified in Schedule A of this licence, that are undertaken for the purpose of extracting and processing ore from the Bellekeno Mine as identified in the Application.

"Board" means the Yukon Water Board.

"Continuous" in the context of flow monitoring means the time averaged measurement of flows with individual measurements completed at least hourly and reported as daily values.

"Decommissioning and Reclamation Plan" means the *Preliminary Decommissioning and Reclamation Plan* that was submitted as part of the Application and included in Water Use Register QZ09-092 as exhibit 1.4.5, and any subsequent revisions.

"DSTF" means the Dry Stack Tailings Facility area and related infrastructure at the Flame and Moth Site that is to be used for storing the dewatered low sulphur tailings from the Flame and Moth Mill and dewatered treatment sludge from the Bellekeno Mine and the Flame and Moth treatment plant.

"EEM" means Environmental Effects Monitoring.

"Flame and Moth Site" means the area of quartz claims 38642, 56401, 38643, 55599 and 55600 located west of Keno City that will be developed for the purposes of processing Bellekeno Mine ore and disposing of resulting low sulphur tailings and Bellekeno Undertaking treatment sludge.

"Flame and Moth Mill" means the building(s), equipment and ancillary infrastructure to be located at the Flame and Moth Site for the purposes of processing ore, including a crusher, mill ore stockpiles, floatation circuits, dewatering equipment, concentrate load-out and support infrastructure.

"Inspector" means any person designated as an Inspector under the Act.

"MMER" means *Metal Mining Effluent Regulations.*

"Natural Boundary" means the visible high water mark of any lake, river, stream or other body of water where the presence and action of water is so common and usual and so long continued as to mark upon the soil of the bed of the lake, river, stream or other body of water a character distinct from that of the banks thereof, both in respect to vegetation and in respect to the nature of the soil itself. In addition, the best estimates of the edge of dormant or old side channels and marsh areas are considered to be the Natural Boundaries.

"N-AML" means non-acid generating and non-metal leaching.

"P-AML" means potentially acid generating or metal leaching.

"Permanent Closure" means

a) a period of cessation of development and production activities that exceeds five years; or
b) a declaration of the permanent cessation of development and production activities followed by implementation of the Decommissioning and Reclamation Plan.

"Pyrite Removal Circuit" means that portion of the milling process that is designed to remove the iron sulphide from the ore for separate treatment and disposal.

"Regulation" means the *Waters Regulation.*

"Spill Contingency Plan" means the *Keno Hill Project Emergency Response Plan* that was submitted as part of the Application and included in Water Use Register QZ09-092 as exhibit 1.4.6, and any subsequent revisions.

"Temporary Closure" means a period of cessation of development and production activities between six months to no longer than five years.

"Underground Workings" means all pre-existing excavations and future excavations below the surface that have been or will be excavated to extract Waste Rock and ore on quartz claims 55426, YA17397, 16097, 14081, 14327, 38730, 16087, 12838, 56443, 16170, 55120, 55327,

55474, 55475 including all stopes, declines, adits, shafts, vents and related supports and infrastructure.

"Waste" means any substance as defined as such in the Act and includes treated and untreated Bellekeno Mine discharges, Bellekeno Mine Waste Rock, Bellekeno Mine treatment sludge, Flame and Moth Mill tailings, and Flame and Moth Site discharges.

"Waste Rock" means rock excavated from underground workings that will not be processed in the Flame and Moth Mill.

"Waste Rock Disposal Area" means the area at the Bellekeno Mine identified in the Application for the disposal of N-AML Waste Rock.

"Waste Rock Management Plan" means the Bellekeno Waste Rock Management plan that was submitted as part of the Application and included in Water Use Register QZ09-092 as Section 6.2 of exhibit 1.3.

"Watercourse" means any stream, lake, pond, river, creek, spring, ravine or swamp whether ordinarily containing water or not.

"Wetted Perimeter" means the horizontal extent of the present water level while the work is taking place.

PART B – GENERAL CONDITIONS

Term of Licence

1. The term of this licence is for the period from the effective date to August 1, 2020.

Harmonization of Area Related Water Use Licences

2. The Licensee shall not use water and/or deposit a Waste, as authorized under this licence, QZ09-092, until application(s) have been submitted to the Board for the amendment or cancellation of water use licences QZ06-076 and QZ07-078.

Other Laws

3. No condition of the water use licence limits applicability of any statutory authority.

4. All construction or installation of works authorized by this licence shall occur on property that the Licensee has the right to enter upon and use for that purpose.

Correspondence

5. Where any direction, notice, order or report under this licence is required to be in writing, it shall be given to:

a) the Licensee, if delivered, faxed or mailed by registered mail to the following address:

Alexco Keno Hill Mining Corporation
Suite 1150-200 Granville Street
Vancouver, BC V6C 1S4

Fax: (604) 633-4887

and shall be deemed to have been given to the Licensee on the day it was delivered or faxed, or 7 days after the day it was mailed, as the case may be;

b) the Board, if delivered, faxed or mailed by registered mail to the following address:

Yukon Water Board
Suite 106, 419 Range Road
Whitehorse, YT Y1A 3V1

Fax: (867) 456-3890

and shall be deemed to have been given to the Board on the day it was delivered or faxed, or 7 days after the day it was mailed, as the case may be.

Non-Compliance

6. In the event that the Licensee fails to comply with any provision or condition of this licence, the Board may, with the approval of the Minister, and subject to the Act, cancel the licence.

Spills and Unauthorized Discharges

7. The Licensee shall keep the Spill Contingency Plan current. Any revisions to the plan will be submitted to the Board within 10 days of the revision.

8. The Licensee shall immediately contact the 24-hour Yukon Spill Report telephone number (867) 667-7244, and implement the most recent spill contingency plan that has been filed with the Board, should a spill or an unauthorized discharge occur. A detailed written report on any such event, including but not limited to, dates, quantities, parameters, causes and other relevant details and explanations, shall be delivered to the Board not later than 10 days after its occurrence.

9. All personnel shall be trained in procedures to be followed and equipment to be used in the containment of a spill.

10. The Spill Contingency Plan shall be posted on site for the duration of the works.

Fuel and Hazardous Materials Storage and Transfer

11. A complete inventory of chemicals, fuels, oils, lubricants and other hazardous materials relating to the water uses authorized by this licence shall be maintained by the Licensee and filed with the Yukon Water Board.

12. Fuel, lubricants, hydraulic fluids, coolants and similar substances shall be stored and/or transferred a minimum of 30 metres from the Natural Boundary of any Watercourse, in such a way that said substances are not deposited in or allowed to be deposited in waters.

Waste Substances

13. Waste substances shall be used, transported, stored or disposed of in such a manner that they are not deposited, or allowed to be deposited, into any Watercourse or on any surrounding land, unless authorized by this licence.

PART C – OPERATING CONDITIONS

Description of Water Use and Deposit of Waste

14. The Licensee is hereby authorized to:

Camp Wastewater Treatment and Disposal Systems

a) direct camp wastewater through wastewater treatment and disposal systems at the Flat Creek Camp site, the Flame and Moth Site, and the Bellekeno Mine and deposit the treated sewage wastewater to ground absorption systems at those locations;

Bellekeno Mine

b) obtain and use water for a quartz mining undertaking at a maximum combined rate of 245.5 m^3/day from treated wastewater from the Bellekeno 625 treatment plant, from the underground workings, as well as from Thunder Gulch and Lightning Creek;

c) operate a mine discharge treatment system and store water in settling ponds prior to discharge;

d) deposit up to 864 m^3/day of treated mine effluent to Thunder Gulch and Lightning Creek;

e) deposit up to 360,000 tonnes of N-AML Waste Rock originating from the Bellekeno Mine in the Waste Rock Disposal Area;

f) deposit up to 355,000 tonnes of Waste Rock, tailings, and cement in the underground workings;

g) deposit up to 100,000 tonnes of P-AML Waste Rock from the underground workings in permanent lined storage cells located on top of the Waste Rock Disposal Area;

Flame and Moth Site

h) obtain and use water for a quartz mining undertaking at a maximum combined rate of 81 m^3/day from treated water from the Galkeno 900 adit, recycled water from the site collection and sedimentation pond, Christal Creek, and Christal Lake;

i) construct and operate a collection, conveyance, storage and treatment system for mill site runoff, mill upset discharges, and DSTF runoff and seepage;

j) construct and operate runoff diversion systems to divert up-gradient overland runoff around the mill site and DSTF;

k) deposit treated effluent to a land disposal system up-gradient of Christal Creek at a rate not exceeding 10 L/s and a total monthly volume not exceeding 0.8% of the corresponding total monthly volume of flow passing monitoring station KV-6 on Christal Creek;

l) deposit up to 322,000 tonnes of Bellekeno Undertaking dewatered low sulphur tailings and treatment sludge in the DSTF; and

Flat Creek Camp Site

m) obtain and use water for domestic camp purposes at a combined rate not exceeding a total of 42.75 m^3/day from Flat Creek and the proposed groundwater supply well;

as described in the Application, and subject to the conditions of this licence. Where there is a discrepancy between the Application and this licence, the conditions of this licence shall prevail.

15. Except as authorized by this licence, no Waste shall enter any watercourse as a result of any operation carried out by the Licensee.

Waste Rock

16. Waste Rock from the Bellekeno underground workings shall be segregated into N-AML Waste Rock and P-AML Waste Rock in accordance with the Waste Rock Management Plan.

17. N-AML Waste Rock can be deposited in the Bellekeno Waste Rock Disposal Area or used for construction purposes as part of the Bellekeno Undertaking.

18. P-AML Waste rock may be stored temporarily at the surface or left underground for later use as mine backfill. If P-AML Waste Rock is brought to the surface it may be returned underground as mine backfill when logistically feasible or placed into permanent surface storage cells at the Waste Rock Disposal Area.

19. At a minimum, the initial 130,000 tonnes of P-AML rock excavated shall be used for mine backfill prior to any permanent P-AML storage cells being loaded at the Waste Rock Disposal Area.

Tailings

20. All tailings produced from the Pyrite Removal Circuit at the Flame and Moth Mill shall be deposited in the underground workings at a level below the expected long term static water level of the closed mine.

PART D – EFFLUENT QUALITY STANDARDS

21. No Waste discharged from the water treatment systems at the Bellekeno 625 adit shall exceed the following limits:

Parameter	**Maximum Concentration in a Grab Sample**
pH	6.5 to 9.5 pH Units
Suspended Solids	25 mg/L
Ammonia Nitrogen	5 mg/L
Arsenic (total)	0.1 mg/L
Cadmium (total)	0.01 mg/L
Copper (total)	0.1 mg/L
Lead (total)	0.2 mg/L
Nickel (total)	0.5 mg/L
Radium 226	0.37 BQ/L
Silver (total)	0.01 mg/L
Zinc (total)	0.5 mg/L
Acute Toxicity Testing	
96-hour Rainbow Trout	Non-Toxic, LC_{50} (100%)

22. No Waste discharged from the water treatment systems at the Flame and Moth Site shall exceed the following limits:

Parameter	**Maximum Concentration in a Grab Sample**
pH	6.5 to 9.5 pH Units
Suspended Solids	25 mg/L
Ammonia Nitrogen	5 mg/L
Arsenic (total)	0.1 mg/L
Cadmium (total)	0.01 mg/L
Copper (total)	0.1 mg/L
Lead (total)	0.2 mg/L
Nickel (total)	0.5 mg/L
Radium 226	0.37 BQ/L

Silver (total)	0.02 mg/L
Zinc (total)	0.5 mg/L
Acute Toxicity Testing	
96-hour Rainbow Trout	Non-Toxic, LC_{50} (100%)

23. The points of compliance at the Bellekeno Mine and the Flame and Moth Site for the effluent quality standards included in this licence shall be the final points of control at stations KV-43 and KV-83 respectively, prior to discharging effluent to the environment.

PART E – DESIGN, CONSTRUCTION AND OPERATION

Design

24. At least 10 days prior to the commencement of construction, the Licensee shall submit to the Board final detailed design construction drawings for those structures for which preliminary design drawings were submitted as part of the Application. The final detailed design drawings must be consistent with the drawings which were submitted as part of the Application and must be sealed by a Professional Engineer licensed to practice in Yukon. All construction shall be carried out in accordance with the final design drawings. As it pertains to the DSTF, the Licensee shall include in the final design:

    a) further characterization of the subgrade below the location of the DSTF, for the purpose of managing slope stability, and to determine specific locations of the drainage layers, ditches, and other up-gradient water diversions; and

    b) the subgrade characterization shall include field determination of the shallow soil profile including the nature and thickness of organics, and the nature and thickness of ice rich permafrost. The spatial density of characterization locations shall be supported by an appropriate rationale; and

    c) the final design of the facility shall include completed slope stability sensitivity studies related to potential excess pore water pressure that may develop during thawing of ice rich permafrost underlying the facility. The sensitivity analysis shall identify triggers for monitoring of pore pressure during operations; and

    d) the final design of the facility shall account for the potential impacts of differential settlement resulting from thawing of underlying heterogeneous ice rich permafrost.

25. Where site conditions require minor modification to the designs submitted to the Board, the Licensee shall notify the Board, at least 10 days in advance, of the details of the modifications or variations from final detailed designs, specifications and quality assurance/quality control procedures previously submitted to the Board. The notice shall include an explanation of the reasons for the change and an assessment of the potential impact on the performance of the works. The notice shall be sealed by a Professional Engineer licensed to practice in Yukon.

26. As-constructed (record) drawings and construction reports, including quality assurance and quality control documentation, for all structures and facilities shall be submitted to the Board within 120 days of the completion of construction. Each submission shall be sealed by a Professional Engineer licensed to practice in Yukon.

27. At least 10 days prior to the proposed date of commencement of construction, the Licensee shall submit to the Board a written notification, together with a detailed construction schedule and the name and contact number(s) of the construction superintendent.

Construction and Operation

28. No heavy equipment shall be operated within the Wetted Perimeter of any Watercourse.

29. All disturbed ground surfaces shall be stabilized in such a manner so as to prevent erosion and surface runoff from carrying sediment into any Watercourse.

30. Construction and maintenance equipment shall be mechanically sound and free of leaks.

31. All works associated with the undertaking shall be maintained in good repair.

Water Pumps

32. The Licensee shall provide barriers consisting of fish guards, screens, coverings or nets on all water intakes as follows:

    a) screens or nets shall have a minimum of 3.5 openings per centimetre and openings no greater than 3.2 millimetres along any given side;

    b) if a punch plate or similar material is used, the opening shall be no greater than 3.2 millimetres in length or width;

    c) there shall be no less than 929 square centimetres of open screen for every 205 litres per minute being withdrawn;

    d) the barriers shall be monitored and maintained to ensure that they function effectively at all times when water is being withdrawn;

    e) the barriers shall be designed and installed in such a manner that the screen is submerged and a uniform flow distribution is maintained through the total screen area;

    f) water shall not be withdrawn when the barrier is removed for renewal, repair or inspection; and

    g) the Licensee shall cease pumping or decanting and take remedial action if there is alteration to the bed or bank of the water channel.

PART F – MONITORING AND SURVEILLANCE

Monitoring Program

33. The Licensee shall comply with the water quality monitoring program and surveillance network program contained in Schedule B of this licence.

34. Monitoring and sampling required as part of this licence shall be carried out in accordance with the procedures and standards described in:

    a) *Guidance Document for the Sampling and Analysis of Metal Mining Effluents*, April 2001, (Report: EPS 2/MM/5), Minerals and Metals Division, Environment Canada;

    b) *Guidance Document for Flow Measurement of Metal Mining Effluents*, April 2001, (Report: EPS 2/MM/4), Minerals and Metals Division, Environment Canada; and

    c) *Standard Guide for Sampling Ground-Water Monitoring Wells*, ASTM D4449-01, ASTM International, PA, USA.

35. Testing results for the effluent water quality parameters listed in this licence shall be provided by a laboratory accredited by the Canadian Association for Environmental Analytical Laboratories Inc.

36. Irrespective of Schedule B, the Licensee shall visit monitoring stations KV-49 and KV-50 at least monthly for twelve consecutive months starting during the month this licence comes into effect. During each monthly visit the Licensee shall sample or attempt to sample water from both monitoring stations and shall measure or attempt to measure the flow at each station.

Flow and Level Monitoring

37. The Licensee shall operate Continuous stream flow gauging stations at KV-6 and KV-41. Data shall be recorded onto data loggers and the data loggers down loaded at least monthly. Manual calibration of the gauging stations shall be completed at least quarterly. The stations shall be established and operational within 90 days of the effective date of this licence.

38. The Licensee shall establish a staff gauge at the Flame and Moth Site collection and sedimentation pond and shall record the pond level daily between April 1 and November 30.

39. The Licensee shall establish flow meters for all pipelines withdrawing water from surface water sources and shall record the cumulative daily volume withdrawn from each surface water source.

40. The Licensee shall monitor the total daily volume of discharges, if any, released from the mill to the Flame and Moth collection and sedimentation pond.

Meteorological Monitoring

41. The Licensee shall establish and maintain a meteorological monitoring station at the Flame and Moth Site. At a minimum, the station shall collect data on precipitation, temperature, and wind speed and direction.

42. The Licensee shall also establish a snow course at the Flame and Moth Site and shall collect standard snow survey information from that site.

43. The meteorological station should be installed and operational within 90 days of the effective date of the licence. The snow course shall be identified and operational for the first winter and spring period following the effective date of the licence.

Groundwater Monitoring

44. Groundwater monitoring shall follow the schedule defined in Schedule B of this licence, with the exception that:

    d) Sampling of all wells shall be completed monthly for the first twelve months that they contain water. Sampling can revert to quarterly as shown in Schedule B, following the first twelve samples.

    e) The Licensee shall monitor the water level in all groundwater monitoring wells where water is present at least monthly for the first year. Level monitoring can be reduced to quarterly after the first twelve monthly readings are completed.

45. Monitoring results should be reviewed after each sampling event to identify groundwater changes, should they occur.

46. Groundwater wells determined to be subject to seasonal freezing shall have pressure transducers installed when cleared of seasonal ice.

Sediment and Benthic Invertebrate Monitoring

47. The Licensee shall implement the MMER EEM program which includes monitoring for benthic invertebrates, stream sediments, fisheries, effluent characterization and sub lethal toxicity testing. Sampling locations and monitoring requirements will be specified in the EEM Study Design. All interpretive reports as required under the MMER EEM program shall be filed with the Board as per MMER EEM program reporting requirements.

48. The Licensee shall conduct sediment and benthic invertebrate characterization studies in Christal Lake during the first year full open water season after the licence is issued. The studies shall involve the collection of lake sediments, phytoplankton, zooplankton and water quality. The Licensee shall provide the results of the study and interpretation to the Board by March 31, 2012.

49. The Licensee shall conduct sediment sampling at the frequency and locations indicated in Schedule B. Sediment sampling shall be carried out as follows:

a) sediment samples shall be collected in replicates of three from the active channel, directly into high density plastic sample jars, using an aluminum or Teflon scoop;

b) samples shall be dried and screened, using sieves at ASTM mesh numbers 10, 20, 40, 60, 100, 140 and 270 (ASTM-E11-61) and the fraction weights shall be recorded; and

c) sub-samples composed of material passing and retained on the 100 mesh number sieve shall be analyzed for metals by a 33 element ICP scan. Loss on ignition shall also be determined by heating the sample to 600°C.

Physical Inspections and Monitoring

50. The Licensee shall conduct physical inspection of water retaining and conveying structures, and associated mine waste and earthworks structures in accordance with the Bellekeno Physical Inspection and Reporting Plan required by this licence.

51. If seepage discharge from any water retaining structures is identified, the Licensee shall report on such discharge as part of the next monthly report in accordance with the Bellekeno Physical Inspection and Reporting Plan. Within 60 days of the discovery of the discharge, the Licensee shall submit a plan for collecting, testing and managing the discharge. Subject to any required assessments, authorizations or approvals, the Licensee shall implement that plan.

52. Annual monitoring and inspection of all water retaining structures shall be carried out by a Professional Engineer licensed to practice in the Yukon. A report prepared by the Professional Engineer, shall be submitted as a part of each annual report.

Waste Rock Monitoring

53. Monthly, between May and October of each year, the Licensee shall inspect all unlined Waste Rock locations including all pre-existing Bellekeno Waste Rock dumps described in the Application, and any new dumps or Waste Rock locations created after the effective date of this licence.

PART G – REPORTING

Reports

54. Unless otherwise specified in this licence, all monitoring data, reports, plans, studies, study results, designs or manuals shall be submitted to the Board in the following format:

a) All reports required to be submitted to the Board will be unbound and reproducible by standard photocopier, accompanied by one electronic copy on a CD/DVD.

b) The Licensee shall provide to the Board 5 additional copies of all reports. The additional copies may be either 5 bound paper copies or 5 electronic copies on individual CDs/DVDs.

c) Electronic copies shall be IBM compatible in one of the following formats: Word 97 - 2003, Excel 97 - 2003 workbooks, or Adobe .pdf format. Water quality results must be presented in Excel 97-2003 .xls format.

Annual Reports

55. Annual reports shall be submitted to the Board by the Licensee. The first report shall be for the period from the effective date of the licence to December 31, 2010. Subsequent reports shall be for each calendar year. Annual reports will be submitted to the Board on or before March 31 of the following year.

56. Annual reports shall include the information required by this licence and by the Regulation, including, but not necessarily limited to:

a) a description of the water use operations carried out during the year reported;

b) the quantity of water used each day from each identified water source;

c) a detailed record of any major maintenance work carried out or planned to be carried out that could have an impact on water;

d) summaries of all data generated as a result of the monitoring requirements of this licence, including analysis and interpretation by a qualified individual or firm and a discussion of any variances from baseline conditions or from previous years' data;

e) the inspection results, including photographs, repairs plans for modification required by the physical monitoring program;

f) a discussion of proposed changes to the monitoring programs;

g) details of any work carried out or planned to be carried out under the Adaptive Management Plan;

h) copies of all orders, directions, and correspondence relating to drinking water sampling or analysis from the Medical Health Officer or from a Health Officer;

i) results and summaries of all data generated as a result of the meteorological monitoring that is required by this licence;

j) an annual update of the Detailed Water Balance Report;

k) report on the status of the Decommissioning and Reclamation Plan and any updates to the Plan that have occurred since the previous submission; and

l) report on the results of the sediment and benthic invertebrate sampling and monitoring.

Reporting on Water Treatment Plant Performance

57. As a component of the annual report, the Licensee shall submit a performance evaluation report for all water treatment plants. The evaluation shall be carried out by a firm or persons qualified to do so through education or experience relevant to the types of treatment plants being operated. At a minimum, the evaluation shall include:

a) an analysis of the plants' performances in terms of treatment efficiency, capacity, and compliance;

b) a review of operators' daily logs, field monitoring data; and

c) any recommended remedial actions and any actions taken by the Licensee.

Reporting on Physical Inspections and Monitoring

58. The Licensee shall submit a report titled, "*Physical Inspections and Monitoring Report*" certified by a Professional Engineer. The report shall be submitted as a part of the annual report. The report shall include, but not necessarily be limited to:

a) documentation of the inspection locations and methodologies;

b) the results of the inspection;

c) all problems identified;

d) remedial measures recommended; and

e) the status of any remedial measures recommended in the previous year's report with an explanation regarding any recommendation not implemented.

59. Actions taken or planned in response to any identified issues and/or to prevent recurrence will be reported annually as part of the annual report.

Reporting on Waste Rock Monitoring

60. At a minimum, the Licensee shall record the following during all inspections and provide the details as part of the annual report:

a) any physical instability including erosion;

b) upstream ponding of water and downstream seepage;

c) the location of ponding and seepage;

d) the volume of flow, field pH and conductivity of ponding or seepage;

e) visual evidence of sulphide oxidation including snow melt areas or the presence of oxidation products; and

f) trends in pH, and conductivity for any recurring seepage or ponding location.

61. Seepage or ponding locations identified through inspection shall be assigned a unique identifier consistent with monitoring stations in this licence. Descriptions of new locations shall be provided to the Board as part of the annual report.

Reporting on Hydrogeological Monitoring

62. The results of hydrogeological monitoring shall be included in the annual report and shall be accompanied by a certified report by a hydrogeologist interpreting the sources of inflows and contaminant loads into the underground workings.

Monthly Reports

63. Unless otherwise specified in this licence, the Licensee shall forward to the Board a copy of all data collected as part of the monitoring programs of this licence no more than 30 days after the conclusion of the month in which that data was collected. The report shall include graphical analysis of the effluent quality parameters listed in this licence and be in the form required by clause 54 of this licence.

64. The first monthly report shall include the location coordinates of those monitoring stations identified in Schedule B – Table 1 Surface Water Monitoring Stations, of this licence, for which location coordinates are not established.

65. Location coordinates for monitoring stations identified in Schedule B – Table 2 Groundwater Monitoring Stations of this licence that are not yet established shall be provided in the first monthly report issued after the monitoring stations have been established.

PART H – MANUALS, PLANS, AND STUDIES

Bellekeno 625 Water Treatment System Operations Manual

66. Within 90 days of the effective date of this licence, the Licensee shall submit to the Board a manual to be titled, "*Bellekeno 625 Mine Water Treatment System Operations Manual*". The manual shall include, but not be necessarily limited to:

a) details of all system components including: piping, tanks, treatment building, additives storage, flow capacity, filtration system, pond design details, pond volumes, discharge controls and details;

b) description of treatment operations, including lime dosing and basis, mixing procedures, polymer additions, filtration, expected retention times in the ponds and basis for these times, bypass events, cold weather operations;

c) maintenance activities being undertaken to keep the facility in good operating condition and minimize breakdowns, along with a schedule for these activities;

d) monitoring that will be undertaken to determine influent quality and volumes and to confirm that discharge criteria are met;

e) details on treatment of contaminants other than metals; and

f) details about contingency plans and system flexibility to adapt to greater flows and poorer water quality than the system was designed for.

Tailings Characterization Plan

67. As part of the Operations, Maintenance, and Surveillance Manual required for the DSTF under QML-0009, the Licensee shall develop and implement a Tailings Characterization Plan and submit the plan to the Board by December 31, 2010.

68. The Tailings Characterization Plan shall include:

a) the testing procedures to confirm the physical, chemical, and mineralogical properties of the low sulphur tailings which will be deposited at the facility. The procedures are required to determine at least the following properties or characteristics of the low sulphur tailings:

i. soil water characteristic curve;

ii. tailings gradation;

iii. tailings specific gravity;

iv. drained and undrained shear strength;

v. tailings pore water chemistry; and

vi. tailings mineralogy and acid base accounting;

b) provisions for conducting long-term humidity cell tests of tailings. Such tests shall be initiated for each new ore body mined and shall be continued until a steady-state has been established; and

c) sampling frequencies for confirming the properties of deposited tailings such that the assumed long term chemical and physical behaviour of the tailings stack can be progressively confirmed during operation of the Bellekeno Mine, and the rationale to support the recommended frequencies.

Detailed Water Balance Report

69. Within six months of the effective date of this licence, the Licensee shall submit a detailed site wide water balance report for the Flame and Moth Site and the Bellekeno Mine. The report shall be based on considering a range of potential input hydrology scenarios in a detailed water balance model developed for the site areas.

70. Input hydrology scenarios shall be developed based on an update of meteorological, stream flow, and groundwater parameters for the site areas including:

a) updated meteorological inputs including precipitation, snowmelt, evaporation, and evapo-transpiration;

b) stream flow monitoring results; and

c) short-term and long term mine inflow predictions.

71. The water balance model shall be capable of modelling all key phases of the project, accounting for production changes, changing surface and underground developments,

surface and underground storage volumes, and changing water use requirements associated with the operations and closure phases of the Bellekeno Undertaking.

72. A subset of the water balance model shall specifically investigate and report on the water balance of the DSTF that accounts for potential runoff, infiltration, and draindown seepage that may occur at this facility during operations and closure.

73. The water balance report shall be updated annually.

Water Management Plan

74. Within six months of the effective date of this licence, the Licensee shall submit to the Board a plan titled, "*Bellekeno Water Management Plan*", and shall implement that plan. The plan shall be based on a detailed water balance and shall include but not be limited to:

a) Protocols, such as water quality requirements, to identify when and for what purpose water other than treated discharge or mine pool water can be used at the Bellekeno Mine;

b) Protocols to identify when and for what purpose water other than Galkeno 900 treated discharge water or water stored at the Flame and Moth collection and sediment pond can be used at the Flame and Moth Site;

c) Procedures and methods for accounting for water use at the Bellekeno Mine and Flame and Moth Site;

d) Procedures and methods for verifying water balance assumptions and collecting water balance input data such as site runoff, precipitation, evaporation, and DSTF seepage; and

e) Contingency plans for operations related to flood or drought conditions and high mine inflow conditions.

Receiving Environment Study

75. Within 24 months of the effective date of this licence, the Licensee shall submit the results of a Receiving Environment Study that identifies receiving environment water quality standards appropriate for the long-term goals of closing the Keno Hill Mines Property.

76. The study shall be consistent with the goal of biological recovery of the Lightning Creek and Christal Creek drainages and shall be consistent with the results of investigations associated with Clause 43 of Water Use Licence QZ06-074.

77. The study shall include recommendations for monitoring frequency and methodology of the receiving environments and any other necessary locations to ascertain that the Bellekeno Undertaking is not causing the Receiving Environment Study standards to be exceeded.

78. The recommendations of the receiving environment study shall be updated at least annually and whenever study and/or recommendations are modified as a result of any regulatory approval process.

Sludge Management Plan

79. Within six months of the effective date of this licence, the Licensee shall submit to the Board a Sludge Management Plan dealing specifically with the Bellekeno Undertaking and shall implement that plan. The plan shall include a description of sludge management for Bellekeno Undertaking treatment sludge both during operations and during closure.

80. The Sludge Management Plan shall demonstrate how the Bellekeno Undertaking sludge is maintained separately from other treatment sludge produced in the Keno Mining District.

Bellekeno Hydrogeology

81. Within 90 days of the effective date of this licence, the Licensee shall submit to the Board a plan developed by a professional hydrogeologist for a phased hydrogeological study of the Bellekeno Mine. The plan shall be structured to include at a minimum, but not necessarily be limited to:

    a) identification of the sources of existing flows and contaminant loads originating from the historical workings of Bellekeno Mine and establishment of methods to monitor those flows and loads during operations at the mine; and

    b) the development of an internal flow and load monitoring plan for the new underground development and stopes that will be excavated within the underground workings.

82. The Licensee shall implement the plan required by clause 81 of this licence within 120 days of the effective date of the licence.

83. All documentation and data produced as part of the plan required by clause 81 of this licence shall be certified by a professional hydrogeologist registered with a provincial regulatory organization, and submitted to the Board as part of the annual report.

84. Not later than six months prior to closure, the Licensee shall submit to the Board a Bellekeno Mine Closure Hydrogeological Assessment report. The report shall present the following:

    a) the results of the hydrogeological monitoring of both the historical and new underground workings;

    b) the predicted static water elevation in the underground workings after closure;

    c) the predicted rate of discharge from the mine after closure;

    d) the predicted water quality discharging from the mine after closure; and

e) the basis for these determinations.

Groundwater Monitoring Plan

85. Within six months of the effective date of this licence, the Licensee shall submit to the Board a Bellekeno Groundwater Monitoring Plan for both the Bellekeno Waste Rock Disposal Area and Flame and Moth Site and shall implement that plan.

86. The plan for the Waste Rock Disposal Area shall include the installation of at least four groundwater monitoring wells.

87. For the Flame and Moth Site, the plan shall be developed by considering existing knowledge of geological structures at the site and the consideration of groundwater table mapping based on sampling of KV-84, KV-85, KV-86, and KV-87. The developed plan shall include, but not necessarily be limited to the following:

a) Installing at least three multi-level groundwater monitoring wells down gradient of DSTF;

b) Where wells are installed into bedrock, the bedrock shall be cored;

c) Developing detailed geological logs for all new well installations including: identification of soil or rock types; soil condition or rock quality; and geological and hydrogeological features such as joints and fractures. The logs are also to include details of the well installations;

d) Based on baseline groundwater quality, development of trigger levels that would be used to enact the adaptive management strategy and provide early warning of the need for mitigative measures and/or changes in facility design/operations.

Bioreactor Design and Operation Plan

88. Within one year of the effective date of this licence, the Licensee shall submit to the Board a plan titled, "Bellekeno Bioreactor Design and Operation Plan". The plan shall include but not be limited to:

a) the results of the tracer study on the Galkeno 900 pilot bioreactor and implications to the design and operation of the proposed Bellekeno bioreactor;

b) the results and analysis of the Galkeno 900 pilot bioreactor operations that will inform the design of the Bellekeno bioreactor;

c) preliminary sizing, design, and operational procedures for the proposed Bellekeno Bioreactor;

d) preliminary costing of the construction and long term operation of the proposed Bellekeno Bioreactor;

e) scheduling of the development of the bioreactor including scheduling of a pilot or transitional phase during which the existing Bellekeno treatment plant will be available to run in series or parallel with the bioreactor; and

f) identification of passive treatment alternatives that are being considered to replace or augment the proposed bioreactor.

89. The Bioreactor design and operation plan shall be updated annually to account for any changes to the predicted water quantity or quality of discharges from the Bellekeno Mine at closure.

Bellekeno Adaptive Management Plan

90. Within six months of the effective date of this licence, the Licensee shall submit to the Board an AMP dealing specifically with Bellekeno Undertaking and shall implement that plan. The AMP should be based on the contents of the existing district-wide AMP submitted as exhibit 1.3.10, but customized for the specific activities and developments of the Bellekeno Undertaking.

91. In addition to these relevant events already identified in the district wide AMP, the Bellekeno AMP should specifically include adaptive management triggers and responses to the following events:

a) development of high pore pressures underneath the DSTF;

b) development of significant erosion of exposed DSTF surfaces;

c) development of erosion at the Flame and Moth Site discharge area;

d) transport of sediment from the Flame and Moth discharge area into Christal Creek;

e) development of large differential settlements at the DSTF;

f) development of large differential settlements along the conveyance flume from the DSTF to the Flame and Moth Site collection and sediment pond;

g) exceedence of recommended water quality standards in the receiving environment occurring irrespective of compliance with effluent discharge standards;

h) identification of groundwater quality impacts at the Flame and Moth or Bellekeno mill sites; and

i) identification of water quality impacts to Keno City water wells.

Physical Inspections and Reporting Plan

92. Within 60 days of the effective date of this licence, the Licensee shall submit to the Board a plan titled, "*Bellekeno Physical Inspection and Reporting Plan*" for all water retaining structures, water conveying structures, and mine Waste structures and shall implement that plan.

93. Inspections will be conducted at least on a weekly basis for all structures identified in the Bellekeno Physical Inspection and Reporting Plan.

94. The Bellekeno Physical Inspection and Reporting Plan shall include the Bellekeno 625 settling ponds, the N-AML Waste Rock disposal area, the P-AML Waste Rock storage

facilities, the access roads, DSTF, and Mill Site and DSTF collection and sedimentation pond.

PART I – SITE DECOMMISSIONING AND RECLAMATION

95. Any substantial modification to the Decommissioning and Reclamation Plan shall require an amendment to this licence.

96. Prior to implementation of the Decommissioning and Reclamation Plan, the Licensee shall investigate whether further assessments, authorizations or approvals are required. The results of this investigation shall be submitted to the Board prior to implementation.

97. Subject to clauses 95 and 96 of this licence, and in the event of Temporary Closure, the Licensee shall implement the Temporary Closure provisions of the Decommissioning and Reclamation Plan.

98. Subject to clauses 95 and 96 of this licence, and in the event of Permanent Closure, the Licensee shall implement the Decommissioning and Reclamation Plan.

SCHEDULE A - MINERAL CLAIMS COVERING THE MINE AND MINE FACILITIES

GRANT NUMBER	GRANT NUMBER
59645	59494
55426	12838
YC42578	56401
YA17395	83011
YC56120	55544
YC42580	55319
YA17397	38819
YC56121	59338
55445	16105
16097	59316
YC42628	38643
YC42627	56403
YC56115	56582
YC42629	16557
59387	15207
55312	55542
55546	55540
56402	16375
56533	15374
16554	55029
16585	16569
55599	56575
13073	56443
55271	16170
59465	59452
14081	55600
14327	55120
38730	16561
55065	59463
56534	83012
38642	55327
16087	55474
55475	

SCHEDULE B: TABLE 1 – SURFACE WATER MONITORING STATIONS

Monitoring Station	Description	Northing[1]	Easting[1]
KV-1	South McQuesten River u/s of Christal Creek	7092790	474008
KV-2	South McQuesten River @ Pumphouse	7090036	472076
KV-6	Christal Creek at Keno Highway	7088242	483909
KV-7	Christal Creek at Hanson Road	7092413	478657
KV-8	Christal Creek @ Mouth	7091944	474585
KV-37[2]	Lightning Creek u/s Hope Gulch	7087776	490315
KV-38	Lightning Creek u/s Thunder Gulch	7087341	488193
KV-39	Hope Gulch u/s Lightning Creek	7087783	490252
KV-40	Charity Gulch u/s Lightning Creek	7087503	488982
KV-41	Lightning Creek u/s bridge at Keno City	7086764	485429
KV-42	Bellekeno 625 Adit	7087062	487363
KV-43	Bellekeno 625 Treatment Pond Decant	7087147	487318
KV-44	Bellekeno 625 Seep	7087195	487361
KV-45	Onek Adit	7087288	485101
KV-49	Hinton Creek u/s of Christal Creek	7086954	483445
KV-50[2]	Christal Creek u/s Hinton Creek	7086897	483575
KV-51	Christal Creek d/s Hinton Creek	7087010	483600
KV-52	Natural Spring to Christal Lake at Old Mackeno pump house	7087869	483756
KV-65	Thunder Gulch Upstream of Bellekeno	7086873	487464
KV-72	South McQuesten River at McQuesten Lake	7104476	482492
KV-76	Thunder Gulch d/s of Bellekeno 625 adit	7087118	487414
KV-77	Thunder Gulch upstream of Bellekeno East	7086013	487742
KV-78	Bellekeno East Temporary Waste Rock Storage Facility	7086158	487605
KV-79	Christal Creek d/s MacKeno Tailings	7088054	483809
KV-80	Christal Lake u/s Mackeno Tailings	7088132	483827
KV-81	Lightning Creek Southwest of Mill Site	7086424	483557
KV-82	Flame and Moth Site collection and sediment pond	TBD[3]	TBD[3]
KV-83	Flame and Moth treatment plant discharge	TBD[3]	TBD[3]

[1] Coordinates are UTM Zone 8 NAD 83
[2] Background
[3] TBD – "to be determined", station not established at this time.

SCHEDULE B: TABLE 2 – GROUNDWATER MONITORING STATIONS

Monitoring Station	Description	Northing[1]	Easting[1]
KV-84	Keno City Well	TBD[2]	TBD[2]
KV-85	Flame and Moth Site Groundwater Well #1 (PH2)	7086952	483864
KV-86	Flame and Moth Site Groundwater Well #2 (PH5)	7086707	483836
KV-87	Flame and Moth Site Groundwater Well #3 (PH6)	7086854	484104
KV-88	Flame and Moth Site Groundwater Well #4	TBD[2]	TBD[2]
KV-89	Flame and Moth Site Groundwater Well #5	TBD[2]	TBD[2]
KV-90	Flame and Moth Site Groundwater Well #6	TBD[2]	TBD[2]
KV-91	Bellekeno Waste Rock Disposal Area well #1	TBD[2]	TBD[2]
KV-92	Bellekeno Waste Rock Disposal Area Well #2	TBD[2]	TBD[2]
KV-93	Bellekeno Waste Rock Disposal Area Well #3	TBD[2]	TBD[2]
KV-94	Bellekeno Waste Rock Disposal Area Well #4	TBD[2]	TBD[2]

[1] Coordinates are UTM Zone 8 NAD 83
[2] TBD – "to be determined", station not established at this time.

SCHEDULE B: TABLE 3 - MONITORING SCHEDULE FREQUENCY LEGEND

Symbol	Frequency
C	Continuous
C-WD	Continuous while discharging
D	Daily
D-WD	Daily while discharging
W	Weekly
W-WD	Weekly while discharging
W/Q	Weekly migrating to quarterly to accord with monitoring frequency pursuant to MMER regulations
M	Monthly
Ms	Monthly from May to October
Q	Quarterly: May/July/October/February
SA	Semi-annually (twice per year)
A	Annually
BA	Bi-annually (every two years)

SCHEDULE B: TABLE 4 - FIELD SCREENING MONITORING SCHEDULE

Monitoring Station	Field Parameters							
	Zn	Ammonia	Turbidity	pH	Temp.	Cond.	Flow	Level
Treatment Sites:								
KV-42	D	D	D	D	D	D	C	-
KV-43	D	D	D	D	D	D	C	-
KV-82	D	D	D	D	D	D	-	D
KV-83	D-WD	D-WD	D-WD	D-WD	D-WD	D-WD	C-WD	-
Surveillance Sites:								
KV-1	-	-	-	Q	Q	Q	Q	-
KV-2	-	-	-	Q	Q	Q	Q	-
KV-6	-	-	-	M	M	M	C	-
KV-7	-	-	-	M	M	M	M	-
KV-8	-	-	-	M	M	M	Q	-
KV-37	-	-	-	Q	Q	Q	Q	-
KV-38	-	-	-	Q	Q	Q	Q	-
KV-39	-	-	-	Q	Q	Q	Q	-
KV-40	-	-	-	Q	Q	Q	Q	-
KV-41	-	-	-	M	M	M	C	-
KV-44	Ms	-	-	Ms	Ms	Ms	Ms	-
KV-45	-	-	-	Q	Q	Q	Q	-
KV-50	-	-	-	Q	Q	Q	Q	-
KV-51	-	-	-	Q	Q	Q	Q	-
KV-52	-	-	-	M	M	M	M	-
KV-65	-	-	-	Q	Q	Q	Q	-
KV-72	-	-	-	Q	Q	Q	Q	-
KV-76	Q	-	-	Q	Q	Q	Q	-
KV-77	-	-	-	Q	Q	Q	Q	-
KV-78	-	-	-	Ms	Ms	Ms	-	Ms
KV-79	-	-	-	Q	Q	Q	-	-
KV-80	-	-	-	Q	Q	Q	-	-
KV-81	-	-	-	Q	Q	Q	-	-
KV-84	-	-	-	Q	Q	Q	-	Q
KV-85	-	-	-	Q	Q	Q	-	Q
KV-86	-	-	-	Q	Q	Q	-	Q
KV-87	-	-	-	Q	Q	Q	-	Q
KV-88	-	-	-	Q	Q	Q	-	Q
KV-89	-	-	-	Q	Q	Q	-	Q
KV-90	-	-	-	Q	Q	Q	-	Q
KV-91	-	-	-	Q	Q	Q	-	Q
KV-92	-	-	-	Q	Q	Q	-	Q
KV-93	-	-	-	Q	Q	Q	-	Q
KV-94	-	-	-	Q	Q	Q	-	Q

SCHEDULE B: TABLE 5- DETAILED MONITORING SCHEDULE

Monitoring Station	Parameters								
	Total ICP Metals[1]	Dissolved ICP Metals[1]	Ammonia -N	Nitrite -N	Nitrate -N	Phosphorous	Sulphate	Dissolved Organic Carbon (DOC)	Hardness
Treatment Sites:									
KV-42	W	W	W	W	W	W	W	M	W
KV-43[2]	W	W	W	W	W	W	W	W	W
KV-82	M	M	M	M	M	M	M	M	M
KV-83[2]	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD	W-WD
Surveillance Sites:									
KV-1	Q	Q	-	-	-	Q	Q	Q	Q
KV-2	Q	Q	-	-	-	Q	Q	Q	Q
KV-6	M	M	M	M	M	M	M	M	M
KV-7	M	M	M	M	M	M	M	M	M
KV-8	M	M	-	-	-	M	M	M	M
KV-37	Q	Q	-	-	-	Q	Q	Q	Q
KV-38	Q	Q	-	-	-	Q	Q	Q	Q
KV-39	Q	Q	-	-	-	Q	Q	Q	Q
KV-40	Q	Q	-	-	-	Q	Q	Q	Q
KV-41	M	M	M	M	M	M	M	M	M
KV-44	-	Q	Q	Q	Q	Q	Q	Q	Q
KV-45	Q	Q	-	-	-	Q	Q	Q	Q
KV-49	Q	Q	-	-	-	Q	Q	Q	Q
KV-50	Q	Q	-	-	-	Q	Q	Q	Q
KV-51	Q	Q	Q	Q	Q	Q	Q	Q	Q
KV-52	M	M	-	-	-	M	M	M	M
KV-65	M	M	-	-	-	M	M	M	M
KV-72	Q	Q	-	-	-	Q	Q	Q	Q
KV-76	Q	Q	-	-	-	Q	Q	Q	Q
KV-77	Q	Q	-	-	-	Q	Q	Q	Q
KV-78	Q	Q	-	-	-	Q	Q	Q	Q
KV-79	Q	Q	-	-	-	Q	Q	Q	Q
KV-80	Q	Q	-	-	-	Q	Q	Q	Q
KV-81	Q	Q	-	-	-	Q	Q	Q	Q
KV-84	Q	Q	-	-	-	Q	Q	Q	Q
KV-85	Q	Q	Q	-	-	Q	Q	Q	Q
KV-86	Q	Q	Q	-	-	Q	Q	Q	Q
KV-87	Q	Q	Q	-	-	Q	Q	Q	Q
KV-88	Q	Q	Q	-	-	Q	Q	Q	Q
KV-89	Q	Q	Q	-	-	Q	Q	Q	Q
KV-90	Q	Q	Q	-	-	Q	Q	Q	Q
KV-91	Q	Q	Q	-	-	Q	Q	Q	Q
KV-92	Q	Q	Q	-	-	Q	Q	Q	Q
KV-93	Q	Q	Q	-	-	Q	Q	Q	Q
KV-94	Q	Q	Q	-	-	Q	Q	Q	Q

[1] ICP Metals include: *Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Sulphur, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc and Zirconium*

[2] Compliance Points

SCHEDULE B: TABLE 5 - DETAILED MONITORING SCHEDULE (CONTINUED)

Monitoring Station	Parameters								
	Alkalinity	pH	Cond.	TSS	Radium 226	LC_{50}	Sediment	Benthic	Sub-lethal Toxicity
Treatment Sites:									
KV-42	W	W	W	W	-	-	-	-	-
KV-43[2]	W	W	W	W	W/Q	M	A	-	SA
KV-82	M	M	M	M	-	-	-	-	-
KV-83[2]	W-WD	W-WD	W-WD	W-WD	W/Q	M	A	-	SA
Surveillance Sites:									
KV-1	Q	Q	Q	Q	-	-	-	-	-
KV-2	Q	Q	Q	Q	-	-	-	-	-
KV-6	M	M	M	M	-	-	BA	BA	-
KV-7	M	M	M	M	-	-	-	-	-
KV-8	M	M	M	M	-	-	-	-	-
KV-37	Q	Q	Q	Q	-	-	-	-	-
KV-38	Q	Q	Q	Q	-	-	A	A	-
KV-39	Q	Q	Q	Q	-	-	-	-	-
KV-40	Q	Q	Q	Q	-	-	-	-	-
KV-41	M	M	M	M	-	-	A	A	-
KV-44	Q	Q	Q	Q	-	Q	-	-	-
KV-45	Q	Q	Q	Q	-	-	-	-	-
KV-49	Q	Q	Q	Q	-	-	-	-	-
KV-50	Q	Q	Q	Q	-	-	-	-	-
KV-51	Q	Q	Q	Q	-	-	-	-	-
KV-52	M	M	M	M	-	-	-	-	-
KV-65	M	M	M	M	-	-	-	-	-
KV-72	Q	Q	Q	Q	-	-	-	-	-
KV-76	Q	Q	Q	Q	-	M	-	-	-
KV-77	Q	Q	Q	Q	-	-	-	-	-
KV-78	Q	Q	Q	Q	-	-	-	-	-
KV-79	Q	Q	Q	Q	-	-	-	-	-
KV-80	Q	Q	Q	Q	-	-	-	-	-
KV-81	Q	Q	Q	Q	-	-	-	-	-
KV-84	Q	Q	Q	Q	-	-	-	-	-
KV-85	Q	Q	Q	Q	-	-	-	-	-
KV-86	Q	Q	Q	Q	-	-	-	-	-
KV-87	Q	Q	Q	Q	-	-	-	-	-
KV-88	Q	Q	Q	Q	-	-	-	-	-
KV-89	Q	Q	Q	Q	-	-	-	-	-
KV-90	Q	Q	Q	Q	-	-	-	-	-
KV-91	Q	Q	Q	Q	-	-	-	-	-
KV-92	Q	Q	Q	Q	-	-	-	-	-
KV-93	Q	Q	Q	Q	-	-	-	-	-
KV-94	Q	Q	Q	Q	-	-	-	-	-

[2] Compliance Points

APPENDIX B

GROUNDWATER MONITORING PLAN (AUGUST 20120), WATER LICENCE QZ09-092

KENO HILL SILVER DISTRICT MINING OPERATIONS

GROUNDWATER MONITORING PLAN

[Status]

August 2012

Prepared for:

ALEXCO KENO HILL MINING CORP.

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1 INTRODUCTION

1.1 PURPOSE OF THE PLAN

This plan was originally submitted to fulfill the conditions set out in Part H, Clauses 85, 86, and 87 of Water Licence QZ09-092 (hereafter referred to as the Licence) issued to Alexco Keno Hill Mining Corp. (AKHM) on August 19th 2010:

85. Within six months of the effective date of this licence, the Licensee shall submit to the Board a Bellekeno Groundwater Monitoring Plan for both the Bellekeno Waste Rock Disposal Area and Flame and Moth Site and shall implement that plan.
86. The plan for the Waste Rock Disposal Area shall include the installation of at least four groundwater monitoring wells.
87. For the Flame and Moth Site, the plan shall be developed by considering existing knowledge of geological structures at the site and the consideration of groundwater table mapping based on sampling of KV -84, KV -85, KV -86, and KV -87. The developed plan shall include, but not necessarily be limited to the following:

    a) Installing at least three multi-level groundwater monitoring wells down gradient of DSTF;
    b) Where wells are installed into bedrock, the bedrock shall be cored;
    c) Developing detailed geological logs for all new well installations including: identification of soil or rock types; soil condition or rock quality; and geological and hydrogeological features such as joints and fractures. The logs are also to include details of the well installations;
    c) Based on baseline groundwater quality, the development of trigger levels that would be used to enact the adaptive management strategy and provide early warning of the need for mitigative measures and/or changes in facility design/operations.

In addition, Part F Clauses 45 and 46 of the Licence provided additional guidance on the groundwater monitoring program:

45. Monitoring results should be reviewed after each sampling event to identify groundwater changes, should they occur.
46. Groundwater wells determined to be subject to seasonal freezing shall have pressure transducers installed when cleared of seasonal ice.

In addition to addressing the above water license conditions for Bellekeno and District Mill sites this plan has been amended to be applicable to the Keno Hill Silver District mining operations, including the Onek and Lucky Queen sites. Thus, the revised groundwater monitoring plan is to be called the Keno Hill Silver District Mining Operations Groundwater Monitoring Plan.

2 MINE LOCATION AND DESCRIPTION

The Keno Hill Silver District (KHSD) is located in central Yukon Territory, 354 km (by air) due north of Whitehorse. The Bellekeno mine area is located approximately 3 km east of Keno City within the KHSD. Lucky Queen is located approximately 4 km northeast of Keno City and Onek is situated about 500 m northeast of Keno City. The mill site and Dry Stack Tailings Facility (hereinafter referred to as the "DSTF") are located approximately 1 km west of Keno City.

The portal at Bellekeno East is located on a steep slope above Thunder Gulch, a narrow tributary of Lightning Creek, and the haul road access to the mill site is provided by an approximately 3 km access road which crosses Lightning Creek approximately 2,200 m downstream from the confluence of Thunder Gulch and Lightning Creek. Please see Figure 1 for the site map.

483500 484000 484500 485000 485500 486000 486500 487000 487500

7091500 7091000 7090500 7090000 7089500 7089000 7088500 7088000 7087500 7087000 7086500 7086000 7085500

N W E S

LUCKY QUEEN

WERNECKE ROAD

TO ELSA/MAYO

PROPOSED TRANSMISSION LINE ROUTING

SILVER TRAIL HIGHWAY

SIGN POST ROAD

CHRISTAL LAKE

ONEK PIT

BELLEKENO MINE SITE

KENO CITY

KENO DISTRICT MILL SITE

BELLEKENO HAUL ROAD

990 PORTAL

PROPOSED BYPASS ROAD

DUNCAN CREEK ROAD

1:18,000 (when printed on 11 x 17 inch paper)

Meters 0 220 440 880 1,320 1,760

483500 484000 484500 485000 485500 486000 486500 487000 487500

Adit
Proposed ByPass Road
Proposed Transmission Line
Highway
Local
Track
Contour (5 m intervals)

Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13th and 14th 2006. Site hydrography and contours derived from 2006 aerial imagery obtained from Aero Geometrics, Calgary Alberta.

Datum: NAD 83; Projection: UTM Zone 8N

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AKHM ACCESS

ALEXCO KENO HILL MINING CORP.
PROPOSED DEVELOPMENT PLAN

FIGURE 1
ONEK AND LUCKY QUEEN AREA OVERVIEW

DRAWN BY JP	JUNE 2012	VERIFIED BY LH

I:\Keno_Area_Mines\ONEK\Maps\2_Permitting\07-YESAB_JUNE2012\990Option\Overview20120612.mxd
(*Last edited by: jpan;6/12/2012/13:41 PM*)

3 PREVIOUS GROUNDWATER STUDIES

SRK Consulting Canada Inc. (SRK) was retained by AKHM to investigate groundwater gradients of the Mill Site in relation to Keno City and Lightning Creek. Three groundwater monitoring wells were installed for this program (PH2, PH5 and PH6). These wells will be referred to in this plan according to their KV station numbers as listed in Schedule A of the Licence, KV-85, KV-86 and KV-87, respectively. Key findings of the SRK groundwater investigation (SRK, 2010) include:

- The water table within the bedrock aquifer under the site and within a relatively thick overburden aquifer to the south is at considerable depth (>25 m);
- Water level data from monitoring wells at site and Keno City indicate that groundwater flows from east to west, or from Keno City towards the mill site and Christal Lake;
- These water level data also indicate a shallow gradient between Lightning Creek towards Christal Lake;
- Water quality analyses of samples taken immediately following monitoring well development indicate that in general, concentrations of dissolved anions and metal are low;
- The only notable exceptions are elevated levels concentrations of chloride and sodium in KV-87, which is located downgradient and could be indicative of seepage from the Keno City dump and; elevated concentrations of sulphate in KV-86 and KV-87, which are deemed to be indicative of natural mineralization in this area;
- The likelihood of effects to groundwater quality in general related to the mill and DSTF are considered very low, due to site water management plans for seepage and runoff interception, and collection and treatment if necessary;
- Because groundwater extraction is not planned at the mill site, there will be no effects on the amount of water available for extraction from wells in Keno City, and;
- The chance of water quality being affected in wells in Keno City is considered insignificant due to current understanding of the local groundwater gradient and the large distance between the mill site and Keno City water wells.

The SRK groundwater report, entitled “Bellekeno Groundwater Program” was issued in May 2010, and was submitted to the Board as supplemental information in support of the application for QZ09-092 (Exhibit 1.12 of the public registry). This report is available at http://www.yukonwaterboard.ca/registers/quartz/QZ09-092/Volume%204/1.12/1.12.pdf.. Prior to issuance of their 2010 Bellekeno Groundwater report, SRK was also retained to complete initial (desktop) assessments of potential impacts of the proposed mill and DSTF site on groundwater quantity and quality (SRK, 2009a; SRK, 2009b).

Interralogic, Inc. conducted a groundwater evaluation for Keno City between October 2010 and March 2012. Two trenches were excavated within a dry stream channel downgradient of the Onek 400 adit in October 2010 to determine if discharge from the adit was following the channel. As part

of the groundwater evaluation Interralogic also completed a Keno City water supply wells field program in fall 2010 to determine water levels, quality, and approximate material transmissivities. Interralogic also sampled five new monitoring wells drilled under the Keno Closure Plan, as well as a monitoring well (ON-MW-01) that was installed in 2011 to understand groundwater elevations near the historic Onek waste rock dumps and open pit.

In order to evaluate the groundwater flow path the wells that were available to measure groundwater levels were gauged and Interralogic came to the following conclusions, which are taken directly from there memo:

- There is a convergence of southwest and northward flowing groundwater below the central portion of Keno City.
- The groundwater below Keno City is conveyed northwest along a feature that appears to have higher permeability than adjacent geologic units. Evidence for this is (1) the interpretation that groundwater converges toward this feature, (2) the change in hydraulic head is relatively small between upgradient wells in Keno City and downgradient wells MW-1A, MW-1B, and MW-2, and (3) the relatively high initial yield of the Firehall well (57 to 96 lpm). The higher permeability feature could be associated with a buried glacial valley (overburden) and/or fracture zone (bedrock).
- Water level contours suggest that groundwater discharges to Lightning Creek east of Keno City. South of Keno City, there appears to be seepage loss from the stream that recharges the groundwater system below the townsite. The zone of high seepage loss from the stream could be associated with the southeast extension of the postulated higher permeability feature.
- At and downstream (west) of the Onek 400 portal, the groundwater flow direction is generally southwest towards the postulated higher permeability feature, but not towards any of the Keno City water wells.

A copy of this technical memorandum has been provided as Appendix A.

4 REGIONAL GEOLOGY AND HYDROGEOLOGICAL IMPLICATIONS

The long history of mining and exploration in the Keno Hill Silver District means that regional geology has been well studied. Although no comprehensive studies specific to groundwater have been completed in the district, a number of observations can be made relating to bedrock and surficial geology and their hydrogeological characteristics. Some background information pertinent to district geology and groundwater, are summarized below from the Environmental Conditions Report (ACG, 2009).

> The Keno Hill District is underlain primarily by Yukon Group metasedimentary rocks, locally divided into three formations; Upper Schist, Central Quartzite and Lower Schist. The Upper Schist (Hyland Group, pre-Cambrian to Cambrian age) overlies the quartzite in what is inferred to be a thrust contact (Robert Service Thrust) and consists of quartz-mica schist, quartzite, graphitic schist and minor limestone. The Central Quartzite (Keno Hill Quartzite, Mississippian age) contains thick-and thin-bedded quartzite, massive quartzite, graphitic phyllite, graphitic schist, calcareous schist and minor Triassic greenstone. This unit is approximately 700 m thick and is host to most of the past producing ore bodies. Structurally juxtaposed below the quartzite is the Lower Schist which has been correlated with the Devonian-Mississippian Earn Group. The Lower Schist includes graphitic schist, argillite, thin-bedded quartzite, calcareous schist, phyllite, slate, sericite schist, minor thick-bedded quartzite and locally significant intervals of Triassic greenstone. The greenstone forms sills and / or boudins and consists of metadiorite and metagabbro. The sills and boudins form bodies up to one kilometre long and thirty metres thick. Regional, greenschist facies metamorphism of all units is believed to have occurred in the Middle Cretaceous, about 105 million years ago.
>
> A number of quartz-feldspar porphyritic sills have intruded the stratigraphy parallel to schistosity. The sills are most common in the Lower and Upper Schists and can reach thicknesses of up to fifty metres; reports of occurrences in the Central Quartzite are inconclusive and vague. The quartz-porphyry sills are believed to be of Cretaceous age.
>
> Structurally, the property is characterized by four sets of faults; many of which have been filled by hydrothermal minerals, forming veins. The oldest fault set consists of south dipping structures that are generally parallel to foliation and are apparently associated with the Tombstone Thrust Fault since movement was contemporaneous or slightly later. Locally, brittle deformation has been observed along these structures. A second fault set, known as “longitudinal veins” strikes north east to east northeast and dips steeply southeast. The latest movement along these faults is sinistral with offsets locally reaching more than 150 metres; however, more than one episode of movement commonly is indicated. Depending on the competency of the host rock, longitudinal

> veins can be up to thirty metres wide in an anastomosing system of sub-veins. Essentially all mineralized rock was mined from these longitudinal veins. A third set of faults, known as "transverse faults", is north-west striking and dips steeply to the north. Transverse faults typically do not contain silver and lead mineralization but are commonly filled by quartz with trace to minor arsenopyrite, pyrite and jamesonite.
>
> A younger set of faults, known as cross faults, strike north to north west with a dip of sixty degrees west to south west and offset vein or longitudinal faults by up to 2,000 metres. In the western part of the property, dextral movement is the most recent event along these structures, whereas in the eastern part of the property sinistral movement with less magnitude prevails."

SRK (2009a) further described the bedrock geology of the site as it relates to hydrogeological characteristics:

> "The bedrock geology of the area around Keno consists predominantly of layered metasedimentary rocks consisting mainly of quartzite, schist and phyllite. Unlike high yielding aquifer rocks such as sandstone, where groundwater can flow through connected 'pores' in the rock mass, the metasediments typically found in the Keno Hill district have a very low permeability, with little or no space between rock grains due to the metamorphosed character. The main medium through which water travels in these metasedimentary rocks therefore is via fractures and joints within the rock. The permeability of the rock (or the ease at which groundwater can flow through the rock formation) in this case is dependent on how many fractures are within the rock, and how well they are connected to each other, and how well connected to a water source (such as rainfall, a lake or a river) these fractures are."

SRK (2009a) also describes surficial sediments and their hydrology:

> "Shallow surficial sediments are found locally and typically are present in topographic lows which control surface drainage patterns. These overburden deposits have limited thickness and lateral extent, and likely form only small local aquifers. It is generally recognised that metasedimentary rocks do not commonly form high yielding aquifers. Fractures are not typically well connected and the resulting permeability is low. Evidence for this around Keno City can be seen in the characteristic marshy conditions seen in the area. The surface water found within these marshy areas is unable to drain easily down through the underlying rocks. The regional groundwater flowpaths can be generally described as mimicking surface water pathways."

It is further recognized in that the presence of complex glacial and glaciofluvial sediments present in the valley bottoms and along the margins of the hills produces complex overburden stratigraphy. Overburden thickness and composition are known to vary widely, which can result in complex

hydrology (e.g. perched aquifers) and generally poor drainage and low permeability. Also, the ubiquitous presence of permafrost and, in some areas, massive ground ice further complicate near surface groundwater regimes. In general, surficial sediment drainage can be described as generally poor, and complex, while bedrock hydrogeology can be described as generally low permeability with groundwater flow controlled by fractures and joints.

5 DISTRICT MILL SITE GROUNDWATER MONITORING

As per Clause 87a of the Licence, three multi-level groundwater monitoring wells were installed down gradient of the DSTF. Clause 87 specifies that three multi-level groundwater monitoring wells (e.g. Westbay type) are to be installed down gradient of the DSTF. However, because of the known challenges in the ground conditions near the DSTF (the presence of permafrost and massive ice, in some cases), AKHM believes that separate boreholes to monitor each potential groundwater zone (shallow overburden, and deep bedrock) are more likely to provide reliable results than complicated multi-level monitoring well systems, which are more likely to fail. The decision to use individual monitoring wells was also based on discussions with professional hydrogeologists experienced in monitoring well installations.

AKHM believes that the intention of Clause 87a was to ensure that three relatively shallow overburden monitoring wells and three deeper, bedrock groundwater monitoring points were installed down gradient of the DSTF to allow for monitoring of both shallow and deep groundwater. AKHM complied with Clause 87a through the use of the groundwater monitoring network described below in Table 1 and shown on **Error! Reference source not found.**2. The selection of these wells was based on a review of available geotechnical and hydrogeological information for the site and in discussion with EBA Engineering Consultants on the location of ground ice in this area.

Table 1 District Mill Site Groundwater Monitoring Well Summary

Station #	Hole #	Purpose	Total Depth (m)	Depth in Overburden (m)	Depth in Bedrock (m)	Northing[1]	Easting[1]
KV-85D	PH2	Deep bedrock groundwater monitoring	42.7	11.5	31.2	7086952	483864
KV-85S	TBD2	Shallow or perched groundwater monitoring	4.2	4.2	-	483858	7086952
KV-86	PH5	Overburden Groundwater Monitoring Well with Pressure Transducer Wire	36	36	-	7086707	483836
KV-87	PH6	Bedrock Groundwater Monitoring Well with Pressure Transducer Wire	57.9	2.7	55.2	7086854	484104
KV-88D		Deep bedrock groundwater monitoring	51.2	-	-	7087016	483946
KV-88S		Shallow or perched groundwater monitoring	3.72	3.72	-	7087016	483942
KV-89D		Deep bedrock groundwater monitoring	39.12	14.5	20.5	7086864	483831
KV-89S	BH17	Shallow or perched groundwater monitoring	4.8	4.8	0	7086844	483825
KV-90						7086845	483829

1Coordinates are UTM Zone 8 NAD 1983

*Estimated based on nearby wells or boreholes

KV-85D and KV-89s are monitoring wells that were installed down gradient of the DSTF. These serve as one of the deep and shallow groundwater monitoring locations (PH2 and BH17 respectively).

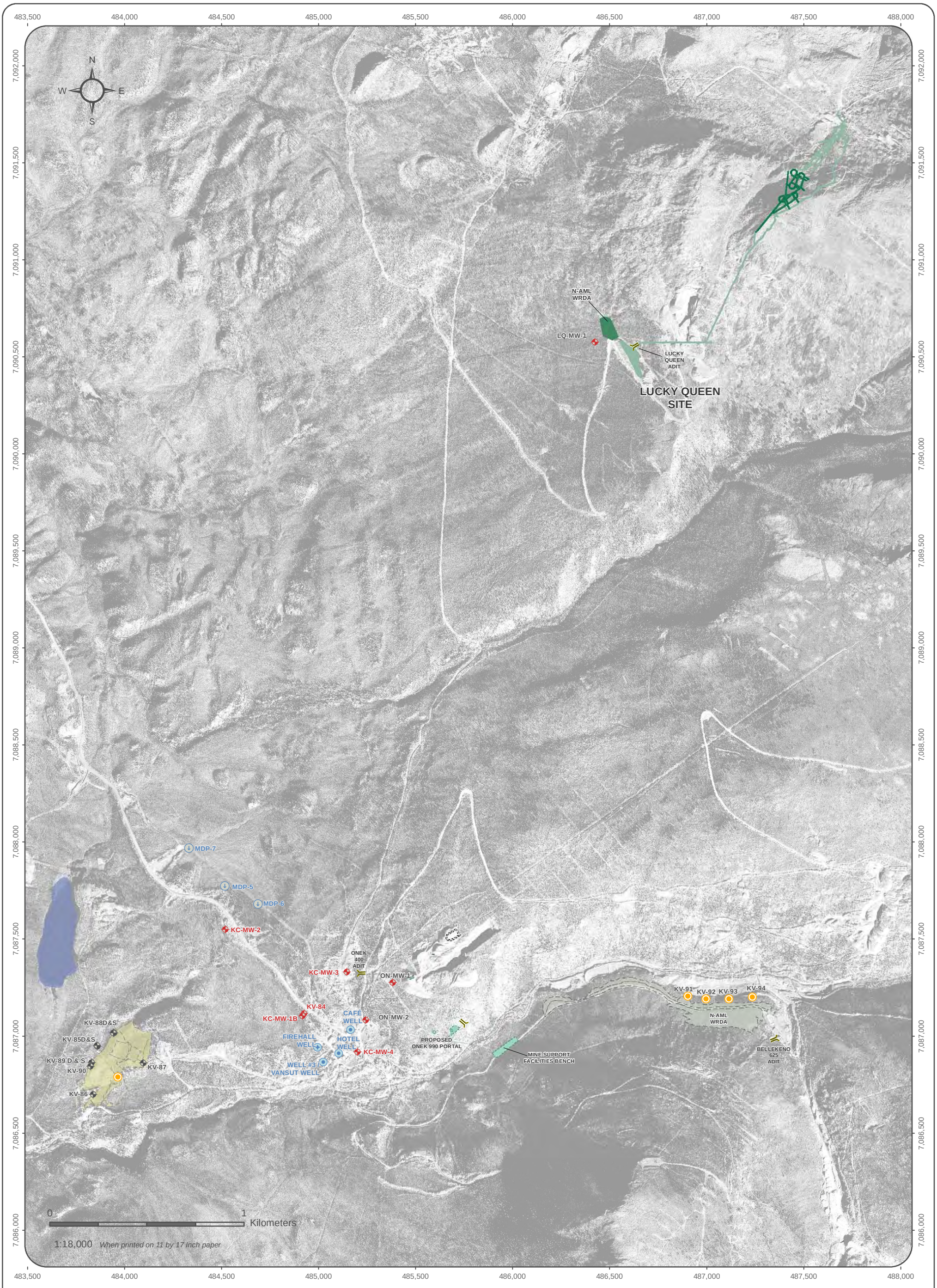
The remaining wells, KV-85S, KV-86, KV-87, KV-88D, KV-88S, and KV-89D, in accordance with Clause 87c of the Licence, which states that all new well installations will include collection of information on soil and rock types, soil condition or rock quality and geological and hydrogeological features such as joints or fractures where possible, and will include details of well installations.

Clause 46 of the Licence, states that all groundwater wells determined to be subject to seasonal freezing shall have pressure transducers installed. AHKM will install data loggers in groundwater wells deemed to be subject to seasonal freezing and these installations will be measured monthly for the first year (twelve monthly readings) as per Clause 44e and then quarterly for water level as per Schedule B Table 4 (also summarized in Table 7 of this report)

Although Clause 87b, requires that where wells are installed into bedrock, the bedrock shall be cored, AKHM's preference was to complete these groundwater well installations (including bedrock holes) using more conventional drilling technology for the installation of monitoring wells (air-rotary, ODEX). Air-rotary drilling is preferable to diamond drilling for monitoring well installation for a number of reasons including:

- More efficient drilling of both overburden and bedrock;
- Larger diameter borehole produced using an air-rotary drilling rig is preferable and reduces the chance of bridging during well completion;
- AKHM did not have a diamond drill program active at site while the monitoring wells were being installed, and;
- An air-rotary drilling rig was on site in late February for other groundwater investigations related to District Closure, which meant that costs could be optimized when combined with that program.

The Reasons for Decision document for the Licence does not provide additional information regarding Clause 87b; however, Alexco believes that the intent of this Clause was to ensure that adequate data and information regarding the subsurface conditions (overburden and especially bedrock and structural geology) of the DSTF and mill site area were collected to better inform AKHM's mill site area construction plans and ensure that the monitoring strategy was appropriate. AKHM believes that information collected in both the shallow subsurface soils and the deeper bedrock is sufficient to inform the groundwater monitoring plan. These data are presented in Sections 5.1 and 5.2 below.



Proposed Groundwater Well
Groundwater Well
Geotechnical Well
Private Drilled Well
Public Drilled Well
Manual Drive Point
Proposed Footprints
Existing Fooprints
District Mill
Highway
Local

Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13th and 14th 2006. Site hydrography and contours derived from 2006 aerial imagery obtained from Aero Geometrics, Calgary Alberta. Datum: NAD 83; Projection: UTM Zone 8N

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AKHM ACCESS

KENO HILL SILVER DISTRICT MINING OPERATIONS

FIGURE 2

KENO HILL SILVER DISTRICT GROUNDWATER MONITORING LOCATIONS

DRAWN BY MD	AUGUST 2012	VERIFIED BY KW

I:\Keno_Area_Mines\ONEK\Maps\1_Overview_Maps\WQ_Stations\GroundWater_Monitoring_20120828.mxd
(*Last edited by: mducharme;28/08/2012/18:18 PM*)

5.1 SHALLOW SUBSURFACE CONDITIONS IN THE DISTRICT MILL AREA

A considerable amount of geotechnical information has been collected from the mill site and the area beneath the DSTF during geotechnical studies in support of preliminary and final design of the DSTF, mill building, mill site pond, ancillary facilities, and site water management infrastructure. This work was carried out by EBA Engineering Consultants Ltd. A summary of the subsurface conditions of the DSTF is provided below and is from the Preliminary Design Report (EBA, 2010):

> "Nine boreholes were drilled near the DSTF. Information gathered in these boreholes indicates two general soil profiles in the area:
>
> - glaciofluvial GRAVEL underlain by bedrock and
> - SILT and SAND till underlain by gravel and bedrock.
>
> The gravel was encountered along the ridge that crosses the site. The gravel in the area of the DSTF was found in both frozen and unfrozen states. It is typically sandy with trace silt, compact, medium grained, well graded, and brown, and it is underlain by a thin layer of silt and sand till and then bedrock. Bedrock encountered in testholes is a competent quartzite. Subsurface conditions for the gravel area are summarized in Table 2.

Table 2 General Subsurface Conditions for Gravel Area

Soil Unit	Min thickness (m)	Max Thickness (m)	Average Thickness (m)
Gravel	1.3	3.7	2.5
Silt and Sand till	0.2	1.3	1.0
Bedrock (quartzite)	@2.1 mbgs*	@5.0 mbgs*	@3.4 mbgs*

*Meters below ground surface

> All silt and sand till encountered in the area of the DSTF was frozen. The silt and sand till typically contains trace gravel and trace clay, is low to non-plastic, olive grey, is underlain by gravel seams within the till and then by quartzite bedrock. Two boreholes on the west side of the ridge, BH15 and BH17, were drilled through the silt and sand layer. The gravel seams were encountered below 16 m depth in BH15, and bedrock was encountered at 14.2 m depth in BH17. One borehole, BH23, was drilled through the till deposit on the east side of the ridge and gravel seams were encountered at 7.6 m depth. Two boreholes, BH24 and BH25, were drilled near a proposed water collection pond. The general soil conditions in this area are gravel fill over glaciofluvial gravel over silt and sand till over glaciofluvial gravel. The glaciofluvial gravel and silt and sand till are similar to the soils described above and are all unfrozen."

The Borehole Logs for those drilled in the vicinity of the mill site and DSTF area are attached as Appendix B. Ongoing work and additional drilling provided further information on subsurface

conditions over the mill site area. Borehole logs for these additional holes are also included in Appendix B. All of this data was taken into consideration for the placement of the groundwater monitoring wells.

5.2 BEDROCK GEOLOGY AND STRUCTURE IN THE DISTRICT MILL AREA

Exploration drilling in the vicinity of the DSTF by AKHM during the 2010 season has provided additional data from the deeper subsurface in the form of information on rock quality and geological features. This drilling was designed to investigate the historically known mineralisation about the Flame and Moth (District Mill area) underground mine workings and comprised 13 holes for a total of 3,974 metres that were completed from five locations.

Basic rock quality designation (RQD) information that is routinely logged for exploration diamond drill core was supplemented with additional data including Rock Strength, Total Fracture Count, Total Vein Count, Vein Strength and % Vein for some of the District Mill holes.

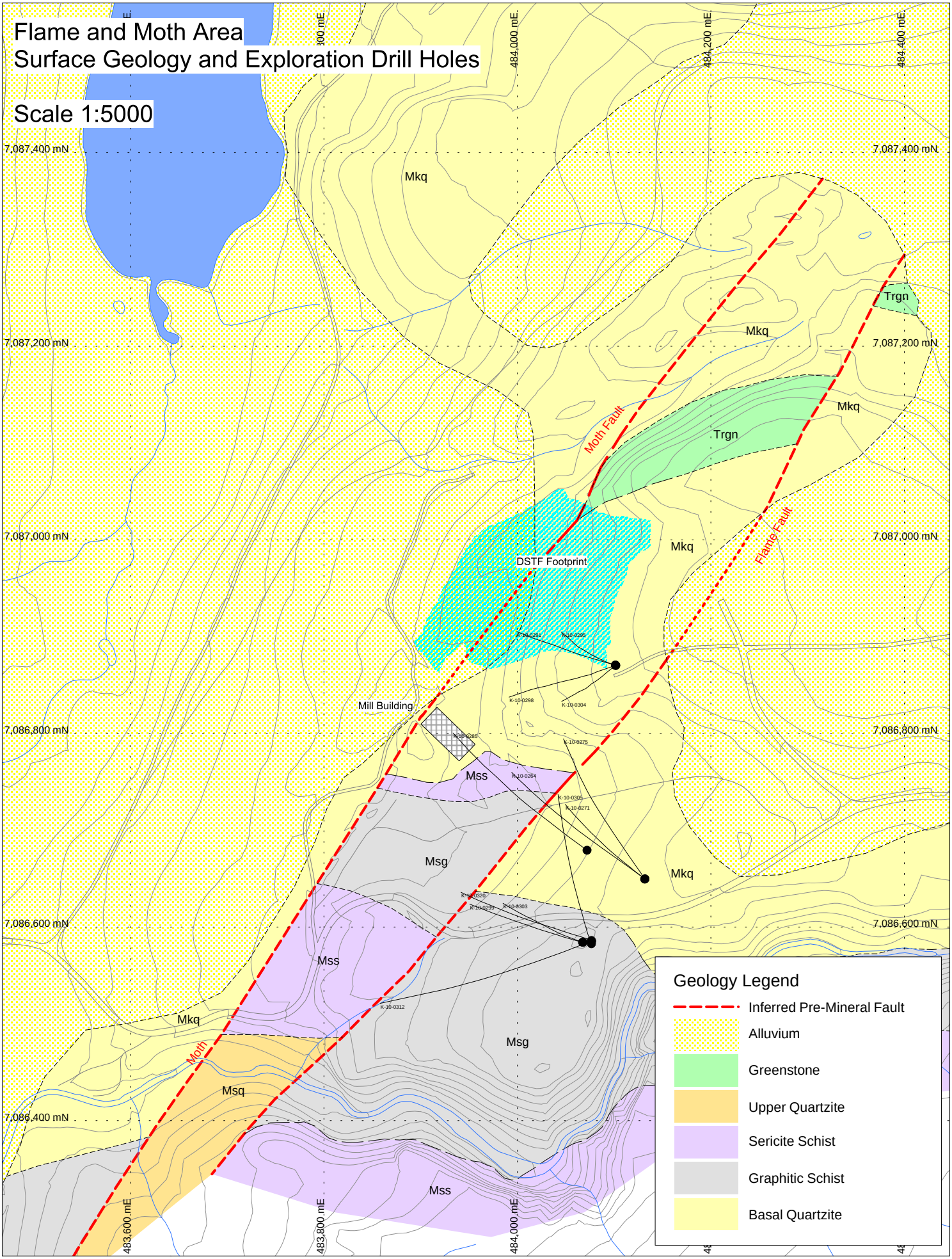
The details of location and orientation of the drill holes are shown in Table 3 while the RQD data, as well as the main rock types intercepted, is included in Appendix C.

Table 3 Details of Diamond Drill Hole at the Flame & Moth Prospect (District Mill Site)

Hole_ID	Total Depth (m)	UTM Easting (m)	UTM Northing (m)	Elev. (m)	Collar Azimuth	Collar Dip	Started	Completed	Core Size
K-10-0264	336.80	484131.8	7086649.8	927.98	306	-60	05/07/2010	20/07/2010	HQ
K-10-0271	347.47	484131.8	7086649.8	927.98	306	-70	21/07/2010	31/07/2010	HQ
K-10-0275	346.57	484131.5	7086649.5	927.98	328	-62	01/08/2010	24/08/2010	HQ
K-10-0285	324.31	484071.9	7086679.4	919.59	306	-50	25/08/2010	06/09/2010	HQ
K-10-0291	192.67	484101.3	7086870.8	936.78	285	-54	08/09/2010	13/09/2010	HQ
K-10-0295	313.94	484101.4	7086870.5	936.78	285	-80	13/09/2010	03/10/2010	HQ
K-10-0298	220.68	484101.5	7086870.4	936.78	250	-60	03/10/2010	11/10/2010	HQ
K-10-0299	306.32	484067.2	7086584.3	923.86	285	-68	05/10/2010	10/10/2010	HQ
K-10-0303	348.08	484067.9	7086584.2	923.85	285	-75	10/10/2010	19/10/2010	HQ
K-10-0304	252.07	484101.7	7086870.3	936.78	230	-75	11/10/2010	19/10/2010	HQ
K-10-0305	352.35	484076.4	7086582.7	924.14	340	-65	20/10/2010	30/10/2010	HQ
K-10-0312	388.93	484076.7	7086585.3	923.89	250	-55	30/10/2010	16/11/2010	HQ
K-10-0320	243.84	484076.5	7086586.1	923.99	290	-55	19/11/2010	26/11/2010	HQ

The interpreted surface geology of the District Mill area is shown in Figure 3. The area is underlain by the Keno Hill Quartzite. Several distinctive east – west striking map units that dip moderately to the south are identified in this area:

- Upper Quartzite (Msq) - Comprising light to dark grey, platey quartzite with grey schist (phyllite) layers.
- Sericite Schist Marker (Mss) – Sericite +/-chlorite schist, schistose grit, minor light grey crystalline limestone.
- Graphitic Schist Marker (Msg) – Medium to dark grey schist (phyllite), locally calcareous.
- Basal Quartzite (Mkq) – Blocky buff, light to medium grey quartzite, locally calcareous. Thin graphitic schist bands are common.
- Greenstone (Trgn) – Chlorite-actinolite+/-calcite greenstone sills, locally with relict phaneritic texture.


Flame and Moth Area
Surface Geology and Exploration Drill Holes
Scale 1:5000
7,087,400 mN
7,087,200 mN
7,087,000 mN
7,086,800 mN
7,086,600 mN
7,086,400 mN
483,600 mE
483,800 mE
484,000 mE
484,200 mE
484,400 mE
Mkq
Trgn
Msg
Mss
Msq
Moth Fault
Flame Fault
DSTF Footprint
Mill Building
K-10-0298
K-10-0304
K-10-0285
K-10-0275
K-10-0264
K-10-0305
K-10-0271
K-10-0320
K-10-0299
K-10-0303
K-10-0312
Geology Legend
Inferred Pre-Mineral Fault
Alluvium
Greenstone
Upper Quartzite
Sericite Schist
Graphitic Schist
Basal Quartzite

As the amount of surface outcrop in the area is poor, the distribution of these rock units as shown on the map is somewhat interpretative. There is however evidence of possibly two significant north-east trending fault structures (Moth and Flame Faults) that offset the stratigraphy and that also host mineralised veins.

There is currently no surface geologic evidence for the presence of any later cross-cutting north-west trending faults.

Two diamond drill holes (K-10-0291, K-10-0295) were completed beneath the footprint of the DSTF from a site that was essentially on outcropping Basal Quartzite. These holes were however drilled at an oblique angle to the dominant stratigraphic structure, and this may affected the quality of the RQD information.

In K-10-0291, two zones displayed increased density of fracture development:

- In quartzite between 88.85 – 96.32 m,
- In a faulted quartzite zone associated with minor mineralisation between 129.84 – 157.28 m.

In K-10-0295, much wider zones in the Basal Quartzite display increased density of fracture development associated:

- Between 8.23 – 87.48 m,
- Between 166.73 – end of hole at 313.94 m.

Some of these fracture zones are associated with minor mineralisation, but may also reflect the thin bedded nature of some of the units.

6 BELLEKENO NON-AML WASTE ROCK DISPOSAL AREA GROUNDWATER MONITORING

Preliminary engineering design based on five (5) boreholes for the Bellekeno Non-Acidic/Metal Leaching (N-AML) Waste Rock Disposal Area (WRDA) was undertaken by EBA Engineering Consultants Ltd. in late 2008 (EBA, 2008). Additional work in support of final design is expected prior to construction. Relevant findings on the subsurface conditions at the proposed WRDA site are excerpted below:

Subsurface Conditions

The subsurface conditions at the site were determined through interpretation of data from the five boreholes advanced by EBA on October 30, 2008. The subsurface conditions consist of sand that is gravely and silty. Bedrock was not encountered in any of the boreholes. The drill lost circulation in the boreholes and prevented the return of cuttings to the surface. A summary of the boreholes and their respective depths is shown in Table 3.

Table 4 Borehole Depths at Bellekeno Site

Borehole Number	Termination Depth (m)
W14101178-BH11(1)	9.0
W14101178-BH12	18.0
W14101178-BH13	12.0
W14101178-BH14	6.0
W14101178-BH15	10.0

Groundwater

Groundwater was not encountered in any of the boreholes at the Bellekeno site.

Permafrost

The moisture content testing completed on the samples collected indicates elevated moisture contents attributed to either the presence of permafrost or increased silt contents of the soils. A ground temperature cable was installed in W14101178-BH11 to 8.0 m. Preliminary readings taken from the ground temperature cable indicate the presence of warm permafrost (-1 to -0.5°C).

Commencement of construction of the (WRDA) is scheduled for Q2 2013. Four groundwater monitoring wells below the Bellekeno WRDA (as per Clause 86 of the Licence) will be installed according to WRDA final design. Due to the known presence of permafrost and sloping topography in the area beneath the proposed WRDA, AKHM expects any seepage to be deflected by the frozen layer, causing it to run downslope within the active layer. Because of this, relatively shallow monitoring wells are considered appropriate and most likely to intersect and monitor for any seepage from the WRDA. Proposed monitoring wells in the vicinity of the WRDA are summarized in Table 5.

Table 5 Bellekeno WRDA Groundwater Monitoring Well Summary

Station Number	Purpose	Estimated Total Depth (m)	Estimated Overburden Depth (m)	Northing[1]	Easting[1]
KV-91	Seepage/shallow groundwater monitoring	10	10	TBD[2]	TBD[2]
KV-92	Seepage/shallow groundwater monitoring	10	10	TBD[2]	TBD[2]
KV-93	Seepage/shallow groundwater monitoring	10	10	TBD[2]	TBD[2]
KV-94	Seepage/shallow groundwater monitoring	10	10	TBD[2]	TBD[2]

[1]Coordinates are UTM Zone 8 NAD 1983

[2]TBD – "to be determined", station not established at this time.

Appropriate layout and borehole locations for the WRDA monitoring wells will be selected based on field conditions prior to construction and will depend on final WRDA and with the input from design engineers. Conceptual WRDA monitoring well locations are shown on **Error! Reference source not found.**.

7 ONEK GROUNDWATER MONITORING

The licence requirement for monitoring of KV-84 requires that a Keno City Well be monitored on a quarterly basis. This monitoring is also subject to Clause 44, requiring that all wells be sampled monthly for the first twelve months that they contain water. Initial sampling as reported in the SRK Bellekeno Groundwater Study (SRK, 2010) used Keno City Well #3 which is owned by a private resident of Keno City. Well #3 and the Keno City Firehall well have been sampled since issuance of the Licence in order to fulfill monitoring requirements for KV-84, but due to difficulties coordinating sampling, this has not been viewed as a satisfactory solution for the duration of the Licence. AKHM, through part of the District Closure Planning, has installed of five wells (KC-MW-1A, KC-MW-1B, KC-MW-2, KC-MW-3, and KC-MW-4) around Keno City as part of a hydrogeologic study of the Keno City area. This work was carried out during March and April 2011, and that once installed. Monitoring well KC-MW-1A was selected for reporting for KV-84. A notification was submitted to the YWB and Water Resources to provide notification to regulators of the final sampling location of the Keno City well. The locations of the existing Keno City area wells including location for KV-84, KC-MW-1B, KC-MW-2, KC-MW-3, and KC-MW-4 are also shown on Figure 2. Additionally, monitoring well ON-MW-01 was installed upgradient of the Onek 400 adit and downgradient of the historic surface mining disturbance

In addition to the groundwater monitoring program that is currently in place through WUL QZ09-092 an additional groundwater monitoring well (ON-MW-02 was installed on August 5, 2012 and monitored as part of routine monitoring for the Onek mine site (Figure 2). This monitoring well will be sampled a minimum of twice prior to mining operations to establish baseline groundwater quality conditions. The proposed monitoring well will be monitored on a monthly basis for the first year and on a quarterly basis thereafter. The borehole log for ON-MW-02 is provided in Appendix D.

This additional monitoring well will be incorporated into the water licence and adaptive management plan. Monitoring wells KV-91 through KV-94 (Figure 2), located downgradient of the licenced Bellekeno N-AML waste rock disposal area are scheduled to be monitored quarterly under current Water Licence QZ09-092 once they have been installed.

8 LUCKY QUEEN GROUNDWATER MONITORING

One monitoring well at Lucky Queen that (LQ-MW-1) was installed on August 6, 2012 downgradient of the proposed N-AML Waste Rock Dump proposed adjacent to the Lucky Queen adit (Figure 2).This monitoring well will be sampled a minimum of twice prior to mining operations to establish baseline groundwater quality conditions. This monitoring well will be monitored on a monthly basis for the first year and on a quarterly basis thereafter. This additional monitoring well will also be incorporated into the water licence and adaptive management plan. The borehole log for LQ-MW-01 is provided in Appendix D.

9 REVIEW OF RESULTS

Effluent Quality Standards (EQS) for underground and development activities at the Bellekeno mine under WUL QZ09-092 are listed in Table 6. The EQS in place for Bellekeno under QZ09-092 are being proposed for the new Lucky Queen adit discharge (Table 6). The EQS will be ultimately determined by the Water Board. The Onek and Lucky Queen mines will also become subject to the MMER, which specifies authorized discharge limits of deleterious substances for a number of set parameters.

Table 6 Effluent Quality Standards for Bellekeno Mine and proposed for the Lucky Queen Mine

Parameter	Maximum Concentration Grab Sample (QZ09-092)
pH	6.5 – 9.5
Suspended Solids	25 mg/L
Ammonia Nitrogen	5.0 mg/L
Arsenic (Total)	0.1 mg/L
Cadmium (Total)	0.01 mg/L
Copper (Total)	0.1 mg/L
Lead (Total)	0.2 mg/L
Nickel (Total)	0.5 mg/L
Radium 226	0.37 BQ/L
Silver (Total)	0.01 mg/L
Zinc (Total)	0.5 mg/L
Acute Toxicity Testing	
96-hour Rainbow Trout	Non-Toxic LC_{50} (100%)

Results of all groundwater monitoring activities will be subject to periodic review and interpretation by AKHM. This review and interpretation is important in identifying any potential changes in baseline conditions, and if necessary, trigger mitigation and/or adaptive management measures. The results of these reviews and analyses will be reported with the Annual Report.

10 GROUNDWATER MONITORING SCHEDULE

Groundwater monitoring will follow the schedule as described in Table 7. Groundwater sampling and monitoring will be carried out by competent and trained field operators. The operators will also document the condition of the well at each location and record any non-standard observations (e.g. icing, blockage, physical damage to wellhead).

Monitoring Well Sampling:
Representative groundwater samples will be collected from each identified site identified in Table 7. Below is a summary of sampling activities to take place:

- Depth to water level will be recorded prior to sampling
- The well volume will be calculated
- Purging will consist of either removal of three (3) well volumes (vol of standing water in the well) by an appropriate method (manually, submersible pump, hydrolift, etc) or by utilizing a low-flow sampling method, such that the discharge rate does not exceed 500 ml/min, drawdown within the well is not greater than 0.1m and stabilization of water quality parameters inclusive of oxidation reduction potential (ORP), dissolved oxygen (DO), pH, conductivity, and temperature have been acheived.
- Following purging of three volumes or low flow stabilization of parameters, groundwater sample collection can then take place.
- For quality assurance/quality control, field duplicates and blank will be collected with a frequency of 1 in 10 groundwater samples collected.

Groundwater Sample Collection and Analyses:
Groundwater samples will be collected in appropriately labelled laboratory grade bottleware with preservation for the analytes requested. At each monitoring well, at the point of sample collection, care will be taken to prevent contact with the inside of the sample containers. In addition, a clean pair of nitrile or latex gloves will be worn during sample collection and handling.

G*roundwater Sample Chain-of-Custody Record, Packing and Shipping*

Once the groundwater samples have been collected the sample information will be added to the chain of custody form, The bottles will then be placed in a cooler with sufficient ice content to cool the samples for shipping. When full, the cooler will be closed, and the lid tightly taped shut to reduce the rate of ice melting.

Based on the remote location of the sites, groundwater samples will be collected and shipped to coincide with immediate offsite transportation. The samples will be shipped via air courier from Whitehorse to a lab in the Vancouver area for analyses.

Table 6 Groundwater Monitoring Program Summary

Site	Description	Water Licence	Insitu Measurements/ Internal Analysis						External Lab Analysis												
		Proposed & Existing Monitoring	Level	Flow	pH	Temp.	Conductivity	Total Zn	Total Metals	Diss. Metals	Hardness	pH	Conductivity	TSS	Alkalinity	Sulphate	Nitrate	Nitrite	Ammonia (-N)	DOC	Total Phosphorous
KV-84	Well SW of Onek 400 adit (deep); Keno City Well	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	-	M/Q	M/Q
KV-85D	Flame and Moth Site Groundwater Well #1 (PH2) Deep	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-85S	Flame and Moth Site Groundwater Well #1 (Shallow)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-86	Flame and Moth Site Groundwater Well #2 (PH5)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-87	Flame and Moth Site Groundwater Well #3 (PH6)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-88D	Flame and Moth Site Groundwater Well #4 (Deep)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-88S	Flame and Moth Site Groundwater Well #4 (Shallow)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-89D	Flame and Moth Site Groundwater Well #5 (Deep)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-89S	Flame and Moth Site Groundwater Well #5 (Shallow)	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-91	Bellekeno Waste Rock Disposal Area well #1	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-92	Bellekeno Waste Rock Disposal Area well #2	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-93	Bellekeno Waste Rock Disposal Area well #3	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KV-94	Bellekeno Waste Rock Disposal Area well #4	Existing	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
KC-MW-4	Well south of Onek 400 adit	Proposed	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	-	-	M/Q	M/Q	M/Q
ON-MW-1	Onek Monitoring Well	Proposed	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q
ON-MW-2	Onek Monitoring Well d/g Project Facilities	Proposed	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q
LQ-MW-1	Lucky Queen Monitoring Well d/g N-AML WRDA	Proposed	M/Q	-	M/Q	M/Q	M/Q	-	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q	M/Q

Legend:

M/Q = Monitoring to occur monthly for first 12 months, reverting to quarterly thereafter

Ms = Monthly (May-Oct)

11 REPORTING

As per Clause 54 of Water Licence QZ09-092:

> *Unless otherwise specified in this licence, all monitoring data, reports, plans, studies, study results, designs or manual shall be submitted to the Board in the following format:*
>
> *a) All reports required to be submitted to the Board will be unbound and reproducible by standard photocopier, accompanied by one electronic copy on a CD/DVD.*
> *b) The Licensee shall provide to the Board 5 additional copies of all reports. The additional copies may be either 5 bound paper copies or 5 electronic copies on individual CDs/DVDs.*
> *c) Electronic copies shall be IBM compatible in one of the following formats: Word 97-2003, Excel 97-2003 workbooks, or Adobe .pdf format. Water quality results must be presented in Excel 97-2003 .xls format.*

The results of the weekly physical inspections will be summarized from the weekly inspection checklists and incorporated into the annual reports (as per section 55 of the licence). Requirements of the annual reports are outlined in sections 55 and 56 of the Licence.

12 REFERENCES

Access Consulting Group, 2009. Keno Hill Silver District Environmental Conditions Report Version 1. Report prepared for Alexco Resource Corp.

EBA Engineering Consultants Ltd. 2010. Preliminary Engineering Design and Management Plan, Dry-Stacked Tailings Facility, Bellekeno Mine Mill Site, Yukon. Report prepared for Alexco Keno Hill Mining Corp.

EBA Engineering Consultants Ltd. 2008. Geotechnical Evaluation – Potential Mill Sites Bellekeno Project near Keno City, Yukon. Letter to Alexco Resource Canada Corp.

SRK Consulting (Canada) Inc (2010) 2010 Bellekeno Groundwater Program. Report Prepared for Alexco Keno Hill Mining Corp. SRK Project # 1CA009.003.

SRK Consulting (Canada) Inc (2009a) Desktop review: Effects of Water Extraction at Christal Lake on Water Levels in the Keno City Community Well. Memorandum to Alexco Keno Hill Mining Corp. SRK Project # 1CE012.003.

SRK Consulting (Canada) Inc (2009b) Assessment of Potential Groundwater Impacts from the Bellekeno Mill Site and Dry Stack Tailings Facility. Letter to Alexco Resource Corp. SRK Project # 1CE012.003.

APPENDIX A

UPDATE: KENO CITY GROUNDWATER EVALUATION

Technical Memorandum

TO: **Access Consulting Group**

FROM: **Interralogic, Inc.**

DATE: **March 27, 2012**

SUBJECT: **Update: Keno City Groundwater Evaluation**

This memorandum describes a groundwater evaluation that was conducted in the Keno City area from October 2010 through March 2012. The activities performed for this evaluation are described below.

Test Trenches At Onek 400 Adit

On October 9, 2010, two observation trenches were excavated in the dry stream channel downstream of the Onek 400 portal. At times the channel has had surface water flow that can be traced back to the portal. Trenches 1 and 2 were located about 180 and 150 m, respectively, downstream (west) of portal (see Figure 1). The purpose of the trenches was to evaluate if discharge from the Onek 400 adit was migrating west within the shallow stream alluvium, as there was no observed surface water flow in the channel at the trench locations. On the day of trenching, the adit discharge was about 1 L/s and free water extended from the portal to a location about 80 m downstream where it was assumed to infiltrate below an ice surface.

The trenches were excavated using a Case model 325 excavator. The trenches extended across the apparent stream channel and had depths of about 2 to 2.5 meters. The following observations were made in each trench.

Trench 1 *(further west):* The geology consisted of an upper 0.3 m layer of cobbles and boulders (active stream channel) underlain by silty sand with gravel, cobbles, and some boulders. The soil contained 25 to 35 percent fines. At some locations in the trench, the soil might be classified as sandy silt. The soils were moist, but nowhere wet. No permafrost was observed. Thirty minutes after excavation, no free water was observed on the trench walls, and no water accumulated in the trench bottom.

Trench 2 *(further east):* The geology consisted of an upper 0.3 meter layer of cobbles and boulders (active stream channel) underlain by a 0.25 m layer of wet coarse sand with gravel. Below the sand, and extending to the bottom of the trench, was clayey silt with cobbles and boulders. No permafrost was observed. Thirty minutes after excavation, no free water was observed on the trench walls, and no water accumulated in the trench bottom.

No water samples were taken from either trench due to the absence of free water.

The following GPS (easting/northing) coordinates were measured:

Midpoint of road above culvert	0485123	7087382
Trench 1	0485056	7087396
Trench 2	0485083	7087396

Keno City Water Wells

Keno City uses a water supply well completed in bedrock (Firehall Well) to provide drinking water for its residents (see location on Figure 1). The well provides good quality water, with no recent exceedances of Canada drinking water standards, except for manganese, which in December 2010 was just over the 50 ug/L limit. On an annual basis, a water sample is obtained from the pump discharge pipe and analyzed for organic and inorganic constituents. The well is not accessible for water levels due to the installed pump and piping.

During the week of 10 October 2010, Fred Marinelli conducted a reconnaissance of the townsite with resident Sonia Stange and identified four existing private water wells. Information on these wells is summarized in Table 1 and the locations are shown on Figure 1. One of the wells is sealed and abandoned, leaving three accessible wells. Note that the VanSut Well is identified as Well #3 in reports pertaining to the Bellekeno Mine.

On 26-27 Nov 2010, the VanSut and Café Wells were purged with an electric submersible pump to remove a minimum of three wellbore volumes and then sampled. On 8 December 2010, the Hotel well was bailed to remove three well volumes and sampled, the Firehall water supply well was sampled during routine pumping, and VanSut Well was bailed and re-sampled.

Using an electric probe, water levels were monitored during pumping and recovery of the VanSut and Café wells. The maximum pumping rates were 19.7 liters per minute (lpm) from the VanSut well and 1.0 liters lpm from the Café well. Water level hydrographs of the two pumping tests are shown on Figures 2 and 3, respectively. Recovery analyses indicate the following transmissivities of materials within the well completion intervals:

VanSut Well: $T = F / (2\pi) * SC = 0.875 * 1.68$ lpm/m $= 2.1$ m^2/day

Café Well: $T = F / (2\pi) * SC = 0.875 * 0.11$ lpm/m $= 0.14$ m^2/day

where SC is specific capacity measured during recovery (flow rate / drawdown) and the shape factor F is assigned a standard value of 5.5. Both wells are completed in fractured bedrock, with the VanSut well exhibiting moderate transmissivity and the Café well exhibiting relatively low transmissivity.

New Monitoring Wells

From 15 March to 22 April, 2011, five groundwater monitoring wells were installed in the Keno City Area. Completion information is summarized in Table 2 and the well locations are shown on Figure 1. The wells were drilled using the ODEX air-hammer method and completed with either 2- or 4-inch schedule 40 PVC pipe/screen depending on depth. Geologic logs, well-completion diagrams, and other information pertaining to the wells were compiled by EBA Consulting and their completion report is provided in Attachment A.

Onek Monitoring Well

While not funded as part of the closure program, an additional monitoring well was installed in the area of the historic Onek Mine to understand bedrock groundwater elevations east-southeast of the Onek 400 portal. An Alexco diamond corehole designated K-11-0337 was drilled in the Keno mine area during April 2011 (see Figure 1). After reaching at total depth of 76.2 m, the corehole was completed as a monitoring well with alternating sections of 3.05 m

screen and 6.10 m solid casing. All casing and screen were 2 inch schedule 40 PVC. EBA Consulting documented the well installation and their completion report is provided in Attachment B.

Groundwater Sampling

Between December 2010 and February 2012, groundwater samples were obtained from the existing Keno City water wells, the new (MW) monitoring wells, the Onek monitoring well. Note that well MW-4 was not sampled until February 2012 due to a stuck bailer that was removed just before the sampling event. The laboratory results for these sampling events are summarized in Table 4. Where highlighted in yellow, the table shows constituents that exceeded Canada drinking water standards. These exceedances are summarized in Table 5. The highlighted values on Table 5 indicate exceedences for cadmium and zinc, constituents that are interpreted to be associated with historical mining in the Keno area.

Groundwater Flow Evaluation

The Keno City area currently contains eight wells that can be used to measure groundwater elevations; Café well, VanSut well, Onek well, and monitoring wells MW-1A, 1B, 2, 3, 4. At various times during 2011 and winter 2012, depth-to-water measurements were made in these wells using an electric water level probe. Water-level elevation is computed by subtracting depth-to-water from the top-of-casing elevation. The resulting water level elevations are provided in Table 3.

On May 12 and 13, 2011 a complete round of water levels was taken in the Keno City water wells and monitoring wells. These data were combined with a single measurement in the Onek well taken on April 15, 2011. On Figure 14 these water levels have been used to develop a water level contour map of the Keno City area. It is assumed in this interpretation that Lightning Creek, a perennial stream, defines where the local water table intersects ground surface. Flow lines, solid and dashed, indicate the inferred groundwater flow directions. A similar map is presented on Figure 5 based on water levels measured during February 2012. While interpretive, the contour maps on Figures 4 and 5 indicate the following:

- There is a convergence of southwest and northward flowing groundwater below the central portion of Keno City.

- The groundwater below Keno City is conveyed northwest along a feature that appears to have higher permeability than adjacent geologic units. Evidence for this is (1) the interpretation that groundwater converges toward this feature, (2) the change in hydraulic head is relatively small between upgradient wells in Keno City and downgradient wells MW-1A, MW-1B, and MW-2, and (3) the relatively high initial yield of the Firehall well (57 to 96 lpm). The higher permeability feature could be associated with a buried glacial valley (overburden) and/or fracture zone (bedrock).

- Water level contours suggest that groundwater discharges to Lightning Creek east of Keno City. South of Keno City, there appears to be seepage loss from the stream that recharges the groundwater system below the townsite. The zone of high seepage loss from the stream could be associated with the southeast extension of the postulated higher permeability feature.

- At and downstream (west) of the Onek 400 portal, the groundwater flow direction is generally southwest towards the postulated higher permeability feature, but not towards any of the Keno City water wells.

Possible Groundwater Impacts and Migration

Outflow from the Onek 400 adit is known to have relatively high concentrations of zinc (29 to 194 mg/L) and cadmium (0.31 to 5.9 mg/L). These constituents are therefore used as circumstantial indicators of impacts associated with the Onek 400 discharge. Review of the data in Table 4 suggests the following:

- Some of the Onek 400 discharge is infiltrating to groundwater as indicated by relatively high zinc and cadmium in MW-3, which is located in overburden just west of the adit portal.

- Elevated concentrations of zinc and/or cadmium suggest that Onek 400 discharge may have affected groundwater at MW-1A/1B and MW-2.

- Wells located in the central portion of Keno City (southeast of MW-1A/1B) do not appear to be impacted.

Discharge from the Onek 400 adit has the potential to travel west as surface water. While it appears that some of the discharge infiltrates near the portal, it is possible that at certain times of the year impacted mine water could infiltrate from the channel west of the portal. With this in mind and considering wells with possible groundwater impacts, the dashed magenta arrows on Figure 1 show *possible* groundwater migration pathways that could be chemically related to the Onek 400 discharge.

Potential impact to groundwater at wells MW-1A/1B, MW-2, and MW-3 is consistent with groundwater flow directions and the possible migration pathways shown on Figures 4 and 5. The absence of impact within the central portion of Keno City is also consistent with the interpreted pathways. Onek 400 discharge has not impacted the Firehall well, the current Keno City water supply, and is unlikely to impact it in the future.

Possible Field Work for 2012

Water-level monitoring and groundwater sampling will continue on a quarterly basis during 2012. The associated laboratory results will be added to the current database shown on Table 4.

Consideration is being given to drilling additional monitoring wells during the 2012 field season. Possible locations for six new monitoring wells are shown on Figure 1. It is anticipated that three new wells will be installed north of the Silver Trail Highway during 2012 to investigate southwest flowing groundwater that could be associated with historical mining areas located northeast of Keno City. Three possible well locations are shown south of the Silver Trail Highway to investigate northwest flowing groundwater that may migrate toward Crystal Creek. The decision to install any or all of these wells will require mutual agreement between Alexco and participating Government agencies.

Table 1 Keno City Water Wells

Well Name	Owner(s)	Northing/ Easting (m)	Casing	Approx Ground Surface (gs) Elev. (m msl)	Well Depth (m bgs)	Yield (L/min)	Geologic Material in Completion Interval	Comments
VanSut (Well #3)	Sharen Vandemier Gordon Sutton	0485016 7086862	6-inch steel Open hole in bedrock	939	67.8	19.7	Bedrock	Pump and discharge pipe removed November 2010.
Hotel Well	Leo Martel	0485104 7086913	6-inch steel	945	32.9	n/a	Unknown	Wellhead in basement. Well is open. No pump. Approx 1 m of water in well. Likely perched groundwater.
Café Well	Mike Mancini	0485164 7087033	6-inch steel Open hole in bedrock	946	67.8	1.0	Bedrock	Pump and discharge pipe removed November 2010
Abandoned House Well	Unknown	0484882 7086851	6-inch steel	935	n/a	n/a	Unknown	No pump. Obstruction at 3.78 m below ground surface. No water. Cannot be sampled.
Firehall Well	Yukon Govt	0484993 7086979	8-inch steel to 36 m 6-inch steel to 57 m Open hole in bedrock to 93 m	936	93	57 to 96 (1987)	Bedrock (top of bedrock at 55.2 m bgs)	Used for municipal water supply. Cannot measure current water level due to installed pump. 1987 water level about 882 m msl.

Table 2 Keno City Monitoring Wells

Well ID	Easting/ Northing (m)	Casing/ Screen	Borehole Diameter (mm)	Approx Ground Surface (gs) Elev. (m msl)	Top of Sand Pack (m bgs)	Top of Screen (m bgs)	Bottom of Screen (m bgs)	Bottom of Sand Pack (m bgs)	Borehole Total Depth (m bgs)	Geologic Material within Completion Interval
MW-1A	08 V 0484923 7087116	2-in Sch 40 PVC	114 (4.50 in)	930	82.9	84.7	93.9	93.9	93.9	Bedrock
MW-1B	08 V 0484913 7087105	2-in Sch 40 PVC	114 (4.50 in)	930	48.8	50.3	59.4	59.4	59.4	Overburden
MW-2	08 V 0484517 7087547	4-in Sch 40 PVC	169 (6.65 in)	907	36.4	38.1	47.1	47.1	47.1	Overburden
MW-3	08 V 0485144 7087330	4-in Sch 40 PVC	169 (6.65 in)	958	6.7	8.2	17.4	17.4	17.4	Bedrock
MW-4	08 V 0485197 7086921	2-in Sch 40 PVC	114 (4.50 in)	943	56.4	57.9	67.1	67.1	67.1	Overburden
Onek	08 V 0485383 7087277	2-in Sch 40 PVC	91 (3.58 in)	998	15.24	17.07 (a)	74.98 (a)	76.20	76.20	Bedrock

(a) Alternating sections of 3 m screen and 6 m solid pipe

Table 3 Groundwater Level Measurements

Well	Date	MP Description	MP Elevation m msl	DTW m bmp	WLE m msl
MW-1a	12-May-11	Top of 2-inch PVC casing	930.88	53.20	877.7
	16-May-11	Top of 2-inch PVC casing	930.88	56.55	874.3
	05-Jul-11	Top of 2-inch PVC casing	930.88	50.08	880.8
	04-Oct-11	Top of 2-inch PVC casing	930.88	49.25	881.6
	09-Feb-12	Top of 2-inch PVC casing	930.88	50.24	880.6
MW-1b	12-May-11	Top of 2-inch PVC casing	930.61	53.14	877.5
	16-May-11	Top of 2-inch PVC casing	930.61	53.04	877.6
	05-Jul-11	Top of 2-inch PVC casing	930.61	50.68	879.9
	04-Oct-11	Top of 2-inch PVC casing	930.61	49.65	881.0
	09-Feb-12	Top of 2-inch PVC casing	930.61	51.68	878.9
MW-2	12-May-11	Top of 4-inch PVC casing	907.91	31.19	876.7
	16-May-11	Top of 4-inch PVC casing	907.91	31.17	876.7
	05-Jul-11	Top of 4-inch PVC casing	907.91	29.20	878.7
	27-Sep-11	Top of 4-inch PVC casing	907.91	27.65	880.3
	08-Feb-12	Top of 4-inch PVC casing	907.91	28.65	879.3
MW-3	12-May-11	Top of 4-inch PVC casing	958.78	9.65	949.1
	16-May-11	Top of 4-inch PVC casing	958.78	9.51	949.3
	05-Jul-11	Top of 4-inch PVC casing	958.78	9.95	948.8
	27-Sep-11	Top of 4-inch PVC casing	958.78	8.59	950.2
	07-Feb-12	Top of 4-inch PVC casing	958.78	10.34	948.4
MW-4	12-May-11	Top of 2-inch PVC casing	944.35	58.37	886.0
	16-May-11	Top of 2-inch PVC casing	944.35	58.35	886.0
	05-Jul-11	Top of 2-inch PVC casing	944.35	57.77	886.6
	15-Feb-12	Top of 2-inch PVC casing	944.35	58.35	886.0
VanSut (Well #3)	11-Feb-10	Ground surface	938.94	42.83	896.1
	26-Nov-10	Top of 6-inch steel casing	939.13	43.44	895.7
	12-May-11	Top of 6-inch steel casing	939.13	44.32	894.8
	12-May-11				894.8
Café well	25-Nov-10	Top of 6-inch steel casing	945.82	50.32	895.5
	13-May-11	Top of 6-inch steel casing	945.82	52.20	893.6
	14-Feb-12	Top of 6-inch steel casing	945.82	50.79	895.0
Onek	15-Apr-11	Top of 2-inch PVC casing	999.26	38.47	960.8
	21-Nov-11	Top of 2-inch PVC casing	999.26	37.25	962.0
	11-Feb-12	Top of 2-inch PVC casing	999.26	38.21	961.1
Hotel	10-Oct-10	Top of 6 inch steel casing	Not surveyed	31.71	n/a
	27-Nov-10	Top of 6 inch steel casing	Not surveyed	31.84	n/a

Used to construct water-level contour map on Figure 4

Used to construct water-level contour map on Figure 5

Table 4 Groundwater Quality

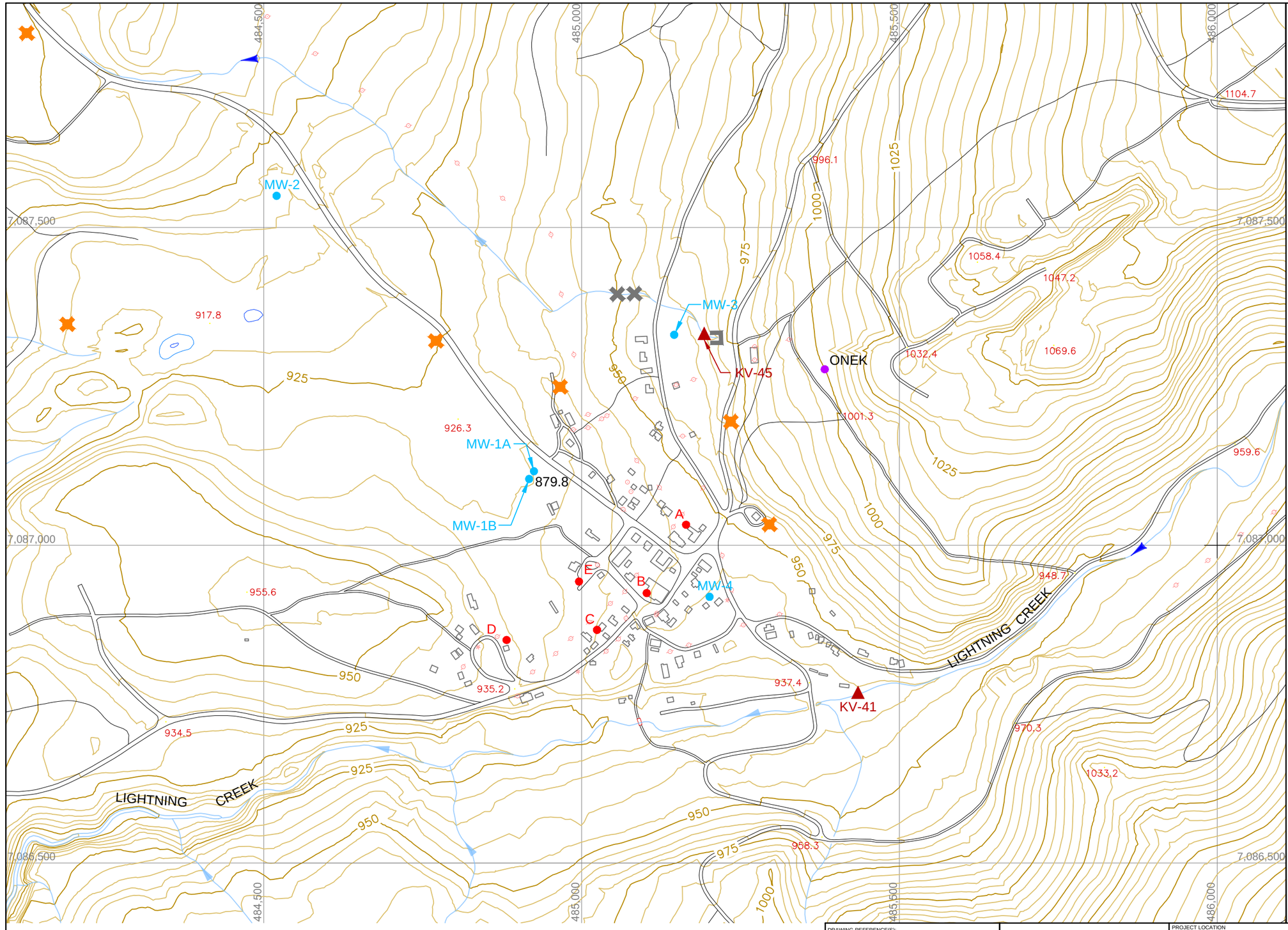
Analyte		Units	Canada Drinking Water Standard	Keno City Monitoring Wells (New)														Onek			Keno City Water Wells (Existing)				
				MW-1A (KV-84)			MW-1B			MW-2				MW-3				MW-4	MW-1			Hotel	VanSut		Café	Firehall
				16-May-11	4-Oct-11	13-Feb-12	16-May-11	4-Oct-11	9-Feb-12	16-May-11	27-Sep-11	21-Nov-11	9-Feb-12	16-May-11	27-Sep-11	21-Nov-11	7-Feb-12	19-Feb-12	21-Nov-11	19-Jan-12	11-Feb-12	8-Dec-10	26-Nov-10	8-Dec-10	26-Nov-10	8-Dec-10
Alkalinity (PP as CaCO3)	Dissolved	mg/L	-	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5		<0.5	<0.5		<0.5						
Alkalinity (Total as CaCO3)	Dissolved	mg/L	-	200	240	253	240	330	329	100	95		91.7	130	120		120	<0.5		307	348					
Bicarbonate (HCO3)	Dissolved	mg/L	-	250	300	309	300	400	401	130	120		112	160	150		146			375	424					
Calcium (Ca)	Dissolved	mg/L	-	319	347	362	379	403	417	84.3	65.8	58	80	105	159	142	143	319	363	308	409	32.6	69.8	44.2	145	103
Carbonate (CO3)	Dissolved	mg/L	-	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5		<0.5	<0.5		<0.5						
Chloride (Cl)	Dissolved	mg/L	250	1.9	2.8		3.1	3.9		1.3	1.3			0.8	2.4											
Fluoride (F)	Dissolved	mg/L	1.5	0.41			0.26			0.07				0.47												
Hardness (CaCO3)	Dissolved	mg/L	-	965	1040	1080	1170	1200	1270	283	216	192	268	311	474	428	426	1010	1070	889	1170	113	240	154	563	352
Hydroxide (OH)	Dissolved	mg/L	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5		<0.5	<0.5		<0.5	<0.5					
Magnesium (Mg)	Dissolved	mg/L	-	41.1	41.1	41.7	54.2	47.9	55.9	17.7	12.5	11.5	16.7	11.9	18.7	17.8	17	52.1	39.3	29.2	37.4	7.57	16.0	10.6	49.0	22.8
Potassium (K)	Dissolved	mg/L	-	0.75	1.31	0.8	0.72	0.83	1	0.4	0.34	0.25	0.29	0.42	0.7	0.6	0.49	0.69	0.71	0.95	0.7	0.61	0.28	0.22	0.42	0.34
Sodium (Na)	Dissolved	mg/L	-	1.98	3.46	1.8	2.26	2.39	2.8	1.53	1.39	1.21	1.37	1.5	1.5	1.4	1.28	2.58	1.86	2.43	1.8	1.50	2.02	1.75	2.21	2.29
Sulphur (S)	Dissolved	mg/L	-	275	267	269	310	282	289	63	42	38	60	83	159	128	122	297	263	249	242	15	30	20	112	62
Aluminum (Al)	Dissolved	mg/L	0.1	<0.003	0.01	0.003	<0.003	0.011	0.003	0.007	0.0164	0.0023	0.0015	0.003	0.007	0.014	0.0034	0.0012	0.0031	0.0019	0.005	0.0018	0.0013	0.0025	0.0014	0.002
Antimony (Sb)	Dissolved	mg/L	0.006	0.0096	<0.01	0.001	<0.0005	<0.01	<0.0001	<0.0005	0.00045		0.00008	<0.0005	0.0003		0.00051	<0.00002	0.00017	0.00026	<0.0001	0.00003	0.0001	0.00008	0.00006	0.00013
Arsenic (As)	Dissolved	mg/L	0.01	0.047	0.0538	0.109	0.0002	0.001	0.0004	0.0005	0.00077	0.00143	0.00075	0.0003	<0.0002	0.0007	0.00027	0.00073	0.00245	0.0021	0.0082	0.00008	0.00248	0.00169	0.00005	0.00263
Barium (Ba)	Dissolved	mg/L	1	0.006	0.015	0.0056	0.012	0.026	0.0181	0.104	0.0779	0.0888	0.0958	0.009	0.0178	0.0153	0.0118	0.0065	0.0245	0.0277	0.0268	0.0938	0.114	0.111	0.057	0.103
Beryllium (Be)	Dissolved	mg/L	-	<0.0001	<0.0001	<0.00005	<0.0001	<0.0001	<0.00005	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.0001	<0.00005	0.00003	<0.00001	<0.00001	<0.00001	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Bismuth (Bi)	Dissolved	mg/L	-	<0.001	<0.001	<0.00003	<0.001	<0.001	<0.00003	<0.001	<0.00005	<0.000005	<0.000005	<0.001	<0.00005	<0.00003	0.000005	<0.000005	<0.000005	<0.000005	<0.00003	<0.000005	<0.000005	0.000006	<0.000005	<0.000005
Boron (B)	Dissolved	mg/L	5	<0.05	<0.05	<0.03	<0.05	<0.05	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.3	<0.05	<0.05	<0.050	<0.050	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	Dissolved	mg/L	0.005	0.00121	0.001	<0.00003	0.00469	0.00551	0.00327	0.00016	0.00686	0.00057	0.000156	0.633	1.2	0.937	0.733	0.0016	0.000138	0.000021	<0.00003	0.000007	0.000314	0.000129	0.000155	0.00124
Chromium (Cr)	Dissolved	mg/L	0.05	<0.001	<0.001	<0.0005	<0.001	<0.001	0.0013	<0.001	0.0004	0.0002	0.0001	<0.001	<0.001	<0.0005	<0.0001	<0.0001	0.0002	0.0006	0.0009	0.0002	0.0005	0.0005	0.0003	0.0004
Cobalt (Co)	Dissolved	mg/L	-	0.0096	0.008	0.00617	0.0428	0.0719	0.0504	<0.0005	0.000155	0.000044	0.000028	0.0029	0.00242	0.00373	0.00236	0.000093	0.00546	0.00472	0.00123	0.000177	0.000017	0.000035	0.00013	0.00018
Copper (Cu)	Dissolved	mg/L		0.0013	0.0163	<0.0003	0.0004	0.004	0.0013	0.0008	0.00191	0.00085	0.00078	0.0034	0.003	0.0043	0.00408	0.00005	0.00007	0.00027	<0.0003	0.00018	0.00063	0.00046	0.00015	0.0209
Iron (Fe)	Dissolved	mg/L	0.3	1.27	1.6	4.98	0.012	0.023	0.045	<0.005	0.017	0.003	0.002	0.011	<0.01	<0.005	0.003	0.005	4.27	2.83	0.697	0.055	0.015	0.013	0.012	0.025
Lead (Pb)	Dissolved	mg/L	0.01	<0.0002	0.0019	<0.00003	0.0002	0.0018	0.001	<0.0002	0.00309	0.000982	0.000263	0.0003	0.00433	0.00177	0.000341	0.000081	0.000058	0.000131	<0.00003	0.00011	0.000182	0.000478	0.000115	0.000493
Lithium (Li)	Dissolved	mg/L	-	0.023	0.025	0.029	0.028	0.03	0.032	<0.005	0.0022	0.0037	0.0057	0.014	0.022	0.018	0.0171	0.0316	0.028	0.0224	0.027	0.0011	0.0017	0.001	0.0118	0.0045
Manganese (Mn)	Dissolved	mg/L	0.05	2	2.07	1.88	5.13	6.38	5.29	0.036	0.0392	0.00956	0.00067	0.011	0.0105	0.0267	0.00693	0.707	1.54	1.51	1.42	0.226	0.00078	0.00195	0.0306	0.0554
Mercury (Hg)	Dissolved	mg/L	0.001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00005	<0.0001	<0.00005	<0.00001	<0.00001	<0.00002	<0.00001	<0.00005					
Molybdenum (Mo)	Dissolved	mg/L	0.25	0.002	0.002	0.0012	<0.001	<0.001	<0.0003	<0.001	0.00051	0.00014	0.00015	<0.001	<0.0005	0.0004	0.00101	0.00008	0.00354	0.00523	<0.0003	0.00021	0.00017	0.0002	0.00008	0.00023
Nickel (Ni)	Dissolved	mg/L	-	0.04	0.033	0.0223	0.035	0.042	0.0396	0.002	0.00248	0.00085	0.00111	0.027	0.0358	0.0312	0.0303	0.00964	0.00728	0.00741	0.0033	0.00083	0.00049	0.00044	0.00164	0.0188
Selenium (Se)	Dissolved	mg/L	0.01	0.0037	0.0041	<0.0002	<0.0001	<0.0005	<0.0002	0.0017	0.00148	0.00124	0.00124	0.0005	0.0005	0.0004	0.00068	0.00018	0.00005	0.00022	<0.0002	0.00063	0.00267	0.0023	0.0139	0.00201
Silicon (Si)	Dissolved	mg/L	-	4.69	4.8	4.7	7.44	7	7.1	3.64	3.4	3	3.5	4.22	5	4	4	6.6	7.7	7.2	7	1.27	3.38	3.03	4.5	3.85
Silver (Ag)	Dissolved	mg/L	-	<0.00002	<0.00002	<0.00003	<0.00002	<0.00002	<0.00003	<0.00002	0.000007	<0.000005	<0.000005	0.00004	0.00006	<0.00003	0.000023	<0.000005	<0.000005	<0.000005	<0.00003	<0.000005	<0.000005	0.000006	<0.000005	<0.000005
Strontium (Sr)	Dissolved	mg/L	-	0.676	0.675	0.681	0.701	0.718	0.696	0.187	0.132	0.128	0.163	0.14	0.218	0.194	0.183	0.615	0.772	0.645	0.751	0.108	0.185	0.131	0.347	0.257
Thallium (Tl)	Dissolved	mg/L	-	<0.00005	<0.00005	<0.00001	<0.00005	<0.00005	<0.00001	<0.00005	0.000004	<0.000002	<0.000002	<0.00005	<0.00002	0.00001	0.000012	0.000003			<0.00001	<0.000002	<0.000002	<0.000002	<0.000002	0.000009
Tin (Sn)	Dissolved	mg/L	-	<0.005	<0.005	<0.001	<0.005	<0.005	<0.001	<0.005	0.00031	0.00018	<0.0002	<0.005	<0.0001	0.00013	0.0007	<0.0002	0.0001	<0.0002	<0.001	0.00002	<0.00001	0.00001	<0.00001	0.00005
Titanium (Ti)	Dissolved	mg/L	-	<0.005	<0.005	<0.003	<0.005	<0.005	<0.003	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.005	<0.003	0.0006	<0.0005	<0.0005	<0.0005	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Uranium (U)	Dissolved	mg/L	0.02	0.0115	0.011	0.0129	0.0206	0.0207	0.0213	0.004	0.00148	0.00256	0.00445	0.0005	0.00036	0.00103	0.000855	0.0252	0.0107	0.0089	0.00371	0.000117	0.00143	0.000564	0.00301	0.00934
Vanadium (V)	Dissolved	mg/L	-	<0.005	<0.005	<0.001	<0.005	<0.005	<0.001	<0.005	<0.0002	<0.0002	<0.0002	<0.005	<0.002	<0.001	0.0005	<0.0002	<0.0002	<0.0002	<0.001	0.0003	<0.0002	0.0003	<0.0002	0.0002
Zinc (Zn)	Dissolved	mg/L	5	0.823	0.657	0.8	0.171	0.222	0.211	0.013	0.289	0.0287	0.0124	41.8	71.4	52.4	39.8	0.0461	0.0159	0.0107	0.0006	0.0022	0.0198	0.0364	0.0728	0.14
Zirconium (Zr)	Dissolved	mg/L	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0005	<0.0001	<0.0001	0.0002	0.0004	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Ammonia (N)	Dissolved	mg/L	-	0.029			0.046			0.01				0.011						0.046		0.24	0.022	0.14	0.022	0.15
Conductivity		µS/cm	-	1600	1560	1650	1800	1820	1840	551	433	402	507	641	1010	933		1610	854	1690	1730	236	465	295	949	648
Filter and HNO3 Preservation		N/A	-	FIELD	FIELD		FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD		FIELD	FIELD	FIELD		FIELD	FIELD	FIELD	FIELD	FIELD
Nitrate (N)	Dissolved	mg/L	45	<0.02	<0.2		<0.02	<0.2		0.34	0.28			0.12	0.16											
Nitrate plus Nitrite (N)	Dissolved	mg/L	48.2	<0.02	<0.2		<0.02	<0.2		0.34	0.28			0.12	0.16											
Nitrite (N)	Dissolved	mg/L	3.2	<0.005	<0.05		<0.005	<0.05		<0.005	<0.005			<0.005	<0.005											
Nitrogen (N)	Dissolved	mg/L																				0.7	1.70	2.25	1.87	1.34
Organic Carbon (C)	Total	mg/L	-	1.8	8.5		<0.5	1		1.9	9			2.2	0.6							1.2	0.9	<0.5	3.7	<0.5
Organic Carbon (C)	Dissolved	mg/L	-	0.8	5	<0.5	1.2	1.8		1.5	1.1			2.5	0.9					2.08		0.6	0.8	<0.5	3.9	<0.5
Orthophosphate (P)	Dissolved	mg/L	-	<0.005	<0.005		<0.005	<0.005		<0.005	0.008			<0.005	<0.005											
Phosphorous (P)	Dissolved	mg/L	-			<0.01			0.01				0.007				<0.002	0.025				0.038	0.006	0.010	0.008	0.005
pH (lab)		pH Units	6.5-8.5	7.94	8.05		7.88	7.81	7.95	8.14	7.8	7.76	7.93	7.74	7.45	7.45	7.52	7.51	7.87	7.63	7.98	7.53	7.90	7.31	7.62	7.70
Sulphate (SO4)	Dissolved	mg/L	500	760	721		870	847	806	170	124	117	167	210	428	374	316	726	764	751	714					180
Total Dissolved Solids	Dissolved	mg/L	500	1400	1300		1600	1500		370	290			500	860							120	270	160	660	410
Total Suspended Solids	Suspended	mg/L	-	29	74		<4	57	15.7	260	130	11.1	<1.0	11	16	15	2.8	35.4	126	88.8	44.1	92	20	120	11	<1

Table 5 Exceedences of Canada Drinking Water Standards in Groundwater

Constituent	Canada Drinking Water Standard mg/L	MW-1A	MW-1B	MW-2	MW-3	MW-4	Onek	Hotel	VanSut	Cafe	Firehall
Antimony	0.006	X									
Arsenic	0.01	X									
Cadmium	0.005		X	X	X						
Iron	0.3 (a)	X					X				
Manganese	0.05	X	X			X	X	X			X
Uranium	0.02		X			X					
Zinc	5				X						
Sulphate	500 (a)	X	X			X	X				
Total Dissolved Solids	500 (a)	X	X		X					X	

(a) Aesthetic standard (not related to health-risk)

Constituent interpreted to be related to historical mining



LEGEND:

- KENO CITY WATER WELL
  - A – CAFE WELL
  - B – HOTEL WELL
  - C – VANSUT WELL
  - D – ABANDONED WELL
  - E – FIREHALL WELL
- MW-3 MONITORING WELL INSTALLED 2011
- TRENCH
- ONEK 400 ADIT PORTAL
- SURFACE WATER SAMPLING STATION
- ONEK MONITORING WELL
- POSSIBLE 2012 MONITORING WELLS

N

120 0 120

(meters)

1 cm = 60 m

DRAWING REFERENCE(S):

DRAWING NAME: FIGURE 1

DATUM: NAD 83

PROJECT LOCATION: KENO CITY, YUKON, CANADA

PROJECT: KENO

TITLE: SITE MAP

INTERRA
4715 Innovation Drive, Suite 110
Fort Collins, Co 80525
970.225.8222

PROJECT NO: 102002

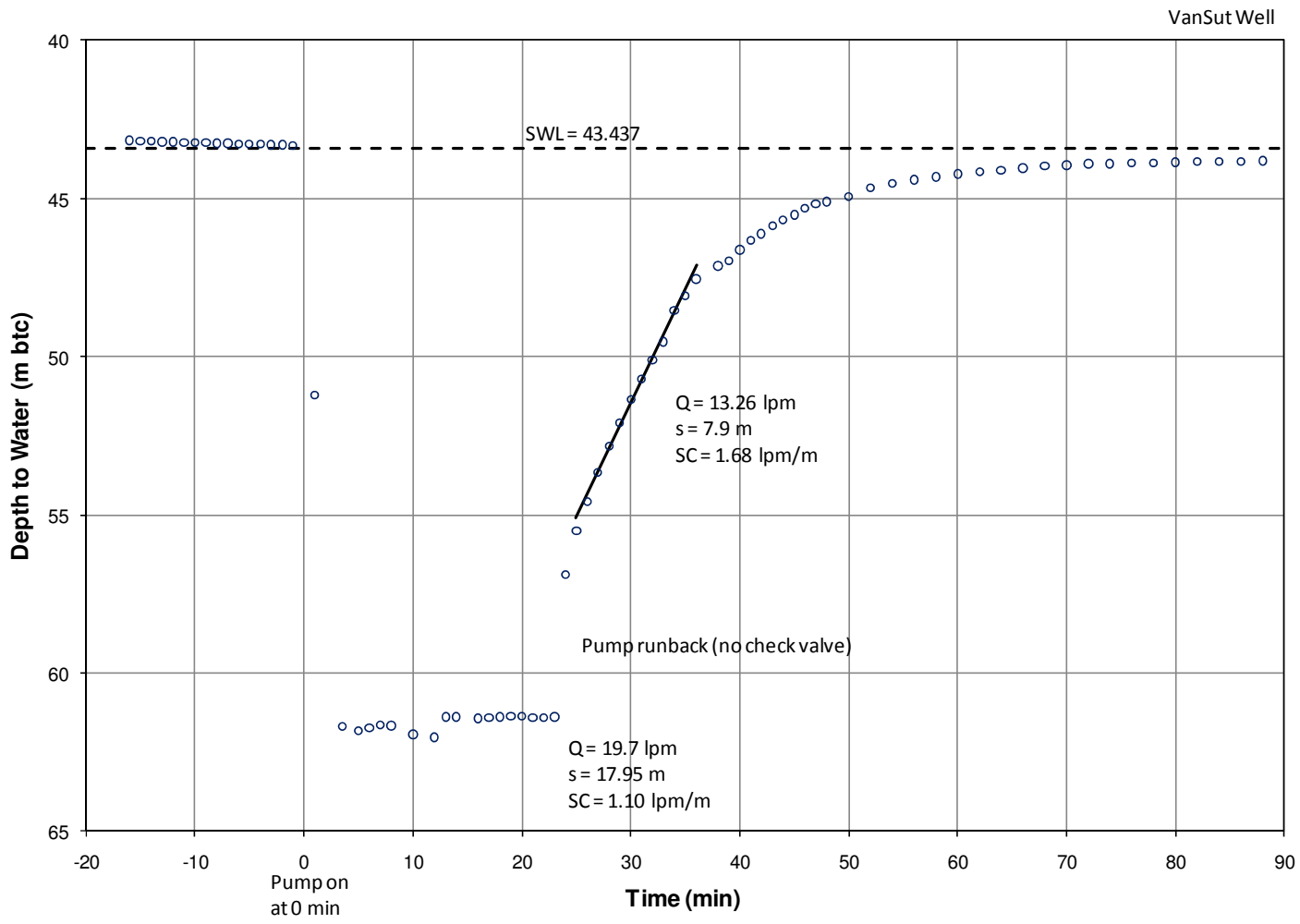
REVISION: 1

SCALE: 1 cm = 60 m

DRAWING NAME: FIGURE 1

SHEET NUMBER:

DRAWING FILENAME: X:\Projects\102002 – Kenny Dam\Admin\Drawdown Contours\Figures [3-22-2012]\FIGURE 1.dwg LAYOUT NAME: FIGURE 1 DATE: Mar 22, 2012 – 8:33pm CAD OPERATOR: mellen
LIST OF XREFS: [External gis--base--data FIGURE]



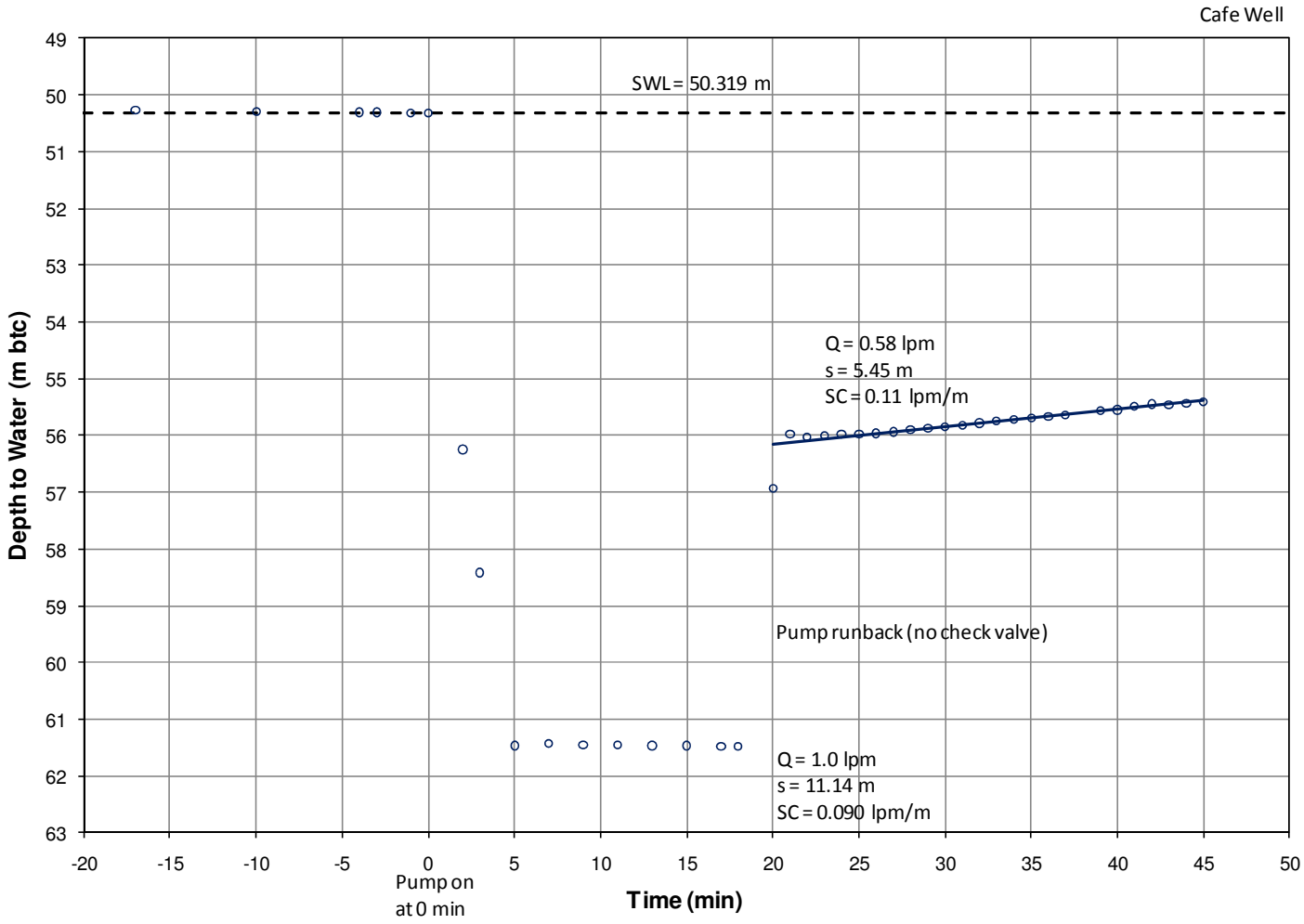
PROJECT NO.: 102003

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4715 Innovation Drive, Suite 110
Fort Collins, CO 80525
970.225.8222

Figure 2
VanSut Well Test

PREPARED FOR:

Access Consulting Group



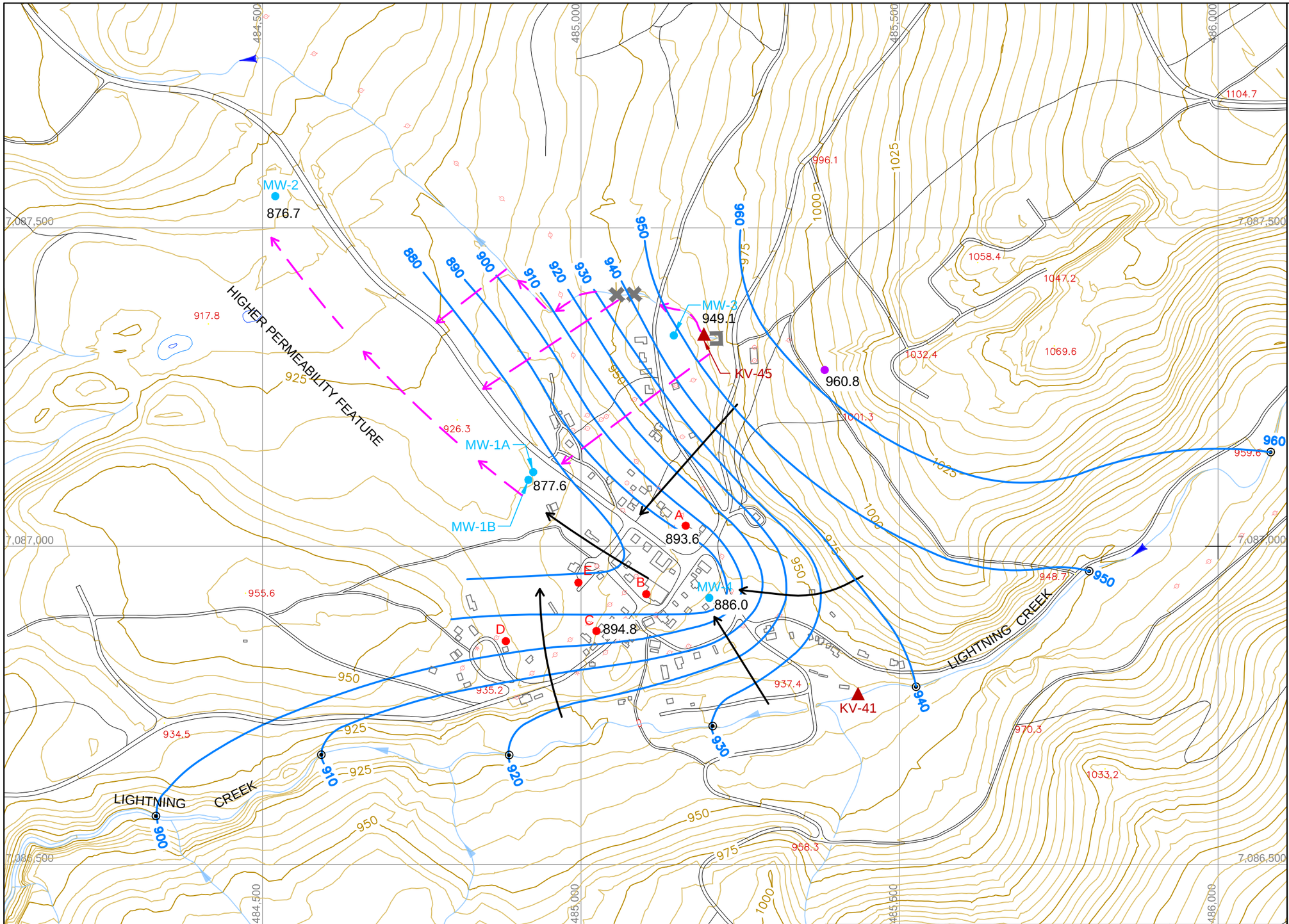
PROJECT NO.: 102003

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Fort Collins, CO 80525
970.225.8222

Figure 3
Café Well Test

PREPARED FOR:

Access Consulting Group



LEGEND:

- KENO CITY WATER WELL
  - A – CAFE WELL
  - B – HOTEL WELL
  - C – VANSUT WELL
  - D – ABANDONED WELL
  - E – FIREHALL WELL
- MW-3 — MONITORING WELL INSTALLED 2011
- TRENCH
- ONEK 400 ADIT PORTAL
- 893.6 — WATER LEVEL ELEVATION MEASURED IN WELL (m MSL)
- 920 — PERENNIAL STREAM WATER LEVEL ELEVATION (m MSL)
- 890 — WATER ELEVATION CONTOUR (m MSL)
- GROUNDWATER FLOW DIRECTION
- POSSIBLE MIGRATION PATHWAY FROM ONEK ADIT
- 960.8 ONEK MONITORING WELL
- SURFACE WATER SAMPLING STATION

N

120 0 120

(meters)
1 cm = 60 m

DRAWING REFERENCE(S):

DRAWING NAME:

DATUM: NAD 83

PROJECT LOCATION
KENO CITY, YUKON, CANADA

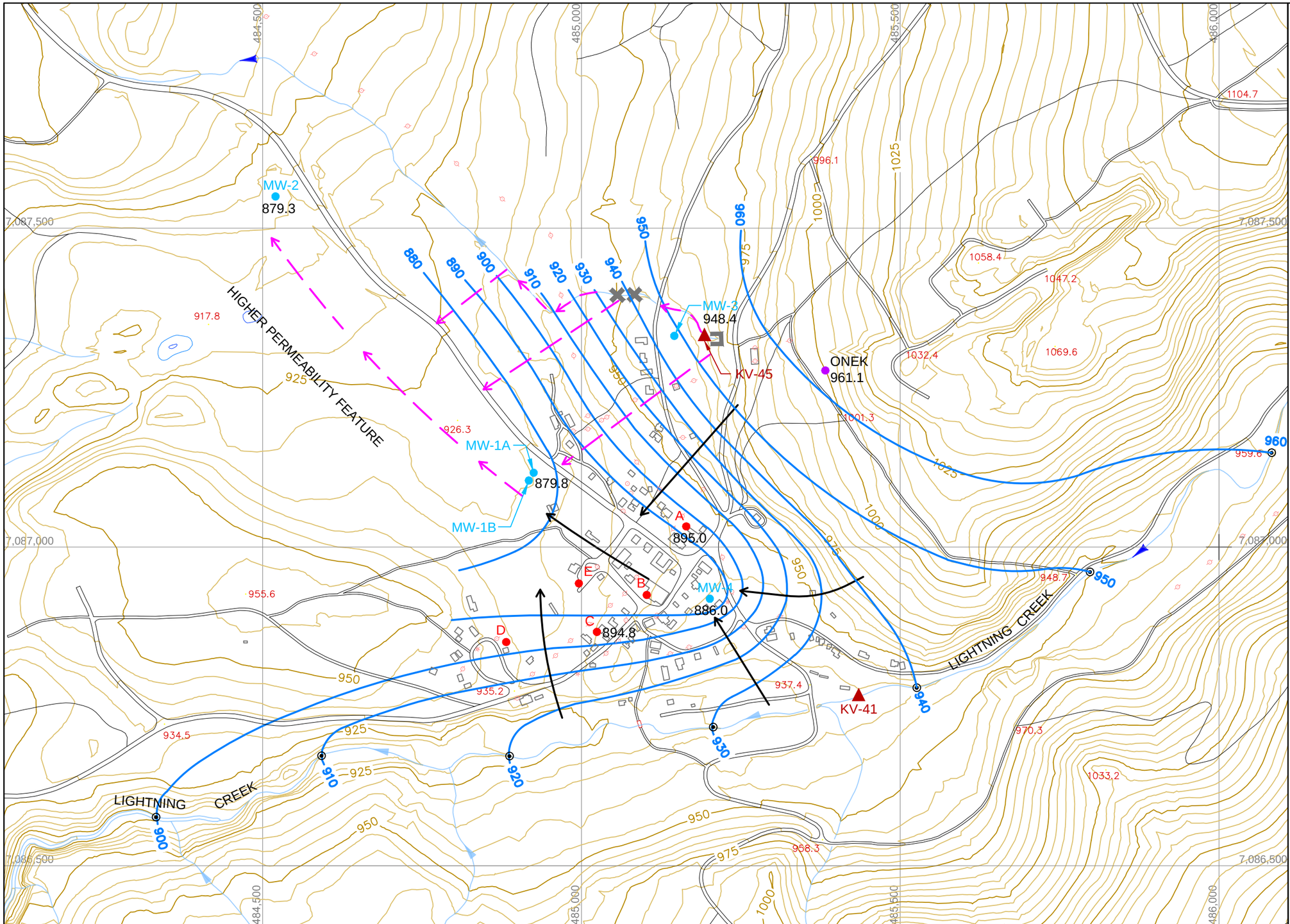
PROJECT
KENO

TITLE
MAY 2011
WATER-LEVEL CONTOUR MAP

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4715 Innovation Drive, Suite 110
Fort Collins, Co 80525
970.225.8222

PROJECT NO: 102002
REVISION: 1
SCALE: 1 cm = 60 m
DRAWING NAME: FIGURE 4
SHEET NUMBER

DRAWING PLOTTED: by VYukon\U0000 on - Hon\Yukon Data\Admin\Groundwater Contours\Figure 4 - 2011 - May 25, 2012 - 10:19pm.DWG OPERATOR: mellen
LAST SAVED: [Unmodified—date missing]



LEGEND:

- KENO CITY WATER WELL
  - A – CAFE WELL
  - B – HOTEL WELL
  - C – VANSUT WELL
  - D – ABANDONED WELL
  - E – FIREHALL WELL
- MW-3 — MONITORING WELL INSTALLED 2011
- TRENCH
- ONEK 400 ADIT PORTAL
- 893.6 — WATER LEVEL ELEVATION MEASURED IN WELL (m MSL)
- 920 — PERENNIAL STREAM WATER LEVEL ELEVATION (m MSL)
- 890 — WATER ELEVATION CONTOUR (m MSL)
- GROUNDWATER FLOW DIRECTION
- POSSIBLE MIGRATION PATHWAY FROM ONEK ADIT
- 961.1 ONEK MONITORING WELL
- SURFACE WATER SAMPLING STATION

WATER ELEVATION CONTOURS BASED ON FEBRUARY 2012 MEASUREMENTS FOR ALL WELLS EXCEPT VANSUT (C), WHICH WAS LAST MEASURED MAY 2011.

120 0 120

(meters)

1 cm = 60 m

DRAWING REFERENCE(S):

DRAWING NAME: FIGURE 5

DATUM: NAD 83

PROJECT LOCATION: KENO CITY, YUKON, CANADA

PROJECT: KENO

TITLE: FEBRUARY 2012 WATER-LEVEL CONTOUR MAP

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Fort Collins, Co 80525
970.225.8222

PROJECT NO: 102002

REVISION: 1

SCALE: 1 cm = 60 m

DRAWING NAME: FIGURE 5

SHEET NUMBER:

Attachment A

Drilling and Completion Report for Keno City Monitoring Wells (MW series)

A TETRA TECH COMPANY

July 6, 2011

ISSUED FOR USE
EBA FILE: W23101422
Via Email: eallen@accessconsulting.com

Access Consulting Group
#3 Calcite Business Centre
151 Industrial Road
Whitehorse, Yukon Y1A 2V3

Confidential

Attention: Mr. Ethan Allen, M.Sc.

Subject: Consulting Services for the Installation of Monitoring Wells in the Keno City Area, Yukon

1.0 INTRODUCTION

1.1 Background

EBA, A Tetra Tech Company (EBA), was engaged by Access Consulting Group (Access) to provide hydrogeological consulting services during the installation of five (5) groundwater monitoring wells in the Keno City area, Yukon. The work was performed in accordance with the scope of work set out in our proposal (Doc Ref PW23100003_Alexco_MWs) dated February 8, 2010 and accepted by Access on March 8, 2011.

1.2 Purpose

The purpose of EBA's work was to provide onsite co-ordination during the drilling and installation of five groundwater monitoring wells in the Keno City area.

1.3 Scope and Sequence of Work

The scope of work included:

- co-ordinate the drilling, installation and construction of five groundwater monitoring wells;
- co-ordinate the development of the five groundwater monitoring wells;
- Onsite testing of the five groundwater monitoring wells for field parameters (pH, EC, temperature)

The work was undertaken with regard to the workplan provided to EBA by Access and additional directions provided by Access and InTerraLogic, Inc (InTerraLogic) during the drilling program.

Table 1-1 summarises the tasks and sequence of events to arrive at this report.

EBA, A Tetra Tech Company
Calcite Business Centre, Unit 6, 151 Industrial Road
Whitehorse, YT Y1A 2V3 CANADA
p. 867.668.3068 f. 867.668.4349

Table 1-1: Sequence of Events

Date	Activity
March 8, 2011	EBA formally appointed by Access Consulting Group to undertake the work
March 10, 2011	Project kick off meeting at Access Consulting, Whitehorse
15 March – 22 April 2011	Well drilling, installation and development program conducted
6 July 2011	Report Issued

2.0 METHOD

2.1 Groundwater Monitoring Well Installation

Wells were sited, named, drilled and installed in accordance with the work plan titled Keno City Groundwater Investigation (ERDC, September 2010) and verbal and email communication during the drilling program with Ethan Allen (Access), Scott Davidson (Access) and Fred Marinelli (InTerraLogic).

EBA was directed to install wells in general compliance with the depths and construction details outlined in the workplan. Note that EBA was directed to drill all boreholes to the top of bedrock prior to installing monitoring wells.

Five groundwater monitoring wells (MW-1, MW-2, MW-3, MW-4 and MW-5) were drilled and installed by Kirk Shaw of Geotech Drilling in March and April 2011. The assigned well numbers were provided to EBA by Access. All wells were drilled with a Fraste Multidrill XL rig using an ODEX drilling technique.

The following products were used in the drilling and construction of the five wells:

- MATEX R.D.O. 302 ES Vegetable oil based rock drill oil (for lubricating the hammer)
- Enviro Cote joint compound (lubricant for drill rod threads)
- KOPR-KOTE joint compound (lubricant for drill rod threads)
- Target Products 10/20 Filter Sand, grain size 0.85 mm – 1.25mm (for filter pack)
- Enviroplug Grout (for well grouting)
- Holeplug 3/8 Coarse Grade Bentonite (for sealing the borehole)

Drilled bore diameters ranged from 114 mm to 169 mm. Casing and factory-slotted screen, consisting of 50 mm and 100 mm PVC with threaded joints, were installed in the wells. A sand filter pack was installed from the base of each well to at least 1.5 m above the top of the screen and a bentonite seal was installed above the filter pack. Wells were grouted from the top of the bentonite seal to several meters below ground level, where a bentonite surface seal was placed to prevent ingress of surface water. Stick-up steel casing protectors with lockable caps were installed to limit access and potential damage to the wells. EBA did not lock the wells and it is recommended that the wells be locked to restrict access and potential damage/vandalism.

Well logs and construction diagrams are provided in Appendix B. Key bore details are presented in Table 2-1.

Table 2-1: Key Well Details

Well ID	Location (UTM NAD83, Zone 8)	Drilled Depth – bgl (m) / (ft)	Casing Diameter (mm) / (inch)	Screened Interval - bgl (m) / (ft)	Filter Pack Interval - bgl (m) / (ft)	Comments
MW-1	E 0484921 N 7087116	93.9 / 308'	50 / 2	84.7 – 93.9 / 278' – 308'	82.9 – 93.9 / 272' – 308'	▪ Monitoring well installed in bedrock. ▪ Borehole pre drilled and casing installed to 41.1 m bgl (135 ft) from previous drill program.
MW-2	E 0485205 N 7086914	74.1 / 243'	100 / 4	38.0 – 47.2 / 125' – 155'	36.4 – 47.2 / 119' – 155'	▪ Monitoring well installed in overburden. ▪ Borehole drilled to 74.1 m bgl. ▪ Bedrock encountered at approximately 72.5 m bgl. ▪ Borehole backfilled with grout from 74.1 – 47.2 m bgl.
MW-3	E 0485143 N 7087332	17.4 / 57'	100 / 4	8.2 – 17.4 / 27' – 57'	6.7 – 17.4 / 22' – 57'	▪ Monitoring well installed in bedrock.
MW-4	E 0485205 N 7086914	82.3 / 270'	50 / 2	57.9 – 67.1 / 190' – 220'	56.4 – 67.1 / 185' – 220'	▪ Monitoring well installed in overburden. ▪ Borehole drilled to 82.3 m bgl, bedrock not encountered
MW-5	E 0484917 N 7087105	59.4 / 195'	50 / 2	50.3 - 59.4 / 165' – 195'	48.8 – 59.4 / 160' – 195'	▪ Monitoring well installed in overburden.

The following points are noted in regards to the drilling and installation program:

- MW-1 had been pre-drilled to 41.1 m bgl by Geotech Drilling under the direction of InTerraLogic during the last drilling program in November 2010. Due to drill rig mechanical issues, the well was not completed during the 2010 program.
- MW-2 was drilled to 74.1 m bgl with bedrock inferred as being intercepted at 72.5 m bgl. The borehole was backfilled with grout to 47.2 m bgl and the monitoring well constructed above this elevation.
- MW-4 was drilled to 82.3 m bgl with bedrock not being encountered. Due to mechanical issues (drill bit spinning off the rods at 82.3 mbgl), the rods and casing were tripped out of borehole, resulting in the hole collapsing to 59.4 m bgl. Following consultation with Fred Marinelli (InTerraLogic) EBA was directed not to re-drill the hole in an attempt to intercept bedrock given the extra time associated with this option along with the driller only having 3 m more casing remaining than what had already been drilled. The collapsed hole was re-drilled from 59. 4 m bgl to 67.1 m bgl and the monitoring well installed.

2.2 Well Development

Of the five wells drilled and installed, only two wells (MW-2 and MW-3) could be developed during the drilling program. Monitoring wells MW-1, MW-4 and MW-5 were too deep to airlift using compressed air. At the direction of Access and InTerraLogic, EBA did not attempt to develop these wells using an alternative method.

Monitoring well MW-3 was developed on April 13, 2011 using an airlifting method. Development was undertaken using a surging technique with groundwater airlifted for a one minute period followed by the air being turned off for one minute. This was repeated for 20 min, with the air being turned off completely for 10 minutes after the 20 min lifting cycle. This process was repeated five times. Discharge water was noted to change from murky with particulates to being clear/slightly murky at the completion of the fifth airlift cycle.

Monitoring well #2 was developed by air lifting, with the PVC tube end placed near the top section of the screen (approximately 110 ft below ground) and lifted continuously for 1.5 hours. Two more 10 ft PVC pipe lengths were then added to develop the middle section of the screen and lifted for another 3 hours. Discharge water changed from cloudy and silty during the initial stages of development to cloudy with minor silt when development was ceased.

2.3 Well Gauging

Groundwater elevations recorded from each of the wells following drilling and installation are detailed in Table 2-2.

Note that the total depth recorded for MW-4 (60.36 m bgl) is quite different to the total depth of the well when it was installed (67.1 m bgl). The reason for this variation is unknown and should be investigated following confirmation of the reduction in depth.

Table 2-2: Groundwater Elevations (April 2011)

Well ID	SWL – bTOC (m / ft)	Total Well Depth – bTOC (m / ft)	GL to TOC (m / ft)
MW-1	52.55 / 172.41	93.88 / 308	0.38 / 1.25
MW-2	31.20 / 102.36	48.01 / 157.51	0.91 / 2.99
MW-3	12.03 / 39.47	17.66 / 57.94	0.76 / 2.49
MW-4	58.67 / 192.49	60.36 / 198.03	0.71 / 2.33
MW-5	53.21 / 174.57	59.68 / 195.80	0.60 / 1.97
SWL – Static water level TOC – Top of PVC casing b – below GL – Ground Level			

2.4 Field Water Quality Analysis

Grab samples were taken from each of the monitoring wells following installation and development (where applicable) and analysed in the field for pH, electrical conductivity and temperature. The results of this analysis are shown in Table 2-3.

Table 2-3: Field Analysis (April 2011)

Well ID	pH (units)	Electrical Conductivity (µS/cm)	Temperature (°C)	Other
MW-1	6.80	583	1.4	Clear, oily residue from DHH residue, peanut oil odor
MW-2	7.49	478	1.8	Cloudy, minor fine silt
MW-3	6.64	324	0.7	Clear, no odor
MW-4*	-	-	-	-
MW-5	6.72	684	1.1	Clear, no odor
*sample unable to be obtained due to bailer sticking to side wall of well				

3.0 RECOMMENDATIONS

The following recommendations are made by EBA to complete the monitoring well installation program:

- MW1, MW4 and MW5 are developed prior to groundwater sampling being undertaken.
- All well are padlocked and access to the wells restricted to those involved in the gauging and sampling of the wells.

4.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Access Consulting Group and their agents. EBA, A Tetra Tech Company, does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Access Consulting Group, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's Services Agreement. EBA's General Conditions are provided in Appendix A of this report.

5.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Sincerely,
EBA, A Tetra Tech Company

Adam Seeley, M.Sc.
Hydrogeologist
Pacific Region
Direct Line: 867.668.2071 x243
aseeley@eba.ca

Stephan Klump, PhD
Hydrogeologist, Team Lead
Pacific Region
Direct Line: 867.668.2071 x250
sklump@eba.ca

APPENDIX A

APPENDIX A EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

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Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the work and the preparation of the report, EBA may rely on information provided by persons other than the Client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX B

APPENDIX B WELL LOGS AND CONSTRUCTION DIAGRAMS

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-1
	7087116N; 484921E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
0	Borehole already drilled to 41.1 m (135 ft)				0
1					5
2					
3					10
4					
5					15
6					
7					20
8					
9					25
10					
11					30
12					
13					35
14					
15					40
16					
17					45
18					
19					50
20					
					55
					60
					65

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LOGGED BY: AS	COMPLETION DEPTH: 93.9m
REVIEWED BY: SK	COMPLETE: 4/7/2011
DRAWING NO:	Page 1 of 5

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-1
	7087116N; 484921E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
20					
21					70
22					
23					75
24					
25					80
26					
27					85
28					
29					90
30					
31					95
32					
33					100
34					
35					105
36					
37					110
38					
39					115
40					
					120
					125
					130
					131

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LOGGED BY: AS	COMPLETION DEPTH: 93.9m
REVIEWED BY: SK	COMPLETE: 4/7/2011
DRAWING NO:	Page 2 of 5

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-1
	7087116N; 484921E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
40					
41	SAND and GRAVEL - occasional boulder and cobble, sub-angular to sub-rounded, well graded, damp		-DHH from 41.1 to 43.3 m (135-145 ft); hole caving, swapped to ODEX, reamed out DHH hole		135
42					
43					140
44					
45					145
46					
47					150
48					
49					155
50					
51					160
52					
53					165
54			- drilling noted to be hard by driller - cuttings dry - left open at 53.3 m (175 ft) for 10 min; water blown to surface when air turned on		170
55					4/6/2011
56	SAND - silty, some gravel, poorly graded, damp, brown				175
57	SAND - gravelly, well graded, sub to well rounded, damp, brown				180
58	SAND and GRAVEL - some silt, poorly graded, saturated, brown with orange and yellow mottling				185
59	SAND - some silt, some gravel, poorly graded, damp, brown				190
60					195
					197

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-1
	7087116N; 484921E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
60					
61					200
62	SAND and GRAVEL - poorly graded, saturated, brown with orange and yellow mottling - possible boulder or cobble, dry, hard				205
63	SAND and GRAVEL - well graded, damp, brown and grey				
64	SAND and GRAVEL - well graded, saturated, grey with minor orange and white		- saturated after air tuned off and rods and casing added		210
65					
66					215
67	SAND - some gravel, poorly graded, damp, brown and grey - saturated		- damp due to air pushing water back into aquifer		220
68	SAND - some silt, fine grained, damp, dark grey		- slow drilling; returns getting stuck between casing and rods		
69					225
70	SILT - saturated, dark grey				
71	- cuttings damp				230
72					
73			- water added to get returns to surface approx 1-2 GPM		235
74	SAND and GRAVEL and SILT - well graded, sub-rounded to rounded, grey with trace brown and orange				240
75					
76					245
77					
78					250
79					
80	GRAVEL - some sand, some silt, poorly graded, sub-angular, saturated, grey				255
					260
					262

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-1
	7087116N; 484921E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
80	gravel with trace sand, yellow and brown - decreasing yellow and brown sands, some larger rounded gravel returns		- drilling hard; ODEX not progressing, swapped to DHH		265
81	BEDROCK - fresh, saturated, dark grey, minor white and orange		- cuttings smaller and more smashed up - large solid cuttings, up to 6 cm x 5 cm x 1 cm		
82					270
83	- becomes dark grey, some white				
84					275
85	- becomes light grey, some yellow				
86					280
87					285
88	- becomes slightly weathered, dark grey, some yellow and orange				
89					290
90	- fresh, dark grey, some orange and white				295
91	- dark grey, some white, trace gold				
92					300
93					305
94	EOH @ 93.9 m (308 ft)				310
95	NOTES: - sufficient water and depth to meet well consturction requirements - target actually 92.4 m (303 ft), however driller drilled 1.5 m (5 ft) extra				
96					315
97					
98					320
99					325
100					328

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LOGGED BY: AS	COMPLETION DEPTH: 93.9m
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Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-2
	7086914N; 485205E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	SAND and GRAVEL - trace silt, medium to coarse grained sand, dry, greyish brown			0
1				
2				5
3	- possible boulder			10
4				
	SAND and GRAVEL - fine grained, moist, brown			15
5				
6				20
	SAND and GRAVEL - fine to medium grained sand, brown, moist			
7				25
8				
9				30
	SAND and GRAVEL - some silt, fine to medium grained sand, moist, brown			
10				35
11				
12	- moist to damp			40
13				
14				45
15	- damp			
16				50
17				55
	GRAVEL - some sand, fine grained gravel, subrounded, dry, grey, dusty			
18	GRAVEL - some sand, coarse grained gravel, some medium to coarse sand, subrounded, dry, grey, dusty			60
19				
20				65
21				69

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LOGGED BY: CM	COMPLETION DEPTH: 74.1m
REVIEWED BY: SK	COMPLETE: 4/21/2011
DRAWING NO:	Page 1 of 4

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-2
	7086914N; 485205E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
21					70
22	SAND and GRAVEL - moist to damp, brown				
23	SAND - some silt, fine grained sand, damp, brown				75
	SAND and GRAVEL - medium to coarse grained sand, fine gravel, moist, brown				
24	GRAVEL - some sand, fine to medium grained gravel, moist, brown				
25	GRAVEL - some sand, coarse grained gravel, medium to coarse sand, subrounded, dry, grey, dusty				80
26	GRAVEL - some sand, moist, brown				
	SAND - fine grained sand, moist, brown				85
27	- becomes wet				
	GRAVEL - some sand, fine grained gravel, medium to coarse grained sand, moist, brown				90
28					
29					95
30	SAND - fine to medium grained, damp, brown				100
31	GRAVEL - trace silt, medium to coarse grained gravel, damp, brown				
32					105
33					
34	SAND - medium to coarse grained sand, wet, brown				110
35					115
	SAND and GRAVEL - coarse grained sand, saturated, brown				
36					
37	GRAVEL - some sand and silt, medium to fine grained sand, brown				120
38					125
39	- increasing silt		- water added to assist returns to surface		
40	SAND and GRAVEL - trace silt, coarse grained sand with some medium grained sand, saturated, grey				130
41					135
42					138

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LOGGED BY: CM	COMPLETION DEPTH: 74.1m
REVIEWED BY: SK	COMPLETE: 4/21/2011
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Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-2
	7086914N; 485205E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
42					140
43					
44					145
45					
46					150
47					
48			- tripped out 6" rods, hole sloughed to approx. 47.2 m (155 ft)		155
49					
50					160
51					
52					165
53					
54					170
55					
56	CLAY - grey				175
57					
58					180
59					
60					185
61					
62					190
63					
					195
					200
					205
					210

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LOGGED BY: CM	COMPLETION DEPTH: 74.1m
REVIEWED BY: SK	COMPLETE: 4/21/2011
DRAWING NO:	Page 3 of 4

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-2
	7086914N; 485205E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
63					210
64					
65					215
66					
67					220
68					
69					225
70					
71					230
72					
73	BEDROCK		- drilling hard and slow		235
74					
75	EOH @ 74.1 m (243 ft) NOTES: - target reached (bedrock)				240
76					
77					245
78					
79					250
80					
81					255
82					
83					260
84					
					265
					270
					275
					276

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LOGGED BY: CM	COMPLETION DEPTH: 74.1m
REVIEWED BY: SK	COMPLETE: 4/21/2011
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Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-3
	7087332N; 485143E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
0	SAND and GRAVEL - moderately to well sorted, subangular to subrounded, dry, grey and brown				0
1	SAND - uniformly graded, fine grained sand, damp, brown				
	SAND and GRAVEL - poorly sorted, subrounded with some subangular and rounded inclusions, dry, greyey brown with some white and trace yellow				5
2					
	BEDROCK (Quartzite) - slightly weathered with fine sand evident on weathered surfaces, low strength, dry, grey, some brown and white, trace pyrite				10
3					
	BEDROCK (Quartzite) - fresh, low strength, dry, grey and white, trace brown		- drilling fast		15
4					
5	- becoming harder				20
6					
7					25
8					
9					30
10					
11	- trace water in returns after air turned off and rods added				35
12	4/12/2011				4/12/2011 40
13					
14	- cuttings moist				45
15					
16					50
17	- significant water after air turned off and rods added				55
	EOH @ 17.4 m (57.0 ft)				
18					60
	NOTES: sufficient water and depth to meet well construction requirements				
19					
20					65 66

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LOGGED BY: AS	COMPLETION DEPTH: 17.4m
REVIEWED BY: SK	COMPLETE: 4/13/2011
DRAWING NO:	Page 1 of 1

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-4
	7086914N; 485205E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
0	SAND and GRAVEL - moderately sorted, subangular to subrounded, dry, grey and brown				0
1					
2	SAND - fine grained, damp, brown				5
	SAND and GRAVEL - moderately sorted, fine to coarse grained sand, subangular to subrounded, dry, grey and brown				
3	- as above with occasional schist fragments and well rounded gravels				10
4	SAND - trace gravel,uniformly sorted, fine grained sand, dry, brown				
	SAND and GRAVEL - moderately sorted, fine to coarse grained sand, subangular to subrounded, dry, grey and brown				15
5					
6					20
7					
8					25
9	SAND and GRAVEL - poorly sorted, fine grained sand, some coarse grained sand, subangular to subrounded, dry, grey, brown and white				30
	SAND - fine grained, damp, brown				
10	SAND - uniformly graded, fine grained, moist to wet, brown/slightly grey				
11					35
12	SAND and GRAVEL - poorly sorted, fine grained sand with some coarse grained sand, subangular to subrounded, dry, grey, brown and white				
	SAND and GRAVEL - well sorted, coarse grained sand with some fine grained sand, subangular with occasional subrounded gravels, dry, grey, some white and brown				40
13					
14					45
15					
	SAND - some gravel, poorly sorted, gravel subrounded, dry, brown				50
16	SAND - uniformly sorted, fine grained, damp, brown				
17	SAND - uniformly sorted, fine grained, moist to wet, brown/slightly grey				55
18					
	SAND and GRAVEL - moderately sorted, fine to coarse grained, subangular to subrounded, dry, grey, some brown				60
19					
20					66

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LOGGED BY: AS	COMPLETION DEPTH: 82.3m
REVIEWED BY: SK	COMPLETE: 4/18/2011
DRAWING NO:	Page 1 of 5

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-4
	7086914N; 485205E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
20	SAND and GRAVEL - well sorted, coarse grained sand, some fine grained sand, subangular with some subrounded gravels, dry, grey, some white and brown				
21					70
22					
23					75
24					
25					80
26					
27	- trace schist present				85
28					
29					90
30	SAND - well sorted, fine and medium grained sand, dry, grey, brown and light brown				95
31	SAND and GRAVEL - well sorted, coarse grained sand, some fine to medium grained sand, fine grained gravel, rounded to subrounded, dry, grey, brown and white				100
32					
33	- as above with occasional schist fragments and well rounded gravels				105
	SILT - soft, moist to damp, brown		- water in returns after casing and rods added - not significant amount - driller started to inject water as cuttings not returning to surface		110
34					
35	- became dark grey in colour				115
36					
37			- no water in cuttings after rods and casing added		120
38					
					125
39	SILTY GRAVEL - some sand, moderately sorted, generally subrounded, moist to damp, grey, brown and orange				
	SAND and GRAVEL - trace silt, well graded, fine to coarse grained sand, fine grained gravel, subrounded, moist, grey, brown and orange				130
40					131

EBA Engineering Consultants Ltd.

LOGGED BY: AS	COMPLETION DEPTH: 82.3m
REVIEWED BY: SK	COMPLETE: 4/18/2011
DRAWING NO:	Page 2 of 5

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-4
	7086914N; 485205E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
40	- becoming drier, less silt				
41	SAND and GRAVEL - well graded, fine to coarse grained sand, fine grained gravel, subrounded, dry, grey with some orange and white				135
42	GRAVEL - some sand, moderately to well graded, fine grained gravel, subrounded, dry, grey with trace white				
43	SAND - well graded, fine to medium grained sand, subrounded, dry, grey, brown, orange and white				140
44	GRAVEL and SAND - moderately graded, fine grained gravel and fine grained sand, subrounded, damp, brown, grey, orange and white - dry				145
45					
46					150
47	- boulder/cobble to around 46.5 m				155
48					
49					160
50					
51					165
52					170
53					
54					175
55					180
56					
57	- boulder/cobble to around 56.7 m				185
58					190
59	SAND - some gravel, well graded, fine to coarse grained sand, fine grained gravel, subangular to subrounded, damp, grey, orange and white				
60	- saturated				195

4/17/2011

4/17/2011

EBA Engineering Consultants Ltd.	LOGGED BY: AS	COMPLETION DEPTH: 82.3m
	REVIEWED BY: SK	COMPLETE: 4/18/2011
	DRAWING NO:	Page 3 of 5

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-4
	7086914N; 485205E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
60					200
61					
62					205
63					
64					210
65					
66					215
67					220
68	SAND - well graded, fine to coarse grained, subrounded to rounded, saturated, brown with grey, white and orange				
69					225
70					
71					230
72					
73					235
74					
75					240
76					
77					245
78					
79	- increasing fine sand and silt		- slow drilling, bit worn?		250
80					255
					260
					265

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LOGGED BY: AS	COMPLETION DEPTH: 82.3m
REVIEWED BY: SK	COMPLETE: 4/18/2011
DRAWING NO:	Page 4 of 5

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-4
	7086914N; 485205E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
80					265
81					
82					270
	EOH @ 82.3 m (270 ft)				
83	NOTE: bit not drilling, too worn. Bedrock not reached. Hole collapsed to 59.4 m (195 ft) when 4" casing pulled. Redrilled to 67.1 m (220 ft).				275
84					
85					280
86					
87					285
88					
89					290
90					
91					295
92					
93					300
94					
95					305
96					
97					310
98					
99					315
100					
					320
					325
					328

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LOGGED BY: AS	COMPLETION DEPTH: 82.3m
REVIEWED BY: SK	COMPLETE: 4/18/2011
DRAWING NO:	Page 5 of 5

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-5
	7087105N; 484917E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
0	SAND and SILT (FILL) - some gravel and cobble) - poorly graded, fine grained sand, subangular to subrounded, dry, brown to light brown, ice in returns				0
1	COBBLE (FILL) - dry, grey, some brown and white				
	SAND (FILL) - some silt and gravel), poorly graded, fine grained sand, moist with some frozen regions, brown, organic inclusions (tree branches),				5
2	SILT - some sand and gravel, moderately sorted, gravel rounded, wet, brown				
	SILT -damp, brown				
3	- water in returns; melted permafrost as ground frozen				10
4					
5					15
6					20
7	SAND and GRAVEL - poorly graded, subangular to subrounded, wet (water being added), grey, some white, trace orange		- water added from 20ft as cuttings not returning to surface		
	GRAVEL - some sand and silt, poorly graded, rounded to subrounded, dry, grey, trace orange and white				25
8	SAND and SILT and GRAVEL - occasional cobble, moderately sorted, subrounded, dry, brown and grey				
9					30
10					
11	SILT - trace gravel, damp, brown				35
	- boulder or cobble				
12	SILT - some cobble, subrounded to subangular cobble, damp, brown				40
	SAND and GRAVEL - trace silt, poorly graded, gravel subrounded to subangular, sand subrounded to rounded, dry, light brown and grey				
13					
14					45
15					50
16	SAND - some silt, well graded, subangular to subrounded moist, grey, brown and orange				
17	- increasing gravel, subrounded to subangular				55
18					60
19					
20					65

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LOGGED BY: AS	COMPLETION DEPTH: 59.4m
REVIEWED BY: SK	COMPLETE: 4/10/2011
DRAWING NO:	Page 1 of 4

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-5
	7087105N; 484917E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
20	SAND - some gravel,well graded, rounded to subrounded, damp, light brown, some grey and orange				
21					70
22	- increasing moisture, damp to moist				
23					75
24	SAND and SILT - sand fine grained, soft, moist, brown				
25					80
26			- water added as cuttings not returning to surface		85
27	- became greyer in colour				
28					90
29					95
30					
31					100
32					105
33					
34	SAND and GRAVEL - occasional boulder/cobble, well graded, subangular to subrounded, damp, light brown and grey, some white and orange				110
35					115
36					
37	- dry				120
38					125
39					
40					130

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-5
	7087105N; 484917E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
40					135
41					
42					140
43					
44					145
45					
46					150
47					
48					155
49					
50					160
51					
52					165
53					
54			- cuttings wet after air turned off to add rods and casing, cuttings dry after approx 30 sec of air being turned on		170
55					
56	- cuttings slightly darker, increased moisture				175
57	- cuttings wet and water blown from hole after rods and casing added - return water changed from brown to orange/brown		- cuttings wet and water blown from hole after rods and casing added		180
58					
59					185
60	EOH @ 59.4 m (195 ft)				190
					195
					197

4/9/2011

4/9/2011

Monitoring Well Installation	CLIENT: Access Consulting Group	PROJECT NO. - BOREHOLE NO.
Keno City, YT	DRILL: Air Rotary	W23101422-MW-5
	7087105N; 484917E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
60	NOTE: sufficient water and depth to meet well construction requirements				200
61					
62					205
63					
64					210
65					
66					215
67					
68					220
69					
70					225
71					
72					230
73					
74					235
75					
76					240
77					
78					245
79					
80					250
					255
					260
					262

EBA Engineering Consultants Ltd.

LOGGED BY: AS	COMPLETION DEPTH: 59.4m
REVIEWED BY: SK	COMPLETE: 4/10/2011
DRAWING NO:	Page 4 of 4

Attachment B

Completion Report for Onek Monitoring Well

A TETRA TECH COMPANY

July 15, 2011

ISSUED FOR USE
EBA FILE: W23101440
Via Email: eallen@accessconsulting.com

Alexco Resource Corp.
#3 Calcite Business Centre
151 Industrial Road
Whitehorse, Yukon Y1A 2V3

Attention: Mr. Ethan Allen, M.Sc.

Subject: Consulting Services for the Installation of a Monitoring Well at Onek Mine, Keno Hill, Yukon

1.0 INTRODUCTION

1.1 Background

EBA, A Tetra Tech Company (EBA) was engaged by Alexco Resource Corp. (Alexco) to provide hydrogeological consulting services during the installation of one (1) groundwater monitoring well at the Onek Mine in the Keno Hill area, Yukon. The work was performed in general accordance with the scope of work set out in our proposal (Doc Ref PW23100003_Alexco_Onek_MW) dated March 30, 2011 and accepted by Alexco on May 16, 2011.

1.2 Purpose

The purpose of EBA's work was to design a groundwater monitoring well for installation in a pre-drilled exploration borehole and to provide onsite co-ordination during construction of the well.

1.3 Scope and Sequence of Work

The scope of work included:

- design of a groundwater monitoring well that would enable long term gauging of groundwater elevations at the Onek Mine site in the Keno Hill area;
- co-ordinate the installation and construction the groundwater monitoring well;
- in addition to the agreed scope, onsite testing of the groundwater monitoring well for field parameters (pH, EC, temperature) was also undertaken.

The work was conducted with regard to the scope of work provided to EBA by Alexco and additional verbal directions provided by Ethan Allen and Scott Davidson of Alexco during the fieldwork program.

EBA, A Tetra Tech Company
Calcite Business Centre, Unit 6, 151 Industrial Road
Whitehorse, YT Y1A 2V3 CANADA
p. 867.668.3068 f. 867.668.4349

2.0 METHOD AND RESULTS

2.1 Groundwater Monitoring Well Design and Installation

EBA was advised by Alexco that the purpose of the monitoring well was to enable long term monitoring of the groundwater elevation in the vicinity of the Onek mine site. Given the potential for the groundwater elevation to be lowered through dewatering during proposed future mining activities, the well design agreed by EBA and Alexco incorporated a long screen interval to accurately measure the unconfined water table elevation.

It is noted that the long screened interval does not allow for discrete groundwater samples to be obtained from individual depths within the well.

The groundwater monitoring well was installed in an exploratory diamond drill hole identified by Alexco as K-11-0337. The borehole was drilled by Kluane Drilling between April 11, 2011 and April 13. Key borehole details are provided in Table 2-1.

Table 2-1: Key Borehole Details

Alexco Borehole ID	Driller	Started	Completed	Total Depth (m bgl)	Core Size	Location (UTM NAD83, Zone 8)	Ground Elevation (m asl)
K-11-0337	Kluane Drilling	11/4/2011	13/4/2011	76.20	HTW OD - 91.0 mm ID – 81.6 mm	E 485382.616 N 7087276.948	998.86

m – meters bgl – below ground level asl – above sea level

The monitoring well was constructed following completion of the exploratory borehole. The well was constructed using 50 mm PVC casing and factory-slotted screen with threaded joints.

Due to lubricants used during the coring process potentially smearing the borehole walls (possibly leading to sticking and bridging of the sand/bentonite/backfill material during installation), the drill rods were left in the borehole and the PVC well installed within the rods. Systematically, small amounts of sand/bentonite/backfill (approx. 0.2 to 0.4 m) were poured in to the annulus between the drill rods and the well, then the rods raised allowing the sand/bentonite/backfill to fall into the annulus between the borehole wall and PVC casing. This process was repeated to surface. This method was employed to minimize the risk of bridging. During installation, the well was lifted approximately 1.2 m to dislodge sand that had bridged during pouring. When lifted, the bottom 1.2 m of the borehole had filled with sand and the well was not able to be lowered back to its original depth.

Given the difficulties inherent in installing the 50 mm monitoring well in the narrow internal diameter HTW rods (typically bridging of sand and bentonite), a Geotech Drilling representative with skill in monitoring well installations assisted in the installation of the monitoring well. This was done with the approval of Alexco to save time and minimise the potential for the installation to fail.

The final well construction details are summarized below and in Table 2-2. Well logs and construction diagrams are provided in Appendix B. EBA notes that the lithological codes detailed in the soil description column of the logs were provided by Alexco. Lithological descriptions were not provided to EBA for inclusion on logs.

- Alternating lengths of 3 m of screened PVC casing then 6 m of solid PVC casing from the well base (74.98 m bgl) to 17.07 m bgl.
- Solid casing from ground level to 17.07 m bgl.
- A sand filter pack was installed from the base of the borehole to 15.24 m bgl.
- A bentonite seal at the top of the sand filter pack from 13.41 m bgl to 15.24 m bgl.
- The borehole was backfilled with native soils from 13.41 m bgl to approximately 1.5 m bgl.
- A bentonite surface seal was placed to prevent ingress of surface water.

Table 2-2: Key Well Details

Alexco Borehole ID	Drilled Depth (m bgl)	Total Borehole Depth (m bTOC)	Casing Diameter (mm)	Borehole Diameter (mm)	Screened PVC Intervals (m bgl)	Solid PVC Intervals (m bgl)	Filter Pack Interval (m bgl)
K-11-0337	76.20	76.60	50	91	17.07 - 20.12 26.21 - 29.26 35.36 - 38.40 44.50 - 47.55 53.64 - 56.69 62.79 - 65.84 71.93 - 74.98	0.00 – 17.07 20.12 - 26.21 29.26 - 35.36 38.40 - 44.50 47.55 - 53.64 56.69 - 62.79 65.84 - 71.93	15.24 – 76.20
m – meters bTOC – below top of PVC casing bgl – below ground level							

The following points are noted in regards to the drilling and installation program:

- K-11-0337 had been pre-drilled to 76.20 m bgl by Kluane Drilling under the direction of Alexco as part of the mining exploratory drilling program.
- The monitoring well was installed by a representative of Geotech Drilling with installation coordinated by an EBA representative.
- Alternating segments of screened PVC and solid PVC pipe were installed to maximize the screened interval whilst also minimizing costs and equipment used. Following discussion with Alexco representatives (Ethan Allen and Scot Davidson), it was concluded that designing the well in this manner would enable long term monitoring of groundwater elevations both under current conditions as well as during mine dewatering, which may substantially lower groundwater elevations .

The following products were used in the construction of the well:

- Target Products 10/20 Filter Sand, grain size 0.85 mm – 1.25mm (for filter pack)
- Holeplug 3/8 Coarse Grade Bentonite (for sealing the borehole).
- Soil sourced from the local vicinity (to backfill the borehole above the water table.

2.2 Well Gauging

The groundwater elevation recorded from K-11-0337 on April 15, 2011, two days after drilling and installation is detailed in Table 2-3.

Table 2-3: Groundwater Elevations (April 2011)

Alexco Borehole ID	Date	gl elevation (m asl)	gl to TOC (m)	SWL (m bTOC)	SWL (m bgl)	SWL (m asl)
K-11-0337	April 15, 2011	998.86	0.40	38.47	38.07	960.79
SWL – Static water level m – meters TOC – Top of PVC casing b – below gl – Ground Level asl – above sea level						

2.3 Field Water Quality Analysis

A grab sample was taken from the monitoring well following installation and analysed in the field for pH, electrical conductivity and temperature. The results of this analysis are shown in Table 2-4.

Table 2-4: Field Analysis (April 2011)

Alexco Borehole ID	Date	pH	Electrical Conductivity (µS/cm)	Temperature (°C)	Other
K-11-0337	April 15, 2011	7.09	645	2.0	Clear with some clear/white particulates present.

3.0 LIMITATIONS OF REPORT

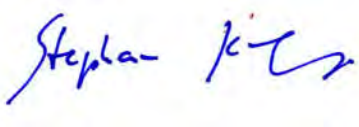
This report and its contents are intended for the sole use of Alexco Resource Corp. and their agents. EBA, A Tetra Tech Company, does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Alexco Resource Corp., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's Services Agreement. EBA's General Conditions are provided in Appendix A of this report.

4.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Sincerely,
EBA, A Tetra Tech Company





Adam Seeley, M.Sc.
Hydrogeologist
Pacific Region
Direct Line: 867.668.2071 x243
aseeley@eba.ca

Stephan Klump, PhD
Hydrogeologist, Team Lead
Pacific Region
Direct Line: 867.668.2071 x250
sklump@eba.ca

APPENDIX A

APPENDIX A EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of EBA’s client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA’s Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA’s instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA’s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA’s instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client’s current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the work and the preparation of the report, EBA may rely on information provided by persons other than the Client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX B

APPENDIX B WELL LOG AND CONSTRUCTION DIAGRAM

Monitoring Well Installation	CLIENT: Alexco Resource Corp.	PROJECT NO. - BOREHOLE NO.
Onek Mine	DRILL: Diamond Core	Alexco ID: K-11-0337
Keno Hill, YT	7087276.948N; 485382.6162E; Zone 8	Ground Elevation (m asl): 998.86

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
0	OVB		**Additional Well Details:** Borehole Diameter: 91 mm; Casing Diameter: 50 mm; Stickup (m agl): 0.40 m; SWL 4/15/2011 (m asL): 960.79		0
1					
2					5
3					
4	ICQS				10
5					
6	TQTZT				15
7					
8					20
9					
10					25
11					
12					30
13	GNST				
14					35
15					
16					40
17					
18					45
19	TQTZT				
20					50
21	GNST				
22					55
23	ICQS				
24					60
25	QTZT				
26					65
					70
					75
					80
					85

eba A TETRA TECH COMPANY	LOGGED BY: Client	COMPLETION DEPTH: 76.20 m
	REVIEWED BY: SK	COMPLETE: 4/13/2011
	DRAWING NO:	Page 1 of 3

Monitoring Well Installation	CLIENT: Alexco Resource Corp.	PROJECT NO. - BOREHOLE NO.
Onek Mine	DRILL: Diamond Core	Alexco ID: K-11-0337
Keno Hill, YT	7087276.948N; 485382.6162E; Zone 8	Ground Elevation (m asl): 998.86

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
26					90
27					
28					
29	TQTZT				95
30					
31	GNST				100
32					
33					105
34					
35	MCQ				110
36					
37					115
38	GNST				
39	GNST TQTZT				120
40					
41	ICQS				125
42					
43					130
44					
45	CHSCH				135
46					
47					140
48					
49					145
50					
51					150
52					155
					160
					165
					170 171

eba A TETRA TECH COMPANY

LOGGED BY: Client	COMPLETION DEPTH: 76.20 m
REVIEWED BY: SK	COMPLETE: 4/13/2011
DRAWING NO:	Page 2 of 3

Monitoring Well Installation	CLIENT: Alexco Resource Corp.	PROJECT NO. - BOREHOLE NO.
Onek Mine	DRILL: Diamond Core	Alexco ID: K-11-0337
Keno Hill, YT	7087276.948N; 485382.6162E; Zone 8	Ground Elevation (m asl): 998.86

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Monitoring well	Depth (ft)
52					175
53					
54					180
55	GSCH				
56	ICQS				185
57	GNST				
58					190
59					
60					195
61					
62					200
63					
64	ICQS				205
65	TQTZT				
66	GSCH				210
67					
68					215
69					
70	TQTZT				220
71					
72					225
73					
74					230
75	ICQS				
76	QTZT				235
77	EOH @ 76.20 m				
78					240
					245
					250
					255
					256

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LOGGED BY: Client	COMPLETION DEPTH: 76.20 m
REVIEWED BY: SK	COMPLETE: 4/13/2011
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APPENDIX B

2010 FLAME AND MOTH DIAMOND DRILL LOGS

Flame and Moth Prospect
Diamond Drill Hole Details - 2010 Exploration

Hole_ID	Total Depth (m)	UTM Easting (m)	UTM Northing (m)	Elevation (m)	Collar Azimuth	Collar Dip	Date_Started	Date_Completed	Core_Size
K-10-0264	336.80	484131.84	7086649.76	927.98	306	-60	05/07/2010	20/07/2010	HQ
K-10-0271	347.47	484131.84	7086649.76	927.98	306	-70	21/07/2010	31/07/2010	HQ
K-10-0275	346.57	484131.54	7086649.51	927.98	328	-62	01/08/2010	24/08/2010	HQ
K-10-0285	324.31	484071.91	7086679.39	919.59	306	-50	25/08/2010	06/09/2010	HQ
K-10-0291	192.67	484101.25	7086870.75	936.78	285	-54	08/09/2010	13/09/2010	HQ
K-10-0295	313.94	484101.35	7086870.5	936.78	285	-80	13/09/2010	03/10/2010	HQ
K-10-0298	220.68	484101.5	7086870.4	936.78	250	-60	03/10/2010	11/10/2010	HQ
K-10-0299	306.32	484067.23	7086584.28	923.86	285	-68	05/10/2010	10/10/2010	HQ
K-10-0303	348.08	484067.96	7086584.23	923.85	285	-75	10/10/2010	19/10/2010	HQ
K-10-0304	252.07	484101.68	7086870.26	936.78	230	-75	11/10/2010	19/10/2010	HQ
K-10-0305	352.35	484076.44	7086582.7	924.14	340	-65	20/10/2010	30/10/2010	HQ
K-10-0312	388.93	484076.65	7086585.25	923.89	250	-55	30/10/2010	16/11/2010	HQ
K-10-0320	243.84	484076.45	7086586.09	923.99	290	-55	19/11/2010	26/11/2010	HQ

Lithology Descriptions

CHSCH	Chloritic Schist	Green, well foliated schist as described below (Schist). Similar in colour to typical greenstone.
CQTZT	Calcareous Quartzite	Quartzite, as described below, with carbonate as a main constituent.
CSCH	Calcareous Schist	Schist, as described below, with carbonate as the main constituent.
FLT	Fault	
GNST	Greenstone	Grayish green to dark green, schistose rocks commonly having a jointed, slabby appearance.
GSCH	Graphitic Schist	Grey to dark gray to black Schist, as described below, with graphite as a main constituent.
ICQS	Iintercalated carbonaceous quartzite schist	Very thinly bedded quartzite with regular dark, carbonaceous, mud-rich horizons or graphitic schist bands. Well-defined schistose fabric. Quartzite bands regularly greater than 1cm wide (3 or 4 cm is common). Has a greater proportion of quartzite and is more competent than graphitic schist; often breaks across foliation.
LMST	Limestone	Gray to black in colour when fresh, sometimes banded with irregular lense-like layers of white or buff carbonate. At times schistose in appearance.
MCQ	Massive carbonaceous quartzite	Very dark grey to black carbonaceous quartzite, usually massive.
OVB	Overburden	
PHY	Phyllite	Most are gray to black when fresh, and display a silky sheen on cleavage surfaces. They may show weak undulations on surfaces but generally cleave into plates better than do the schists. Quartz stringers and boudins may be present but are not nearly as abundant as in the schists.
QFP	Quartz Feldspar Porphyry	
QTZT	Quartzite	Fresh colours range from white to bluish grey. Bedding may be visible throughout, giving the unit a somewhat gneissoid (foliated) appearance. Some are very fine grained, with a sugary texture and resemble re-crystallized cherts. SCH may be interbedded throughout, but must comprise less than 10% of the unit in order to be considered massive Quartzite.
SCH	Schist, undivided	Fresh colours range from light to dark greyish black or green depending on the dominant mineral content. Fracture surfaces generally have a metallic sheen and show well developed schistose foliation. They contain plications, wrinkle laminations, small drag folds and crenulations. Most contain irregular masses of quartz as stringers or boudins. stringers or boudins. QTZT may be interbedded throughout, but must comprise less than 10% of the unit in order to be considered massive Schist.
SM	Stringer Mineralization	
SSCH	Sericite Schist	Light green Schist with sericite as the main constituent.
TQTZT	Thin bedded Quartzite	<30 cm thick bands or beds of QTZT, SCH or mixture
VM	Vein Mineralized	
VN	Vein	
VNLT	Veinlet	

Geotechnical Core Logging Guide

RQD (Rock Quality Data)

The sum of the length of all core pieces greater than 10 cm in length.

Rock Strength

R0	Extremely weak	Indented by thumbnail
R1	Very weak	Crumbles under firm blow of geology hammer, Peeled by pocket knife
R2	Weak	Shallow indentation under firm blow of geology hammer
R3	Medium strong	Fractured with single blow of geology hammer
R4	Strong	Requires more than one blow of geology hammer to fracture
R5	Very strong	Requires many blows of geology hammer to fracture
R6	Extremely strong	Can only be chipped with strong blows of geology hammer

Cemented Joint/Vein Strength

Drop test from knee height defects

1	Strong	- never breaks
2	Moderate	- sometimes breaks
3	Weak	- always breaks

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0264	0.00	46.02	OVB
K-10-0264	46.02	53.05	QTZT
K-10-0264	53.05	53.84	FLT
K-10-0264	53.84	55.17	QTZT
K-10-0264	55.17	58.08	QTZT
K-10-0264	58.08	59.85	ICQS
K-10-0264	59.85	65.28	TQTZT
K-10-0264	65.28	70.39	QTZT
K-10-0264	70.39	71.25	ICQS
K-10-0264	71.25	71.80	QTZT
K-10-0264	71.80	73.41	CHSCH
K-10-0264	73.41	73.95	GSCH
K-10-0264	73.95	74.95	CHSCH
K-10-0264	74.95	82.65	ICQS
K-10-0264	82.65	86.38	QTZT
K-10-0264	86.38	89.38	FLT
K-10-0264	89.38	91.03	TQTZT
K-10-0264	91.03	92.60	QTZT
K-10-0264	92.60	94.49	TQTZT
K-10-0264	94.49	102.29	QTZT
K-10-0264	102.29	106.41	TQTZT
K-10-0264	106.41	109.93	QTZT
K-10-0264	109.93	111.87	TQTZT
K-10-0264	111.87	114.12	QTZT
K-10-0264	114.12	120.42	CQTZT
K-10-0264	120.42	122.55	QTZT
K-10-0264	122.55	124.42	CQTZT
K-10-0264	124.42	128.49	QTZT
K-10-0264	128.49	129.54	CQTZT
K-10-0264	129.54	136.07	TQTZT
K-10-0264	136.07	136.88	ICQS
K-10-0264	136.88	138.84	QTZT
K-10-0264	138.84	141.08	CQTZT
K-10-0264	141.08	142.33	QTZT
K-10-0264	142.33	142.60	TQTZT
K-10-0264	142.60	143.01	CQTZT
K-10-0264	143.01	145.10	QTZT
K-10-0264	145.10	146.21	CQTZT
K-10-0264	146.21	152.12	ICQS
K-10-0264	152.12	157.44	CQTZT
K-10-0264	157.44	162.53	GNST
K-10-0264	162.53	164.52	QTZT
K-10-0264	164.52	165.70	ICQS
K-10-0264	165.70	167.80	QTZT
K-10-0264	167.80	168.58	ICQS
K-10-0264	168.58	170.67	QTZT
K-10-0264	170.67	171.62	TQTZT
K-10-0264	171.62	174.20	CQTZT
K-10-0264	174.20	176.74	TQTZT
K-10-0264	176.74	178.09	CHSCH
K-10-0264	178.09	185.69	QTZT
K-10-0264	185.69	189.70	ICQS
K-10-0264	189.70	195.05	TQTZT
K-10-0264	195.05	199.95	CQTZT
K-10-0264	199.95	204.01	TQTZT
K-10-0264	204.01	209.97	QTZT
K-10-0264	209.97	216.74	QTZT
K-10-0264	216.74	248.44	GNST
K-10-0264	248.44	251.87	VM
K-10-0264	251.87	254.59	VM
K-10-0264	254.59	254.99	VM
K-10-0264	254.99	256.41	TQTZT
K-10-0264	256.41	256.81	VN
K-10-0264	256.81	259.03	TQTZT
K-10-0264	259.03	263.51	ICQS
K-10-0264	263.51	270.20	QTZT
K-10-0264	270.20	271.46	GSCH
K-10-0264	271.46	282.12	TQTZT
K-10-0264	282.12	283.84	ICQS
K-10-0264	283.84	289.50	QTZT
K-10-0264	289.50	293.16	ICQS
K-10-0264	293.16	300.60	QTZT
K-10-0264	300.60	301.76	ICQS
K-10-0264	301.76	305.05	QTZT
K-10-0264	305.05	306.70	TQTZT
K-10-0264	306.70	316.07	QTZT
K-10-0264	316.07	319.02	TQTZT
K-10-0264	319.02	321.11	QTZT
K-10-0264	321.11	323.75	GSCH
K-10-0264	323.75	326.91	TQTZT
K-10-0264	326.91	328.49	GSCH
K-10-0264	328.49	336.80	QTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0264	47.55	49.07	1.52	1.13	74.34	0.00	0.00	HQ					
K-10-0264	49.07	50.60	1.53	1.41	92.16	0.48	31.37	HQ					
K-10-0264	50.60	52.12	1.52	1.30	85.53	0.28	18.42	HQ					
K-10-0264	52.12	53.64	1.52	1.34	88.16	0.00	0.00	HQ					
K-10-0264	53.64	55.17	1.53	1.40	91.50	0.61	39.87	HQ					
K-10-0264	55.17	56.69	1.52	1.26	82.89	0.23	15.13	HQ					
K-10-0264	56.69	58.22	1.53	1.23	80.39	0.41	26.80	HQ					
K-10-0264	58.22	59.74	1.52	1.45	95.39	0.26	17.11	HQ					
K-10-0264	59.74	60.05	0.31	0.46	148.39	0.33	106.45	HQ					
K-10-0264	60.05	61.26	1.21	0.80	66.12	0.00	0.00	HQ					
K-10-0264	61.26	62.79	1.53	1.50	98.04	0.93	60.78	HQ					
K-10-0264	62.79	64.47	1.68	1.52	90.48	0.69	41.07	HQ					
K-10-0264	64.47	65.84	1.37	1.28	93.43	0.53	38.69	HQ					
K-10-0264	65.84	68.88	3.04	3.02	99.34	2.53	83.22	HQ					
K-10-0264	68.88	71.93	3.05	2.72	89.18	1.19	39.02	HQ					
K-10-0264	71.93	74.98	3.05	2.98	97.70	0.52	17.05	HQ					
K-10-0264	74.98	77.42	2.44	2.41	98.77	0.24	9.84	HQ					
K-10-0264	77.42	78.03	0.61	0.51	83.61	0.00	0.00	HQ					
K-10-0264	78.03	81.08	3.05	2.84	93.11	1.23	40.33	HQ					
K-10-0264	81.08	83.52	2.44	2.27	93.03	0.72	29.51	HQ					
K-10-0264	83.52	84.12	0.60	0.51	85.00	0.28	46.67	HQ					
K-10-0264	84.12	85.95	1.83	2.24	122.40	0.70	38.25	HQ					
K-10-0264	85.95	87.17	1.22	0.58	47.54	0.15	12.30	HQ					
K-10-0264	87.17	88.39	1.22	0.37	30.33	0.00	0.00	HQ					
K-10-0264	88.39	90.22	1.83	1.57	85.79	0.13	7.10	HQ					
K-10-0264	90.22	92.66	2.44	2.18	89.34	0.60	24.59	HQ					
K-10-0264	92.66	93.57	0.91	0.35	38.46	0.00	0.00	HQ					
K-10-0264	93.57	95.10	1.53	1.77	115.69	0.50	32.68	HQ					
K-10-0264	95.10	96.32	1.22	0.82	67.21	0.32	26.23	HQ					
K-10-0264	96.32	98.15	1.83	1.86	101.64	0.38	20.77	HQ					
K-10-0264	98.15	99.36	1.21	1.01	83.47	0.50	41.32	HQ					
K-10-0264	99.36	100.74	1.38	1.22	88.41	0.83	60.14	HQ					
K-10-0264	100.74	102.41	1.67	1.51	90.42	0.45	26.95	HQ					
K-10-0264	102.41	104.24	1.83	1.65	90.16	0.42	22.95	HQ					
K-10-0264	104.24	105.46	1.22	1.00	81.97	0.00	0.00	HQ					
K-10-0264	105.46	106.22	0.76	0.42	55.26	0.00	0.00	HQ					
K-10-0264	106.22	108.51	2.29	1.97	86.03	0.47	20.52	HQ					
K-10-0264	108.51	111.56	3.05	2.65	86.89	1.06	34.75	HQ					
K-10-0264	111.56	114.60	3.04	2.77	91.12	1.41	46.38	HQ					
K-10-0264	114.60	117.65	3.05	2.90	95.08	2.15	70.49	HQ					
K-10-0264	117.65	117.96	0.31	0.36	116.13	0.33	106.45	HQ					
K-10-0264	117.96	118.87	0.91	0.99	108.79	0.73	80.22	HQ					
K-10-0264	118.87	120.70	1.83	0.54	29.51	0.31	16.94	NQ					
K-10-0264	120.70	123.44	2.74	2.86	104.38	1.96	71.53	NQ					
K-10-0264	123.44	126.49	3.05	2.87	94.10	1.96	64.26	NQ					
K-10-0264	126.49	129.54	3.05	3.01	98.69	2.51	82.30	NQ					
K-10-0264	129.54	132.74	3.20	2.91	90.94	1.33	41.56	NQ					
K-10-0264	132.74	135.79	3.05	3.03	99.34	1.92	62.95	NQ					
K-10-0264	135.79	138.84	3.05	2.90	95.08	1.97	64.59	NQ					
K-10-0264	138.84	141.88	3.04	2.87	94.41	2.39	78.62	NQ					
K-10-0264	141.88	144.93	3.05	2.86	93.77	1.70	55.74	NQ					
K-10-0264	144.93	147.98	3.05	2.80	91.80	0.72	23.61	NQ					
K-10-0264	147.98	151.03	3.05	2.90	95.08	1.14	37.38	NQ					
K-10-0264	151.03	153.31	2.28	2.56	112.28	1.52	66.67	NQ					
K-10-0264	153.31	154.08	0.77	0.24	31.17	0.20	25.97	NQ					
K-10-0264	154.08	157.28	3.20	2.40	75.00	1.15	35.94	NQ					
K-10-0264	157.28	160.32	3.04	3.05	100.33	2.68	88.16	NQ					
K-10-0264	160.32	163.37	3.05	2.90	95.08	2.45	80.33	NQ					
K-10-0264	163.37	166.42	3.05	2.83	92.79	1.46	47.87	NQ					
K-10-0264	166.42	169.47	3.05	2.90	95.08	2.23	73.11	NQ					
K-10-0264	169.47	172.52	3.05	3.05	100.00	2.15	70.49	NQ					
K-10-0264	172.52	175.52	3.00	2.85	95.00	1.87	62.33	NQ					
K-10-0264	175.52	178.61	3.09	2.90	93.85	1.36	44.01	NQ					
K-10-0264	178.61	181.66	3.05	2.92	95.74	2.08	68.20	NQ					
K-10-0264	181.66	184.71	3.05	2.81	92.13	1.23	40.33	NQ					
K-10-0264	184.71	187.76	3.05	2.90	95.08	1.58	51.80	NQ					
K-10-0264	187.76	188.52	0.76	0.58	76.32	0.12	15.79	NQ					
K-10-0264	188.52	190.80	2.28	1.95	85.53	0.26	11.40	NQ					
K-10-0264	190.80	192.02	1.22	0.70	57.38	0.00	0.00	NQ					
K-10-0264	192.02	193.85	1.83	1.32	72.13	0.31	16.94	NQ					
K-10-0264	193.85	196.29	2.44	2.00	81.97	0.62	25.41	NQ					
K-10-0264	196.29	199.34	3.05	3.07	100.66	1.58	51.80	NQ					
K-10-0264	199.34	199.95	0.61	0.65	106.56	0.00	0.00	NQ					
K-10-0264	199.95	203.00	3.05	2.90	95.08	1.46	47.87	NQ					
K-10-0264	203.00	206.04	3.04	3.00	98.68	2.60	85.53	NQ					
K-10-0264	206.04	209.09	3.05	3.05	100.00	2.60	85.25	NQ					
K-10-0264	209.09	212.14	3.05	2.95	96.72	1.50	49.18	NQ					
K-10-0264	212.14	215.19	3.05	3.00	98.36	2.24	73.44	NQ					
K-10-0264	215.19	218.24	3.05	3.00	98.36	2.48	81.31	NQ					
K-10-0264	218.24	221.28	3.04	3.05	100.33	2.97	97.70	NQ					
K-10-0264	221.28	224.33	3.05	3.08	100.98	2.97	97.38	NQ					
K-10-0264	224.33	227.38	3.05	2.90	95.08	2.90	95.08	NQ					
K-10-0264	227.38	230.43	3.05	3.10	101.64	3.04	99.67	NQ					
K-10-0264	230.43	233.48	3.05	3.08	100.98	2.08	68.20	NQ					
K-10-0264	233.48	236.52	3.04	3.00	98.68	2.70	88.82	NQ					
K-10-0264	236.52	239.57	3.05	3.05	100.00	2.98	97.70	NQ					
K-10-0264	239.57	242.62	3.05	3.00	98.36	3.00	98.36	NQ					
K-10-0264	242.62	245.67	3.05	3.00	98.36	1.79	58.69	NQ					
K-10-0264	245.67	248.72	3.05	3.00	98.36	2.26	74.10	NQ					
K-10-0264	248.72	251.76	3.04	3.02	99.34	2.55	83.88	NQ					
K-10-0264	251.76	254.81	3.05	3.00	98.36	2.80	91.80	NQ					
K-10-0264	254.81	257.86	3.05	2.90	95.08	1.26	41.31	NQ					
K-10-0264	257.86	260.91	3.05	3.03	99.34	0.82	26.89	NQ					
K-10-0264	260.91	263.96	3.05	2.90	95.08	0.74	24.26	NQ					
K-10-0264	263.96	265.18	1.22	1.07	87.70	0.73	59.84	NQ					
K-10-0264	265.18	266.79	1.61	1.60	99.38	0.50	31.06	NQ					
K-10-0264	266.79	267.00	0.21	0.09	42.86	0.00	0.00	NQ					

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0264	267.00	270.05	3.05	2.83	92.79	2.09	68.52	NQ					
K-10-0264	270.05	273.10	3.05	2.80	91.80	0.96	31.48	NQ					
K-10-0264	273.10	276.15	3.05	2.86	93.77	0.77	25.25	NQ					
K-10-0264	276.15	277.37	1.22	0.72	59.02	0.00	0.00	NQ					
K-10-0264	277.37	279.20	1.83	1.35	73.77	0.10	5.46	NQ					
K-10-0264	279.20	282.24	3.04	2.80	92.11	0.70	23.03	NQ					
K-10-0264	282.24	285.29	3.05	2.86	93.77	0.55	18.03	NQ					
K-10-0264	285.29	288.34	3.05	2.90	95.08	1.69	55.41	NQ					
K-10-0264	288.34	291.39	3.05	3.00	98.36	1.15	37.70	NQ					
K-10-0264	291.39	294.28	2.89	2.40	83.04	0.80	27.68	NQ					
K-10-0264	294.28	297.33	3.05	3.05	100.00	1.86	60.98	NQ					
K-10-0264	297.33	297.48	0.15	0.18	120.00	0.14	93.33	NQ					
K-10-0264	297.48	298.18	0.70	0.85	121.43	0.55	78.57	NQ					
K-10-0264	298.18	300.53	2.35	2.00	85.11	0.90	38.30	NQ					
K-10-0264	300.53	303.58	3.05	3.00	98.36	1.22	40.00	NQ					
K-10-0264	303.58	306.63	3.05	3.00	98.36	1.44	47.21	NQ					
K-10-0264	306.63	309.68	3.05	3.05	100.00	1.98	64.92	NQ					
K-10-0264	309.68	312.72	3.04	3.05	100.33	1.87	61.51	NQ					
K-10-0264	312.72	315.77	3.05	2.80	91.80	1.78	58.36	NQ					
K-10-0264	315.77	318.82	3.05	2.75	90.16	1.00	32.79	NQ					
K-10-0264	318.82	321.87	3.05	3.00	98.36	1.55	50.82	NQ					
K-10-0264	321.87	324.92	3.05	2.85	93.44	0.50	16.39	NQ					
K-10-0264	324.92	327.05	2.13	1.70	79.81	0.61	28.64	NQ					
K-10-0264	327.05	330.71	3.66	2.33	63.66	0.99	27.05	NQ					
K-10-0264	330.71	333.76	3.05	2.82	92.46	1.34	43.93	NQ					
K-10-0264	333.76	336.79	3.03	2.95	97.36	0.54	17.82	NQ					

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0271	0.00	12.55	OVB
K-10-0271	12.55	14.07	CQTZT
K-10-0271	14.07	16.58	TQTZT
K-10-0271	16.58	18.68	TQTZT
K-10-0271	18.68	28.57	TQTZT
K-10-0271	28.57	31.85	TQTZT
K-10-0271	31.85	33.62	ICQS
K-10-0271	33.62	34.86	QTZT
K-10-0271	34.86	37.55	TQTZT
K-10-0271	37.55	39.23	ICQS
K-10-0271	39.23	39.62	SSCH
K-10-0271	39.62	40.67	GSCH
K-10-0271	40.67	42.67	FLT
K-10-0271	42.67	44.55	GSCH
K-10-0271	44.55	45.00	QTZT
K-10-0271	45.00	47.90	TQTZT
K-10-0271	47.90	52.68	QTZT
K-10-0271	52.68	59.20	TQTZT
K-10-0271	59.20	66.34	QTZT
K-10-0271	66.34	69.30	SSCH
K-10-0271	69.30	72.10	ICQS
K-10-0271	72.10	79.20	TQTZT
K-10-0271	79.20	81.42	FLT
K-10-0271	81.42	91.33	TQTZT
K-10-0271	91.33	92.03	FLT
K-10-0271	92.03	93.10	CQTZT
K-10-0271	93.10	95.53	ICQS
K-10-0271	95.53	96.98	CQTZT
K-10-0271	96.98	100.42	QTZT
K-10-0271	100.42	101.25	ICQS
K-10-0271	101.25	105.25	QTZT
K-10-0271	105.25	108.35	CQTZT
K-10-0271	108.35	109.98	GSCH
K-10-0271	109.98	118.50	QTZT
K-10-0271	118.50	119.74	ICQS
K-10-0271	119.74	125.90	CQTZT
K-10-0271	125.90	126.80	FLT
K-10-0271	126.80	130.89	TQTZT
K-10-0271	130.89	132.32	ICQS
K-10-0271	132.32	142.60	TQTZT
K-10-0271	142.60	144.33	ICQS
K-10-0271	144.33	150.10	GNST
K-10-0271	150.10	151.13	ICQS
K-10-0271	151.13	152.90	QTZT
K-10-0271	152.90	159.68	TQTZT
K-10-0271	159.68	166.73	QTZT
K-10-0271	166.73	167.35	GNST
K-10-0271	167.35	170.48	TQTZT
K-10-0271	170.48	178.03	QTZT
K-10-0271	178.03	183.73	TQTZT
K-10-0271	183.73	188.50	CQTZT
K-10-0271	188.50	190.61	TQTZT
K-10-0271	190.61	192.12	ICQS
K-10-0271	192.12	197.42	QTZT
K-10-0271	197.42	198.46	QTZT
K-10-0271	198.46	202.60	ICQS
K-10-0271	202.60	251.23	GNST
K-10-0271	251.23	254.57	CHSCH
K-10-0271	254.57	255.40	SSCH
K-10-0271	255.40	264.78	GNST
K-10-0271	264.78	278.33	TQTZT
K-10-0271	278.33	281.88	GNST
K-10-0271	281.88	281.99	VM
K-10-0271	281.99	286.07	GNST
K-10-0271	286.07	288.07	ICQS
K-10-0271	288.07	291.67	TQTZT
K-10-0271	291.67	310.14	ICQS
K-10-0271	310.14	318.30	TQTZT
K-10-0271	318.30	319.03	VN
K-10-0271	319.03	322.10	VM
K-10-0271	322.10	324.32	VM
K-10-0271	324.32	327.00	VM
K-10-0271	327.00	332.12	VM
K-10-0271	332.12	335.17	VM
K-10-0271	335.17	335.96	VN
K-10-0271	335.96	339.14	GNST
K-10-0271	339.14	342.62	QTZT
K-10-0271	342.62	347.47	TQTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0271	0.00	5.79	5.79					HQ					
K-10-0271	5.79	7.62	1.83					HQ					
K-10-0271	7.62	8.84	1.22					HQ					
K-10-0271	8.84	9.14	0.30					HQ					
K-10-0271	9.14	9.75	0.61					HQ					
K-10-0271	9.75	10.97	1.22					HQ					
K-10-0271	10.97	12.50	1.53					HQ					
K-10-0271	12.50	14.02	1.52	1.48	97.37	0.31	20.39	HQ					
K-10-0271	14.02	17.07	3.05	2.99	98.03	0.87	28.52	HQ					
K-10-0271	17.07	18.59	1.52	1.61	105.92	0.92	60.53	HQ					
K-10-0271	18.59	20.12	1.53	1.47	96.08	0.35	22.88	HQ					
K-10-0271	20.12	21.64	1.52	1.60	105.26	0.95	62.50	HQ					
K-10-0271	21.64	23.16	1.52	1.50	98.68	0.53	34.87	HQ					
K-10-0271	23.16	26.21	3.05	3.10	101.64	2.10	68.85	HQ					
K-10-0271	26.21	29.26	3.05	3.11	101.97	1.37	44.92	HQ					
K-10-0271	29.26	32.31	3.05	3.08	100.98	1.58	51.80	HQ					
K-10-0271	32.31	35.36	3.05	2.93	96.07	0.98	32.13	HQ					
K-10-0271	35.36	37.80	2.44	2.73	111.89	0.42	17.21	HQ					
K-10-0271	37.80	38.40	0.60	0.60	100.00	0.14	23.33	HQ					
K-10-0271	38.40	39.93	1.53	1.54	100.65	0.00	0.00	HQ					
K-10-0271	39.93	41.45	1.52	1.58	103.95	0.10	6.58	HQ					
K-10-0271	41.45	42.67	1.22	1.15	94.26	0.00	0.00	HQ					
K-10-0271	42.67	44.50	1.83	1.57	85.79	0.10	5.46	HQ					
K-10-0271	44.50	47.55	3.05	2.96	97.05	0.00	0.00	HQ					
K-10-0271	47.55	50.66	3.11	3.01	96.78	0.12	3.86	HQ					
K-10-0271	50.66	53.64	2.98	3.24	108.72	0.63	21.14	HQ					
K-10-0271	53.64	56.69	3.05	3.08	100.98	1.19	39.02	HQ					
K-10-0271	56.69	59.44	2.75	2.96	107.64	0.63	22.91	HQ					
K-10-0271	59.44	62.48	3.04	3.26	107.24	0.73	24.01	HQ					
K-10-0271	62.48	65.68	3.20	3.12	97.50	0.37	11.56	HQ					
K-10-0271	65.68	65.99	0.31	0.32	103.23	0.00	0.00	HQ					
K-10-0271	65.99	67.21	1.22	0.93	76.23	0.25	20.49	HQ					
K-10-0271	67.21	68.88	1.67	1.90	113.77	0.22	13.17	HQ					
K-10-0271	68.88	70.87	1.99	2.19	110.05	0.13	6.53	HQ					
K-10-0271	70.87	71.93	1.06	0.94	88.68	0.00	0.00	HQ					
K-10-0271	71.93	74.68	2.75	2.64	96.00	0.52	18.91	HQ					
K-10-0271	74.68	74.98	0.30	0.25	83.33	0.00	0.00	HQ					
K-10-0271	74.98	76.99	2.01	2.10	104.48	0.73	36.32	HQ					
K-10-0271	76.99	78.03	1.04	1.03	99.04	0.00	0.00	HQ					
K-10-0271	78.03	79.25	1.22	0.97	79.51	0.12	9.84	HQ					
K-10-0271	79.25	80.62	1.37	1.50	109.49	0.00	0.00	HQ					
K-10-0271	80.62	81.08	0.46	0.40	86.96	0.00	0.00	HQ					
K-10-0271	81.08	82.69	1.61	1.77	109.94	0.00	0.00	HQ					
K-10-0271	82.69	84.12	1.43	1.39	97.20	0.13	9.09	HQ					
K-10-0271	84.12	87.17	3.05	3.25	106.56	0.44	14.43	HQ					
K-10-0271	87.17	89.15	1.98	2.20	111.11	0.30	15.15	HQ					
K-10-0271	89.15	90.22	1.07	1.05	98.13	0.25	23.36	HQ					
K-10-0271	90.22	91.74	1.52	1.55	101.97	0.13	8.55	HQ					
K-10-0271	91.74	92.84	1.10	1.12	101.82	0.10	9.09	HQ					
K-10-0271	92.84	93.27	0.43	0.44	102.33	0.00	0.00	HQ					
K-10-0271	93.27	95.10	1.83	1.89	103.28	0.30	16.39	HQ					
K-10-0271	95.10	96.32	1.22	1.28	104.92	0.20	16.39	HQ					
K-10-0271	96.32	99.36	3.04	2.90	95.39	0.46	15.13	HQ					
K-10-0271	99.36	101.65	2.29	2.54	110.92	0.69	30.13	HQ					
K-10-0271	101.65	102.41	0.76	0.69	90.79	0.54	71.05	HQ					
K-10-0271	102.41	105.46	3.05	3.12	102.30	0.48	15.74	HQ					
K-10-0271	105.46	108.51	3.05	3.04	99.67	0.92	30.16	HQ					
K-10-0271	108.51	111.51	3.00	3.04	101.33	0.90	30.00	HQ					
K-10-0271	111.51	114.60	3.09	3.05	98.71	1.51	48.87	HQ					
K-10-0271	114.60	117.65	3.05	3.12	102.30	0.81	26.56	HQ					
K-10-0271	117.65	118.87	1.22	1.25	102.46	0.29	23.77	NQ					
K-10-0271	118.87	120.70	1.83	1.60	87.43	0.00	0.00	NQ					
K-10-0271	120.70	123.74	3.04	2.93	96.38	1.52	50.00	NQ					
K-10-0271	123.74	126.80	3.06	2.65	86.60	1.62	52.94	NQ					
K-10-0271	126.80	129.54	2.74	2.50	91.24	1.98	72.26	NQ					
K-10-0271	129.54	129.84	0.30	0.37	123.33	0.12	40.00	NQ					
K-10-0271	129.84	132.89	3.05	3.05	100.00	1.96	64.26	NQ					
K-10-0271	132.89	135.94	3.05	2.80	91.80	1.95	63.93	NQ					
K-10-0271	135.94	138.99	3.05	3.05	100.00	2.22	72.79	NQ					
K-10-0271	138.99	142.04	3.05	2.95	96.72	2.25	73.77	NQ					
K-10-0271	142.04	145.08	3.04	2.90	95.39	1.22	40.13	NQ					
K-10-0271	145.08	148.13	3.05	3.03	99.34	2.36	77.38	NQ					
K-10-0271	148.13	151.18	3.05	2.95	96.72	1.84	60.33	NQ					
K-10-0271	151.18	154.23	3.05	2.77	90.82	1.71	56.07	NQ					
K-10-0271	154.23	157.28	3.05	2.80	91.80	2.09	68.52	NQ					
K-10-0271	157.28	159.59	2.31	2.00	86.58	0.82	35.50	NQ					
K-10-0271	159.59	160.32	0.73	0.70	95.89	0.33	45.21	NQ					
K-10-0271	160.32	163.37	3.05	3.05	100.00	1.50	49.18	NQ					
K-10-0271	163.37	166.42	3.05	2.45	80.33	0.57	18.69	NQ					
K-10-0271	166.42	166.73	0.31	0.15	48.39	0.00	0.00	NQ					
K-10-0271	166.73	169.47	2.74	2.80	102.19	2.43	88.69	NQ					
K-10-0271	169.47	172.52	3.05	2.95	96.72	2.18	71.48	NQ					
K-10-0271	172.52	175.56	3.04	2.70	88.82	0.83	27.30	NQ					
K-10-0271	175.56	176.48	0.92	0.46	50.00	0.24	26.09	NQ					
K-10-0271	176.48	177.39	0.91	0.87	95.60	0.41	45.05	NQ					
K-10-0271	177.39	178.61	1.22	0.82	67.21	0.32	26.23	NQ					
K-10-0271	178.61	180.29	1.68	1.35	80.36	0.45	26.79	NQ					
K-10-0271	180.29	181.66	1.37	1.40	102.19	0.69	50.36	NQ					
K-10-0271	181.66	184.71	3.05	3.03	99.34	1.31	42.95	NQ					
K-10-0271	184.71	187.76	3.05	3.05	100.00	2.68	87.87	NQ					
K-10-0271	187.76	190.80	3.04	2.93	96.38	1.26	41.45	NQ					
K-10-0271	190.80	193.85	3.05	3.00	98.36	2.00	65.57	NQ					
K-10-0271	193.85	196.90	3.05	2.95	96.72	2.40	78.69	NQ					
K-10-0271	196.90	199.95	3.05	3.00	98.36	1.09	35.74	NQ					
K-10-0271	199.95	203.00	3.05	3.05	100.00	3.02	99.02	NQ					
K-10-0271	203.00	206.04	3.04	3.05	100.33	2.92	96.05	NQ					
K-10-0271	206.04	208.33	2.29	2.38	103.93	2.31	100.87	NQ					

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0271	208.33	209.09	0.76	0.65	85.53	0.44	57.89	NQ					
K-10-0271	209.09	212.14	3.05	3.01	98.69	2.74	89.84	NQ					
K-10-0271	212.14	215.19	3.05	3.06	100.33	2.94	96.39	NQ					
K-10-0271	215.19	218.24	3.05	3.20	104.92	1.98	64.92	NQ					
K-10-0271	218.24	221.18	2.94	3.15	107.14	2.05	69.73	NQ					
K-10-0271	221.18	224.33	3.15	3.02	95.87	3.02	95.87	NQ					
K-10-0271	224.33	227.38	3.05	3.05	100.00	2.94	96.39	NQ					
K-10-0271	227.38	230.43	3.05	3.15	103.28	2.92	95.74	NQ					
K-10-0271	230.43	233.48	3.05	3.04	99.67	2.96	97.05	NQ					
K-10-0271	233.48	236.52	3.04	3.06	100.66	2.90	95.39	NQ					
K-10-0271	236.52	239.57	3.05	3.02	99.02	2.61	85.57	NQ					
K-10-0271	239.57	242.62	3.05	2.98	97.70	2.00	65.57	NQ					
K-10-0271	242.62	245.67	3.05	3.12	102.30	2.63	86.23	NQ					
K-10-0271	245.67	248.71	3.04	3.04	100.00	2.46	80.92	NQ					
K-10-0271	248.71	251.77	3.06	2.97	97.06	2.03	66.34	NQ					
K-10-0271	251.77	254.81	3.04	3.03	99.67	1.50	49.34	NQ					
K-10-0271	254.81	257.86	3.05	3.02	99.02	1.83	60.00	NQ					
K-10-0271	257.86	260.91	3.05	3.05	100.00	1.55	50.82	NQ					
K-10-0271	260.91	263.96	3.05	2.85	93.44	1.92	62.95	NQ					
K-10-0271	263.96	264.87	0.91	0.81	89.01	0.34	37.36	NQ					
K-10-0271	264.87	267.00	2.13	2.02	94.84	0.41	19.25	NQ					
K-10-0271	267.00	270.05	3.05	3.06	100.33	1.10	36.07	NQ					
K-10-0271	270.05	271.27	1.22	1.45	118.85	0.91	74.59	NQ					
K-10-0271	271.27	273.10	1.83	1.07	58.47	0.37	20.22	NQ					
K-10-0271	273.10	274.32	1.22	1.45	118.85	0.54	44.26	NQ					
K-10-0271	274.32	276.15	1.83	1.17	63.93	0.30	16.39	NQ					
K-10-0271	276.15	279.20	3.05	3.07	100.66	0.68	22.30	NQ					
K-10-0271	279.20	280.29	1.09	1.36	124.77	0.28	25.69	NQ					
K-10-0271	280.29	281.29	1.00	1.00	100.00	0.32	32.00	NQ					
K-10-0271	281.29	282.24	0.95	0.89	93.68	0.00	0.00	NQ					
K-10-0271	282.24	285.29	3.05	3.30	108.20	1.31	42.95	NQ					
K-10-0271	285.29	288.34	3.05	3.19	104.59	0.13	4.26	NQ					
K-10-0271	288.34	290.47	2.13	2.27	106.57	0.35	16.43	NQ					
K-10-0271	290.47	291.39	0.92	0.80	86.96	0.13	14.13	NQ					
K-10-0271	291.39	293.22	1.83	2.14	116.94	0.29	15.85	NQ					
K-10-0271	293.22	294.44	1.22	1.10	90.16	0.59	48.36	NQ					
K-10-0271	294.44	297.48	3.04	3.19	104.93	0.76	25.00	NQ					
K-10-0271	297.48	300.53	3.05	3.10	101.64	0.64	20.98	NQ					
K-10-0271	300.53	303.58	3.05	3.04	99.67	1.63	53.44	NQ					
K-10-0271	303.58	306.63	3.05	3.13	102.62	1.01	33.11	NQ					
K-10-0271	306.63	309.68	3.05	3.10	101.64	1.65	54.10	NQ					
K-10-0271	309.68	312.72	3.04	3.00	98.68	0.65	21.38	NQ					
K-10-0271	312.72	315.77	3.05	3.16	103.61	0.14	4.59	NQ					
K-10-0271	315.77	318.82	3.05	3.07	100.66	0.52	17.05	NQ					
K-10-0271	318.82	321.87	3.05	3.04	99.67	1.73	56.72	NQ					
K-10-0271	321.87	324.92	3.05	3.06	100.33	1.26	41.31	NQ					
K-10-0271	324.92	326.59	1.67	1.76	105.39	0.33	19.76	NQ					
K-10-0271	326.59	327.70	1.11	0.45	40.54	0.10	9.01	NQ					
K-10-0271	327.70	327.96	0.26	0.30	115.38	0.10	38.46	NQ					
K-10-0271	327.96	331.01	3.05	2.92	95.74	0.94	30.82	NQ					
K-10-0271	331.01	334.06	3.05	2.26	74.10	0.00	0.00	NQ					
K-10-0271	334.06	337.11	3.05	2.86	93.77	0.92	30.16	NQ					
K-10-0271	337.11	340.16	3.05	3.14	102.95	1.00	32.79	NQ					
K-10-0271	340.16	343.20	3.04	3.03	99.67	0.96	31.58	NQ					
K-10-0271	343.20	346.25	3.05	3.05	100.00	1.30	42.62	NQ					
K-10-0271	346.25	347.17	0.92	1.10	119.57	0.46	50.00	NQ					
K-10-0271	347.17	347.47	0.30	0.41	136.67	0.27	90.00	NQ					

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0275	0.00	10.92	OVB
K-10-0275	10.92	20.99	ICQS
K-10-0275	20.99	24.28	FLT
K-10-0275	24.28	28.92	ICQS
K-10-0275	28.92	30.31	FLT
K-10-0275	30.31	31.95	QTZT
K-10-0275	31.95	34.04	FLT
K-10-0275	34.04	34.75	SSCH
K-10-0275	34.75	36.13	FLT
K-10-0275	36.13	37.27	GSCH
K-10-0275	37.27	39.75	ICQS
K-10-0275	39.75	49.24	QTZT
K-10-0275	49.24	51.51	TQTZT
K-10-0275	51.51	52.96	ICQS
K-10-0275	52.96	54.91	TQTZT
K-10-0275	54.91	60.68	QTZT
K-10-0275	60.68	60.99	GSCH
K-10-0275	60.99	61.21	FLT
K-10-0275	61.21	62.82	SSCH
K-10-0275	62.82	67.55	GSCH
K-10-0275	67.55	68.68	QTZT
K-10-0275	68.68	72.00	GSCH
K-10-0275	72.00	73.54	QTZT
K-10-0275	73.54	75.13	ICQS
K-10-0275	75.13	78.91	TQTZT
K-10-0275	78.91	80.91	ICQS
K-10-0275	80.91	82.25	QTZT
K-10-0275	82.25	83.23	ICQS
K-10-0275	83.23	86.39	QTZT
K-10-0275	86.39	88.65	GSCH
K-10-0275	88.65	94.98	QTZT
K-10-0275	94.98	95.60	GSCH
K-10-0275	95.60	99.15	QTZT
K-10-0275	99.15	104.50	CQTZT
K-10-0275	104.50	104.93	GSCH
K-10-0275	104.93	110.53	QTZT
K-10-0275	110.53	114.72	CQTZT
K-10-0275	114.72	117.90	ICQS
K-10-0275	117.90	119.25	CQTZT
K-10-0275	119.25	121.05	ICQS
K-10-0275	121.05	131.48	CQTZT
K-10-0275	131.48	137.58	ICQS
K-10-0275	137.58	139.34	QTZT
K-10-0275	139.34	139.75	ICQS
K-10-0275	139.75	141.04	QTZT
K-10-0275	141.04	147.04	GNST
K-10-0275	147.04	149.34	QTZT
K-10-0275	149.34	151.42	GNST
K-10-0275	151.42	152.75	ICQS
K-10-0275	152.75	155.68	TQTZT
K-10-0275	155.68	159.78	CQTZT
K-10-0275	159.78	160.80	QTZT
K-10-0275	160.80	161.86	ICQS
K-10-0275	161.86	163.28	QTZT
K-10-0275	163.28	167.13	TQTZT
K-10-0275	167.13	169.69	QTZT
K-10-0275	169.69	171.85	ICQS
K-10-0275	171.85	175.62	CQTZT
K-10-0275	175.62	178.00	GSCH
K-10-0275	178.00	182.93	CQTZT
K-10-0275	182.93	183.53	ICQS
K-10-0275	183.53	188.89	QTZT
K-10-0275	188.89	191.78	ICQS
K-10-0275	191.78	193.72	QTZT
K-10-0275	193.72	252.66	GNST
K-10-0275	252.66	258.26	CHSCH
K-10-0275	258.26	260.93	GNST
K-10-0275	260.93	265.64	GSCH
K-10-0275	265.64	268.04	CQTZT
K-10-0275	268.04	277.94	GNST
K-10-0275	277.94	278.41	GNST
K-10-0275	278.41	281.80	GSCH
K-10-0275	281.80	282.09	FLT
K-10-0275	282.09	282.62	GSCH
K-10-0275	282.62	285.39	ICQS
K-10-0275	285.39	286.12	QTZT
K-10-0275	286.12	289.79	GSCH
K-10-0275	289.79	290.05	FLT
K-10-0275	290.05	292.76	GSCH
K-10-0275	292.76	294.10	FLT

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0275	294.10	299.39	VL
K-10-0275	299.39	303.32	SM
K-10-0275	303.32	303.98	VM
K-10-0275	303.98	305.41	SM
K-10-0275	305.41	307.82	QTZT
K-10-0275	307.82	312.34	FLT
K-10-0275	312.34	312.86	GSCH
K-10-0275	312.86	314.91	QTZT
K-10-0275	314.91	317.06	QTZT
K-10-0275	317.06	321.65	TQTZT
K-10-0275	321.65	322.48	ICQS
K-10-0275	322.48	331.07	GNST
K-10-0275	331.07	334.20	TQTZT
K-10-0275	334.20	340.06	QTZT
K-10-0275	340.06	342.77	GSCH
K-10-0275	342.77	346.55	TQTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0275	0.00	3.99	3.99	0.70	17.54	0.00	0.00	HQ					
K-10-0275	3.99	5.18	1.19	0.33	27.73	0.10	8.40	HQ					
K-10-0275	5.18	5.79	0.61	0.61	100.00	0.00	0.00	HQ					
K-10-0275	5.79	10.06	4.27	0.89	20.84	0.26	6.09	HQ					
K-10-0275	10.06	10.37	0.31	0.31	100.00	0.00	0.00	HQ					
K-10-0275	10.37	14.02	3.65	1.37	37.53	0.32	8.77	HQ					
K-10-0275	14.02	15.85	1.83	1.80	98.36	0.25	13.66	HQ					
K-10-0275	15.85	16.46	0.61	0.51	83.61	0.13	21.31	HQ					
K-10-0275	16.46	19.51	3.05	2.26	74.10	0.56	18.36	HQ					
K-10-0275	19.51	21.33	1.82	1.49	81.87	0.00	0.00	HQ					
K-10-0275	21.33	24.38	3.05	0.65	21.31	0.00	0.00	HQ					
K-10-0275	24.38	25.60	1.22	0.72	59.02	0.15	12.30	HQ					
K-10-0275	25.60	28.65	3.05	0.81	26.56	0.00	0.00	HQ					
K-10-0275	28.65	31.78	3.13	3.05	97.44	0.00	0.00	HQ					
K-10-0275	31.78	32.61	0.83	0.92	110.84	0.70	84.34	HQ					
K-10-0275	32.61	34.14	1.53	1.14	74.51	0.38	24.84	HQ					
K-10-0275	34.14	34.75	0.61	0.43	70.49	0.00	0.00	HQ					
K-10-0275	34.75	37.79	3.04	2.87	94.41	0.53	17.43	HQ					
K-10-0275	37.79	39.32	1.53	1.32	86.27	0.22	14.38	HQ					
K-10-0275	39.32	40.84	1.52	1.32	86.84	0.66	43.42	HQ					
K-10-0275	40.84	42.85	2.01	1.85	92.04	0.48	23.88	HQ					
K-10-0275	42.85	43.89	1.04	0.95	91.35	0.29	27.88	HQ					
K-10-0275	43.89	46.94	3.05	2.85	93.44	2.10	68.85	HQ					
K-10-0275	46.94	49.99	3.05	2.65	86.89	0.77	25.25	HQ					
K-10-0275	49.99	53.03	3.04	2.97	97.70	0.81	26.64	HQ					
K-10-0275	53.03	54.25	1.22	1.08	88.52	0.42	34.43	HQ					
K-10-0275	54.25	55.47	1.22	1.23	100.82	0.44	36.07	HQ					
K-10-0275	55.47	56.08	0.61	0.42	68.85	0.10	16.39	HQ					
K-10-0275	56.08	59.13	3.05	2.96	97.05	1.19	39.02	HQ					
K-10-0275	59.13	62.28	3.15	2.80	88.89	0.63	20.00	HQ					
K-10-0275	62.28	65.23	2.95	2.46	83.39	0.74	25.08	HQ					
K-10-0275	65.23	68.27	3.04	2.76	90.79	0.67	22.04	HQ					
K-10-0275	68.27	70.71	2.44	2.00	81.97	0.83	34.02	HQ					
K-10-0275	70.71	71.47	0.76	0.44	57.89	0.00	0.00	HQ					
K-10-0275	71.47	72.54	1.07	0.67	62.62	0.10	9.35	HQ					
K-10-0275	72.54	74.37	1.83	1.30	71.04	0.00	0.00	HQ					
K-10-0275	74.37	77.42	3.05	2.17	71.15	0.33	10.82	HQ					
K-10-0275	77.42	80.47	3.05	2.21	72.46	0.55	18.03	HQ					
K-10-0275	80.47	83.51	3.04	3.16	103.95	1.18	38.82	HQ					
K-10-0275	83.51	86.56	3.05	2.67	87.54	1.04	34.10	HQ					
K-10-0275	86.56	89.61	3.05	1.82	59.67	0.76	24.92	HQ					
K-10-0275	89.61	92.66	3.05	2.26	74.10	0.54	17.70	HQ					
K-10-0275	92.66	95.71	3.05	2.03	66.56	0.45	14.75	HQ					
K-10-0275	95.71	98.75	3.04	2.49	81.91	1.59	52.30	HQ					
K-10-0275	98.75	99.97	1.22	1.26	103.28	0.28	22.95	HQ					
K-10-0275	99.97	101.80	1.83	1.61	87.98	1.45	79.23	HQ					
K-10-0275	101.80	104.85	3.05	2.63	86.23	1.72	56.39	HQ					
K-10-0275	104.85	107.90	3.05	2.96	97.05	2.13	69.84	HQ					
K-10-0275	107.90	110.65	2.75	2.80	101.82	1.94	70.55	HQ					
K-10-0275	110.65	113.38	2.73	2.45	89.74	2.09	76.56	HQ					
K-10-0275	113.38	116.43	3.05	2.99	98.03	1.80	59.02	HQ					
K-10-0275	116.43	118.26	1.83	1.55	84.70	0.99	54.10	HQ					
K-10-0275	118.26	120.09	1.83	1.81	98.91	0.79	43.17	HQ					
K-10-0275	120.09	123.14	3.05	2.95	96.72	2.63	86.23	HQ					
K-10-0275	123.14	126.19	3.05	2.85	93.44	2.09	68.52	HQ					
K-10-0275	126.19	129.23	3.04	2.97	97.70	2.71	89.14	HQ					
K-10-0275	129.23	132.28	3.05	3.05	100.00	2.02	66.23	HQ					
K-10-0275	132.28	135.33	3.05	3.10	101.64	1.16	38.03	HQ					
K-10-0275	135.33	138.38	3.05	3.02	99.02	1.97	64.59	HQ					
K-10-0275	138.38	141.43	3.05	3.07	100.66	2.43	79.67	HQ					
K-10-0275	141.43	144.47	3.04	2.96	97.37	2.82	92.76	HQ					
K-10-0275	144.47	147.52	3.05	3.07	100.66	2.79	91.48	HQ					
K-10-0275	147.52	150.57	3.05	2.94	96.39	2.60	85.25	HQ					
K-10-0275	150.57	153.62	3.05	2.90	95.08	2.52	82.62	HQ					
K-10-0275	153.62	156.67	3.05	2.90	95.08	2.50	81.97	HQ					
K-10-0275	156.67	159.72	3.05	2.92	95.74	1.73	56.72	HQ					
K-10-0275	159.72	162.76	3.04	2.80	92.11	1.79	58.88	HQ					
K-10-0275	162.76	165.81	3.05	2.93	96.07	1.85	60.66	HQ					
K-10-0275	165.81	167.64	1.83	1.86	101.64	1.44	78.69	HQ					
K-10-0275	167.64	168.86	1.22	1.13	92.62	0.97	79.51	HQ					
K-10-0275	168.86	171.91	3.05	3.02	99.02	2.25	73.77	HQ					
K-10-0275	171.91	174.96	3.05	3.07	100.66	1.32	43.28	HQ					
K-10-0275	174.96	178.00	3.04	3.06	100.66	0.00	0.00	HQ					
K-10-0275	178.00	181.05	3.05	3.06	100.33	1.49	48.85	HQ					
K-10-0275	181.05	184.10	3.05	3.10	101.64	1.59	52.13	HQ					
K-10-0275	184.10	187.15	3.05	3.11	101.97	2.46	80.66	HQ					
K-10-0275	187.15	190.20	3.05	3.08	100.98	2.32	76.07	HQ					
K-10-0275	190.20	193.24	3.04	3.03	99.67	1.84	60.53	HQ					
K-10-0275	193.24	196.29	3.05	3.05	100.00	2.62	85.90	HQ					
K-10-0275	196.29	199.34	3.05	3.02	99.02	2.81	92.13	HQ					
K-10-0275	199.34	202.39	3.05	3.11	101.97	3.05	100.00	HQ					
K-10-0275	202.39	205.49	3.10	3.05	98.39	2.46	79.35	HQ					
K-10-0275	205.49	208.48	2.99	3.03	101.34	3.03	101.34	HQ					
K-10-0275	208.48	211.53	3.05	2.90	95.08	2.68	87.87	HQ					
K-10-0275	211.53	214.58	3.05	2.96	97.05	2.80	91.80	HQ					
K-10-0275	214.58	217.63	3.05	3.09	101.31	2.82	92.46	HQ					
K-10-0275	217.63	220.68	3.05	3.07	100.66	2.46	80.66	HQ					
K-10-0275	220.68	223.72	3.04	3.07	100.99	2.86	94.08	HQ					
K-10-0275	223.72	226.77	3.05	2.93	96.07	2.93	96.07	HQ					
K-10-0275	226.77	229.82	3.05	3.02	99.02	2.88	94.43	HQ					
K-10-0275	229.82	232.87	3.05	3.07	100.66	2.75	90.16	HQ					
K-10-0275	232.87	235.92	3.05	3.10	101.64	3.00	98.36	HQ					
K-10-0275	235.92	238.96	3.04	3.06	100.66	2.50	82.24	HQ					
K-10-0275	238.96	242.01	3.05	3.04	99.67	2.90	95.08	HQ					
K-10-0275	242.01	245.06	3.05	3.11	101.97	2.84	93.11	HQ					
K-10-0275	245.06	248.11	3.05	2.98	97.70	2.68	87.87	HQ					
K-10-0275	248.11	251.16	3.05	3.08	100.98	2.91	95.41	HQ					

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0275	251.16	254.20	3.04	3.04	100.00	2.62	86.18	HQ					
K-10-0275	254.20	257.25	3.05	3.04	99.67	1.42	46.56	HQ					
K-10-0275	257.25	260.30	3.05	3.18	104.26	1.77	58.03	HQ					
K-10-0275	260.30	263.35	3.05	3.14	102.95	0.87	28.52	HQ					
K-10-0275	263.35	266.40	3.05	3.08	100.98	0.00	0.00	HQ					
K-10-0275	266.40	269.44	3.04	3.15	103.62	1.37	45.07	HQ					
K-10-0275	269.44	272.49	3.05	3.04	99.67	2.76	90.49	HQ					
K-10-0275	272.49	275.54	3.05	3.05	100.00	3.05	100.00	HQ					
K-10-0275	275.54	278.59	3.05	3.01	98.69	2.30	75.41	HQ					
K-10-0275	278.59	281.64	3.05	3.06	100.33	0.27	8.85	HQ					
K-10-0275	281.64	284.68	3.04	3.00	98.68	0.00	0.00	HQ					
K-10-0275	284.68	287.73	3.05	3.09	101.31	0.34	11.15	HQ					
K-10-0275	287.73	290.78	3.05	2.99	98.03	0.84	27.54	HQ					
K-10-0275	290.78	293.83	3.05	2.85	93.44	0.00	0.00	HQ					
K-10-0275	293.83	296.88	3.05	2.82	92.46	1.64	53.77	HQ					
K-10-0275	296.88	299.92	3.04	2.99	98.36	1.90	62.50	HQ					
K-10-0275	299.92	300.84	0.92	0.87	94.57	0.33	35.87	HQ					
K-10-0275	300.84	302.97	2.13	2.09	98.12	0.59	27.70	HQ					
K-10-0275	302.97	305.41	2.44	2.40	98.36	1.37	56.15	HQ					
K-10-0275	305.41	306.02	0.61	0.63	103.28	0.00	0.00	HQ					
K-10-0275	306.02	309.07	3.05	2.57	84.26	1.15	37.70	HQ					
K-10-0275	309.07	310.13	1.06	0.27	25.47	0.00	0.00	HQ					
K-10-0275	310.13	310.74	0.61	0.10	16.39	0.00	0.00	HQ					
K-10-0275	310.74	311.51	0.77	0.20	25.97	0.00	0.00	HQ					
K-10-0275	311.51	311.96	0.45	0.32	71.11	0.00	0.00	HQ					
K-10-0275	311.96	312.12	0.16	0.13	81.25	0.00	0.00	HQ					
K-10-0275	312.12	313.18	1.06	1.15	108.49	0.41	38.68	HQ					
K-10-0275	313.18	315.16	1.98	1.89	95.45	1.37	69.19	HQ					
K-10-0275	315.16	318.21	3.05	3.05	100.00	1.40	45.90	HQ					
K-10-0275	318.21	321.26	3.05	3.00	98.36	0.89	29.18	HQ					
K-10-0275	321.26	324.31	3.05	3.03	99.34	1.51	49.51	HQ					
K-10-0275	324.31	327.36	3.05	3.01	98.69	2.84	93.11	HQ					
K-10-0275	327.36	330.40	3.04	3.04	100.00	2.72	89.47	HQ					
K-10-0275	330.40	333.45	3.05	2.96	97.05	1.63	53.44	HQ					
K-10-0275	333.45	336.50	3.05	3.00	98.36	1.83	60.00	HQ					
K-10-0275	336.50	339.50	3.00	3.24	108.00	1.51	50.33	HQ					
K-10-0275	339.50	342.60	3.10	2.84	91.61	0.26	8.39	HQ					
K-10-0275	342.60	345.64	3.04	3.09	101.64	1.51	49.67	HQ					
K-10-0275	345.64	346.55	0.91	0.91	100.00	0.00	0.00						

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0285	0.00	64.24	OVB
K-10-0285	64.24	68.88	CHSCH
K-10-0285	68.88	72.05	GSCH
K-10-0285	72.05	75.54	QTZT
K-10-0285	75.54	77.94	TQTZT
K-10-0285	77.94	81.69	FLT
K-10-0285	81.69	84.77	QTZT
K-10-0285	84.77	87.41	TQTZT
K-10-0285	87.41	93.64	QTZT
K-10-0285	93.64	98.09	TQTZT
K-10-0285	98.09	101.25	CQTZT
K-10-0285	101.25	103.13	GSCH
K-10-0285	103.13	112.12	QTZT
K-10-0285	112.12	113.05	ICQS
K-10-0285	113.05	122.77	QTZT
K-10-0285	122.77	130.63	TQTZT
K-10-0285	130.63	146.43	QTZT
K-10-0285	146.43	147.65	FLT
K-10-0285	147.65	158.28	QTZT
K-10-0285	158.28	162.12	TQTZT
K-10-0285	162.12	162.82	GSCH
K-10-0285	162.82	164.31	GNST
K-10-0285	164.31	169.61	QTZT
K-10-0285	169.61	170.44	FLT
K-10-0285	170.44	170.61	VN
K-10-0285	170.61	172.88	QTZT
K-10-0285	172.88	175.11	GSCH
K-10-0285	175.11	176.14	QTZT
K-10-0285	176.14	181.35	TQTZT
K-10-0285	181.35	184.71	TQTZT
K-10-0285	184.71	186.23	NR
K-10-0285	186.23	188.95	TQTZT
K-10-0285	188.95	199.47	QTZT
K-10-0285	199.47	199.71	VM
K-10-0285	199.71	203.16	QTZT
K-10-0285	203.16	209.98	GNST
K-10-0285	209.98	210.84	GNST
K-10-0285	210.84	211.91	VM
K-10-0285	211.91	216.75	GNST
K-10-0285	216.75	218.85	FLT
K-10-0285	218.85	220.07	NR
K-10-0285	220.07	220.56	FLT
K-10-0285	220.56	221.49	VM
K-10-0285	221.49	225.19	QTZT
K-10-0285	225.19	228.38	TQTZT
K-10-0285	228.38	230.86	TQTZT
K-10-0285	230.86	232.60	GSCH
K-10-0285	232.60	236.48	CQTZT
K-10-0285	236.48	237.30	GSCH
K-10-0285	237.30	242.52	QTZT
K-10-0285	242.52	260.00	TQTZT
K-10-0285	260.00	261.52	GSCH
K-10-0285	261.52	267.58	TQTZT
K-10-0285	267.58	268.07	GSCH
K-10-0285	268.07	270.48	QTZT
K-10-0285	270.48	271.04	FLT
K-10-0285	271.04	275.97	GSCH
K-10-0285	275.97	280.09	QTZT
K-10-0285	280.09	282.72	TQTZT
K-10-0285	282.72	283.41	GSCH
K-10-0285	283.41	287.41	ICQS
K-10-0285	287.41	291.01	GNST
K-10-0285	291.01	309.61	QTZT
K-10-0285	309.61	324.31	TQTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0285	64.24	64.31	0.07	0.08	114.29	0.00	0.00	HQ					
K-10-0285	64.31	65.53	1.22	1.03	84.43	0.25	20.49	HQ					
K-10-0285	65.53	68.88	3.35	1.31	39.10	0.00	0.00	HQ					
K-10-0285	68.88	69.95	1.07	0.86	80.37	0.00	0.00	NQ					
K-10-0285	69.95	71.63	1.68	1.77	105.36	0.00	0.00	NQ					
K-10-0285	71.63	71.93	0.30	0.21	70.00	0.00	0.00	NQ					
K-10-0285	71.93	74.52	2.59	1.63	62.93	0.00	0.00	NQ					
K-10-0285	74.52	74.98	0.46	0.27	58.70	0.00	0.00	NQ					
K-10-0285	74.98	76.35	1.37	0.95	69.34	0.00	0.00	NQ					
K-10-0285	76.35	78.02	1.67	1.44	86.23	0.00	0.00	NQ					
K-10-0285	78.02	81.08	3.06	1.17	38.24	0.00	0.00	NQ					
K-10-0285	81.08	81.69	0.61	0.52	85.25	0.00	0.00	NQ					
K-10-0285	81.69	82.30	0.61	0.53	86.89	0.00	0.00	NQ					
K-10-0285	82.30	83.97	1.67	1.36	81.44	0.38	22.75	NQ					
K-10-0285	83.97	85.19	1.22	1.19	97.54	0.00	0.00	NQ					
K-10-0285	85.19	85.80	0.61	0.46	75.41	0.25	40.98	NQ					
K-10-0285	85.80	86.56	0.76	0.93	122.37	0.00	0.00	NQ					
K-10-0285	86.56	87.17	0.61	0.50	81.97	0.00	0.00	NQ					
K-10-0285	87.17	88.70	1.53	0.55	35.95	0.00	0.00	NQ					
K-10-0285	88.70	89.92	1.22	1.45	118.85	0.10	8.20	NQ					
K-10-0285	89.92	90.53	0.61	0.50	81.97	0.00	0.00	NQ					
K-10-0285	90.53	91.14	0.61	0.89	145.90	0.00	0.00	NQ					
K-10-0285	91.14	93.27	2.13	1.95	91.55	0.40	18.78	NQ					
K-10-0285	93.27	96.32	3.05	2.95	96.72	1.38	45.25	NQ					
K-10-0285	96.32	96.62	0.30	0.20	66.67	0.00	0.00	NQ					
K-10-0285	96.62	98.15	1.53	1.25	81.70	0.00	0.00	NQ					
K-10-0285	98.15	99.36	1.21	1.10	90.91	0.55	45.45	NQ					
K-10-0285	99.36	102.41	3.05	2.90	95.08	0.86	28.20	NQ					
K-10-0285	102.41	105.46	3.05	2.80	91.80	1.82	59.67	NQ					
K-10-0285	105.46	108.51	3.05	3.05	100.00	2.05	67.21	NQ					
K-10-0285	108.51	111.56	3.05	3.05	100.00	2.47	80.98	NQ					
K-10-0285	111.56	112.93	1.37	1.50	109.49	0.50	36.50	NQ					
K-10-0285	112.93	114.60	1.67	1.70	101.80	0.80	47.90	NQ					
K-10-0285	114.60	117.65	3.05	3.08	100.98	1.52	49.84	NQ					
K-10-0285	117.65	120.70	3.05	3.08	100.98	1.88	61.64	NQ					
K-10-0285	120.70	123.75	3.05	3.00	98.36	1.02	33.44	NQ					
K-10-0285	123.75	126.80	3.05	3.00	98.36	1.95	63.93	NQ					
K-10-0285	126.80	129.84	3.04	3.00	98.68	2.25	74.01	NQ					
K-10-0285	129.84	132.89	3.05	3.00	98.36	1.42	46.56	NQ					
K-10-0285	132.89	135.94	3.05	3.00	98.36	1.30	42.62	NQ					
K-10-0285	135.94	138.99	3.05	2.90	95.08	1.86	60.98	NQ					
K-10-0285	138.99	142.04	3.05	3.07	100.66	1.48	48.52	NQ					
K-10-0285	142.04	143.26	1.22	1.80	147.54	0.64	52.46	NQ					
K-10-0285	143.26	145.08	1.82	1.07	58.79	0.00	0.00	NQ					
K-10-0285	145.08	148.13	3.05	3.08	100.98	0.90	29.51	NQ					
K-10-0285	148.13	151.18	3.05	2.93	96.07	1.95	63.93	NQ					
K-10-0285	151.18	154.23	3.05	2.93	96.07	1.46	47.87	NQ					
K-10-0285	154.23	157.28	3.05	3.08	100.98	1.75	57.38	NQ					
K-10-0285	157.28	160.32	3.04	2.90	95.39	1.57	51.64	NQ					
K-10-0285	160.32	162.76	2.44	2.20	90.16	0.41	16.80	NQ					
K-10-0285	162.76	163.37	0.61	0.45	73.77	0.00	0.00	NQ					
K-10-0285	163.37	166.42	3.05	2.80	91.80	0.63	20.66	NQ					
K-10-0285	166.42	167.34	0.92	0.79	85.87	0.30	32.61	NQ					
K-10-0285	167.34	169.47	2.13	2.26	106.10	0.60	28.17	NQ					
K-10-0285	169.47	172.52	3.05	2.55	83.61	0.00	0.00	NQ					
K-10-0285	172.52	175.56	3.04	2.86	94.08	0.58	19.08	NQ					
K-10-0285	175.56	178.61	3.05	2.79	91.48	1.40	45.90	NQ					
K-10-0285	178.61	181.66	3.05	3.04	99.67	0.66	21.64	NQ					
K-10-0285	181.66	184.25	2.59	2.52	97.30	0.54	20.85	NQ					
K-10-0285	184.25	184.71	0.46	0.30	65.22	0.00	0.00	NQ					
K-10-0285	184.71	186.23	1.52	0.00	0.00	0.00	0.00	NQ					
K-10-0285	186.23	187.76	1.53	1.18	77.12	0.11	7.19	NQ					
K-10-0285	187.76	190.80	3.04	2.92	96.05	0.66	21.71	NQ					
K-10-0285	190.80	193.85	3.05	2.50	81.97	0.88	28.85	NQ					
K-10-0285	193.85	196.90	3.05	2.93	96.07	0.92	30.16	NQ					
K-10-0285	196.90	199.95	3.05	2.73	89.51	0.86	28.20	NQ					
K-10-0285	199.95	204.06	4.11	2.05	49.88	0.26	6.33	NQ					
K-10-0285	204.06	206.04	1.98	0.92	46.46	0.23	11.62	NQ					
K-10-0285	206.04	207.26	1.22	0.54	44.26	0.00	0.00	NQ					
K-10-0285	207.26	209.09	1.83	0.91	49.73	0.22	12.02	NQ					
K-10-0285	209.09	212.14	3.05	2.49	81.64	0.69	22.62	NQ					
K-10-0285	212.14	215.19	3.05	2.42	79.34	0.87	28.52	NQ					
K-10-0285	215.19	216.10	0.91	0.72	79.12	0.15	16.48	NQ					
K-10-0285	216.10	218.23	2.13	2.06	96.71	0.49	23.00	NQ					
K-10-0285	218.23	218.85	0.62	0.20	32.26	0.00	0.00	NQ					
K-10-0285	218.85	219.76	0.91	0.00	0.00	0.00	0.00	NQ					
K-10-0285	219.76	220.07	0.31	0.00	0.00	0.00	0.00	NQ					
K-10-0285	220.07	221.28	1.21	1.09	90.08	0.38	31.40	NQ					
K-10-0285	221.28	224.33	3.05	2.94	96.39	2.19	71.80	NQ					
K-10-0285	224.33	227.38	3.05	2.97	97.38	2.06	67.54	NQ					
K-10-0285	227.38	230.43	3.05	2.95	96.72	2.16	70.82	NQ					
K-10-0285	230.43	233.48	3.05	3.00	98.36	1.95	63.93	NQ					
K-10-0285	233.48	236.52	3.04	2.95	97.04	2.15	70.72	NQ					
K-10-0285	236.52	239.57	3.05	2.98	97.70	1.78	58.36	NQ					
K-10-0285	239.57	242.62	3.05	2.93	96.07	1.03	33.77	NQ					
K-10-0285	242.62	245.67	3.05	1.20	39.34	0.81	26.56	NQ					
K-10-0285	245.67	248.72	3.05	2.90	95.08	1.25	40.98	NQ					
K-10-0285	248.72	249.94	1.22	1.29	105.74	0.77	63.11	NQ					
K-10-0285	249.94	251.76	1.82	1.44	79.12	0.62	34.07	NQ					
K-10-0285	251.76	253.44	1.68	1.71	101.79	0.36	21.43	NQ					
K-10-0285	253.44	254.81	1.37	1.16	84.67	0.87	63.50	NQ					
K-10-0285	254.81	256.79	1.98	1.76	88.89	0.65	32.83	NQ					
K-10-0285	256.79	257.86	1.07	1.16	108.41	0.00	0.00	NQ					
K-10-0285	257.86	260.91	3.05	2.93	96.07	0.97	31.80	NQ					
K-10-0285	260.91	261.52	0.61	0.72	118.03	0.27	44.26	NQ					
K-10-0285	261.52	263.96	2.44	2.32	95.08	0.71	29.10	NQ					
K-10-0285	263.96	267.00	3.04	2.88	94.74	0.96	31.58	NQ					

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0285	267.00	268.07	1.07	1.14	106.54	0.16	14.95	NQ					
K-10-0285	268.07	270.05	1.98	1.68	84.85	0.78	39.39	NQ					
K-10-0285	270.05	273.10	3.05	2.94	96.39	0.40	13.11	NQ					
K-10-0285	273.10	275.53	2.43	1.98	81.48	1.11	45.68	NQ					
K-10-0285	275.53	276.15	0.62	0.83	133.87	0.40	64.52	NQ					
K-10-0285	276.15	279.20	3.05	3.05	100.00	1.58	51.80	NQ					
K-10-0285	279.20	280.26	1.06	1.17	110.38	0.52	49.06	NQ					
K-10-0285	280.26	282.24	1.98	1.92	96.97	0.22	11.11	NQ					
K-10-0285	282.24	285.29	3.05	3.05	100.00	1.00	32.79	NQ					
K-10-0285	285.29	288.34	3.05	3.05	100.00	1.05	34.43	NQ					
K-10-0285	288.34	291.39	3.05	2.95	96.72	2.09	68.52	NQ					
K-10-0285	291.39	294.44	3.05	3.05	100.00	2.05	67.21	NQ					
K-10-0285	294.44	297.48	3.04	2.75	90.46	0.25	8.22	NQ					
K-10-0285	297.48	300.53	3.05	3.05	100.00	2.10	68.85	NQ					
K-10-0285	300.53	303.58	3.05	3.05	100.00	1.27	41.64	NQ					
K-10-0285	303.58	306.32	2.74	2.80	102.19	1.16	42.34	NQ					
K-10-0285	306.32	306.63	0.31	0.25	80.65	0.13	41.94	NQ					
K-10-0285	306.63	309.68	3.05	3.05	100.00	2.25	73.77	NQ					
K-10-0285	309.68	311.20	1.52	1.52	100.00	0.96	63.16	NQ					
K-10-0285	311.20	312.72	1.52	1.20	78.95	0.12	7.89	NQ					
K-10-0285	312.72	315.77	3.05	2.28	74.75	0.86	28.20	NQ					
K-10-0285	315.77	318.82	3.05	3.05	100.00	1.70	55.74	NQ					
K-10-0285	318.82	321.87	3.05	3.05	100.00	1.92	62.95	NQ					
K-10-0285	321.87	324.15	2.28	2.45	107.46	0.94	41.23	NQ					
K-10-0285	324.15	324.31	0.16	0.19	118.75	0.00	0.00	NQ					

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0291	0.00	2.10	OVB
K-10-0291	2.10	10.20	CQTZT
K-10-0291	10.20	14.47	ICQS
K-10-0291	14.47	18.64	QTZT
K-10-0291	18.64	20.44	ICQS
K-10-0291	20.44	24.85	QTZT
K-10-0291	24.85	25.20	ICQS
K-10-0291	25.20	28.14	QTZT
K-10-0291	28.14	31.40	ICQS
K-10-0291	31.40	32.81	QTZT
K-10-0291	32.81	33.94	ICQS
K-10-0291	33.94	34.65	TQTZT
K-10-0291	34.65	39.58	QTZT
K-10-0291	39.58	41.45	ICQS
K-10-0291	41.45	42.87	QTZT
K-10-0291	42.87	47.78	ICQS
K-10-0291	47.78	52.20	QTZT
K-10-0291	52.20	53.36	ICQS
K-10-0291	53.36	53.90	SSCH
K-10-0291	53.90	64.50	QTZT
K-10-0291	64.50	66.64	TQTZT
K-10-0291	66.64	66.99	SSCH
K-10-0291	66.99	69.29	QTZT
K-10-0291	69.29	70.60	TQTZT
K-10-0291	70.60	73.16	CQTZT
K-10-0291	73.16	74.98	CQTZT
K-10-0291	74.98	77.87	CQTZT
K-10-0291	77.87	79.35	TQTZT
K-10-0291	79.35	80.95	GNST
K-10-0291	80.95	86.68	QTZT
K-10-0291	86.68	88.18	GSCH
K-10-0291	88.18	88.85	FLT
K-10-0291	88.85	92.33	TQTZT
K-10-0291	92.33	94.11	GSCH
K-10-0291	94.11	99.21	CQTZT
K-10-0291	99.21	100.57	GSCH
K-10-0291	100.57	116.00	QTZT
K-10-0291	116.00	117.65	SM
K-10-0291	117.65	118.92	QTZT
K-10-0291	118.92	119.10	VL
K-10-0291	119.10	121.04	QTZT
K-10-0291	121.04	122.95	VM
K-10-0291	122.95	125.26	SM
K-10-0291	125.26	133.60	GNST
K-10-0291	133.60	135.46	FLT
K-10-0291	135.46	136.55	FLT
K-10-0291	136.55	139.93	FLT
K-10-0291	139.93	141.05	SM
K-10-0291	141.05	145.32	FLT
K-10-0291	145.32	149.89	ICQS
K-10-0291	149.89	157.54	TQTZT
K-10-0291	157.54	158.66	GSCH
K-10-0291	158.66	160.76	SSCH
K-10-0291	160.76	165.20	VL
K-10-0291	165.20	173.36	TQTZT
K-10-0291	173.36	176.60	GSCH
K-10-0291	176.60	178.40	ICQS
K-10-0291	178.40	185.09	TQTZT
K-10-0291	185.09	186.00	ICQS
K-10-0291	186.00	188.30	QTZT
K-10-0291	188.30	192.67	TQTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0291	1.98	3.35	1.37	1.13	82.48	0.88	64.23	HQ	4	R5	3	1	
K-10-0291	3.35	4.42	1.07	1.04	97.20	0.57	53.27	HQ	2	R5	4	1	
K-10-0291	4.42	4.57	0.15	0.15	100.00	0.11	73.33	HQ	4	R5	1	1	
K-10-0291	4.57	5.18	0.61	0.61	100.00	0.20	32.79	HQ	7	R5	1	1	
K-10-0291	5.18	7.92	2.74	2.74	100.00	2.37	86.50	HQ	6	R5	3	1	
K-10-0291	7.92	9.14	1.22	1.07	87.70	0.90	73.77	HQ	2	R5	0		
K-10-0291	9.14	10.97	1.83	1.71	93.44	0.88	48.09	HQ	10	R4	0		
K-10-0291	10.97	11.77	0.80	0.72	90.00	0.22	27.50	HQ	8	R3	0		
K-10-0291	11.77	14.02	2.25	2.40	106.67	1.12	49.78	HQ	9	R2	0		
K-10-0291	14.02	17.07	3.05	2.93	96.07	2.64	86.56	HQ	5	R5	1	1	
K-10-0291	17.07	20.12	3.05	2.79	91.48	2.07	67.87	HQ	6	R5	0		
K-10-0291	20.12	23.16	3.04	3.04	100.00	2.42	79.61	HQ	6	R5	0		
K-10-0291	23.16	26.21	3.05	3.02	99.02	2.31	75.74	HQ	8	R4	1	1	
K-10-0291	26.21	28.35	2.14	2.00	93.46	1.33	62.15	HQ	7	R5	2	1	
K-10-0291	28.35	29.26	0.91	0.69	75.82	0.12	13.19	HQ	8	R3	0		
K-10-0291	29.26	32.31	3.05	2.88	94.43	1.90	62.30	HQ	11	R4	3	1	
K-10-0291	32.31	35.36	3.05	3.05	100.00	2.37	77.70	HQ	8	R3	0		
K-10-0291	35.36	35.66	0.30	0.34	113.33	0.22	73.33	HQ	1	R5	0		
K-10-0291	35.66	38.40	2.74	2.72	99.27	1.98	72.26	HQ	4	R5	0		
K-10-0291	38.40	41.45	3.05	3.00	98.36	2.00	65.57	HQ	7	R4	1	1	
K-10-0291	41.45	44.50	3.05	2.98	97.70	2.31	75.74	HQ	5	R4	0		
K-10-0291	44.50	47.54	3.04	2.91	95.72	2.28	75.00	HQ	6	R3	0		
K-10-0291	47.54	50.60	3.06	3.05	99.67	2.34	76.47	HQ	5	R5	0		
K-10-0291	50.60	52.12	1.52	1.58	103.95	0.98	64.47	HQ	11	R5	1	1	
K-10-0291	52.12	53.64	1.52	1.26	82.89	0.61	40.13	HQ	5	R3	0		
K-10-0291	53.64	56.69	3.05	2.93	96.07	2.01	65.90	HQ	4	R5	0		
K-10-0291	56.69	59.74	3.05	2.96	97.05	1.78	58.36	HQ	7	R5	4	1	
K-10-0291	59.74	60.20	0.46	0.62	134.78	0.62	134.78	HQ	1	R5	1	1	
K-10-0291	60.20	62.79	2.59	2.34	90.35	1.39	53.67	HQ	5	R5	2	1	
K-10-0291	62.79	65.84	3.05	3.01	98.69	2.39	78.36	HQ	4	R5	1	1	
K-10-0291	65.84	68.88	3.04	2.85	93.75	1.19	39.14	HQ	6	R5	0		
K-10-0291	68.88	70.71	1.83	1.47	80.33	0.70	38.25	HQ	15	R5	0		
K-10-0291	70.71	71.93	1.22	1.18	96.72	0.56	45.90	HQ	7	R5	0		
K-10-0291	71.93	74.98	3.05	3.03	99.34	1.89	61.97	HQ	10	R5	0		
K-10-0291	74.98	78.03	3.05	3.05	100.00	2.72	89.18	HQ	4	R5	0		
K-10-0291	78.03	81.07	3.04	3.04	100.00	2.09	68.75	HQ	6	R5	1	1	
K-10-0291	81.07	81.38	0.31	0.25	80.65	0.25	80.65	HQ	0	R4	0		
K-10-0291	81.38	84.12	2.74	2.74	100.00	1.69	61.68	HQ	9	R5	0		
K-10-0291	84.12	87.17	3.05	3.05	100.00	2.02	66.23	HQ	10	R3	2	1	
K-10-0291	87.17	88.85	1.68	1.56	92.86	0.69	41.07	HQ	8	R2	1	1	
K-10-0291	88.85	90.07	1.22	1.06	86.89	0.24	19.67	HQ	24	R5	0		
K-10-0291	90.07	90.68	0.61	0.61	100.00	0.00	0.00	HQ	20	R5	0		
K-10-0291	90.68	91.74	1.06	0.99	93.40	0.00	0.00	HQ	25	R5	0		
K-10-0291	91.74	92.35	0.61	0.56	91.80	0.00	0.00	HQ	18	R5	0		
K-10-0291	92.35	93.27	0.92	0.35	38.04	0.12	13.04	HQ	6	R3	0		
K-10-0291	93.27	96.32	3.05	3.05	100.00	1.46	47.87	HQ	16	R4	1	1	
K-10-0291	96.32	97.23	0.91	0.91	100.00	0.18	19.78	HQ	6	R5	0		
K-10-0291	97.23	99.36	2.13	1.71	80.28	0.91	42.72	HQ	10	R4	0		
K-10-0291	99.36	102.41	3.05	3.00	98.36	2.05	67.21	HQ	8	R3	0		
K-10-0291	102.41	102.71	0.30	0.23	76.67	0.14	46.67	HQ	0	R5	0		
K-10-0291	102.71	104.85	2.14	2.14	100.00	1.62	75.70	HQ	10	R5	0		
K-10-0291	104.85	105.46	0.61	0.60	98.36	0.25	40.98	HQ	3	R5	0		
K-10-0291	105.46	108.51	3.05	2.97	97.38	2.45	80.33	HQ	4	R5	6	1	
K-10-0291	108.51	111.56	3.05	2.95	96.72	2.62	85.90	HQ	6	R5	4	1	
K-10-0291	111.56	114.60	3.04	3.04	100.00	3.04	100.00	HQ	2	R5	9	1	
K-10-0291	114.60	117.65	3.05	2.97	97.38	2.73	89.51	HQ	4	R5	1	1	
K-10-0291	117.65	120.70	3.05	3.05	100.00	2.93	96.07	HQ	2	R5	9	1	
K-10-0291	120.70	123.75	3.05	2.99	98.03	2.53	82.95	HQ	2	R4	9	2	
K-10-0291	123.75	126.60	2.85	2.80	98.25	2.62	91.93	HQ	1	R5	9	2	
K-10-0291	126.60	129.84	3.24	2.92	90.12	2.54	78.40	HQ	1	R5	8	2	
K-10-0291	129.84	132.89	3.05	3.05	100.00	1.41	46.23	HQ	19	R5	2	1	
K-10-0291	132.89	134.87	1.98	1.19	60.10	0.57	28.79	HQ	16	R5	2	2	
K-10-0291	134.87	135.94	1.07	0.70	65.42	0.38	35.51	HQ	18	R3	0		
K-10-0291	135.94	136.55	0.61	0.56	91.80	0.32	52.46	HQ	2	R3	1	2	
K-10-0291	136.55	138.99	2.44	2.37	97.13	1.35	55.33	HQ	14	R2	3	2	
K-10-0291	138.99	142.04	3.05	2.95	96.72	1.47	48.20	HQ	24	R2	4	2	
K-10-0291	142.04	143.87	1.83	1.76	96.17	1.07	58.47	HQ	18	R2	2	2	
K-10-0291	143.87	145.08	1.21	1.15	95.04	0.54	44.63	HQ	10	R1	1	1	
K-10-0291	145.08	148.13	3.05	3.05	100.00	1.77	58.03	HQ	16	R5	5	1	
K-10-0291	148.13	148.74	0.61	0.57	93.44	0.51	83.61	HQ	2	R5	0		
K-10-0291	148.74	151.18	2.44	2.40	98.36	1.43	58.61	HQ	17	R5	3	1	
K-10-0291	151.18	154.23	3.05	3.05	100.00	1.78	58.36	HQ	12	R4	4	1	
K-10-0291	154.23	157.28	3.05	3.00	98.36	1.78	58.36	HQ	12	R4	5	1	
K-10-0291	157.28	160.32	3.04	2.92	96.05	2.03	66.78	HQ	6	R3	7	2	
K-10-0291	160.32	163.37	3.05	2.75	90.16	2.45	80.33	HQ	4	R5	7	1	
K-10-0291	163.37	166.42	3.05	3.05	100.00	2.63	86.23	HQ	7	R4	3	1	
K-10-0291	166.42	169.47	3.05	2.94	96.39	2.56	83.93	HQ	8	R5	4	1	
K-10-0291	169.47	172.52	3.05	3.05	100.00	2.30	75.41	HQ	8	R5	4	2	
K-10-0291	172.52	175.56	3.04	3.02	99.34	2.01	66.12	HQ	7	R3	2	1	
K-10-0291	175.56	178.61	3.05	3.00	98.36	2.05	67.21	HQ	9	R3	0		
K-10-0291	178.61	181.66	3.05	2.96	97.05	2.09	68.52	HQ	7	R3	0		
K-10-0291	181.66	184.71	3.05	3.05	100.00	2.23	73.11	HQ	11	R4	0		
K-10-0291	184.71	187.76	3.05	2.78	91.15	1.71	56.07	HQ	14	R4	1	1	
K-10-0291	187.76	190.80	3.04	2.81	92.43	1.72	56.58	HQ	8	R3	1	1	
K-10-0291	190.80	192.67	1.87	1.62	86.63	1.48	79.14	HQ	6	R4	2	1	

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0295	0.00	2.44	OVB
K-10-0295	2.44	8.65	CQTZT
K-10-0295	8.65	15.42	TQTZT
K-10-0295	15.42	17.74	ICQS
K-10-0295	17.74	19.35	QTZT
K-10-0295	19.35	20.48	GSCH
K-10-0295	20.48	22.34	CQTZT
K-10-0295	22.34	27.13	GSCH
K-10-0295	27.13	33.48	QTZT
K-10-0295	33.48	41.08	TQTZT
K-10-0295	41.08	46.48	CQTZT
K-10-0295	46.48	47.85	GSCH
K-10-0295	47.85	48.13	SSCH
K-10-0295	48.13	61.53	QTZT
K-10-0295	61.53	61.94	SSCH
K-10-0295	61.94	69.24	TQTZT
K-10-0295	69.24	70.40	SSCH
K-10-0295	70.40	73.67	TQTZT
K-10-0295	73.67	75.82	GSCH
K-10-0295	75.82	78.41	CQTZT
K-10-0295	78.41	81.38	GSCH
K-10-0295	81.38	86.00	CQTZT
K-10-0295	86.00	87.48	GSCH
K-10-0295	87.48	107.53	CQTZT
K-10-0295	107.53	110.77	TQTZT
K-10-0295	110.77	110.98	GNST
K-10-0295	110.98	113.53	GSCH
K-10-0295	113.53	115.81	TQTZT
K-10-0295	115.81	153.30	GNST
K-10-0295	153.30	159.95	CHSCH
K-10-0295	159.95	163.28	QTZT
K-10-0295	163.28	167.38	QTZT
K-10-0295	167.38	181.36	TQTZT
K-10-0295	181.36	182.71	GNST
K-10-0295	182.71	186.17	FLT
K-10-0295	186.17	190.20	ICQS
K-10-0295	190.20	196.22	TQTZT
K-10-0295	196.22	197.22	ICQS
K-10-0295	197.22	198.57	QTZT
K-10-0295	198.57	200.93	SM
K-10-0295	200.93	204.70	TQTZT
K-10-0295	204.70	212.32	SM
K-10-0295	212.32	215.49	TQTZT
K-10-0295	215.49	221.03	QTZT
K-10-0295	221.03	231.67	TQTZT
K-10-0295	231.67	232.93	ICQS
K-10-0295	232.93	239.65	GNST
K-10-0295	239.65	244.74	QTZT
K-10-0295	244.74	248.00	TQTZT
K-10-0295	248.00	252.29	QTZT
K-10-0295	252.29	259.69	TQTZT
K-10-0295	259.69	266.70	QTZT
K-10-0295	266.70	269.02	TQTZT
K-10-0295	269.02	275.47	QTZT
K-10-0295	275.47	280.60	ICQS
K-10-0295	280.60	285.09	TQTZT
K-10-0295	285.09	288.58	ICQS
K-10-0295	288.58	306.63	QTZT
K-10-0295	306.63	307.43	GNST
K-10-0295	307.43	313.94	ICQS

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0295	2.44	4.11	1.67	1.34	80.24	0.46	27.54	HQ	1	R5	1	1	0.0
K-10-0295	4.11	5.18	1.07	0.96	89.72	0.91	85.05	HQ	4	R5	0	1	0.0
K-10-0295	5.18	8.23	3.05	2.77	90.82	2.64	86.56	HQ	10	R4	4	1	0.0
K-10-0295	8.23	11.28	3.05	2.80	91.80	0.87	28.52	HQ	34	R4	10	2	2.0
K-10-0295	11.28	14.33	3.05	2.91	95.41	1.65	54.10	HQ	27	R4	13	3	1.0
K-10-0295	14.33	17.37	3.04	2.88	94.74	1.48	48.68	HQ	31	R4	15	2	20.0
K-10-0295	17.37	20.42	3.05	2.86	93.77	1.71	56.07	HQ	41	R4	20	3	4.0
K-10-0295	20.42	23.47	3.05	2.91	95.41	2.31	75.74	HQ	23	R4	28	1	0.5
K-10-0295	23.47	26.52	3.05	3.01	98.69	1.40	45.90	HQ	41	R4	27	2	2.0
K-10-0295	26.52	29.57	3.05	2.98	97.70	2.26	74.10	HQ	27	R5	62	2	8.0
K-10-0295	29.57	32.61	3.04	3.01	99.01	2.85	93.75	HQ	17	R5	54	2	3.0
K-10-0295	32.61	35.66	3.05	2.94	96.39	2.23	73.11	HQ	18	R4	23	1	0.1
K-10-0295	35.66	38.71	3.05	2.86	93.77	1.67	54.75	HQ	32	R3	21	2	5.0
K-10-0295	38.71	41.76	3.05	3.06	100.33	1.92	62.95	HQ	29	R4	24	2	2.0
K-10-0295	41.76	44.81	3.05	3.00	98.36	2.68	87.87	HQ	15	R5	17	2	0.5
K-10-0295	44.81	46.63	1.82	1.86	102.20	0.93	51.10	HQ	19	R5	17	2	0.1
K-10-0295	46.63	47.85	1.22	1.07	87.70	0.20	16.39	HQ	29	R3	3	2	0.1
K-10-0295	47.85	50.90	3.05	3.04	99.67	2.03	66.56	HQ	29	R6	26	2	2.0
K-10-0295	50.90	53.95	3.05	2.96	97.05	2.23	73.11	HQ	20	R6	3	1	1.0
K-10-0295	53.95	54.78	0.83	0.96	115.66	0.84	101.20	HQ	8	R5	10	1	1.0
K-10-0295	54.78	57.00	2.22	2.06	92.79	1.14	51.35	HQ	22	R5	11	2	2.0
K-10-0295	57.00	60.05	3.05	3.01	98.69	2.80	91.80	HQ	9	R5	5	3	1.0
K-10-0295	60.05	63.09	3.04	2.86	94.08	1.43	47.04	HQ	39	R3	17	2	0.0
K-10-0295	63.09	66.14	3.05	2.97	97.38	1.22	40.00	HQ	37	R3	8	2	0.1
K-10-0295	66.14	69.19	3.05	2.19	71.80	0.96	31.48	HQ	54	R3	6	2	0.0
K-10-0295	69.19	72.24	3.05	3.10	101.64	1.41	46.23	HQ	39	R4	16	2	4.0
K-10-0295	72.24	75.29	3.05	3.02	99.02	1.34	43.93	HQ	43	R3	19	2	10.0
K-10-0295	75.29	76.35	1.06	0.82	77.36	0.00	0.00	HQ	38	R2	1	3	0.0
K-10-0295	76.35	77.72	1.37	1.02	74.45	0.00	0.00	HQ	24	R3	1	3	0.0
K-10-0295	77.72	78.33	0.61	0.27	44.26	0.13	21.31	HQ	6	R4	0	1	0.0
K-10-0295	78.33	81.38	3.05	1.89	61.97	0.57	18.69	NQ	27	R4	11	2	4.0
K-10-0295	81.38	84.43	3.05	2.95	96.72	2.24	73.44	NQ	22	R4	4	1	1.0
K-10-0295	84.43	87.48	3.05	3.07	100.66	1.20	39.34	NQ	58	R2	20	3	2.0
K-10-0295	87.48	90.53	3.05	3.08	100.98	2.50	81.97	NQ	17	R6	2	1	0.0
K-10-0295	90.53	93.57	3.04	2.95	97.04	2.95	97.04	NQ	8	R6	9	1	0.2
K-10-0295	93.57	96.62	3.05	2.94	96.39	2.80	91.80	NQ	12	R6	10	2	0.1
K-10-0295	96.62	99.67	3.05	2.92	95.74	2.37	77.70	NQ	20	R6	5	3	0.0
K-10-0295	99.67	102.72	3.05	3.01	98.69	2.44	80.00	NQ	13	R6	8	2	3.0
K-10-0295	102.72	105.77	3.05	3.04	99.67	1.56	51.15	NQ	28	R5	12	2	1.0
K-10-0295	105.77	108.81	3.04	3.08	101.32	1.80	59.21	NQ	36	R5	7	2	1.0
K-10-0295	108.81	111.86	3.05	2.90	95.08	1.56	51.15	NQ	5	R4	5	3	2.0
K-10-0295	111.86	113.39	1.53	1.53	100.00	0.93	60.78	NQ	6	R3	0	2	0.0
K-10-0295	113.39	114.91	1.52	1.39	91.45	1.15	75.66	NQ	3	R4	2	3	3.0
K-10-0295	114.91	117.65	2.74	2.78	101.46	2.40	87.59	NQ	2	R4	4	3	1.0
K-10-0295	117.65	118.87	1.22	1.42	116.39	1.42	116.39	NQ	0	R4	3	3	2.0
K-10-0295	118.87	121.01	2.14	1.78	83.18	1.76	82.24	NQ	0	R4	5	3	2.0
K-10-0295	121.01	124.05	3.04	3.05	100.33	3.05	100.33	NQ	1	R4	6	2	1.0
K-10-0295	124.05	127.10	3.05	3.05	100.00	3.05	100.00	NQ	0	R4	9	2	1.0
K-10-0295	127.10	130.15	3.05	3.05	100.00	3.05	100.00	NQ	0	R4	6	2	1.0
K-10-0295	130.15	133.20	3.05	3.05	100.00	3.05	100.00	NQ	0	R4	5	2	0.1
K-10-0295	133.20	136.25	3.05	3.05	100.00	3.05	100.00	NQ	0	R4	0		0.0
K-10-0295	136.25	139.29	3.04	3.00	98.68	3.00	98.68	NQ	0	R4	2	2	0.5
K-10-0295	139.29	142.34	3.05	2.93	96.07	2.93	96.07	NQ	0	R4	2	3	0.1
K-10-0295	142.34	145.39	3.05	3.05	100.00	3.05	100.00	NQ	0	R4	4	3	0.1
K-10-0295	145.39	148.44	3.05	3.05	100.00	3.05	100.00	NQ	0	R4	2	3	0.1
K-10-0295	148.44	151.49	3.05	3.05	100.00	3.05	100.00	NQ	0	R4	5	3	0.0
K-10-0295	151.49	154.53	3.04	3.05	100.33	2.85	93.75	NQ	2	R4	5	3	0.0
K-10-0295	154.53	157.58	3.05	3.05	100.00	2.78	91.15	NQ	5	R4	11	2	4.0
K-10-0295	157.58	160.63	3.05	2.90	95.08	2.08	68.20	NQ	3	R3	7	2	3.0
K-10-0295	160.63	163.68	3.05	3.05	100.00	2.87	94.10	NQ	2	R5	14	2	3.0
K-10-0295	163.68	166.73	3.05	3.05	100.00	2.92	95.74	NQ	6	R5	19	2	10.0
K-10-0295	166.73	170.08	3.35	3.05	91.04	1.11	33.13	NQ	37	R3	6	2	1.0
K-10-0295	170.08	172.82	2.74	2.38	86.86	1.16	42.34	NQ	22	R4	12	3	2.0
K-10-0295	172.82	174.65	1.83	1.72	93.99	1.43	78.14	NQ	24	R3	9	3	2.0
K-10-0295	174.65	175.87	1.22	0.82	67.21	0.00	0.00	NQ	19	R5	1	3	0.1
K-10-0295	175.87	176.17	0.30	0.22	73.33	0.00	0.00	NQ	5	R3	0	3	0.0
K-10-0295	176.17	178.92	2.75	2.34	85.09	1.10	40.00	NQ	20	R3	9	2	3.0
K-10-0295	178.92	179.71	0.79	0.46	58.23	0.00	0.00	NQ	13	R3	4	2	8.0
K-10-0295	179.71	181.23	1.52	1.57	103.29	0.90	59.21	NQ	19	R4	7	2	2.0
K-10-0295	181.23	181.96	0.73	0.70	95.89	0.11	15.07	NQ	13	R4	4	2	2.0
K-10-0295	181.96	184.10	2.14	1.87	87.38	0.93	43.46	NQ			10		6.0
K-10-0295	184.10	185.01	0.91	0.80	87.91	0.00	0.00	NQ					
K-10-0295	185.01	186.23	1.22	1.12	91.80	0.00	0.00	NQ					
K-10-0295	186.23	187.15	0.92	0.49	53.26	0.00	0.00	NQ	11	R1	2	3	1.0
K-10-0295	187.15	188.06	0.91	0.73	80.22	0.11	12.09	NQ	13	R2	3	3	1.0
K-10-0295	188.06	190.20	2.14	1.30	60.75	0.00	0.00	NQ		R1	3	3	1.0
K-10-0295	190.20	191.11	0.91	0.80	87.91	0.62	68.13	NQ	14	R3	9	2	1.0
K-10-0295	191.11	192.94	1.83	1.70	92.90	1.47	80.33	NQ	25	R3	9	2	2.0
K-10-0295	192.94	194.17	1.23	1.05	85.37	0.42	34.15	NQ	18	R3	4	3	9.0
K-10-0295	194.17	197.21	3.04	2.77	91.12	1.37	45.07	NQ	30	R3	6	2	6.0
K-10-0295	197.21	199.95	2.74	2.59	94.53	1.14	41.61	NQ	25	R3	11	3	15.0
K-10-0295	199.95	200.25	0.30	0.40	133.33	0.30	100.00	NQ	2	R4	5	2	3.0
K-10-0295	200.25	202.35	2.10	2.20	104.76	0.89	42.38	NQ	32	R4	18	2	10.0
K-10-0295	202.35	203.30	0.95	0.59	62.11	0.15	15.79	NQ	16	R3	6	2	10.0
K-10-0295	203.30	204.70	1.40	1.24	88.57	0.18	12.86	NQ	32	R4	7	2	5.0
K-10-0295	204.70	206.35	1.65	1.65	100.00	0.30	18.18	NQ	42	R4	9	2	40.0
K-10-0295	206.35	207.14	0.79	0.46	58.23	0.00	0.00	NQ	13	R4	8	2	15.0
K-10-0295	207.14	209.40	2.26	1.39	61.50	0.35	15.49	NQ	34	R4	5	2	3.0
K-10-0295	209.40	210.01	0.61	0.49	80.33	0.00	0.00	NQ	20	R4	10	2	6.0
K-10-0295	210.01	212.32	2.31	1.93	83.55	0.63	27.27	NQ	43	R4	34	2	2.0
K-10-0295	212.32	212.45	0.13	0.13	100.00	0.13	100.00	NQ	3	R5	1	3	1.0
K-10-0295	212.45	214.88	2.43	2.24	92.18	1.05	43.21	NQ	38	R4	5	3	2.0
K-10-0295	214.88	215.49	0.61	0.61	100.00	0.00	0.00	NQ	44	R4	7	2	0.3
K-10-0295	215.49	216.10	0.61	0.51	83.61	0.28	45.90	NQ	6	R5	6	1	5.0
K-10-0295	216.10	217.20	1.10	0.85	77.27	0.72	65.45	NQ	4	R5	17	2	20.0
K-10-0295	217.20	218.54	1.34	1.24	92.54	1.02	76.12	NQ	12	R5	10	2	50.0
K-10-0295	218.54	221.59	3.05	2.97	97.38	1.89	61.97	NQ	34	R5	22	2	25.0

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0295	221.59	223.11	1.52	1.12	73.68	0.20	13.16	NQ	26	R4	7	2	2.0
K-10-0295	223.11	224.64	1.53	1.30	84.97	0.20	13.07	NQ	33	R4	5	2	5.0
K-10-0295	224.64	227.69	3.05	2.38	78.03	0.84	27.54	NQ	47	R4	5	2	1.0
K-10-0295	227.69	228.30	0.61	0.25	40.98	0.00	0.00	NQ	8	R4	2	2	10.0
K-10-0295	228.30	230.72	2.42	2.42	100.00	0.87	35.95	NQ	44	R4	10	2	20.0
K-10-0295	230.72	233.30	2.58	2.36	91.47	0.59	22.87	NQ	70	R3	13	1	3.0
K-10-0295	233.30	236.83	3.53	2.95	83.57	2.42	68.56	NQ	22	R3	22	2	1.0
K-10-0295	236.83	239.88	3.05	2.95	96.72	2.57	84.26	NQ	28	R5	2	1	20.0
K-10-0295	239.88	242.50	2.62	2.60	99.24	1.63	62.21	NQ	34	R6	3	2	2.0
K-10-0295	242.50	242.93	0.43	0.44	102.33	0.33	76.74	NQ	8	R5	0	1	0.0
K-10-0295	242.93	245.55	2.62	2.26	86.26	1.19	45.42	NQ	27	R5	4	1	5.0
K-10-0295	245.55	245.97	0.42	0.24	57.14	0.13	30.95	NQ	5	R3	0	1	0.0
K-10-0295	245.97	246.77	0.80	0.99	123.75	0.75	93.75	NQ	12	R4	1	2	3.0
K-10-0295	246.77	249.02	2.25	2.10	93.33	1.32	58.67	NQ	21	R4	5	2	3.0
K-10-0295	249.02	249.94	0.92	1.06	115.22	0.33	35.87	NQ	17	R5	3	1	2.0
K-10-0295	249.94	252.07	2.13	2.09	98.12	1.86	87.32	NQ	11	R6	0	1	0.0
K-10-0295	252.07	254.20	2.13	2.08	97.65	1.42	66.67	NQ	22	R4	6	1	4.0
K-10-0295	254.20	255.12	0.92	0.72	78.26	0.10	10.87	NQ	20	R3	0	1	0.0
K-10-0295	255.12	256.34	1.22	1.13	92.62	0.81	66.39	NQ	13	R4	2	1	20.0
K-10-0295	256.34	256.95	0.61	0.55	90.16	0.26	42.62	NQ	13	R5	0	1	0.0
K-10-0295	256.95	257.25	0.30	0.31	103.33	0.00	0.00	NQ	8	R4	0	1	0.0
K-10-0295	257.25	258.17	0.92	0.59	64.13	0.00	0.00	NQ	20	R4	1	1	5.0
K-10-0295	258.17	259.69	1.52	1.47	96.71	0.34	22.37	NQ	35	R4	3	2	3.0
K-10-0295	259.69	261.21	1.52	1.51	99.34	1.12	73.68	NQ	14	R5	4	2	2.0
K-10-0295	261.21	262.43	1.22	1.21	99.18	0.40	32.79	NQ	21	R4	3	2	2.0
K-10-0295	262.43	264.26	1.83	1.00	54.64	0.14	7.65	NQ	26	R4	2	2	3.0
K-10-0295	264.26	265.79	1.53	1.55	101.31	1.22	79.74	NQ	24	R4	0	1	0.0
K-10-0295	265.79	266.09	0.30	0.14	46.67	0.14	46.67	NQ	4	R5	0	1	0.0
K-10-0295	266.09	266.70	0.61	0.64	104.92	0.56	91.80	NQ	9	R5	2	1	2.0
K-10-0295	266.70	269.75	3.05	3.00	98.36	2.00	65.57	NQ	31	R6	8	1	5.0
K-10-0295	269.75	272.80	3.05	3.06	100.33	2.77	90.82	NQ	15	R5	4	1	3.0
K-10-0295	272.80	275.84	3.04	2.98	98.03	2.44	80.26	NQ	22	R4	3	2	2.0
K-10-0295	275.84	276.45	0.61	0.49	80.33	0.00	0.00	NQ	17	R3	0	1	0.0
K-10-0295	276.45	279.50	3.05	3.03	99.34	0.21	6.89	NQ	70	R3	2	3	1.0
K-10-0295	279.50	282.55	3.05	3.06	100.33	1.42	46.56	NQ	52	R4	6	2	5.0
K-10-0295	282.55	285.60	3.05	2.92	95.74	2.35	77.05	NQ	23	R5	14	1	15.0
K-10-0295	285.60	288.65	3.05	3.05	100.00	0.74	24.26	NQ	44	R3	4	2	5.0
K-10-0295	288.65	291.69	3.04	3.09	101.64	2.46	80.92	NQ	22	R5	6	2	3.0
K-10-0295	291.69	294.74	3.05	3.06	100.33	1.00	32.79	NQ	53	R4	1	1	2.0
K-10-0295	294.74	297.79	3.05	3.05	100.00	1.57	51.48	NQ	37	R5	1	1	1.0
K-10-0295	297.79	300.84	3.05	3.10	101.64	2.00	65.57	NQ	31	R4	6	1	20.0
K-10-0295	300.84	303.89	3.05	2.97	97.38	1.91	62.62	NQ	28	R5	2	1	1.0
K-10-0295	303.89	306.63	2.74	2.85	104.01	2.47	90.15	NQ	23	R5	12	1	20.0
K-10-0295	306.63	309.68	3.05	3.00	98.36	1.02	33.44	NQ	50	R3	6	2	5.0
K-10-0295	309.68	312.42	2.74	2.79	101.82	0.26	9.49	NQ	65	R3	2	2	2.0
K-10-0295	312.42	313.94	1.52	1.22	80.26	0.70	46.05	NQ	22	R3	3	2	3.0

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0298	2.13	12.56	CQTZT
K-10-0298	12.56	13.87	TQTZT
K-10-0298	13.87	26.86	CQTZT
K-10-0298	26.86	30.10	TQTZT
K-10-0298	30.10	34.14	QTZT
K-10-0298	34.14	36.39	TQTZT
K-10-0298	36.39	43.19	QTZT
K-10-0298	43.19	53.40	TQTZT
K-10-0298	53.40	58.67	CQTZT
K-10-0298	58.67	60.48	SSCH
K-10-0298	60.48	63.99	SSCH
K-10-0298	63.99	66.55	SSCH
K-10-0298	66.55	69.49	QTZT
K-10-0298	69.49	71.93	TQTZT
K-10-0298	71.93	80.01	QTZT
K-10-0298	80.01	84.37	GSCH
K-10-0298	84.37	93.87	QTZT
K-10-0298	93.87	96.67	SSCH
K-10-0298	96.67	100.11	QTZT
K-10-0298	100.11	101.56	TQTZT
K-10-0298	101.56	107.93	QTZT
K-10-0298	107.93	112.20	ICQS
K-10-0298	112.20	116.74	CQTZT
K-10-0298	116.74	121.16	ICQS
K-10-0298	121.16	126.92	CQTZT
K-10-0298	126.92	131.49	ICQS
K-10-0298	131.49	134.43	QTZT
K-10-0298	134.43	135.24	SM
K-10-0298	135.24	148.28	QTZT
K-10-0298	148.28	151.42	ICQS
K-10-0298	151.42	155.66	VM
K-10-0298	155.66	156.05	SM
K-10-0298	156.05	156.62	SSCH
K-10-0298	156.62	157.44	GSCH
K-10-0298	157.44	158.14	SM
K-10-0298	158.14	162.33	QTZT
K-10-0298	162.33	163.80	TQTZT
K-10-0298	163.80	166.31	GNST
K-10-0298	166.31	172.52	TQTZT
K-10-0298	172.52	175.52	SM
K-10-0298	175.52	177.88	CHSCH
K-10-0298	177.88	179.75	FLT
K-10-0298	179.75	184.56	ICQS
K-10-0298	184.56	186.04	QTZT
K-10-0298	186.04	189.00	ICQS
K-10-0298	189.00	192.14	TQTZT
K-10-0298	192.14	195.38	VL
K-10-0298	195.38	197.45	QTZT
K-10-0298	197.45	198.33	VL
K-10-0298	198.33	199.37	QTZT
K-10-0298	199.37	201.51	TQTZT
K-10-0298	201.51	204.34	ICQS
K-10-0298	204.34	206.50	QTZT
K-10-0298	206.50	220.68	TQTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0298	0.00	4.88	4.88	1.71	35.04	0.55	11.27	HQ	26	R6	0	1	0
K-10-0298	4.88	6.40	1.52	1.47	96.71	1.30	85.53	HQ	8	R6	0	1	0
K-10-0298	6.40	7.93	1.53	1.41	92.16	1.22	79.74	HQ	6	R6	0	1	0
K-10-0298	7.93	9.45	1.52	1.56	102.63	0.78	51.32	HQ	18	R5	0	1	0
K-10-0298	9.45	10.36	0.91	1.06	116.48	0.77	84.62	HQ	12	R5	0	1	0
K-10-0298	10.36	10.97	0.61	0.52	85.25	0.13	21.31	HQ	6	R5	0	1	0
K-10-0298	10.97	13.41	2.44	2.73	111.89	1.17	47.95	HQ	51	R4	3	3	2
K-10-0298	13.41	14.02	0.61	0.40	65.57	0.13	21.31	HQ	12	R4	0	1	0
K-10-0298	14.02	17.07	3.05	3.09	101.31	2.12	69.51	HQ	36	R5	3	2	4
K-10-0298	17.07	19.51	2.44	2.30	94.26	1.56	63.93	HQ	24	R6	1	2	2
K-10-0298	19.51	20.12	0.61	0.42	68.85	0.21	34.43	HQ	7	R5	1	2	20
K-10-0298	20.12	23.17	3.05	2.94	96.39	2.39	78.36	HQ	25	R6	1	1	2
K-10-0298	23.17	26.21	3.04	3.01	99.01	2.80	92.11	HQ	12	R6	1	1	1
K-10-0298	26.21	29.26	3.05	2.90	95.08	1.69	55.41	HQ	38	R4	2	1	4
K-10-0298	29.26	32.31	3.05	3.12	102.30	2.11	69.18	HQ	30	R6	2	1	4
K-10-0298	32.31	35.36	3.05	2.98	97.70	1.71	56.07	HQ	28	R4	1	2	2
K-10-0298	35.36	38.41	3.05	3.02	99.02	2.54	83.28	HQ	25	R4	1	2	5
K-10-0298	38.41	39.93	1.52	1.55	101.97	1.39	91.45	HQ	7	R6	0	1	0
K-10-0298	39.93	40.59	0.66	0.56	84.85	0.30	45.45	HQ	6	R5	0	1	0
K-10-0298	40.59	41.45	0.86	1.07	124.42	0.90	104.65	HQ	9	R5	1	1	2
K-10-0298	41.45	44.50	3.05	3.08	100.98	2.35	77.05	HQ	28	R5	1	1	1
K-10-0298	44.50	47.55	3.05	2.95	96.72	2.14	70.16	HQ	25	R4	2	2	1
K-10-0298	47.55	50.60	3.05	2.98	97.70	2.24	73.44	HQ	23	R4	4	2	2
K-10-0298	50.60	51.51	0.91	0.57	62.64	0.00	0.00	HQ	14	R4	0	1	0
K-10-0298	51.51	53.65	2.14	2.22	103.74	1.15	53.74	HQ	35	R4	1	2	2
K-10-0298	53.65	56.69	3.04	3.04	100.00	2.17	71.38	HQ	38	R5	1	1	1
K-10-0298	56.69	58.67	1.98	1.73	87.37	0.93	46.97	HQ	18	R5	0	1	0
K-10-0298	58.67	59.47	0.80	1.01	126.25	0.10	12.50	HQ	24	R4	1	1	2
K-10-0298	59.47	61.57	2.10	1.80	85.71	1.43	68.10	HQ	18	R4	1	1	2
K-10-0298	61.57	62.48	0.91	1.07	117.58	0.42	46.15	HQ	15	R4	1	1	1
K-10-0298	62.48	65.23	2.75	2.61	94.91	1.72	62.55	HQ	20	R4	3	2	2
K-10-0298	65.23	66.45	1.22	1.24	101.64	1.05	86.07	HQ	3	R5	4	1	6
K-10-0298	66.45	68.88	2.43	2.60	107.00	2.60	107.00	HQ	8	R5	5	1	5
K-10-0298	68.88	70.71	1.83	1.81	98.91	1.55	84.70	HQ	5	R5	2	2	5
K-10-0298	70.71	71.93	1.22	1.10	90.16	0.45	36.89	HQ	3	R4	3	3	3
K-10-0298	71.93	73.76	1.83	1.80	98.36	1.37	74.86	HQ	11	R4	2	2	5
K-10-0298	73.76	74.98	1.22	1.19	97.54	1.19	97.54	HQ	2	R6	1	1	2
K-10-0298	74.98	77.72	2.74	2.66	97.08	2.39	87.23	HQ	11	R6	2	2	1
K-10-0298	77.72	80.01	2.29	2.34	102.18	1.69	73.80	HQ	16	R5	0	1	0
K-10-0298	80.01	81.08	1.07	1.17	109.35	0.76	71.03	HQ	9	R3	0	1	0
K-10-0298	81.08	84.13	3.05	2.80	91.80	2.04	66.89	HQ	19	R3	4	3	2
K-10-0298	84.13	85.34	1.21	1.33	109.92	1.01	83.47	HQ	5	R5	1	1	1
K-10-0298	85.34	87.17	1.83	1.68	91.80	1.40	76.50	HQ	9	R5	0	1	0
K-10-0298	87.17	88.09	0.92	0.92	100.00	0.92	100.00	HQ	3	R5	0		0
K-10-0298	88.09	90.22	2.13	2.13	100.00	1.64	77.00	HQ	14	R5	1	1	1
K-10-0298	90.22	92.81	2.59	2.59	100.00	1.88	72.59	HQ	25	R5	0		0
K-10-0298	92.81	93.27	0.46	0.35	76.09	0.14	30.43	HQ	0	R5	0		0
K-10-0298	93.27	95.10	1.83	1.74	95.08	0.96	52.46	HQ	17	R4	0		0
K-10-0298	95.10	96.01	0.91	0.90	98.90	0.27	29.67	HQ	9	R4	1	1	2
K-10-0298	96.01	99.06	3.05	2.66	87.21	1.84	60.33	HQ	18	R6	2	1	3
K-10-0298	99.06	99.37	0.31	0.23	74.19	0.23	74.19	HQ	0	R6	0		0
K-10-0298	99.37	100.13	0.76	0.76	100.00	0.66	86.84	HQ	5	R6	0		0
K-10-0298	100.13	102.11	1.98	1.80	90.91	1.08	54.55	HQ	14	R4	2	2	2
K-10-0298	102.11	102.41	0.30	0.30	100.00	0.30	100.00	HQ	0	R5	1	2	20
K-10-0298	102.41	103.78	1.37	1.34	97.81	0.32	23.36	HQ	12	R5	3	2	5
K-10-0298	103.78	105.46	1.68	1.63	97.02	0.11	6.55	HQ	16	R4	2	2	3
K-10-0298	105.46	107.29	1.83	1.83	100.00	1.37	74.86	HQ	11	R5	3	1	2
K-10-0298	107.29	108.51	1.22	1.20	98.36	0.47	38.52	HQ	12	R4	3	2	2
K-10-0298	108.51	110.03	1.52	1.44	94.74	1.22	80.26	HQ	7	R3	0	1	0
K-10-0298	110.03	111.56	1.53	1.47	96.08	1.01	66.01	HQ	9	R3	0	1	0
K-10-0298	111.56	112.17	0.61	0.61	100.00	0.14	22.95	HQ	6	R3	0	1	0
K-10-0298	112.17	113.39	1.22	0.94	77.05	0.00	0.00	HQ	11	R5	0	1	0
K-10-0298	113.39	114.15	0.76	0.76	100.00	0.46	60.53	HQ	8	R4	0	1	0
K-10-0298	114.15	115.06	0.91	0.80	87.91	0.41	45.05	HQ	6	R4	0	1	0
K-10-0298	115.06	116.74	1.68	1.57	93.45	1.06	63.10	HQ	10	R5	2	1	2
K-10-0298	116.74	118.26	1.52	1.52	100.00	0.76	50.00	HQ	13	R3	2	2	3
K-10-0298	118.26	119.18	0.92	0.92	100.00	0.39	42.39	HQ	8	R3	1	1	1
K-10-0298	119.18	121.62	2.44	2.14	87.70	1.55	63.52	HQ	15	R3	1	3	2
K-10-0298	121.62	122.23	0.61	0.51	83.61	0.15	24.59	HQ	5	R5	0	1	0
K-10-0298	122.23	122.53	0.30	0.30	100.00	0.11	36.67	HQ	3	R5	0	1	0
K-10-0298	122.53	123.75	1.22	1.11	90.98	0.75	61.48	HQ	6	R5	0	1	0
K-10-0298	123.75	124.21	0.46	0.46	100.00	0.14	30.43	HQ	11	R4	0	1	0
K-10-0298	124.21	125.88	1.67	1.62	97.01	0.87	52.10	HQ	7	R4	0	1	0
K-10-0298	125.88	126.80	0.92	0.84	91.30	0.70	76.09	HQ	3	R5	0	1	0
K-10-0298	126.80	129.85	3.05	3.04	99.67	1.86	60.98	HQ	15	R3	0	1	0
K-10-0298	129.85	131.06	1.21	1.21	100.00	0.37	30.58	HQ	7	R3	0	1	0
K-10-0298	131.06	132.04	0.98	0.98	100.00	0.92	93.88	HQ	9	R4	1	1	1
K-10-0298	132.04	132.89	0.85	0.22	25.88	0.16	18.82	HQ	1	R5	1	1	1
K-10-0298	132.89	135.48	2.59	2.59	100.00	2.33	89.96	HQ	11	R6	5	1	4
K-10-0298	135.48	135.94	0.46	0.29	63.04	0.14	30.43	HQ	2	R6	0	1	0
K-10-0298	135.94	138.68	2.74	2.74	100.00	2.10	76.64	HQ	12	R6	0	1	0
K-10-0298	138.68	138.99	0.31	0.26	83.87	0.26	83.87	HQ	0	R6	0	1	0
K-10-0298	138.99	140.21	1.22	1.22	100.00	0.93	76.23	HQ	7	R6	0	1	0
K-10-0298	140.21	142.04	1.83	1.79	97.81	1.39	75.96	HQ	7	R6	0	1	0
K-10-0298	142.04	143.56	1.52	1.52	100.00	1.24	81.58	HQ	10	R6	0	1	0
K-10-0298	143.56	145.09	1.53	1.28	83.66	0.93	60.78	HQ	4	R6	0	1	0
K-10-0298	145.09	147.22	2.13	2.06	96.71	0.97	45.54	HQ	15	R4	1	2	1
K-10-0298	147.22	148.13	0.91	0.79	86.81	0.33	36.26	HQ	7	R6	0	1	0
K-10-0298	148.13	150.11	1.98	1.98	100.00	0.40	20.20	HQ	22	R4	1	2	1
K-10-0298	150.11	151.18	1.07	0.99	92.52	0.32	29.91	HQ	12	R4	2	2	1
K-10-0298	151.18	151.94	0.76	0.68	89.47	0.35	46.05	HQ	16	R2	0		0
K-10-0298	151.94	153.62	1.68	1.59	94.64	0.95	56.55	HQ	18	R3	3	2	30
K-10-0298	153.62	154.23	0.61	0.41	67.21	0.24	39.34	HQ	9	R2	0		0
K-10-0298	154.23	155.14	0.91	0.86	94.51	0.21	23.08	HQ	20	R2	3	1	2
K-10-0298	155.14	156.97	1.83	1.53	83.61	0.44	24.04	HQ	24	R3	4	2	3
K-10-0298	156.97	157.28	0.31	0.29	93.55	0.00	0.00	HQ	3	R4	0		0
K-10-0298	157.28	158.95	1.67	1.63	97.60	1.05	62.87	HQ	8	R6	3	2	1

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0298	158.95	160.33	1.38	1.24	89.86	0.96	69.57	HQ	6	R6	4	1	5
K-10-0298	160.33	161.54	1.21	1.29	106.61	0.72	59.50	HQ	11	R6	3	2	1
K-10-0298	161.54	163.07	1.53	1.39	90.85	0.80	52.29	HQ	10	R5	0		0
K-10-0298	163.07	163.32	0.25	0.16	64.00	0.00	0.00	HQ	4	R3	0		0
K-10-0298	163.32	163.98	0.66	0.62	93.94	0.11	16.67	HQ	10	R5	5	2	2
K-10-0298	163.98	165.81	1.83	1.61	87.98	0.78	42.62	HQ	18	R4	11	2	40
K-10-0298	165.81	166.42	0.61	0.52	85.25	0.34	55.74	HQ	5	R4	6	2	10
K-10-0298	166.42	168.10	1.68	1.40	83.33	0.47	27.98	HQ	23	R4	14	2	30
K-10-0298	168.10	169.47	1.37	1.32	96.35	0.20	14.60	HQ	18	R3	5	2	5
K-10-0298	169.47	170.84	1.37	1.41	102.92	0.54	39.42	HQ	21	R3	5	2	20
K-10-0298	170.84	172.52	1.68	1.38	82.14	0.57	33.93	HQ	19	R4	0		0
K-10-0298	172.52	175.41	2.89	2.73	94.46	0.83	28.72	HQ	32	R5	8	2	3
K-10-0298	175.41	176.48	1.07	0.39	36.45	0.00	0.00	HQ	16	R2	0		0
K-10-0298	176.48	178.00	1.52	0.97	63.82	0.00	0.00	HQ	36	R2	0		0
K-10-0298	178.00	178.61	0.61	0.28	45.90	0.00	0.00	HQ	9	R1	0		0
K-10-0298	178.61	180.14	1.53	1.46	95.42	0.23	15.03	HQ	32	R2	2	2	3
K-10-0298	180.14	181.66	1.52	1.28	84.21	0.15	9.87	HQ	36	R2	2	2	1
K-10-0298	181.66	183.49	1.83	1.83	100.00	0.00	0.00	HQ	42	R2	8	2	4
K-10-0298	183.49	184.71	1.22	1.01	82.79	0.21	17.21	HQ	20	R3	2	2	2
K-10-0298	184.71	185.93	1.22	1.22	100.00	0.26	21.31	HQ	37	R3	4	2	2
K-10-0298	185.93	186.54	0.61	0.56	91.80	0.00	0.00	HQ	11	R3	1	1	1
K-10-0298	186.54	187.45	0.91	0.79	86.81	0.00	0.00	HQ	28	R2	4	2	3
K-10-0298	187.45	187.76	0.31	0.28	90.32	0.00	0.00	HQ	10	R2	3	2	2
K-10-0298	187.76	188.37	0.61	0.53	86.89	0.00	0.00	HQ	11	R3	1	1	1
K-10-0298	188.37	190.04	1.67	1.52	91.02	0.30	17.96	HQ	25	R3	3	1	2
K-10-0298	190.04	190.81	0.77	0.58	75.32	0.27	35.06	HQ	17	R3	4	1	2
K-10-0298	190.81	193.24	2.43	1.89	77.78	0.73	30.04	HQ	36	R3	5	2	5
K-10-0298	193.24	193.85	0.61	0.39	63.93	0.00	0.00	HQ	16	R2	0		0
K-10-0298	193.85	195.07	1.22	1.11	90.98	0.26	21.31	HQ	35	R3	4	2	15
K-10-0298	195.07	195.38	0.31	0.24	77.42	0.00	0.00	HQ	4	R3	1	2	25
K-10-0298	195.38	195.53	0.15	0.12	80.00	0.00	0.00	HQ	5	R3	0		0
K-10-0298	195.53	196.90	1.37	1.17	85.40	0.80	58.39	HQ	15	R4	8	2	10
K-10-0298	196.90	199.03	2.13	2.11	99.06	0.65	30.52	HQ	23	R3	12	2	30
K-10-0298	199.03	199.95	0.92	0.82	89.13	0.21	22.83	HQ	19	R3	3	1	5
K-10-0298	199.95	201.17	1.22	1.22	100.00	0.55	45.08	HQ	18	R4	5	1	10
K-10-0298	201.17	202.84	1.67	1.42	85.03	0.43	25.75	HQ	25	R3	9	1	5
K-10-0298	202.84	204.22	1.38	1.36	98.55	0.66	47.83	HQ	26	R3	4	2	5
K-10-0298	204.22	206.05	1.83	1.63	89.07	1.13	61.75	HQ	19	R4	11	1	15
K-10-0298	206.05	206.50	0.45	0.38	84.44	0.13	28.89	HQ	5	R4	3	1	2
K-10-0298	206.50	207.42	0.92	0.86	93.48	0.21	22.83	HQ	13	R3	4	2	10
K-10-0298	207.42	209.09	1.67	1.45	86.83	0.68	40.72	HQ	17	R3	16	2	5
K-10-0298	209.09	209.40	0.31	0.24	77.42	0.00	0.00	HQ	9	R2	0		0
K-10-0298	209.40	211.68	2.28	2.23	97.81	0.81	35.53	HQ	17	R4	6	2	25
K-10-0298	211.68	212.14	0.46	0.26	56.52	0.00	0.00	HQ	5	R4	0		0
K-10-0298	212.14	213.66	1.52	1.49	98.03	0.41	26.97	HQ	20	R5	4	1	5
K-10-0298	213.66	215.19	1.53	1.35	88.24	0.32	20.92	HQ	19	R4	14	2	10
K-10-0298	215.19	215.80	0.61	0.60	98.36	0.11	18.03	HQ	17	R4	2	1	1
K-10-0298	215.80	217.37	1.57	1.50	95.54	0.53	33.76	HQ	18	R4	14	1	30
K-10-0298	217.37	218.24	0.87	0.83	95.40	0.12	13.79	HQ	12	R3	3	1	2
K-10-0298	218.24	220.37	2.13	2.07	97.18	0.75	35.21	HQ	23	R4	6	1	10
K-10-0298	220.37	220.67	0.30	0.28	93.33	0.10	33.33	HQ	2	R5	0		0

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0299	0.00	7.13	OVB
K-10-0299	7.13	15.77	ICQS
K-10-0299	15.77	18.67	GSCH
K-10-0299	18.67	21.28	ICQS
K-10-0299	21.28	22.10	SSCH
K-10-0299	22.10	26.93	TQTZT
K-10-0299	26.93	31.13	TQTZT
K-10-0299	31.13	32.26	QTZT
K-10-0299	32.26	35.45	QTZT
K-10-0299	35.45	39.36	TQTZT
K-10-0299	39.36	41.15	QTZT
K-10-0299	41.15	44.53	QTZT
K-10-0299	44.53	46.12	TQTZT
K-10-0299	46.12	48.82	ICQS
K-10-0299	48.82	50.71	QTZT
K-10-0299	50.71	52.37	TQTZT
K-10-0299	52.37	66.91	TQTZT
K-10-0299	66.91	74.68	ICQS
K-10-0299	74.68	78.84	QTZT
K-10-0299	78.84	81.02	TQTZT
K-10-0299	81.02	83.13	ICQS
K-10-0299	83.13	85.83	TQTZT
K-10-0299	85.83	92.59	QTZT
K-10-0299	92.59	96.72	TQTZT
K-10-0299	96.72	100.83	ICQS
K-10-0299	100.83	104.09	SSCH
K-10-0299	104.09	105.07	ICQS
K-10-0299	105.07	108.49	QTZT
K-10-0299	108.49	110.02	ICQS
K-10-0299	110.02	118.70	TQTZT
K-10-0299	118.70	120.81	QTZT
K-10-0299	120.81	128.11	TQTZT
K-10-0299	128.11	130.61	TQTZT
K-10-0299	130.61	138.86	QTZT
K-10-0299	138.86	139.82	ICQS
K-10-0299	139.82	142.58	SSCH
K-10-0299	142.58	151.57	ICQS
K-10-0299	151.57	154.99	TQTZT
K-10-0299	154.99	172.34	TQTZT
K-10-0299	172.34	173.41	TQTZT
K-10-0299	173.41	174.80	QTZT
K-10-0299	174.80	177.24	QTZT
K-10-0299	177.24	180.93	TQTZT
K-10-0299	180.93	181.62	ICQS
K-10-0299	181.62	186.78	QTZT
K-10-0299	186.78	187.68	ICQS
K-10-0299	187.68	188.62	ICQS
K-10-0299	188.62	190.95	QTZT
K-10-0299	190.95	192.36	QTZT
K-10-0299	192.36	198.68	ICQS
K-10-0299	198.68	199.64	QTZT
K-10-0299	199.64	201.30	TQTZT
K-10-0299	201.30	202.00	NR
K-10-0299	202.00	203.10	QTZT
K-10-0299	203.10	204.66	ICQS
K-10-0299	204.66	207.80	QTZT
K-10-0299	207.80	209.44	TQTZT
K-10-0299	209.44	213.44	TQTZT
K-10-0299	213.44	218.66	TQTZT
K-10-0299	218.66	219.96	TQTZT
K-10-0299	219.96	223.74	ICQS
K-10-0299	223.74	227.03	QTZT
K-10-0299	227.03	228.73	TQTZT
K-10-0299	228.73	229.56	ICQS
K-10-0299	229.56	231.36	ICQS
K-10-0299	231.36	235.06	TQTZT
K-10-0299	235.06	235.53	VL
K-10-0299	235.53	236.78	TQTZT
K-10-0299	236.78	237.66	VM
K-10-0299	237.66	239.46	VM
K-10-0299	239.46	241.43	VM
K-10-0299	241.43	242.22	VM
K-10-0299	242.22	242.75	SM
K-10-0299	242.75	243.29	VL
K-10-0299	243.29	243.85	SM
K-10-0299	243.85	245.36	SM
K-10-0299	245.36	246.61	SM
K-10-0299	246.61	247.18	SM
K-10-0299	247.18	247.68	VM
K-10-0299	247.68	248.41	VM

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0299	248.41	248.67	GNST
K-10-0299	248.67	256.20	TQTZT
K-10-0299	256.20	258.05	ICQS
K-10-0299	258.05	261.14	QTZT
K-10-0299	261.14	262.32	TQTZT
K-10-0299	262.32	266.30	GNST
K-10-0299	266.30	270.12	TQTZT
K-10-0299	270.12	270.96	ICQS
K-10-0299	270.96	271.84	TQTZT
K-10-0299	271.84	273.80	SM
K-10-0299	273.80	277.91	SM
K-10-0299	277.91	281.30	SM
K-10-0299	281.30	282.20	FLT
K-10-0299	282.20	282.76	QTZT
K-10-0299	282.76	285.46	ICQS
K-10-0299	285.46	286.03	QTZT
K-10-0299	286.03	286.51	ICQS
K-10-0299	286.51	287.03	TQTZT
K-10-0299	287.03	289.90	FLT
K-10-0299	289.90	291.00	SM
K-10-0299	291.00	292.44	SM
K-10-0299	292.44	293.47	SM
K-10-0299	293.47	294.18	ICQS
K-10-0299	294.18	295.70	SM
K-10-0299	295.70	296.29	ICQS
K-10-0299	296.29	297.37	SM
K-10-0299	297.37	298.17	ICQS
K-10-0299	298.17	298.63	TQTZT
K-10-0299	298.63	299.37	ICQS
K-10-0299	299.37	300.42	TQTZT
K-10-0299	300.42	302.83	QTZT
K-10-0299	302.83	305.39	TQTZT
K-10-0299	305.39	306.32	QTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0299	0.00	3.05	3.05	0.64	20.98	0.00	0.00	HTW	0	R0	0		
K-10-0299	3.05	4.57	1.52	0.37	24.34	0.00	0.00	HTW	0	R0	0		
K-10-0299	4.57	6.10	1.53	0.54	35.29	0.00	0.00	HTW	0	R0	0		
K-10-0299	6.10	7.62	1.52	0.62	40.79	0.49	32.24	HTW	3	R3	2	1	2
K-10-0299	7.62	9.14	1.52	1.52	100.00	1.38	90.79	HTW	9	R3	2	1	1
K-10-0299	9.14	10.67	1.53	1.45	94.77	1.40	91.50	HTW	9	R3	2	1	0.5
K-10-0299	10.67	12.19	1.52	1.10	72.37	0.57	37.50	HTW	18	R4	2	2	2
K-10-0299	12.19	13.72	1.53	1.52	99.35	0.73	47.71	HTW	29	R4	1	1	0.5
K-10-0299	13.72	15.24	1.52	1.43	94.08	0.74	48.68	NTW	22	R4	3	1	4
K-10-0299	15.24	16.76	1.52	1.27	83.55	0.00	0.00	NTW	34	R2	1	1	2
K-10-0299	16.76	18.26	1.50	1.33	88.67	0.22	14.67	NTW	43	R2	0		0
K-10-0299	18.26	19.81	1.55	1.52	98.06	0.84	54.19	NTW	21	R3	2	2	1
K-10-0299	19.81	21.34	1.53	1.49	97.39	1.22	79.74	NTW	13	R3	4	1	5
K-10-0299	21.34	22.86	1.52	1.52	100.00	1.00	65.79	NTW	20	R3	3	1	1
K-10-0299	22.86	24.38	1.52	1.52	100.00	1.33	87.50	NTW	16	R3	3	1	4
K-10-0299	24.38	25.91	1.53	1.41	92.16	1.16	75.82	NTW	14	R4	2	1	0.5
K-10-0299	25.91	27.43	1.52	1.49	98.03	1.02	67.11	NTW	23	R3	1	1	0.5
K-10-0299	27.43	28.96	1.53	1.52	99.35	0.53	34.64	NTW	31	R2	0		0
K-10-0299	28.96	30.48	1.52	1.46	96.05	0.47	30.92	NTW	16	R3	2	1	1
K-10-0299	30.48	32.00	1.52	1.12	73.68	0.34	22.37	NTW	25	R3	0		0
K-10-0299	32.00	33.53	1.53	1.45	94.77	0.78	50.98	NTW	18	R3	3	1	3
K-10-0299	33.53	35.05	1.52	1.37	90.13	0.77	50.66	NTW	15	R2	4	1	5
K-10-0299	35.05	36.58	1.53	1.41	92.16	0.84	54.90	NTW	16	R3	7	1	3
K-10-0299	36.58	38.10	1.52	1.35	88.82	0.89	58.55	NTW	10	R4	3	1	1
K-10-0299	38.10	39.62	1.52	1.52	100.00	0.97	63.82	NTW	12	R3	2	1	1
K-10-0299	39.62	41.15	1.53	1.48	96.73	0.92	60.13	NTW	9	R3	0		0
K-10-0299	41.15	42.67	1.52	1.43	94.08	1.14	75.00	NTW	9	R3	1	1	0.5
K-10-0299	42.67	44.20	1.53	1.50	98.04	1.20	78.43	NTW	8	R3	4	2	2
K-10-0299	44.20	45.72	1.52	1.46	96.05	0.67	44.08	NTW	16	R2	6	1	3
K-10-0299	45.72	47.24	1.52	1.31	86.18	0.32	21.05	NTW	37	R1	2	1	1
K-10-0299	47.24	48.77	1.53	1.49	97.39	0.76	49.67	NTW	20	R2	1	1	0.5
K-10-0299	48.77	50.29	1.52	1.48	97.37	0.34	22.37	NTW	15	R3	5	1	1
K-10-0299	50.29	51.82	1.53	1.47	96.08	0.62	40.52	NTW	27	R3	7	1	3
K-10-0299	51.82	53.34	1.52	1.33	87.50	0.59	38.82	NTW	25	R3	3	1	0.5
K-10-0299	53.34	54.86	1.52	1.42	93.42	0.71	46.71	NTW	19	R3	8	1	3
K-10-0299	54.86	56.39	1.53	1.21	79.08	0.25	16.34	NTW	26	R3	2	1	1
K-10-0299	56.39	57.91	1.52	1.41	92.76	0.76	50.00	NTW	22	R2	3	1	1
K-10-0299	57.91	59.44	1.53	1.44	94.12	0.43	28.10	NTW	23	R2	2	1	0.5
K-10-0299	59.44	60.96	1.52	1.24	81.58	0.71	46.71	NTW	14	R2	2	1	0.5
K-10-0299	60.96	62.48	1.52	1.33	87.50	0.76	50.00	NTW	28	R2	3	1	0.5
K-10-0299	62.48	64.01	1.53	1.50	98.04	0.28	18.30	NTW	21	R1	4	1	1
K-10-0299	64.01	65.53	1.52	1.52	100.00	0.28	18.42	NTW	36	R1	3	1	2
K-10-0299	65.53	67.06	1.53	1.39	90.85	0.59	38.56	NTW	27	R2	4	1	1
K-10-0299	67.06	68.58	1.52	1.33	87.50	0.55	36.18	NTW	21	R2	4	1	2
K-10-0299	68.58	70.10	1.52	1.49	98.03	1.18	77.63	NTW	12	R2	7	1	2
K-10-0299	70.10	71.63	1.53	1.30	84.97	0.45	29.41	NTW	13	R2	6	1	3
K-10-0299	71.63	73.15	1.52	1.46	96.05	0.96	63.16	NTW	8	R2	11	1	2
K-10-0299	73.15	74.68	1.53	1.34	87.58	0.17	11.11	NTW	39	R1	5	1	1
K-10-0299	74.68	76.20	1.52	1.10	72.37	0.35	23.03	NTW	31	R2	2	1	0.5
K-10-0299	76.20	77.72	1.52	0.61	40.13	0.00	0.00	NTW	0	R1	0		
K-10-0299	77.72	79.25	1.53	1.31	85.62	0.56	36.60	NTW	21	R3	3	1	1
K-10-0299	79.25	80.77	1.52	1.47	96.71	0.86	56.58	NTW	14	R3	5	1	2
K-10-0299	80.77	82.30	1.53	1.48	96.73	1.23	80.39	NTW	9	R3	4	1	1
K-10-0299	82.30	83.82	1.52	1.43	94.08	1.12	73.68	NTW	9	R3	11	2	5
K-10-0299	83.82	85.34	1.52	1.44	94.74	1.08	71.05	NTW	8	R4	5	2	2
K-10-0299	85.34	86.87	1.53	1.39	90.85	0.78	50.98	NTW	12	R4	3	1	1
K-10-0299	86.87	88.39	1.52	1.46	96.05	1.26	82.89	NTW	7	R4	6	1	4
K-10-0299	88.39	89.92	1.53	1.47	96.08	1.16	75.82	NTW	9	R4	3	1	2
K-10-0299	89.92	91.44	1.52	1.39	91.45	0.99	65.13	NTW	7	R4	4	1	2
K-10-0299	91.44	92.96	1.52	1.44	94.74	1.11	73.03	NTW	10	R4	15	1	20
K-10-0299	92.96	94.49	1.53	1.43	93.46	0.67	43.79	NTW	12	R4	1	1	0.5
K-10-0299	94.49	96.01	1.52	1.42	93.42	0.65	42.76	NTW	11	R4	6	1	3
K-10-0299	96.01	97.54	1.53	1.50	98.04	0.85	55.56	NTW	14	R3	8	1	5
K-10-0299	97.54	99.06	1.52	1.51	99.34	0.86	56.58	NTW	24	R3	14	1	7
K-10-0299	99.06	100.58	1.52	1.33	87.50	0.69	45.39	NTW	21	R2	12	1	3
K-10-0299	100.58	102.11	1.53	1.46	95.42	0.93	60.78	NTW	19	R3	16	1	5
K-10-0299	102.11	103.63	1.52	1.43	94.08	0.78	51.32	NTW	16	R3	5	1	8
K-10-0299	103.63	105.16	1.53	1.27	83.01	0.69	45.10	NTW	14	R3	4	1	2
K-10-0299	105.16	106.58	1.42	1.41	99.30	0.89	62.68	NTW	9	R4	8	1	4
K-10-0299	106.58	108.20	1.62	1.36	83.95	0.98	60.49	NTW	9	R4	4	1	2
K-10-0299	108.20	109.73	1.53	1.52	99.35	0.45	29.41	NTW	13	R3	5	1	2
K-10-0299	109.73	111.25	1.52	1.36	89.47	0.80	52.63	NTW	11	R4	6	1	3
K-10-0299	111.25	112.78	1.53	1.40	91.50	0.90	58.82	NTW	9	R5	5	1	2
K-10-0299	112.78	114.30	1.52	1.39	91.45	0.77	50.66	NTW	12	R5	6	2	2
K-10-0299	114.30	115.82	1.52	1.40	92.11	1.16	76.32	NTW	7	R5	5	2	5
K-10-0299	115.82	117.35	1.53	1.52	99.35	1.33	86.93	NTW	8	R4	2	2	2
K-10-0299	117.35	118.87	1.52	1.49	98.03	1.18	77.63	NTW	7	R4	8	2	5
K-10-0299	118.87	120.04	1.17	1.17	100.00	0.88	75.21	NTW	5	R5	2	1	2
K-10-0299	120.04	121.92	1.88	1.40	74.47	0.96	51.06	NTW	7	R4	5	1	3
K-10-0299	121.92	123.44	1.52	1.37	90.13	0.50	32.89	NTW	11	R5	25	2	1
K-10-0299	123.44	124.97	1.53	1.43	93.46	0.84	54.90	NTW	12	R5	5	1	4
K-10-0299	124.97	126.49	1.52	1.44	94.74	0.92	60.53	NTW	10	R3	7	2	5
K-10-0299	126.49	128.02	1.53	1.49	97.39	1.20	78.43	NTW	6	R5	7	1	20
K-10-0299	128.02	129.54	1.52	1.47	96.71	0.88	57.89	NTW	9	R5	12	2	30
K-10-0299	129.54	131.00	1.46	1.44	98.63	0.64	43.84	NTW	15	R5	7	2	40
K-10-0299	131.00	132.59	1.59	1.38	86.79	0.93	58.49	NTW	7	R6	3	1	5
K-10-0299	132.59	134.11	1.52	1.44	94.74	1.02	67.11	NTW	9	R6	6	2	7
K-10-0299	134.11	135.64	1.53	1.37	89.54	0.91	59.48	NTW	6	R4	13	2	25
K-10-0299	135.64	137.16	1.52	1.41	92.76	1.00	65.79	NTW	9	R5	10	2	40
K-10-0299	137.16	138.68	1.52	1.45	95.39	1.41	92.76	NTW	3	R6	2	2	1
K-10-0299	138.68	140.21	1.53	1.26	82.35	0.52	33.99	NTW	15	R4	6	1	10
K-10-0299	140.21	141.73	1.52	1.43	94.08	1.18	77.63	NTW	7	R5	18	1	20
K-10-0299	141.73	143.26	1.53	1.48	96.73	0.76	49.67	NTW	11	R3	8	2	8
K-10-0299	143.26	144.78	1.52	1.38	90.79	0.42	27.63	NTW	18	R3	9	1	5
K-10-0299	144.78	146.30	1.52	1.46	96.05	0.60	39.47	NTW	15	R3	5	2	5
K-10-0299	146.30	147.83	1.53	1.49	97.39	1.10	71.90	NTW	7	R3	4	2	20
K-10-0299	147.83	149.35	1.52	1.30	85.53	0.74	48.68	NTW	10	R3	7	1	10

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0299	149.35	150.88	1.53	1.29	84.31	0.19	12.42	NTW	26	R3	6	1	3
K-10-0299	150.88	152.40	1.52	1.38	90.79	1.26	82.89	NTW	8	R4	9	1	2
K-10-0299	152.40	153.92	1.52	1.42	93.42	0.55	36.18	NTW	13	R5	7	1	5
K-10-0299	153.92	155.45	1.53	1.36	88.89	0.91	59.48	NTW	9	R4	4	2	5
K-10-0299	155.45	156.97	1.52	1.49	98.03	0.56	36.84	NTW	11	R3	5	2	2
K-10-0299	156.97	158.50	1.53	1.37	89.54	0.86	56.21	NTW	14	R4	6	1	4
K-10-0299	158.50	160.02	1.52	1.38	90.79	0.87	57.24	NTW	10	R4	4	2	10
K-10-0299	160.02	161.54	1.52	1.40	92.11	0.90	59.21	NTW	11	R4	6	2	5
K-10-0299	161.54	163.07	1.53	1.33	86.93	0.74	48.37	NTW	11	R3	8	2	20
K-10-0299	163.07	164.59	1.52	1.29	84.87	0.61	40.13	NTW	16	R3	2	1	2
K-10-0299	164.59	166.12	1.53	1.44	94.12	0.33	21.57	NTW	24	R3	9	2	5
K-10-0299	166.12	167.64	1.52	1.32	86.84	0.12	7.89	NTW	27	R3	8	2	15
K-10-0299	167.64	169.16	1.52	1.20	78.95	0.27	17.76	NTW	29	R2	10	2	10
K-10-0299	169.16	170.69	1.53	1.40	91.50	0.59	38.56	NTW	20	R3	5	2	5
K-10-0299	170.69	172.21	1.52	1.42	93.42	0.75	49.34	NTW	19	R4	7	2	5
K-10-0299	172.21	173.74	1.53	1.24	81.05	0.67	43.79	NTW	14	R3	6	1	2
K-10-0299	173.74	175.26	1.52	1.40	92.11	0.97	63.82	NTW	8	R4	2	1	1
K-10-0299	175.26	176.78	1.52	1.22	80.26	0.48	31.58	NTW	13	R3	0		0
K-10-0299	176.78	178.31	1.53	1.47	96.08	0.22	14.38	NTW	21	R3	7	2	3
K-10-0299	178.31	179.83	1.52	1.37	90.13	0.81	53.29	NTW	17	R3	3	2	2
K-10-0299	179.83	181.36	1.53	1.48	96.73	0.53	34.64	NTW	15	R3	6	1	4
K-10-0299	181.36	182.88	1.52	1.41	92.76	0.69	45.39	NTW	13	R4	3	1	2
K-10-0299	182.88	184.40	1.52	1.43	94.08	1.07	70.39	NTW	4	R6	4	1	5
K-10-0299	184.40	185.93	1.53	1.51	98.69	1.10	71.90	NTW	12	R5	3	1	3
K-10-0299	185.93	187.45	1.52	1.46	96.05	0.65	42.76	NTW	10	R5	6	2	5
K-10-0299	187.45	188.98	1.53	1.47	96.08	1.11	72.55	NTW	11	R3	7	2	20
K-10-0299	188.98	190.50	1.52	1.41	92.76	1.01	66.45	NTW	10	R3	7	3	20
K-10-0299	190.50	192.02	1.52	1.19	78.29	0.61	40.13	NTW	27	R3	5	1	3
K-10-0299	192.02	193.55	1.53	1.46	95.42	1.03	67.32	NTW	9	R3	8	2	20
K-10-0299	193.55	195.07	1.52	1.41	92.76	0.53	34.87	NTW	32	R2	4	1	3
K-10-0299	195.07	196.60	1.53	1.38	90.20	0.00	0.00	NTW	36	R2	3	2	2
K-10-0299	196.60	198.12	1.52	1.36	89.47	0.81	53.29	NTW	10	R3	15	1	10
K-10-0299	198.12	199.64	1.52	1.19	78.29	0.47	30.92	NTW	18	R3	5	2	10
K-10-0299	199.64	201.17	1.53	1.21	79.08	0.12	7.84	NTW	33	R2	2	2	2
K-10-0299	201.17	202.69	1.52	0.83	54.61	0.00	0.00	NTW	25	R2	1	1	2
K-10-0299	202.69	204.22	1.53	1.46	95.42	1.21	79.08	NTW	8	R3	6	2	5
K-10-0299	204.22	205.74	1.52	1.37	90.13	0.76	50.00	NTW	6	R4	4	1	10
K-10-0299	205.74	207.26	1.52	1.47	96.71	0.57	37.50	NTW	7	R5	14	2	15
K-10-0299	207.26	208.79	1.53	1.09	71.24	0.21	13.73	NTW	31	R3	10	2	10
K-10-0299	208.79	210.31	1.52	1.37	90.13	0.73	48.03	NTW	13	R4	1	1	1
K-10-0299	210.31	211.84	1.53	1.36	88.89	0.68	44.44	NTW	12	R4	1	1	2
K-10-0299	211.84	213.36	1.52	1.14	75.00	0.00	0.00	NTW	33	R3	2	1	2
K-10-0299	213.36	214.88	1.52	1.52	100.00	0.27	17.76	NTW	44	R2	1	1	1
K-10-0299	214.88	216.41	1.53	1.47	96.08	0.98	64.05	NTW	17	R3	6	2	2
K-10-0299	216.41	217.93	1.52	1.39	91.45	0.56	36.84	NTW	18	R3	4	2	2
K-10-0299	217.93	219.46	1.53	1.58	103.27	0.31	20.26	NTW	40	R3	4	1	1
K-10-0299	219.46	220.98	1.52	1.47	96.71	0.62	40.79	NTW	25	R4	15	2	15
K-10-0299	220.98	222.50	1.52	1.48	97.37	0.16	10.53	NTW	31	R2	5	2	5
K-10-0299	222.50	224.03	1.53	1.31	85.62	0.20	13.07	NTW	38	R3	3	2	5
K-10-0299	224.03	225.55	1.52	1.02	67.11	0.38	25.00	NTW	23	R3	2	2	2
K-10-0299	225.55	227.08	1.53	1.33	86.93	0.61	39.87	NTW	27	R3	4	1	2
K-10-0299	227.08	228.60	1.52	1.45	95.39	0.25	16.45	NTW	21	R3	1	1	1
K-10-0299	228.60	230.12	1.52	1.40	92.11	0.62	40.79	NTW	17	R3	6	1	5
K-10-0299	230.12	231.65	1.53	1.46	95.42	0.51	33.33	NTW	13	R3	4	2	2
K-10-0299	231.65	233.17	1.52	1.43	94.08	0.68	44.74	NTW	17	R4	6	1	1
K-10-0299	233.17	234.70	1.53	1.36	88.89	0.22	14.38	NTW	20	R4	5	2	5
K-10-0299	234.70	236.22	1.52	1.37	90.13	0.38	25.00	NTW	21	R4	7	1	20
K-10-0299	236.22	237.44	1.22	1.22	100.00	0.82	67.21	NTW	21	R5	6	2	40
K-10-0299	237.44	239.27	1.83	1.48	80.87	1.43	78.14	NTW	5	R5	13	2	70
K-10-0299	239.27	240.79	1.52	1.50	98.68	1.50	98.68	NTW	3	R5	11	2	70
K-10-0299	240.79	242.32	1.53	1.49	97.39	1.03	67.32	NTW	6	R4	14	2	70
K-10-0299	242.32	243.84	1.52	1.49	98.03	1.34	88.16	NTW	5	R5	8	2	50
K-10-0299	243.84	245.36	1.52	1.48	97.37	1.28	84.21	NTW	2	R5	15	2	40
K-10-0299	245.36	246.89	1.53	1.44	94.12	1.23	80.39	NTW	6	R5	5	1	10
K-10-0299	246.89	248.41	1.52	1.31	86.18	0.97	63.82	NTW	9	R4	8	2	25
K-10-0299	248.41	249.94	1.53	1.50	98.04	0.86	56.21	NTW	15	R4	6	1	10
K-10-0299	249.94	251.46	1.52	1.44	94.74	1.07	70.39	NTW	10	R5	7	2	10
K-10-0299	251.46	252.98	1.52	1.45	95.39	1.17	76.97	NTW	12	R5	5	1	5
K-10-0299	252.98	254.51	1.53	1.46	95.42	0.98	64.05	NTW	15	R4	5	1	2
K-10-0299	254.51	256.03	1.52	1.41	92.76	0.71	46.71	NTW	14	R4	2	2	1
K-10-0299	256.03	257.56	1.53	1.47	96.08	0.52	33.99	NTW	22	R3	11	2	5
K-10-0299	257.56	259.08	1.52	1.42	93.42	0.57	37.50	NTW	21	R3	5	1	5
K-10-0299	259.08	260.60	1.52	1.40	92.11	1.00	65.79	NTW	9	R5	2	1	1
K-10-0299	260.60	262.13	1.53	1.44	94.12	1.08	70.59	NTW	10	R4	8	2	5
K-10-0299	262.13	263.65	1.52	1.52	100.00	1.40	92.11	NTW	3	R6	0		0
K-10-0299	263.65	265.18	1.53	1.41	92.16	1.15	75.16	NTW	2	R6	2	1	1
K-10-0299	265.18	266.70	1.52	1.49	98.03	1.10	72.37	NTW	7	R6	8	2	10
K-10-0299	266.70	268.22	1.52	1.44	94.74	0.71	46.71	NTW	11	R5	4	2	5
K-10-0299	268.22	269.75	1.53	1.25	81.70	0.83	54.25	NTW	12	R5	7	2	10
K-10-0299	269.75	271.27	1.52	1.41	92.76	0.66	43.42	NTW	11	R4	7	1	5
K-10-0299	271.27	272.80	1.53	1.36	88.89	0.63	41.18	NTW	9	R5	6	2	5
K-10-0299	272.80	274.32	1.52	1.31	86.18	0.80	52.63	NTW	12	R4	6	2	7
K-10-0299	274.32	275.84	1.52	1.40	92.11	0.46	30.26	NTW	9	R4	5	1	5
K-10-0299	275.84	277.37	1.53	1.28	83.66	1.12	73.20	NTW	20	R4	5	1	2
K-10-0299	277.37	278.89	1.52	1.42	93.42	0.26	17.11	NTW	16	R3	10	2	10
K-10-0299	278.89	280.42	1.53	1.47	96.08	0.69	45.10	NTW	12	R4	11	1	20
K-10-0299	280.42	281.94	1.52	1.50	98.68	0.58	38.16	NTW	16	R3	5	2	5
K-10-0299	281.94	283.46	1.52	1.30	85.53	0.41	26.97	NTW	31	R3	8	2	15
K-10-0299	283.46	284.99	1.53	1.44	94.12	0.42	27.45	NTW	22	R3	16	1	15
K-10-0299	284.99	286.31	1.32	1.32	100.00	0.51	38.64	NTW	21	R3	8	1	5
K-10-0299	286.31	288.04	1.73	1.43	82.66	0.11	6.36	NTW	32	R2	12	2	20
K-10-0299	288.04	289.56	1.52	1.15	75.66	0.00	0.00	NTW	44	R2	5	2	5
K-10-0299	289.56	291.08	1.52	1.52	100.00	0.68	44.74	NTW	34	R3	10	2	10
K-10-0299	291.08	292.61	1.53	1.39	90.85	0.65	42.48	NTW	12	R4	19	2	40
K-10-0299	292.61	294.13	1.52	1.50	98.68	0.98	64.47	NTW	9	R5	11	1	15
K-10-0299	294.13	295.66	1.53	1.45	94.77	0.52	33.99	NTW	18	R4	15	2	20
K-10-0299	295.66	297.18	1.52	1.41	92.76	0.82	53.95	NTW	11	R4	10	1	20

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0299	297.18	298.70	1.52	1.50	98.68	0.56	36.84	NTW	17	R4	9	1	10
K-10-0299	298.70	300.23	1.53	1.41	92.16	0.44	28.76	NTW	20	R3	13	1	5
K-10-0299	300.23	301.75	1.52	1.43	94.08	1.16	76.32	NTW	5	R5	4	2	2
K-10-0299	301.75	303.28	1.53	1.52	99.35	1.11	72.55	NTW	4	R6	5	2	10
K-10-0299	303.28	304.80	1.52	1.40	92.11	0.85	55.92	NTW	10	R5	5	1	5
K-10-0299	304.80	306.32	1.52	1.34	88.16	0.86	56.58	NTW	14	R5	9	1	5

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0303	0.00	4.70	OVB
K-10-0303	4.70	11.52	ICQS
K-10-0303	11.52	14.32	GSCH
K-10-0303	14.32	15.29	SSCH
K-10-0303	15.29	17.58	ICQS
K-10-0303	17.58	19.43	SSCH
K-10-0303	19.43	28.37	TQTZT
K-10-0303	28.37	35.43	QTZT
K-10-0303	35.43	39.47	TQTZT
K-10-0303	39.47	43.77	ICQS
K-10-0303	43.77	48.99	TQTZT
K-10-0303	48.99	52.85	QTZT
K-10-0303	52.85	61.47	TQTZT
K-10-0303	61.47	69.05	ICQS
K-10-0303	69.05	74.56	TQTZT
K-10-0303	74.56	76.21	ICQS
K-10-0303	76.21	85.62	QTZT
K-10-0303	85.62	90.00	TQTZT
K-10-0303	90.00	94.32	ICQS
K-10-0303	94.32	96.66	SSCH
K-10-0303	96.66	97.43	ICQS
K-10-0303	97.43	99.05	SSCH
K-10-0303	99.05	100.77	ICQS
K-10-0303	100.77	123.90	TQTZT
K-10-0303	123.90	130.33	QTZT
K-10-0303	130.33	133.59	TQTZT
K-10-0303	133.59	134.58	GSCH
K-10-0303	134.58	136.35	SSCH
K-10-0303	136.35	138.30	TQTZT
K-10-0303	138.30	141.72	QTZT
K-10-0303	141.72	143.50	ICQS
K-10-0303	143.50	154.90	TQTZT
K-10-0303	154.90	157.18	FLT
K-10-0303	157.18	161.48	TQTZT
K-10-0303	161.48	166.60	QTZT
K-10-0303	166.60	170.21	TQTZT
K-10-0303	170.21	171.20	TQTZT
K-10-0303	171.20	173.09	FLT
K-10-0303	173.09	175.64	QTZT
K-10-0303	175.64	176.21	FLT
K-10-0303	176.21	177.31	QTZT
K-10-0303	177.31	184.81	GNST
K-10-0303	184.81	188.85	QTZT
K-10-0303	188.85	190.74	ICQS
K-10-0303	190.74	196.62	QTZT
K-10-0303	196.62	204.33	TQTZT
K-10-0303	204.33	209.09	MCQ
K-10-0303	209.09	212.65	TQTZT
K-10-0303	212.65	213.81	ICQS
K-10-0303	213.81	217.76	TQTZT
K-10-0303	217.76	221.78	ICQS
K-10-0303	221.78	224.97	QTZT
K-10-0303	224.97	227.06	ICQS
K-10-0303	227.06	230.09	TQTZT
K-10-0303	230.09	236.58	QTZT
K-10-0303	236.58	239.77	TQTZT
K-10-0303	239.77	280.30	GNST
K-10-0303	280.30	287.15	SM
K-10-0303	287.15	288.43	VM
K-10-0303	288.43	295.60	SM
K-10-0303	295.60	301.37	SM
K-10-0303	301.37	302.15	SM
K-10-0303	302.15	303.66	VM
K-10-0303	303.66	306.15	FLT
K-10-0303	306.15	307.60	QTZT
K-10-0303	307.60	310.56	ICQS
K-10-0303	310.56	312.63	QTZT
K-10-0303	312.63	315.39	ICQS
K-10-0303	315.39	317.25	QTZT
K-10-0303	317.25	318.41	ICQS
K-10-0303	318.41	327.06	QTZT
K-10-0303	327.06	329.58	QTZT
K-10-0303	329.58	330.84	ICQS
K-10-0303	330.84	332.47	QTZT
K-10-0303	332.47	334.39	TQTZT
K-10-0303	334.39	335.71	GSCH
K-10-0303	335.71	338.60	QTZT
K-10-0303	338.60	339.06	ICQS
K-10-0303	339.06	340.84	QTZT
K-10-0303	340.84	342.30	TQTZT

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0303	342.30	343.30	ICQS
K-10-0303	343.30	345.48	ICQS
K-10-0303	345.48	346.72	QTZT
K-10-0303	346.72	348.08	ICQS

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0303	0.00	4.57	4.57	1.65	36.11	0.32	7.00	HTW					
K-10-0303	4.57	6.10	1.53	1.74	113.73	0.91	59.48	HTW					
K-10-0303	6.10	7.62	1.52	1.58	103.95	0.94	61.84	HTW					
K-10-0303	7.62	9.14	1.52	1.66	109.21	0.86	56.58	HTW					
K-10-0303	9.14	10.67	1.53	1.23	80.39	0.35	22.88	HTW					
K-10-0303	10.67	12.19	1.52	1.34	88.16	0.00	0.00	HTW					
K-10-0303	12.19	13.72	1.53	1.23	80.39	0.00	0.00	HTW					
K-10-0303	13.72	15.24	1.52	1.50	98.68	0.20	13.16	HTW					
K-10-0303	15.24	16.76	1.52	1.44	94.74	0.44	28.95	HTW					
K-10-0303	16.76	18.29	1.53	1.38	90.20	0.59	38.56	HTW					
K-10-0303	18.29	19.81	1.52	1.26	82.89	0.51	33.55	HTW					
K-10-0303	19.81	21.34	1.53	1.19	77.78	0.29	18.95	NTW					
K-10-0303	21.34	22.86	1.52	1.22	80.26	0.24	15.79	NTW					
K-10-0303	22.86	24.38	1.52	1.38	90.79	0.91	59.87	NTW					
K-10-0303	24.38	25.91	1.53	1.37	89.54	1.19	77.78	NTW					
K-10-0303	25.91	27.43	1.52	1.43	94.08	1.41	92.76	NTW					
K-10-0303	27.43	28.96	1.53	1.40	91.50	0.39	25.49	NTW					
K-10-0303	28.96	30.48	1.52	1.46	96.05	0.89	58.55	NTW					
K-10-0303	30.48	33.53	3.05	2.87	94.10	1.65	54.10	NTW					
K-10-0303	33.53	36.58	3.05	2.54	83.28	1.08	35.41	NTW					
K-10-0303	36.58	39.62	3.04	2.86	94.08	1.38	45.39	NTW					
K-10-0303	39.62	42.67	3.05	2.47	80.98	1.53	50.16	NTW					
K-10-0303	42.67	45.72	3.05	2.35	77.05	0.57	18.69	NTW					
K-10-0303	45.72	48.77	3.05	1.93	63.28	0.00	0.00	NTW					
K-10-0303	48.77	51.82	3.05	2.56	83.93	1.48	48.52	NTW					
K-10-0303	51.82	54.86	3.04	2.52	82.89	0.81	26.64	NTW					
K-10-0303	54.86	57.91	3.05	2.57	84.26	0.74	24.26	NTW					
K-10-0303	57.91	60.96	3.05	2.44	80.00	0.57	18.69	NTW					
K-10-0303	60.96	62.48	1.52	1.34	88.16	0.51	33.55	NTW					
K-10-0303	62.48	65.53	3.05	2.86	93.77	0.64	20.98	NTW					
K-10-0303	65.53	68.58	3.05	2.79	91.48	0.82	26.89	NTW					
K-10-0303	68.58	71.63	3.05	2.93	96.07	0.19	6.23	NTW					
K-10-0303	71.63	74.68	3.05	2.89	94.75	0.80	26.23	NTW					
K-10-0303	74.68	77.72	3.04	2.88	94.74	0.97	31.91	NTW					
K-10-0303	77.72	80.77	3.05	3.05	100.00	2.79	91.48	NTW					
K-10-0303	80.77	83.82	3.05	2.88	94.43	2.01	65.90	NTW					
K-10-0303	83.82	85.34	1.52	1.46	96.05	1.18	77.63	NTW					
K-10-0303	85.34	88.39	3.05	2.42	79.34	1.52	49.84	NTW					
K-10-0303	88.39	91.44	3.05	2.21	72.46	0.54	17.70	NTW					
K-10-0303	91.44	94.49	3.05	2.41	79.02	0.59	19.34	NTW					
K-10-0303	94.49	97.54	3.05	2.63	86.23	0.88	28.85	NTW					
K-10-0303	97.54	100.58	3.04	2.81	92.43	1.21	39.80	NTW					
K-10-0303	100.58	103.63	3.05	2.64	86.56	1.23	40.33	NTW					
K-10-0303	103.63	106.68	3.05	2.98	97.70	2.31	75.74	NTW					
K-10-0303	106.68	109.73	3.05	2.86	93.77	2.14	70.16	NTW					
K-10-0303	109.73	112.78	3.05	2.75	90.16	2.17	71.15	NTW					
K-10-0303	112.78	115.82	3.04	2.80	92.11	1.49	49.01	NTW					
K-10-0303	115.82	118.87	3.05	3.04	99.67	1.87	61.31	NTW					
K-10-0303	118.87	120.40	1.53	1.28	83.66	1.13	73.86	NTW					
K-10-0303	120.40	121.92	1.52	1.47	96.71	0.96	63.16	NTW					
K-10-0303	121.92	124.97	3.05	2.71	88.85	1.83	60.00	NTW					
K-10-0303	124.97	126.49	1.52	1.36	89.47	1.29	84.87	NTW					
K-10-0303	126.49	128.02	1.53	1.47	96.08	1.08	70.59	NTW					
K-10-0303	128.02	129.54	1.52	1.32	86.84	0.81	53.29	NTW					
K-10-0303	129.54	132.59	3.05	2.47	80.98	1.23	40.33	NTW					
K-10-0303	132.59	134.11	1.52	1.32	86.84	0.57	37.50	NTW					
K-10-0303	134.11	137.16	3.05	2.84	93.11	1.94	63.61	NTW					
K-10-0303	137.16	140.21	3.05	2.96	97.05	1.80	59.02	NTW					
K-10-0303	140.21	143.26	3.05	2.99	98.03	2.27	74.43	NTW					
K-10-0303	143.26	146.30	3.04	2.95	97.04	2.58	84.87	NTW					
K-10-0303	146.30	149.35	3.05	2.68	87.87	1.84	60.33	NTW					
K-10-0303	149.35	150.88	1.53	1.36	88.89	0.91	59.48	NTW					
K-10-0303	150.88	153.92	3.04	2.47	81.25	1.63	53.62	NTW					
K-10-0303	153.92	155.45	1.53	0.68	44.44	0.00	0.00	NTW					
K-10-0303	155.45	156.97	1.52	0.79	51.97	0.13	8.55	NTW					
K-10-0303	156.97	160.02	3.05	2.85	93.44	2.24	73.44	NTW					
K-10-0303	160.02	163.07	3.05	3.05	100.00	2.67	87.54	NTW					
K-10-0303	163.07	164.59	1.52	1.39	91.45	1.07	70.39	NTW					
K-10-0303	164.59	167.64	3.05	2.78	91.15	1.86	60.98	NTW					
K-10-0303	167.64	170.69	3.05	2.67	87.54	1.38	45.25	NTW					
K-10-0303	170.69	173.74	3.05	2.62	85.90	1.04	34.10	NTW					
K-10-0303	173.74	176.78	3.04	2.70	88.82	1.12	36.84	NTW					
K-10-0303	176.78	179.83	3.05	3.00	98.36	2.43	79.67	NTW					
K-10-0303	179.83	182.88	3.05	3.00	98.36	2.50	81.97	NTW					
K-10-0303	182.88	185.93	3.05	3.05	100.00	2.32	76.07	NTW					
K-10-0303	185.93	188.98	3.05	3.00	98.36	2.31	75.74	NTW					
K-10-0303	188.98	192.02	3.04	3.00	98.68	1.14	37.50	NTW					
K-10-0303	192.02	195.07	3.05	2.95	96.72	2.63	86.23	NTW					
K-10-0303	195.07	198.12	3.05	3.03	99.34	1.87	61.31	NTW					
K-10-0303	198.12	201.17	3.05	3.05	100.00	2.01	65.90	NTW					
K-10-0303	201.17	204.22	3.05	2.89	94.75	1.60	52.46	NTW					
K-10-0303	204.22	207.26	3.04	2.87	94.41	0.22	7.24	NTW					
K-10-0303	207.26	210.31	3.05	2.81	92.13	0.89	29.18	NTW					
K-10-0303	210.31	213.36	3.05	2.77	90.82	1.21	39.67	NTW					
K-10-0303	213.36	214.88	1.52	1.52	100.00	0.34	22.37	NTW					
K-10-0303	214.88	216.41	1.53	1.54	100.65	0.95	62.09	NTW					
K-10-0303	216.41	219.46	3.05	2.82	92.46	0.91	29.84	NTW					
K-10-0303	219.46	222.50	3.04	2.65	87.17	1.34	44.08	NTW					
K-10-0303	222.50	224.03	1.53	1.30	84.97	0.85	55.56	NTW					
K-10-0303	224.03	225.55	1.52	1.64	107.89	1.26	82.89	NTW					
K-10-0303	225.55	228.60	3.05	3.05	100.00	1.19	39.02	NTW					
K-10-0303	228.60	231.65	3.05	2.98	97.70	1.52	49.84	NTW					
K-10-0303	231.65	234.70	3.05	3.00	98.36	3.00	98.36	NTW					
K-10-0303	234.70	237.74	3.04	3.04	100.00	1.80	59.21	NTW					
K-10-0303	237.74	240.79	3.05	2.71	88.85	1.28	41.97	NTW					
K-10-0303	240.79	243.84	3.05	3.01	98.69	2.55	83.61	NTW					
K-10-0303	243.84	246.89	3.05	2.99	98.03	2.67	87.54	NTW					

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0303	246.89	249.94	3.05	3.02	99.02	2.21	72.46	NTW					
K-10-0303	249.94	251.46	1.52	1.41	92.76	0.73	48.03	NTW					
K-10-0303	251.46	252.98	1.52	1.49	98.03	1.31	86.18	NTW					
K-10-0303	252.98	256.03	3.05	3.05	100.00	2.30	75.41	NTW					
K-10-0303	256.03	259.08	3.05	2.93	96.07	2.45	80.33	NTW					
K-10-0303	259.08	262.13	3.05	2.88	94.43	2.58	84.59	NTW					
K-10-0303	262.13	265.18	3.05	2.90	95.08	2.29	75.08	NTW					
K-10-0303	265.18	268.22	3.04	2.85	93.75	1.89	62.17	NTW					
K-10-0303	268.22	271.27	3.05	2.55	83.61	1.96	64.26	NTW					
K-10-0303	271.27	274.32	3.05	2.86	93.77	1.41	46.23	NTW					
K-10-0303	274.32	277.37	3.05	2.94	96.39	1.77	58.03	NTW					
K-10-0303	277.37	280.42	3.05	2.87	94.10	0.14	4.59	NTW					
K-10-0303	280.42	283.46	3.04	2.97	97.70	2.53	83.22	NTW					
K-10-0303	283.46	286.51	3.05	2.68	87.87	1.81	59.34	NTW					
K-10-0303	286.51	289.56	3.05	3.00	98.36	2.23	73.11	NTW					
K-10-0303	289.56	292.61	3.05	2.87	94.10	1.91	62.62	NTW					
K-10-0303	292.61	295.66	3.05	2.98	97.70	2.57	84.26	NTW					
K-10-0303	295.66	298.70	3.04	2.81	92.43	2.03	66.78	NTW					
K-10-0303	298.70	301.75	3.05	2.80	91.80	1.55	50.82	NTW					
K-10-0303	301.75	303.28	1.53	1.52	99.35	0.93	60.78	NTW					
K-10-0303	303.28	304.80	1.52	1.14	75.00	0.53	34.87	NTW					
K-10-0303	304.80	306.32	1.52	1.50	98.68	0.17	11.18	NTW					
K-10-0303	306.32	309.37	3.05	2.76	90.49	0.47	15.41	NTW					
K-10-0303	309.37	310.90	1.53	1.27	83.01	0.00	0.00	NTW					
K-10-0303	310.90	313.94	3.04	3.02	99.34	0.68	22.37	NTW					
K-10-0303	313.94	315.47	1.53	1.32	86.27	0.13	8.50	NTW					
K-10-0303	315.47	316.99	1.52	1.56	102.63	0.26	17.11	NTW					
K-10-0303	316.99	320.04	3.05	2.90	95.08	0.51	16.72	NTW					
K-10-0303	320.04	321.56	1.52	1.51	99.34	0.00	0.00	NTW					
K-10-0303	321.56	323.09	1.53	1.41	92.16	0.51	33.33	NTW					
K-10-0303	323.09	324.61	1.52	1.67	109.87	0.94	61.84	NTW					
K-10-0303	324.61	327.66	3.05	2.88	94.43	1.38	45.25	NTW					
K-10-0303	327.66	329.18	1.52	1.52	100.00	0.34	22.37	NTW					
K-10-0303	329.18	330.71	1.53	1.18	77.12	0.44	28.76	NTW					
K-10-0303	330.71	333.76	3.05	3.05	100.00	1.10	36.07	NTW					
K-10-0303	333.76	336.80	3.04	2.90	95.39	1.40	46.05	NTW					
K-10-0303	336.80	338.33	1.53	1.53	100.00	0.84	54.90	NTW					
K-10-0303	338.33	339.85	1.52	1.52	100.00	1.21	79.61	NTW					
K-10-0303	339.85	342.90	3.05	3.02	99.02	1.19	39.02	NTW					
K-10-0303	342.90	345.95	3.05	2.30	75.41	0.51	16.72	NTW					
K-10-0303	345.95	347.47	1.52	1.42	93.42	0.13	8.55	NTW					
K-10-0303	347.47	348.07	0.60	0.61	101.67	0.00	0.00	NTW					

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0304	0.00	22.46	QTZT
K-10-0304	22.46	25.60	ICQS
K-10-0304	25.60	30.20	QTZT
K-10-0304	30.20	31.24	ICQS
K-10-0304	31.24	31.90	TQTZT
K-10-0304	31.90	38.28	QTZT
K-10-0304	38.28	42.34	ICQS
K-10-0304	42.34	47.24	TQTZT
K-10-0304	47.24	52.25	QTZT
K-10-0304	52.25	52.90	TQTZT
K-10-0304	52.90	58.99	SSCH
K-10-0304	58.99	66.14	QTZT
K-10-0304	66.14	66.90	TQTZT
K-10-0304	66.90	69.74	QTZT
K-10-0304	69.74	73.30	ICQS
K-10-0304	73.30	78.28	QTZT
K-10-0304	78.28	79.15	TQTZT
K-10-0304	79.15	80.70	CHSCH
K-10-0304	80.70	86.21	TQTZT
K-10-0304	86.21	87.90	QTZT
K-10-0304	87.90	90.74	TQTZT
K-10-0304	90.74	92.15	ICQS
K-10-0304	92.15	96.32	QTZT
K-10-0304	96.32	99.47	ICQS
K-10-0304	99.47	103.09	QTZT
K-10-0304	103.09	105.50	TQTZT
K-10-0304	105.50	110.21	ICQS
K-10-0304	110.21	118.14	QTZT
K-10-0304	118.14	127.10	TQTZT
K-10-0304	127.10	137.00	TQTZT
K-10-0304	137.00	138.94	ICQS
K-10-0304	138.94	146.50	GNST
K-10-0304	146.50	147.14	VL
K-10-0304	147.14	154.53	GNST
K-10-0304	154.53	155.12	VL
K-10-0304	155.12	169.52	GNST
K-10-0304	169.52	173.70	CHSCH
K-10-0304	173.70	174.41	GNST
K-10-0304	174.41	185.06	GNST
K-10-0304	185.06	185.39	GSCH
K-10-0304	185.39	188.13	QTZT
K-10-0304	188.13	198.07	TQTZT
K-10-0304	198.07	200.44	ICQS
K-10-0304	200.44	201.19	SM
K-10-0304	201.19	201.77	TQTZT
K-10-0304	201.77	202.85	SM
K-10-0304	202.85	203.35	ICQS
K-10-0304	203.35	203.61	VM
K-10-0304	203.61	203.93	QTZT
K-10-0304	203.93	205.21	NR
K-10-0304	205.21	207.45	SM
K-10-0304	207.45	207.80	VM
K-10-0304	207.80	212.58	GSCH
K-10-0304	212.58	214.97	SM
K-10-0304	214.97	217.01	FLT
K-10-0304	217.01	217.38	FLT
K-10-0304	217.38	219.60	FLT
K-10-0304	219.60	220.71	FLT
K-10-0304	220.71	221.60	FLT
K-10-0304	221.60	222.36	TQTZT
K-10-0304	222.36	225.05	GNST
K-10-0304	225.05	226.27	TQTZT
K-10-0304	226.27	230.45	GNST
K-10-0304	230.45	231.59	SM
K-10-0304	231.59	233.66	TQTZT
K-10-0304	233.66	234.23	GSCH
K-10-0304	234.23	237.38	TQTZT
K-10-0304	237.38	241.80	QTZT
K-10-0304	241.80	247.11	TQTZT
K-10-0304	247.11	248.12	ICQS
K-10-0304	248.12	252.07	TQTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0304	0.00	5.18	5.18	1.79	34.56	0.94	18.15	HQ	14	R4	1	1	1
K-10-0304	5.18	8.23	3.05	2.76	90.49	2.05	67.21	HQ	11	R4	0		0
K-10-0304	8.23	9.60	1.37	1.24	90.51	0.88	64.23	HQ	10	R4	0		0
K-10-0304	9.60	11.28	1.68	1.50	89.29	1.16	69.05	HQ	6	R4	1	1	1
K-10-0304	11.28	14.33	3.05	2.94	96.39	1.88	61.64	HQ	14	R4	1	1	1
K-10-0304	14.33	14.94	0.61	0.60	98.36	0.37	60.66	HQ	7	R4	0		0
K-10-0304	14.94	17.37	2.43	2.18	89.71	1.06	43.62	HQ	11	R4	2	1	1
K-10-0304	17.37	18.75	1.38	0.95	68.84	0.52	37.68	HQ	10	R4	1	1	1
K-10-0304	18.75	19.20	0.45	0.23	51.11	0.00	0.00	HQ	8	R3	1	1	2
K-10-0304	19.20	20.42	1.22	1.03	84.43	0.88	72.13	HQ	9	R5	3	1	45
K-10-0304	20.42	22.56	2.14	2.15	100.47	1.72	80.37	HQ	12	R6	17	2	60
K-10-0304	22.56	23.47	0.91	0.67	73.63	0.00	0.00	HQ	12	R3	1	1	1
K-10-0304	23.47	26.52	3.05	2.95	96.72	1.15	37.70	HQ	33	R3	9	2	10
K-10-0304	26.52	28.65	2.13	2.02	94.84	1.71	80.28	HQ	8	R5	12	2	5
K-10-0304	28.65	29.57	0.92	0.79	85.87	0.59	64.13	HQ	3	R5	5	1	30
K-10-0304	29.57	32.31	2.74	2.64	96.35	1.54	56.20	HQ	24	R4	14	1	25
K-10-0304	32.31	32.61	0.30	0.30	100.00	0.18	60.00	HQ	2	R5	0		0
K-10-0304	32.61	35.20	2.59	2.39	92.28	2.15	83.01	HQ	7	R6	3	1	2
K-10-0304	35.20	35.66	0.46	0.46	100.00	0.46	100.00	HQ	2	R6	2	1	25
K-10-0304	35.66	37.49	1.83	1.57	85.79	1.08	59.02	HQ	9	R5	2	1	5
K-10-0304	37.49	38.40	0.91	0.91	100.00	0.36	39.56	HQ	12	R4	13	1	10
K-10-0304	38.40	38.71	0.31	0.36	116.13	0.27	87.10	HQ					
K-10-0304	38.71	39.62	0.91	0.76	83.52	0.52	57.14	HQ	4	R4	5	1	5
K-10-0304	39.62	41.76	2.14	2.00	93.46	0.90	42.06	HQ	23	R3	3	1	2
K-10-0304	41.76	44.81	3.05	2.92	95.74	1.60	52.46	HQ	38	R3	6	1	5
K-10-0304	44.81	47.24	2.43	2.40	98.77	0.83	34.16	HQ	33	R3	7	1	10
K-10-0304	47.24	47.85	0.61	0.61	100.00	0.23	37.70	HQ	7	R4	3	1	5
K-10-0304	47.85	50.29	2.44	2.27	93.03	1.40	57.38	HQ	23	R4	3	1	2
K-10-0304	50.29	50.90	0.61	0.60	98.36	0.30	49.18	HQ	5	R4	0		0
K-10-0304	50.90	52.73	1.83	1.72	93.99	0.92	50.27	HQ	25	R3	0		0
K-10-0304	52.73	53.95	1.22	0.90	73.77	0.40	32.79	HQ	16	R3	4	1	25
K-10-0304	53.95	57.00	3.05	2.86	93.77	1.21	39.67	HQ	34	R4	9	1	15
K-10-0304	57.00	59.13	2.13	2.04	95.77	1.38	64.79	HQ	15	R3	6	1	10
K-10-0304	59.13	59.59	0.46	0.42	91.30	0.13	28.26	HQ	6	R4	1	1	10
K-10-0304	59.59	60.05	0.46	0.37	80.43	0.18	39.13	HQ	8	R4	1	1	5
K-10-0304	60.05	62.79	2.74	2.79	101.82	2.35	85.77	HQ	8	R5	15	1	15
K-10-0304	62.79	63.09	0.30	0.26	86.67	0.26	86.67	HQ	0	R5	0		0
K-10-0304	63.09	63.70	0.61	0.59	96.72	0.53	86.89	HQ	1	R5	1	1	5
K-10-0304	63.70	65.53	1.83	1.53	83.61	1.06	57.92	HQ	11	R4	12	1	5
K-10-0304	65.53	66.14	0.61	0.52	85.25	0.42	68.85	HQ	2	R5	1	1	20
K-10-0304	66.14	66.90	0.76	0.66	86.84	0.18	23.68	HQ	10	R4	4	2	15
K-10-0304	66.90	69.19	2.29	2.15	93.89	1.30	56.77	HQ	19	R4	5	2	30
K-10-0304	69.19	71.17	1.98	1.98	100.00	0.93	46.97	HQ	28	R2	6	2	5
K-10-0304	71.17	72.24	1.07	1.07	100.00	0.46	42.99	HQ	9	R3	2	1	1
K-10-0304	72.24	74.52	2.28	2.19	96.05	1.33	58.33	HQ	13	R3	4	1	3
K-10-0304	74.52	75.29	0.77	0.78	101.30	0.41	53.25	HQ	5	R5	1	1	5
K-10-0304	75.29	75.90	0.61	0.55	90.16	0.36	59.02	HQ	6	R5	1	1	5
K-10-0304	75.90	76.20	0.30	0.17	56.67	0.00	0.00	HQ	8	R3	0		0
K-10-0304	76.20	78.33	2.13	1.91	89.67	0.92	43.19	HQ	14	R5	9	1	35
K-10-0304	78.33	80.01	1.68	1.70	101.19	0.80	47.62	HQ	17	R4	8	1	25
K-10-0304	80.01	81.38	1.37	1.26	91.97	0.14	10.22	HQ	37	R4	4	1	10
K-10-0304	81.38	83.21	1.83	1.83	100.00	0.71	38.80	HQ	36	R4	16	1	50
K-10-0304	83.21	84.43	1.22	1.06	86.89	0.47	38.52	HQ	16	R4	4	1	25
K-10-0304	84.43	84.73	0.30	0.30	100.00	0.14	46.67	HQ	8	R3	1	1	5
K-10-0304	84.73	85.34	0.61	0.60	98.36	0.00	0.00	HQ	13	R3	3	1	10
K-10-0304	85.34	87.17	1.83	1.83	100.00	1.15	62.84	HQ	21	R4	8	1	15
K-10-0304	87.17	87.48	0.31	0.18	58.06	0.00	0.00	HQ	5	R4	1	1	1
K-10-0304	87.48	88.24	0.76	0.76	100.00	0.34	44.74	HQ	6	R4	2	2	5
K-10-0304	88.24	90.22	1.98	1.98	100.00	0.96	48.48	HQ	19	R3	7	1	5
K-10-0304	90.22	90.53	0.31	0.15	48.39	0.00	0.00	HQ	5	R3	1	1	1
K-10-0304	90.53	91.14	0.61	0.65	106.56	0.10	16.39	HQ	17	R3	1	1	1
K-10-0304	91.14	92.35	1.21	1.21	100.00	0.28	23.14	HQ	18	R3	5	1	10
K-10-0304	92.35	93.57	1.22	0.61	50.00	0.14	11.48	HQ	11	R3	0		0
K-10-0304	93.57	93.88	0.31	0.25	80.65	0.00	0.00	HQ	12	R3	0		0
K-10-0304	93.88	94.49	0.61	0.20	32.79	0.00	0.00	HQ	12	R3	0		0
K-10-0304	94.49	96.32	1.83	1.26	68.85	0.48	26.23	HQ	21	R4	0		0
K-10-0304	96.32	96.62	0.30	0.22	73.33	0.00	0.00	HQ	5	R3	1	1	5
K-10-0304	96.62	97.08	0.46	0.46	100.00	0.18	39.13	HQ	9	R4	4	1	5
K-10-0304	97.08	99.67	2.59	2.45	94.59	1.39	53.67	HQ	19	R3	7	1	5
K-10-0304	99.67	102.72	3.05	2.92	95.74	1.76	57.70	HQ	20	R5	2	1	1
K-10-0304	102.72	105.46	2.74	2.61	95.26	1.17	42.70	HQ	24	R4	3	1	5
K-10-0304	105.46	105.77	0.31	0.30	96.77	0.16	51.61	HQ	1	R3	0		0
K-10-0304	105.77	108.51	2.74	2.67	97.45	1.72	62.77	HQ	12	R4	7	1	5
K-10-0304	108.51	108.81	0.30	0.24	80.00	0.24	80.00	HQ	1	R4	3	1	5
K-10-0304	108.81	111.60	2.79	2.69	96.42	1.57	56.27	HQ	17	R4	12	1	10
K-10-0304	111.60	111.86	0.26	0.20	76.92	0.20	76.92	HQ	1	R5	1	1	1
K-10-0304	111.86	114.60	2.74	2.58	94.16	1.65	60.22	HQ	19	R4	7	1	5
K-10-0304	114.60	114.91	0.31	0.31	100.00	0.22	70.97	HQ	1	R5	1		0
K-10-0304	114.91	117.96	3.05	2.70	88.52	1.78	58.36	HQ	21	R5	7	1	35
K-10-0304	117.96	121.01	3.05	2.92	95.74	1.76	57.70	HQ	15	R6	1	1	1
K-10-0304	121.01	124.05	3.04	2.78	91.45	1.34	44.08	HQ	26	R4	4	1	3
K-10-0304	124.05	126.49	2.44	2.44	100.00	1.77	72.54	HQ	16	R4	2	1	1
K-10-0304	126.49	127.10	0.61	0.51	83.61	0.40	65.57	HQ	1	R4	0		0
K-10-0304	127.10	130.15	3.05	2.92	95.74	1.78	58.36	HQ	26	R4	8	1	5
K-10-0304	130.15	131.67	1.52	1.22	80.26	0.31	20.39	HQ	34	R3	2	1	1
K-10-0304	131.67	133.20	1.53	1.53	100.00	1.07	69.93	HQ	19	R4	2	1	2
K-10-0304	133.20	136.25	3.05	2.89	94.75	1.91	62.62	HQ	19	R4	1	1	1
K-10-0304	136.25	139.29	3.04	3.04	100.00	2.10	69.08	HQ	28	R5	4	2	10
K-10-0304	139.29	142.34	3.05	2.94	96.39	2.53	82.95	HQ	4	R6	10	1	15
K-10-0304	142.34	145.39	3.05	2.86	93.77	2.13	69.84	HQ	14	R4	6	1	10
K-10-0304	145.39	148.44	3.05	3.05	100.00	2.37	77.70	HQ	7	R5	5	1	30
K-10-0304	148.44	151.49	3.05	2.95	96.72	2.54	83.28	HQ	4	R6	10	1	10
K-10-0304	151.49	154.53	3.04	3.04	100.00	2.77	91.12	HQ	6	R6	8	2	10
K-10-0304	154.53	157.58	3.05	2.86	93.77	2.25	73.77	HQ	5	R5	8	1	25
K-10-0304	157.58	160.63	3.05	2.88	94.43	1.80	59.02	HQ	17	R5	5	2	10
K-10-0304	160.63	162.95	2.32	2.02	87.07	1.12	48.28	HQ	16	R5	9	1	12
K-10-0304	162.95	163.68	0.73	0.73	100.00	0.73	100.00	HQ	0	R6	13	1	90

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0304	163.68	166.73	3.05	2.91	95.41	2.26	74.10	HQ	8	R6	19	1	50
K-10-0304	166.73	169.77	3.04	3.05	100.33	1.96	64.47	HQ	16	R5	4	1	20
K-10-0304	169.77	172.82	3.05	2.79	91.48	1.47	48.20	HQ	17	R5	5	1	10
K-10-0304	172.82	174.35	1.53	1.53	100.00	0.91	59.48	HQ	14	R5	1	1	1
K-10-0304	174.35	175.87	1.52	1.22	80.26	1.00	65.79	HQ	6	R5	3	1	20
K-10-0304	175.87	178.16	2.29	2.29	100.00	2.24	97.82	HQ	13	R5	1	1	1
K-10-0304	178.16	178.92	0.76	0.66	86.84	0.34	44.74	HQ	7	R5	3	1	15
K-10-0304	178.92	181.20	2.28	2.01	88.16	1.15	50.44	HQ	10	R5	4	1	5
K-10-0304	181.20	181.97	0.77	0.77	100.00	0.60	77.92	HQ	4	R6	1	1	1
K-10-0304	181.97	185.01	3.04	2.74	90.13	1.61	52.96	HQ	20	R5	12	1	20
K-10-0304	185.01	187.15	2.14	2.03	94.86	1.28	59.81	HQ	6	R6	9	1	10
K-10-0304	187.15	188.06	0.91	0.91	100.00	0.49	53.85	HQ	7	R4	9	1	10
K-10-0304	188.06	189.28	1.22	1.15	94.26	0.68	55.74	HQ	10	R4	8	1	30
K-10-0304	189.28	191.11	1.83	1.57	85.79	0.87	47.54	HQ	15	R4	5	1	15
K-10-0304	191.11	193.24	2.13	1.81	84.98	0.66	30.99	HQ	32	R4	3	1	5
K-10-0304	193.24	194.16	0.92	0.92	100.00	0.34	36.96	HQ	11	R4	4	1	5
K-10-0304	194.16	197.21	3.05	2.82	92.46	1.39	45.57	HQ	31	R4	7	1	5
K-10-0304	197.21	198.73	1.52	0.97	63.82	0.51	33.55	HQ	25	R3	5	1	5
K-10-0304	198.73	200.25	1.52	1.22	80.26	0.00	0.00	HQ	23	R3	4	2	15
K-10-0304	200.25	202.08	1.83	1.77	96.72	0.85	46.45	HQ	26	R3	9	1	10
K-10-0304	202.08	203.30	1.22	1.20	98.36	0.00	0.00	HQ	31	R3	5	1	5
K-10-0304	203.30	205.44	2.14	0.86	40.19	0.29	13.55	HQ	20	R2	3	2	40
K-10-0304	205.44	206.35	0.91	0.67	73.63	0.20	21.98	HQ	23	R3	1	1	1
K-10-0304	206.35	207.87	1.52	1.30	85.53	0.40	26.32	HQ	30	R3	4	1	5
K-10-0304	207.87	209.40	1.53	1.53	100.00	0.78	50.98	HQ	18	R2	4	1	2
K-10-0304	209.40	211.23	1.83	1.60	87.43	0.13	7.10	HQ	33	R2	1	2	1
K-10-0304	211.23	212.45	1.22	1.24	101.64	0.12	9.84	HQ	15	R2	2	3	1
K-10-0304	212.45	215.49	3.04	3.05	100.33	1.24	40.79	HQ	24	R2	3	2	1
K-10-0304	215.49	216.71	1.22	1.16	95.08	0.00	0.00	HQ	0	R0	0	3	0
K-10-0304	216.71	218.54	1.83	1.78	97.27	0.00	0.00	HQ	9	R2	2	2	20
K-10-0304	218.54	220.37	1.83	1.63	89.07	0.00	0.00	HQ	6	R6	1	2	1
K-10-0304	220.37	221.59	1.22	1.32	108.20	0.00	0.00	HQ	9	R2	1	2	1
K-10-0304	221.59	223.11	1.52	1.55	101.97	0.57	37.50	HQ	11	R4	2	2	5
K-10-0304	223.11	224.64	1.53	1.40	91.50	0.90	58.82	HQ	10	R6	1	1	0.5
K-10-0304	224.64	227.69	3.05	3.04	99.67	1.72	56.39	HQ	9	R5	1	1	0.5
K-10-0304	227.69	230.73	3.04	3.07	100.99	2.30	75.66	HQ	6	R5	4	2	10
K-10-0304	230.73	233.78	3.05	2.88	94.43	1.02	33.44	HQ	12	R3	5	2	3
K-10-0304	233.78	236.83	3.05	3.01	98.69	1.40	45.90	HQ	8	R4	1	2	0.5
K-10-0304	236.83	239.88	3.05	2.94	96.39	1.28	41.97	HQ	5	R4	1	1	2
K-10-0304	239.88	242.93	3.05	2.83	92.79	0.56	18.36	HQ	15	R3	4	3	10
K-10-0304	242.93	245.06	2.13	2.18	102.35	0.78	36.62	HQ	17	R4	3	1	3
K-10-0304	245.06	245.97	0.91	0.75	82.42	0.00	0.00	HQ	4	R4	4	2	8
K-10-0304	245.97	249.02	3.05	2.87	94.10	1.13	37.05	HQ	23	R3	5	2	5
K-10-0304	249.02	250.55	1.53	1.27	83.01	0.00	0.00	HQ	5	R3	2	2	2
K-10-0304	250.55	252.07	1.52	1.43	94.08	0.89	58.55	HQ					

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0305	0.00	11.10	OVB
K-10-0305	11.10	17.66	ICQS
K-10-0305	17.66	18.10	SSCH
K-10-0305	18.10	28.43	TQTZT
K-10-0305	28.43	33.02	QTZT
K-10-0305	33.02	35.36	ICQS
K-10-0305	35.36	37.93	TQTZT
K-10-0305	37.93	40.57	ICQS
K-10-0305	40.57	61.05	TQTZT
K-10-0305	61.05	65.46	ICQS
K-10-0305	65.46	69.93	TQTZT
K-10-0305	69.93	73.85	ICQS
K-10-0305	73.85	84.06	TQTZT
K-10-0305	84.06	86.18	ICQS
K-10-0305	86.18	87.63	SSCH
K-10-0305	87.63	88.30	ICQS
K-10-0305	88.30	88.86	SSCH
K-10-0305	88.86	89.72	ICQS
K-10-0305	89.72	91.82	QTZT
K-10-0305	91.82	112.02	TQTZT
K-10-0305	112.02	112.66	VN
K-10-0305	112.66	117.61	QTZT
K-10-0305	117.61	119.47	SSCH
K-10-0305	119.47	120.38	FLT
K-10-0305	120.38	121.28	QTZT
K-10-0305	121.28	122.83	FLT
K-10-0305	122.83	124.77	QTZT
K-10-0305	124.77	125.58	FLT
K-10-0305	125.58	127.78	QTZT
K-10-0305	127.78	128.57	FLT
K-10-0305	128.57	130.38	FLT
K-10-0305	130.38	131.45	QTZT
K-10-0305	131.45	132.08	VN
K-10-0305	132.08	134.54	CQTZT
K-10-0305	134.54	135.94	ICQS
K-10-0305	135.94	141.33	QTZT
K-10-0305	141.33	147.56	TQTZT
K-10-0305	147.56	153.36	QTZT
K-10-0305	153.36	155.54	ICQS
K-10-0305	155.54	157.96	GSCH
K-10-0305	157.96	159.89	ICQS
K-10-0305	159.89	162.39	QTZT
K-10-0305	162.39	162.81	VN
K-10-0305	162.81	164.29	TQTZT
K-10-0305	164.29	171.64	GNST
K-10-0305	171.64	175.32	TQTZT
K-10-0305	175.32	185.23	QTZT
K-10-0305	185.23	188.83	ICQS
K-10-0305	188.83	194.30	QTZT
K-10-0305	194.30	200.79	ICQS
K-10-0305	200.79	209.78	TQTZT
K-10-0305	209.78	215.41	QTZT
K-10-0305	215.41	220.10	TQTZT
K-10-0305	220.10	268.23	GNST
K-10-0305	268.23	272.22	CHSCH
K-10-0305	272.22	279.26	QTZT
K-10-0305	279.26	286.13	TQTZT
K-10-0305	286.13	290.52	QTZT
K-10-0305	290.52	290.95	GSCH
K-10-0305	290.95	297.21	GNST
K-10-0305	297.21	299.45	ICQS
K-10-0305	299.45	304.88	TQTZT
K-10-0305	304.88	308.66	ICQS
K-10-0305	308.66	315.91	GSCH
K-10-0305	315.91	317.63	SM
K-10-0305	317.63	318.64	VM
K-10-0305	318.64	319.01	VM
K-10-0305	319.01	320.65	SM
K-10-0305	320.65	321.51	VM
K-10-0305	321.51	323.17	SM
K-10-0305	323.17	324.82	SM
K-10-0305	324.82	326.21	VN
K-10-0305	326.21	327.36	VM
K-10-0305	327.36	328.15	SM
K-10-0305	328.15	329.20	VM
K-10-0305	329.20	330.03	FLT
K-10-0305	330.03	334.58	FLT
K-10-0305	334.58	335.69	FLT
K-10-0305	335.69	336.62	GSCH
K-10-0305	336.62	340.24	QTZT

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0305	340.24	349.75	GNST
K-10-0305	349.75	350.85	QTZT
K-10-0305	350.85	351.18	QTZT
K-10-0305	351.18	352.35	QTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0305	0.00	6.10	6.10	0.00	0.00	0.00	0.00	HQ					
K-10-0305	6.10	9.75	3.65	1.07	29.32	0.10	2.74	HQ					
K-10-0305	9.75	10.97	1.22	0.45	36.89	0.30	24.59	HQ					
K-10-0305	10.97	14.21	3.24	2.93	90.43	0.81	25.00	HQ					
K-10-0305	14.21	17.07	2.86	2.86	100.00	1.62	56.64	HQ					
K-10-0305	17.07	20.12	3.05	2.95	96.72	1.30	42.62	HQ					
K-10-0305	20.12	21.34	1.22	0.53	43.44	0.00	0.00	HQ					
K-10-0305	21.34	23.17	1.83	1.83	100.00	0.49	26.78	HQ					
K-10-0305	23.17	26.21	3.04	2.43	79.93	0.96	31.58	HQ					
K-10-0305	26.21	27.13	0.92	0.70	76.09	0.46	50.00	HQ					
K-10-0305	27.13	27.74	0.61	0.61	100.00	0.00	0.00	HQ					
K-10-0305	27.74	29.26	1.52	1.52	100.00	0.27	17.76	HQ					
K-10-0305	29.26	29.56	0.30	0.30	100.00	0.17	56.67	HQ					
K-10-0305	29.56	32.31	2.75	2.56	93.09	0.85	30.91	HQ					
K-10-0305	32.31	35.36	3.05	2.58	84.59	0.15	4.92	HQ					
K-10-0305	35.36	36.58	1.22	1.00	81.97	0.42	34.43	HQ					
K-10-0305	36.58	37.34	0.76	0.76	100.00	0.66	86.84	HQ					
K-10-0305	37.34	38.41	1.07	0.85	79.44	0.21	19.63	HQ					
K-10-0305	38.41	41.45	3.04	2.82	92.76	2.03	66.78	HQ					
K-10-0305	41.45	44.50	3.05	3.05	100.00	2.13	69.84	HQ					
K-10-0305	44.50	46.63	2.13	2.13	100.00	0.92	43.19	HQ					
K-10-0305	46.63	47.55	0.92	0.92	100.00	0.36	39.13	HQ					
K-10-0305	47.55	49.53	1.98	1.97	99.49	0.80	40.40	HQ					
K-10-0305	49.53	50.60	1.07	0.98	91.59	0.47	43.93	HQ					
K-10-0305	50.60	53.64	3.04	3.04	100.00	0.70	23.03	HQ					
K-10-0305	53.64	56.08	2.44	2.48	101.64	1.34	54.92	HQ					
K-10-0305	56.08	56.69	0.61	0.56	91.80	0.22	36.07	HQ					
K-10-0305	56.69	56.99	0.30	0.17	56.67	0.00	0.00	HQ					
K-10-0305	56.99	58.52	1.53	1.52	99.35	0.51	33.33	HQ					
K-10-0305	58.52	58.83	0.31	0.30	96.77	0.00	0.00	HQ					
K-10-0305	58.83	59.74	0.91	0.89	97.80	0.53	58.24	HQ					
K-10-0305	59.74	62.78	3.04	3.04	100.00	1.76	57.89	HQ					
K-10-0305	62.78	65.84	3.06	2.98	97.39	1.28	41.83	HQ					
K-10-0305	65.84	68.88	3.04	2.89	95.07	1.00	32.89	HQ					
K-10-0305	68.88	71.02	2.14	1.95	91.12	0.86	40.19	HQ					
K-10-0305	71.02	71.93	0.91	0.91	100.00	0.33	36.26	HQ					
K-10-0305	71.93	74.98	3.05	2.68	87.87	1.39	45.57	HQ					
K-10-0305	74.98	76.81	1.83	1.83	100.00	1.83	100.00	HQ					
K-10-0305	76.81	78.03	1.22	1.21	99.18	0.38	31.15	HQ					
K-10-0305	78.03	81.08	3.05	3.05	100.00	1.76	57.70	HQ					
K-10-0305	81.08	84.12	3.04	2.72	89.47	1.67	54.93	HQ					
K-10-0305	84.12	87.17	3.05	2.87	94.10	0.74	24.26	HQ					
K-10-0305	87.17	90.22	3.05	2.91	95.41	1.29	42.30	HQ					
K-10-0305	90.22	93.27	3.05	2.96	97.05	1.89	61.97	HQ					
K-10-0305	93.27	94.49	1.22	1.12	91.80	0.58	47.54	HQ					
K-10-0305	94.49	96.32	1.83	1.83	100.00	1.20	65.57	HQ					
K-10-0305	96.32	99.37	3.05	3.05	100.00	1.90	62.30	HQ					
K-10-0305	99.37	102.41	3.04	2.82	92.76	1.65	54.28	HQ					
K-10-0305	102.41	105.46	3.05	3.05	100.00	1.79	58.69	HQ					
K-10-0305	105.46	108.05	2.59	2.68	103.47	2.00	77.22	HQ					
K-10-0305	108.05	108.51	0.46	0.45	97.83	0.28	60.87	HQ					
K-10-0305	108.51	111.56	3.05	3.05	100.00	2.28	74.75	HQ					
K-10-0305	111.56	114.61	3.05	3.05	100.00	2.16	70.82	HQ					
K-10-0305	114.61	115.52	0.91	0.86	94.51	0.32	35.16	HQ					
K-10-0305	115.52	117.65	2.13	1.38	64.79	0.48	22.54	HQ					
K-10-0305	117.65	118.57	0.92	1.06	115.22	0.80	86.96	HQ					
K-10-0305	118.57	120.70	2.13	1.52	71.36	0.34	15.96	HQ					
K-10-0305	120.70	121.92	1.22	0.90	73.77	0.36	29.51	HQ					
K-10-0305	121.92	122.83	0.91	0.83	91.21	0.00	0.00	HQ					
K-10-0305	122.83	123.75	0.92	0.87	94.57	0.22	23.91	HQ					
K-10-0305	123.75	125.58	1.83	1.81	98.91	0.51	27.87	HQ					
K-10-0305	125.58	126.80	1.22	1.10	90.16	0.34	27.87	HQ					
K-10-0305	126.80	129.85	3.05	2.37	77.70	0.64	20.98	HQ					
K-10-0305	129.85	132.89	3.04	3.05	100.33	0.79	25.99	HQ					
K-10-0305	132.89	135.94	3.05	3.05	100.00	0.37	12.13	HQ					
K-10-0305	135.94	138.99	3.05	3.05	100.00	1.79	58.69	HQ					
K-10-0305	138.99	142.04	3.05	2.91	95.41	2.07	67.87	HQ					
K-10-0305	142.04	145.09	3.05	2.76	90.49	1.14	37.38	HQ					
K-10-0305	145.09	146.30	1.21	0.71	58.68	0.32	26.45	HQ					
K-10-0305	146.30	147.22	0.92	0.86	93.48	0.30	32.61	HQ					
K-10-0305	147.22	148.13	0.91	0.84	92.31	0.45	49.45	HQ					
K-10-0305	148.13	149.35	1.22	1.32	108.20	0.81	66.39	HQ					
K-10-0305	149.35	151.18	1.83	1.71	93.44	1.39	75.96	HQ					
K-10-0305	151.18	154.23	3.05	3.00	98.36	2.10	68.85	HQ					
K-10-0305	154.23	157.28	3.05	3.05	100.00	1.90	62.30	HQ					
K-10-0305	157.28	160.32	3.04	3.05	100.33	1.77	58.22	HQ					
K-10-0305	160.32	163.37	3.05	2.96	97.05	2.10	68.85	HQ					
K-10-0305	163.37	166.42	3.05	3.05	100.00	2.35	77.05	HQ					
K-10-0305	166.42	169.47	3.05	2.94	96.39	2.85	93.44	HQ					
K-10-0305	169.47	172.52	3.05	3.05	100.00	2.40	78.69	HQ					
K-10-0305	172.52	173.74	1.22	1.22	100.00	0.71	58.20	HQ					
K-10-0305	173.74	174.35	0.61	0.61	100.00	0.38	62.30	HQ					
K-10-0305	174.35	175.56	1.21	1.16	95.87	0.84	69.42	HQ					
K-10-0305	175.56	176.17	0.61	0.86	140.98	0.41	67.21	HQ					
K-10-0305	176.17	177.09	0.92	0.85	92.39	0.31	33.70	HQ					
K-10-0305	177.09	178.61	1.52	1.70	111.84	0.90	59.21	HQ					
K-10-0305	178.61	181.66	3.05	3.00	98.36	2.25	73.77	HQ					
K-10-0305	181.66	184.71	3.05	3.03	99.34	2.20	72.13	HQ					
K-10-0305	184.71	187.76	3.05	2.99	98.03	0.89	29.18	HQ					
K-10-0305	187.76	188.06	0.30	0.30	100.00	0.00	0.00	HQ					
K-10-0305	188.06	190.20	2.14	2.14	100.00	1.16	54.21	HQ					
K-10-0305	190.20	190.80	0.60	0.65	108.33	0.40	66.67	HQ					
K-10-0305	190.80	193.85	3.05	2.85	93.44	1.83	60.00	HQ					
K-10-0305	193.85	196.90	3.05	2.78	91.15	0.78	25.57	HQ					
K-10-0305	196.90	199.95	3.05	2.90	95.08	0.48	15.74	HQ					
K-10-0305	199.95	203.00	3.05	2.83	92.79	1.22	40.00	HQ					
K-10-0305	203.00	206.04	3.04	3.01	99.01	1.30	42.76	HQ					

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0305	206.04	209.09	3.05	2.98	97.70	1.23	40.33	HQ					
K-10-0305	209.09	212.14	3.05	3.05	100.00	2.35	77.05	HQ					
K-10-0305	212.14	215.19	3.05	2.88	94.43	1.55	50.82	HQ					
K-10-0305	215.19	218.24	3.05	2.92	95.74	1.42	46.56	HQ					
K-10-0305	218.24	221.28	3.04	3.05	100.33	1.96	64.47	HQ					
K-10-0305	221.28	224.33	3.05	3.05	100.00	3.05	100.00	HQ					
K-10-0305	224.33	227.38	3.05	3.05	100.00	2.34	76.72	HQ					
K-10-0305	227.38	230.43	3.05	2.95	96.72	2.68	87.87	HQ					
K-10-0305	230.43	233.48	3.05	2.96	97.05	2.38	78.03	HQ					
K-10-0305	233.48	236.52	3.04	2.81	92.43	2.42	79.61	HQ					
K-10-0305	236.52	239.57	3.05	3.01	98.69	2.36	77.38	HQ					
K-10-0305	239.57	242.62	3.05	2.89	94.75	2.60	85.25	HQ					
K-10-0305	242.62	245.67	3.05	3.05	100.00	2.21	72.46	HQ					
K-10-0305	245.67	248.72	3.05	3.05	100.00	2.85	93.44	HQ					
K-10-0305	248.72	251.76	3.04	3.04	100.00	2.94	96.71	HQ					
K-10-0305	251.76	254.81	3.05	2.98	97.70	2.87	94.10	HQ					
K-10-0305	254.81	257.86	3.05	2.98	97.70	2.88	94.43	HQ					
K-10-0305	257.86	260.91	3.05	2.95	96.72	2.62	85.90	HQ					
K-10-0305	260.91	263.96	3.05	2.96	97.05	1.44	47.21	HQ					
K-10-0305	263.96	267.01	3.05	2.98	97.70	2.34	76.72	HQ					
K-10-0305	267.01	270.05	3.04	2.94	96.71	1.41	46.38	HQ					
K-10-0305	270.05	273.10	3.05	2.95	96.72	1.40	45.90	HQ					
K-10-0305	273.10	276.15	3.05	2.90	95.08	1.00	32.79	HQ					
K-10-0305	276.15	279.20	3.05	2.92	95.74	1.59	52.13	HQ					
K-10-0305	279.20	279.81	0.61	0.61	100.00	0.12	19.67	HQ					
K-10-0305	279.81	282.25	2.44	1.52	62.30	0.61	25.00	HQ					
K-10-0305	282.25	285.29	3.04	2.60	85.53	0.54	17.76	HQ					
K-10-0305	285.29	286.82	1.53	1.09	71.24	0.17	11.11	HQ					
K-10-0305	286.82	288.34	1.52	1.60	105.26	0.49	32.24	HQ					
K-10-0305	288.34	291.39	3.05	2.87	94.10	1.35	44.26	HQ					
K-10-0305	291.39	294.44	3.05	2.91	95.41	1.67	54.75	HQ					
K-10-0305	294.44	297.49	3.05	2.82	92.46	0.00	0.00	HQ					
K-10-0305	297.49	300.53	3.04	2.93	96.38	0.43	14.14	HQ					
K-10-0305	300.53	301.45	0.92	0.66	71.74	0.00	0.00	HQ					
K-10-0305	301.45	302.36	0.91	0.75	82.42	0.00	0.00	HQ					
K-10-0305	302.36	303.58	1.22	1.30	106.56	0.15	12.30	HQ					
K-10-0305	303.58	306.63	3.05	2.78	91.15	0.40	13.11	HQ					
K-10-0305	306.63	308.76	2.13	2.05	96.24	0.27	12.68	HQ					
K-10-0305	308.76	309.68	0.92	0.90	97.83	0.11	11.96	HQ					
K-10-0305	309.68	311.81	2.13	1.81	84.98	0.00	0.00	HQ					
K-10-0305	311.81	312.73	0.92	0.56	60.87	0.00	0.00	HQ					
K-10-0305	312.73	313.94	1.21	1.12	92.56	0.23	19.01	HQ					
K-10-0305	313.94	314.86	0.92	0.84	91.30	0.14	15.22	HQ					
K-10-0305	314.86	315.77	0.91	0.68	74.73	0.33	36.26	HQ					
K-10-0305	315.77	318.82	3.05	2.82	92.46	1.68	55.08	HQ					
K-10-0305	318.82	320.65	1.83	1.70	92.90	0.32	17.49	HQ					
K-10-0305	320.65	321.87	1.22	0.99	81.15	0.00	0.00	HQ					
K-10-0305	321.87	324.31	2.44	2.21	90.57	0.35	14.34	HQ					
K-10-0305	324.31	324.92	0.61	0.61	100.00	0.51	83.61	HQ					
K-10-0305	324.92	327.97	3.05	2.85	93.44	1.53	50.16	HQ					
K-10-0305	327.97	331.01	3.04	2.73	89.80	1.36	44.74	HQ					
K-10-0305	331.01	332.84	1.83	1.50	81.97	0.22	12.02	HQ					
K-10-0305	332.84	334.06	1.22	1.36	111.48	0.28	22.95	HQ					
K-10-0305	334.06	335.59	1.53	1.13	73.86	0.12	7.84	HQ					
K-10-0305	335.59	337.11	1.52	1.28	84.21	0.36	23.68	HQ					
K-10-0305	337.11	340.16	3.05	2.90	95.08	2.02	66.23	HQ					
K-10-0305	340.16	343.21	3.05	2.91	95.41	1.28	41.97	HQ					
K-10-0305	343.21	346.25	3.04	3.00	98.68	1.15	37.83	HQ					
K-10-0305	346.25	349.30	3.05	3.04	99.67	2.08	68.20	HQ					
K-10-0305	349.30	352.35	3.05	2.83	92.79	1.83	60.00	HQ					

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0312	0.00	11.57	OVB
K-10-0312	11.57	28.53	ICQS
K-10-0312	28.53	30.74	SSCH
K-10-0312	30.74	38.69	TQTZT
K-10-0312	38.69	42.35	TQTZT
K-10-0312	42.35	53.43	TQTZT
K-10-0312	53.43	56.79	FLT
K-10-0312	56.79	61.92	TQTZT
K-10-0312	61.92	64.32	ICQS
K-10-0312	64.32	68.70	TQTZT
K-10-0312	68.70	69.90	ICQS
K-10-0312	69.90	81.73	QTZT
K-10-0312	81.73	87.17	TQTZT
K-10-0312	87.17	96.77	QTZT
K-10-0312	96.77	98.40	TQTZT
K-10-0312	98.40	104.27	GSCH
K-10-0312	104.27	105.46	FLT
K-10-0312	105.46	108.51	GSCH
K-10-0312	108.51	108.87	FLT
K-10-0312	108.87	110.70	TQTZT
K-10-0312	110.70	112.23	GSCH
K-10-0312	112.23	126.62	CQTZT
K-10-0312	126.62	136.36	TQTZT
K-10-0312	136.36	147.87	SSCH
K-10-0312	147.87	149.50	GSCH
K-10-0312	149.50	152.71	QTZT
K-10-0312	152.71	155.35	GSCH
K-10-0312	155.35	160.10	TQTZT
K-10-0312	160.10	165.51	QTZT
K-10-0312	165.51	169.18	TQTZT
K-10-0312	169.18	177.73	QTZT
K-10-0312	177.73	179.41	ICQS
K-10-0312	179.41	186.48	QTZT
K-10-0312	186.48	191.26	TQTZT
K-10-0312	191.26	197.10	QTZT
K-10-0312	197.10	199.25	GSCH
K-10-0312	199.25	201.32	QTZT
K-10-0312	201.32	203.86	GSCH
K-10-0312	203.86	207.50	QTZT
K-10-0312	207.50	208.34	GSCH
K-10-0312	208.34	209.78	SSCH
K-10-0312	209.78	210.80	GSCH
K-10-0312	210.80	211.20	SSCH
K-10-0312	211.20	222.60	GSCH
K-10-0312	222.60	227.99	QTZT
K-10-0312	227.99	229.06	ICQS
K-10-0312	229.06	233.25	TQTZT
K-10-0312	233.25	233.75	FLT
K-10-0312	233.75	239.45	QTZT
K-10-0312	239.45	240.10	FLT
K-10-0312	240.10	241.68	QTZT
K-10-0312	241.68	243.73	FLT
K-10-0312	243.73	245.14	QTZT
K-10-0312	245.14	245.40	FLT
K-10-0312	245.40	248.00	TQTZT
K-10-0312	248.00	252.47	QTZT
K-10-0312	252.47	259.55	TQTZT
K-10-0312	259.55	261.28	ICQS
K-10-0312	261.28	266.86	QTZT
K-10-0312	266.86	267.70	GSCH
K-10-0312	267.70	275.77	TQTZT
K-10-0312	275.77	282.02	QTZT
K-10-0312	282.02	282.77	FLT
K-10-0312	282.77	291.18	QTZT
K-10-0312	291.18	300.26	TQTZT
K-10-0312	300.26	303.40	GSCH
K-10-0312	303.40	304.84	SSCH
K-10-0312	304.84	307.24	QTZT
K-10-0312	307.24	320.48	GNST
K-10-0312	320.48	321.87	QTZT
K-10-0312	321.87	323.40	GSCH
K-10-0312	323.40	327.97	TQTZT
K-10-0312	327.97	337.90	GSCH
K-10-0312	337.90	338.95	QTZT
K-10-0312	338.95	342.64	GSCH
K-10-0312	342.64	344.30	QTZT
K-10-0312	344.30	345.50	ICQS
K-10-0312	345.50	346.75	SM
K-10-0312	346.75	348.86	GSCH
K-10-0312	348.86	350.11	QTZT

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0312	350.11	351.30	GSCH
K-10-0312	351.30	353.85	QTZT
K-10-0312	353.85	359.85	SM
K-10-0312	359.85	362.20	SM
K-10-0312	362.20	362.79	VM
K-10-0312	362.79	365.16	SM
K-10-0312	365.16	365.36	VM
K-10-0312	365.36	367.08	SM
K-10-0312	367.08	368.33	GNST
K-10-0312	368.33	369.57	SM
K-10-0312	369.57	370.64	VM
K-10-0312	370.64	371.97	SM
K-10-0312	371.97	372.47	VM
K-10-0312	372.47	373.78	SM
K-10-0312	373.78	376.80	VM
K-10-0312	376.80	377.95	SM
K-10-0312	377.95	379.20	FLT
K-10-0312	379.20	380.18	QTZT
K-10-0312	380.18	388.93	TQTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0312	0.00	4.88	4.88	0.75	15.37	0.00	0.00	HQ					
K-10-0312	4.88	7.01	2.13	0.42	19.72	0.00	0.00	HQ					
K-10-0312	7.01	7.93	0.92	0.25	27.17	0.00	0.00	HQ					
K-10-0312	7.93	9.75	1.82	0.24	13.19	0.00	0.00	HQ					
K-10-0312	9.75	10.67	0.92	0.41	44.57	0.12	13.04	HQ					
K-10-0312	10.67	11.89	1.22	0.62	50.82	0.10	8.20	HQ					
K-10-0312	11.89	14.02	2.13	1.93	90.61	1.40	65.73	HQ					
K-10-0312	14.02	17.07	3.05	2.81	92.13	0.58	19.02	HQ					
K-10-0312	17.07	20.12	3.05	2.77	90.82	0.25	8.20	HQ					
K-10-0312	20.12	23.17	3.05	2.96	97.05	1.33	43.61	HQ					
K-10-0312	23.17	26.21	3.04	2.87	94.41	1.12	36.84	HQ					
K-10-0312	26.21	29.26	3.05	2.85	93.44	0.94	30.82	HQ					
K-10-0312	29.26	32.31	3.05	2.80	91.80	1.77	58.03	HQ					
K-10-0312	32.31	32.92	0.61	0.65	106.56	0.18	29.51	HQ					
K-10-0312	32.92	35.36	2.44	1.88	77.05	1.04	42.62	HQ					
K-10-0312	35.36	36.58	1.22	1.21	99.18	0.51	41.80	HQ					
K-10-0312	36.58	37.64	1.06	0.23	21.70	0.00	0.00	HQ					
K-10-0312	37.64	38.41	0.77	0.54	70.13	0.00	0.00	HQ					
K-10-0312	38.41	39.47	1.06	0.87	82.08	0.00	0.00	HQ					
K-10-0312	39.47	41.45	1.98	1.75	88.38	0.21	10.61	HQ					
K-10-0312	41.45	44.50	3.05	2.56	83.93	0.61	20.00	HQ					
K-10-0312	44.50	47.55	3.05	2.89	94.75	1.04	34.10	HQ					
K-10-0312	47.55	50.60	3.05	3.05	100.00	0.59	19.34	HQ					
K-10-0312	50.60	53.65	3.05	2.02	66.23	0.48	15.74	HQ					
K-10-0312	53.65	56.69	3.04	1.76	57.89	0.44	14.47	HQ					
K-10-0312	56.69	59.74	3.05	1.22	40.00	0.00	0.00	HQ					
K-10-0312	59.74	62.79	3.05	2.67	87.54	0.49	16.07	HQ					
K-10-0312	62.79	65.84	3.05	3.01	98.69	1.89	61.97	HQ					
K-10-0312	65.84	67.82	1.98	1.74	87.88	1.00	50.51	HQ					
K-10-0312	67.82	68.89	1.07	1.11	103.74	0.73	68.22	HQ					
K-10-0312	68.89	70.10	1.21	1.07	88.43	0.32	26.45	HQ					
K-10-0312	70.10	71.93	1.83	1.65	90.16	1.01	55.19	HQ					
K-10-0312	71.93	73.30	1.37	1.37	100.00	0.30	21.90	HQ					
K-10-0312	73.30	74.98	1.68	1.52	90.48	1.01	60.12	HQ					
K-10-0312	74.98	77.11	2.13	2.04	95.77	1.42	66.67	HQ					
K-10-0312	77.11	78.03	0.92	0.60	65.22	0.00	0.00	HQ					
K-10-0312	78.03	78.94	0.91	0.69	75.82	0.33	36.26	HQ					
K-10-0312	78.94	79.71	0.77	0.76	98.70	0.00	0.00	HQ					
K-10-0312	79.71	81.08	1.37	1.44	105.11	0.53	38.69	HQ					
K-10-0312	81.08	83.67	2.59	2.63	101.54	1.20	46.33	HQ					
K-10-0312	83.67	84.13	0.46	0.45	97.83	0.13	28.26	HQ					
K-10-0312	84.13	85.65	1.52	1.01	66.45	0.54	35.53	HQ					
K-10-0312	85.65	87.17	1.52	1.50	98.68	0.72	47.37	HQ					
K-10-0312	87.17	90.22	3.05	2.76	90.49	0.56	18.36	HQ					
K-10-0312	90.22	93.27	3.05	2.71	88.85	0.69	22.62	HQ					
K-10-0312	93.27	96.32	3.05	2.83	92.79	1.77	58.03	HQ					
K-10-0312	96.32	99.37	3.05	2.79	91.48	0.48	15.74	HQ					
K-10-0312	99.37	102.41	3.04	2.93	96.38	0.78	25.66	HQ					
K-10-0312	102.41	105.46	3.05	2.46	80.66	0.66	21.64	HQ					
K-10-0312	105.46	108.51	3.05	1.31	42.95	0.00	0.00	HQ					
K-10-0312	108.51	111.56	3.05	2.87	94.10	0.67	21.97	HQ					
K-10-0312	111.56	113.08	1.52	1.44	94.74	0.63	41.45	HQ					
K-10-0312	113.08	114.61	1.53	1.45	94.77	0.88	57.52	HQ					
K-10-0312	114.61	117.65	3.04	2.83	93.09	1.94	63.82	HQ					
K-10-0312	117.65	120.70	3.05	2.97	97.38	2.17	71.15	HQ					
K-10-0312	120.70	123.75	3.05	2.81	92.13	2.18	71.48	HQ					
K-10-0312	123.75	126.80	3.05	3.05	100.00	2.15	70.49	HQ					
K-10-0312	126.80	129.84	3.04	2.78	91.45	2.29	75.33	HQ					
K-10-0312	129.84	130.76	0.92	0.87	94.57	0.61	66.30	HQ					
K-10-0312	130.76	132.89	2.13	2.07	97.18	1.42	66.67	HQ					
K-10-0312	132.89	135.94	3.05	2.94	96.39	1.20	39.34	HQ					
K-10-0312	135.94	138.07	2.13	2.12	99.53	0.70	32.86	HQ					
K-10-0312	138.07	138.99	0.92	0.91	98.91	0.80	86.96	HQ					
K-10-0312	138.99	140.36	1.37	1.38	100.73	0.46	33.58	HQ					
K-10-0312	140.36	142.04	1.68	1.52	90.48	0.62	36.90	HQ					
K-10-0312	142.04	144.32	2.28	2.39	104.82	0.80	35.09	HQ					
K-10-0312	144.32	145.09	0.77	0.57	74.03	0.00	0.00	HQ					
K-10-0312	145.09	145.69	0.60	0.50	83.33	0.00	0.00	HQ					
K-10-0312	145.69	147.22	1.53	1.52	99.35	0.51	33.33	HQ					
K-10-0312	147.22	148.13	0.91	0.90	98.90	0.29	31.87	HQ					
K-10-0312	148.13	149.50	1.37	1.27	92.70	0.68	49.64	HQ					
K-10-0312	149.50	151.18	1.68	1.52	90.48	0.88	52.38	HQ					
K-10-0312	151.18	152.71	1.53	1.52	99.35	0.43	28.10	HQ					
K-10-0312	152.71	154.23	1.52	1.31	86.18	0.78	51.32	HQ					
K-10-0312	154.23	157.28	3.05	2.83	92.79	1.57	51.48	HQ					
K-10-0312	157.28	160.33	3.05	3.05	100.00	1.87	61.31	HQ					
K-10-0312	160.33	163.37	3.04	2.89	95.07	2.19	72.04	HQ					
K-10-0312	163.37	165.51	2.14	2.13	99.53	1.39	64.95	HQ					
K-10-0312	165.51	166.42	0.91	0.88	96.70	0.38	41.76	HQ					
K-10-0312	166.42	167.64	1.22	0.95	77.87	0.57	46.72	HQ					
K-10-0312	167.64	169.47	1.83	2.00	109.29	1.32	72.13	HQ					
K-10-0312	169.47	172.52	3.05	3.03	99.34	2.49	81.64	HQ					
K-10-0312	172.52	175.57	3.05	2.88	94.43	1.98	64.92	HQ					
K-10-0312	175.57	178.61	3.04	2.99	98.36	2.07	68.09	HQ					
K-10-0312	178.61	181.66	3.05	3.04	99.67	1.96	64.26	HQ					
K-10-0312	181.66	184.71	3.05	2.96	97.05	2.19	71.80	HQ					
K-10-0312	184.71	187.15	2.44	2.30	94.26	1.63	66.80	HQ					
K-10-0312	187.15	187.76	0.61	0.61	100.00	0.41	67.21	HQ					
K-10-0312	187.76	188.67	0.91	0.89	97.80	0.64	70.33	HQ					
K-10-0312	188.67	190.81	2.14	2.10	98.13	1.38	64.49	HQ					
K-10-0312	190.81	193.83	3.02	2.81	93.05	1.55	51.32	HQ					
K-10-0312	193.83	195.38	1.55	1.41	90.97	0.91	58.71	HQ					
K-10-0312	195.38	196.90	1.52	1.52	100.00	0.82	53.95	HQ					
K-10-0312	196.90	197.66	0.76	0.65	85.53	0.52	68.42	HQ					
K-10-0312	197.66	199.95	2.29	2.03	88.65	1.56	68.12	HQ					
K-10-0312	199.95	201.32	1.37	1.26	91.97	0.53	38.69	HQ					
K-10-0312	201.32	203.00	1.68	1.52	90.48	0.14	8.33	HQ					

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0312	203.00	203.30	0.30	0.30	100.00	0.30	100.00	HQ					
K-10-0312	203.30	206.05	2.75	2.62	95.27	1.90	69.09	HQ					
K-10-0312	206.05	209.09	3.04	2.93	96.38	1.79	58.88	HQ					
K-10-0312	209.09	212.14	3.05	2.92	95.74	2.06	67.54	HQ					
K-10-0312	212.14	215.19	3.05	3.05	100.00	1.85	60.66	HQ					
K-10-0312	215.19	218.24	3.05	3.00	98.36	1.85	60.66	HQ					
K-10-0312	218.24	221.29	3.05	2.86	93.77	1.01	33.11	HQ					
K-10-0312	221.29	222.81	1.52	1.34	88.16	0.49	32.24	HQ					
K-10-0312	222.81	224.33	1.52	1.30	85.53	0.55	36.18	HQ					
K-10-0312	224.33	226.31	1.98	1.73	87.37	0.73	36.87	HQ					
K-10-0312	226.31	227.38	1.07	0.99	92.52	0.50	46.73	HQ					
K-10-0312	227.38	227.99	0.61	0.51	83.61	0.18	29.51	HQ					
K-10-0312	227.99	229.06	1.07	1.04	97.20	0.40	37.38	HQ					
K-10-0312	229.06	230.43	1.37	1.13	82.48	0.16	11.68	HQ					
K-10-0312	230.43	231.95	1.52	1.35	88.82	0.54	35.53	HQ					
K-10-0312	231.95	233.48	1.53	1.52	99.35	0.61	39.87	HQ					
K-10-0312	233.48	235.00	1.52	1.36	89.47	0.44	28.95	HQ					
K-10-0312	235.00	236.22	1.22	1.07	87.70	0.32	26.23	HQ					
K-10-0312	236.22	236.53	0.31	0.31	100.00	0.25	80.65	HQ					
K-10-0312	236.53	238.05	1.52	1.42	93.42	0.63	41.45	HQ					
K-10-0312	238.05	239.57	1.52	1.41	92.76	0.41	26.97	HQ					
K-10-0312	239.57	242.62	3.05	2.55	83.61	0.36	11.80	HQ					
K-10-0312	242.62	245.67	3.05	3.05	100.00	1.05	34.43	HQ					
K-10-0312	245.67	248.72	3.05	2.83	92.79	0.69	22.62	HQ					
K-10-0312	248.72	251.77	3.05	3.05	100.00	2.04	66.89	HQ					
K-10-0312	251.77	252.98	1.21	1.05	86.78	0.86	71.07	HQ					
K-10-0312	252.98	254.81	1.83	1.52	83.06	0.88	48.09	HQ					
K-10-0312	254.81	255.21	0.40	0.31	77.50	0.14	35.00	HQ					
K-10-0312	255.21	256.49	1.28	1.33	103.91	0.33	25.78	HQ					
K-10-0312	256.49	257.56	1.07	1.24	115.89	0.57	53.27	HQ					
K-10-0312	257.56	258.47	0.91	0.52	57.14	0.45	49.45	HQ					
K-10-0312	258.47	259.99	1.52	1.33	87.50	0.23	15.13	HQ					
K-10-0312	259.99	260.91	0.92	0.77	83.70	0.12	13.04	HQ					
K-10-0312	260.91	261.52	0.61	0.60	98.36	0.00	0.00	HQ					
K-10-0312	261.52	263.35	1.83	1.37	74.86	0.44	24.04	HQ					
K-10-0312	263.35	263.96	0.61	0.65	106.56	0.51	83.61	HQ					
K-10-0312	263.96	266.40	2.44	2.41	98.77	1.25	51.23	HQ					
K-10-0312	266.40	267.01	0.61	0.59	96.72	0.26	42.62	HQ					
K-10-0312	267.01	267.92	0.91	0.62	68.13	0.28	30.77	HQ					
K-10-0312	267.92	270.05	2.13	2.11	99.06	0.96	45.07	HQ					
K-10-0312	270.05	273.10	3.05	2.96	97.05	1.92	62.95	HQ					
K-10-0312	273.10	276.15	3.05	2.93	96.07	0.65	21.31	HQ					
K-10-0312	276.15	279.20	3.05	2.95	96.72	2.04	66.89	HQ					
K-10-0312	279.20	282.25	3.05	2.71	88.85	1.48	48.52	HQ					
K-10-0312	282.25	285.29	3.04	2.95	97.04	1.44	47.37	HQ					
K-10-0312	285.29	288.34	3.05	3.00	98.36	1.99	65.25	HQ					
K-10-0312	288.34	291.39	3.05	2.88	94.43	1.59	52.13	HQ					
K-10-0312	291.39	294.44	3.05	2.51	82.30	0.65	21.31	HQ					
K-10-0312	294.44	295.96	1.52	1.45	95.39	0.37	24.34	HQ					
K-10-0312	295.96	297.49	1.53	1.41	92.16	0.72	47.06	HQ					
K-10-0312	297.49	298.40	0.91	0.86	94.51	0.00	0.00	HQ					
K-10-0312	298.40	299.62	1.22	1.04	85.25	0.10	8.20	HQ					
K-10-0312	299.62	300.53	0.91	0.88	96.70	0.54	59.34	HQ					
K-10-0312	300.53	302.82	2.29	2.17	94.76	0.40	17.47	HQ					
K-10-0312	302.82	303.58	0.76	0.95	125.00	0.00	0.00	HQ					
K-10-0312	303.58	304.50	0.92	0.85	92.39	0.00	0.00	HQ					
K-10-0312	304.50	306.02	1.52	1.34	88.16	0.15	9.87	HQ					
K-10-0312	306.02	306.63	0.61	0.30	49.18	0.00	0.00	HQ					
K-10-0312	306.63	307.24	0.61	0.49	80.33	0.14	22.95	HQ					
K-10-0312	307.24	309.37	2.13	2.20	103.29	1.59	74.65	HQ					
K-10-0312	309.37	309.68	0.31	0.30	96.77	0.11	35.48	HQ					
K-10-0312	309.68	311.66	1.98	1.83	92.42	0.58	29.29	HQ					
K-10-0312	311.66	312.73	1.07	1.14	106.54	0.74	69.16	HQ					
K-10-0312	312.73	315.77	3.04	3.05	100.33	1.40	46.05	HQ					
K-10-0312	315.77	318.82	3.05	2.85	93.44	1.54	50.49	HQ					
K-10-0312	318.82	320.19	1.37	1.21	88.32	0.68	49.64	HQ					
K-10-0312	320.19	321.87	1.68	1.10	65.48	0.40	23.81	HQ					
K-10-0312	321.87	322.48	0.61	0.35	57.38	0.18	29.51	HQ					
K-10-0312	322.48	323.39	0.91	0.73	80.22	0.00	0.00	HQ					
K-10-0312	323.39	324.46	1.07	1.05	98.13	0.34	31.78	HQ					
K-10-0312	324.46	324.92	0.46	0.37	80.43	0.10	21.74	HQ					
K-10-0312	324.92	325.83	0.91	0.72	79.12	0.12	13.19	HQ					
K-10-0312	325.83	327.66	1.83	0.95	51.91	0.47	25.68	HQ					
K-10-0312	327.66	327.97	0.31	0.26	83.87	0.00	0.00	HQ					
K-10-0312	327.97	328.73	0.76	0.71	93.42	0.00	0.00	HQ					
K-10-0312	328.73	329.49	0.76	0.74	97.37	0.15	19.74	HQ					
K-10-0312	329.49	330.71	1.22	1.01	82.79	0.00	0.00	HQ					
K-10-0312	330.71	331.01	0.30	0.25	83.33	0.11	36.67	HQ					
K-10-0312	331.01	331.62	0.61	0.26	42.62	0.00	0.00	HQ					
K-10-0312	331.62	334.06	2.44	0.64	26.23	0.29	11.89	HQ					
K-10-0312	334.06	337.11	3.05	2.75	90.16	0.15	4.92	HQ					
K-10-0312	337.11	340.16	3.05	2.98	97.70	0.32	10.49	HQ					
K-10-0312	340.16	343.21	3.05	2.83	92.79	1.03	33.77	HQ					
K-10-0312	343.21	346.25	3.04	2.71	89.14	0.56	18.42	HQ					
K-10-0312	346.25	347.02	0.77	0.75	97.40	0.23	29.87	HQ					
K-10-0312	347.02	349.00	1.98	1.86	93.94	0.93	46.97	HQ					
K-10-0312	349.00	349.30	0.30	0.28	93.33	0.19	63.33	HQ					
K-10-0312	349.30	350.98	1.68	1.52	90.48	0.57	33.93	HQ					
K-10-0312	350.98	352.35	1.37	1.10	80.29	0.00	0.00	HQ					
K-10-0312	352.35	353.42	1.07	0.64	59.81	0.00	0.00	HQ					
K-10-0312	353.42	355.40	1.98	2.06	104.04	0.90	45.45	HQ					
K-10-0312	355.40	358.45	3.05	2.82	92.46	2.02	66.23	HQ					
K-10-0312	358.45	361.49	3.04	2.96	97.37	2.30	75.66	HQ					
K-10-0312	361.49	364.54	3.05	3.02	99.02	2.33	76.39	HQ					
K-10-0312	364.54	365.76	1.22	1.17	95.90	0.62	50.82	HQ					
K-10-0312	365.76	367.59	1.83	1.90	103.83	1.34	73.22	HQ					
K-10-0312	367.59	370.64	3.05	3.03	99.34	1.95	63.93	HQ					

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0312	370.64	373.69	3.05	2.88	94.43	2.44	80.00	HQ					
K-10-0312	373.69	376.73	3.04	3.05	100.33	2.72	89.47	HQ					
K-10-0312	376.73	377.95	1.22	0.92	75.41	0.40	32.79	HQ					
K-10-0312	377.95	379.78	1.83	0.97	53.01	0.00	0.00	HQ					
K-10-0312	379.78	381.31	1.53	1.41	92.16	0.00	0.00	HQ					
K-10-0312	381.31	382.83	1.52	1.39	91.45	0.11	7.24	HQ					
K-10-0312	382.83	383.74	0.91	0.98	107.69	0.00	0.00	HQ					
K-10-0312	383.74	385.72	1.98	1.86	93.94	0.18	9.09	HQ					
K-10-0312	385.72	385.77	0.05	0.05	100.00	0.00	0.00	HQ					
K-10-0312	385.77	387.40	1.63	1.39	85.28	0.00	0.00	HQ					
K-10-0312	387.40	388.93	1.53	1.45	94.77	0.63	41.18	HQ					

Hole_ID	mFrom	mTo	Dominant Lithology
K-10-0320	0.00	13.62	OVB
K-10-0320	13.62	21.90	GSCH
K-10-0320	21.90	22.70	SSCH
K-10-0320	22.70	27.23	TQTZT
K-10-0320	27.23	50.22	QTZT
K-10-0320	50.22	52.13	GSCH
K-10-0320	52.13	54.63	QTZT
K-10-0320	54.63	55.57	ICQS
K-10-0320	55.57	56.69	FLT
K-10-0320	56.69	63.35	QTZT
K-10-0320	63.35	70.32	TQTZT
K-10-0320	70.32	75.20	ICQS
K-10-0320	75.20	81.08	QTZT
K-10-0320	81.08	81.90	ICQS
K-10-0320	81.90	87.60	QTZT
K-10-0320	87.60	92.10	ICQS
K-10-0320	92.10	95.44	QTZT
K-10-0320	95.44	98.18	TQTZT
K-10-0320	98.18	101.94	QTZT
K-10-0320	101.94	103.13	TQTZT
K-10-0320	103.13	105.72	QTZT
K-10-0320	105.72	109.03	GSCH
K-10-0320	109.03	110.71	SSCH
K-10-0320	110.71	111.33	GSCH
K-10-0320	111.33	113.40	SSCH
K-10-0320	113.40	114.65	GSCH
K-10-0320	114.65	117.56	QTZT
K-10-0320	117.56	118.35	GSCH
K-10-0320	118.35	123.60	TQTZT
K-10-0320	123.60	133.20	QTZT
K-10-0320	133.20	135.00	ICQS
K-10-0320	135.00	140.65	TQTZT
K-10-0320	140.65	149.20	QTZT
K-10-0320	149.20	152.58	TQTZT
K-10-0320	152.58	157.98	SSCH
K-10-0320	157.98	169.95	GSCH
K-10-0320	169.95	188.98	TQTZT
K-10-0320	188.98	189.45	FLT
K-10-0320	189.45	195.38	QTZT
K-10-0320	195.38	202.26	TQTZT
K-10-0320	202.26	207.47	TQTZT
K-10-0320	207.47	209.56	GSCH
K-10-0320	209.56	216.52	QTZT
K-10-0320	216.52	219.76	FLT
K-10-0320	219.76	221.00	VM
K-10-0320	221.00	224.02	VM
K-10-0320	224.02	227.00	GSCH
K-10-0320	227.00	229.25	QTZT
K-10-0320	229.25	241.50	ICQS
K-10-0320	241.50	242.83	FLT
K-10-0320	242.83	243.26	GNST
K-10-0320	243.26	243.84	TQTZT

Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0320	7.01	7.93	0.92	0.92	100.00	0.24	26.09	HQ					
K-10-0320	7.93	10.06	2.13	0.75	35.21	0.20	9.39	HQ					
K-10-0320	10.06	10.97	0.91	0.41	45.05	0.13	14.29	HQ					
K-10-0320	10.97	13.11	2.14	0.50	23.36	0.00	0.00	HQ					
K-10-0320	13.11	14.02	0.91	0.91	100.00	0.00	0.00	HQ					
K-10-0320	14.02	15.85	1.83	1.75	95.63	0.32	17.49	HQ					
K-10-0320	15.85	17.07	1.22	1.14	93.44	0.00	0.00	HQ					
K-10-0320	17.07	18.90	1.83	1.80	98.36	1.16	63.39	HQ					
K-10-0320	18.90	20.12	1.22	1.21	99.18	0.61	50.00	HQ					
K-10-0320	20.12	23.17	3.05	3.00	98.36	2.00	65.57	HQ					
K-10-0320	23.17	26.21	3.04	2.95	97.04	1.95	64.14	HQ					
K-10-0320	26.21	29.26	3.05	3.01	98.69	1.85	60.66	HQ					
K-10-0320	29.26	32.31	3.05	2.97	97.38	1.54	50.49	HQ					
K-10-0320	32.31	35.36	3.05	3.05	100.00	2.05	67.21	HQ					
K-10-0320	35.36	36.73	1.37	1.40	102.19	0.86	62.77	HQ					
K-10-0320	36.73	38.41	1.68	1.68	100.00	1.11	66.07	HQ					
K-10-0320	38.41	41.45	3.04	2.92	96.05	1.57	51.64	HQ					
K-10-0320	41.45	43.89	2.44	2.10	86.07	1.22	50.00	HQ					
K-10-0320	43.89	44.50	0.61	0.55	90.16	0.36	59.02	HQ					
K-10-0320	44.50	47.55	3.05	2.98	97.70	1.93	63.28	HQ					
K-10-0320	47.55	50.60	3.05	2.70	88.52	1.20	39.34	HQ					
K-10-0320	50.60	53.65	3.05	2.90	95.08	0.35	11.48	HQ					
K-10-0320	53.65	56.69	3.04	2.65	87.17	1.16	38.16	HQ					
K-10-0320	56.69	57.46	0.77	0.49	63.64	0.00	0.00	HQ					
K-10-0320	57.46	59.74	2.28	1.52	66.67	0.46	20.18	HQ					
K-10-0320	59.74	62.79	3.05	2.88	94.43	1.27	41.64	HQ					
K-10-0320	62.79	65.84	3.05	2.82	92.46	1.68	55.08	HQ					
K-10-0320	65.84	68.89	3.05	2.50	81.97	0.41	13.44	HQ					
K-10-0320	68.89	71.93	3.04	2.83	93.09	1.27	41.78	HQ					
K-10-0320	71.93	74.98	3.05	2.94	96.39	0.59	19.34	HQ					
K-10-0320	74.98	78.03	3.05	2.74	89.84	0.75	24.59	HQ					
K-10-0320	78.03	80.47	2.44	2.07	84.84	0.94	38.52	HQ					
K-10-0320	80.47	81.08	0.61	0.60	98.36	0.00	0.00	HQ					
K-10-0320	81.08	84.13	3.05	3.05	100.00	1.05	34.43	HQ					
K-10-0320	84.13	87.17	3.04	3.04	100.00	0.96	31.58	HQ					
K-10-0320	87.17	88.54	1.37	1.29	94.16	0.51	37.23	HQ					
K-10-0320	88.54	90.22	1.68	1.63	97.02	0.90	53.57	HQ					
K-10-0320	90.22	90.83	0.61	0.61	100.00	0.34	55.74	HQ					
K-10-0320	90.83	92.81	1.98	1.44	72.73	0.43	21.72	HQ					
K-10-0320	92.81	93.27	0.46	0.34	73.91	0.00	0.00	HQ					
K-10-0320	93.27	96.32	3.05	2.80	91.80	2.12	69.51	HQ					
K-10-0320	96.32	99.37	3.05	2.89	94.75	2.06	67.54	HQ					
K-10-0320	99.37	100.13	0.76	0.69	90.79	0.42	55.26	HQ					
K-10-0320	100.13	102.41	2.28	2.07	90.79	1.15	50.44	HQ					
K-10-0320	102.41	105.46	3.05	3.05	100.00	1.80	59.02	HQ					
K-10-0320	105.46	106.22	0.76	0.65	85.53	0.25	32.89	HQ					
K-10-0320	106.22	108.51	2.29	2.22	96.94	1.44	62.88	HQ					
K-10-0320	108.51	111.56	3.05	2.92	95.74	1.25	40.98	HQ					
K-10-0320	111.56	113.08	1.52	1.52	100.00	0.54	35.53	HQ					
K-10-0320	113.08	114.61	1.53	1.45	94.77	0.95	62.09	HQ					
K-10-0320	114.61	117.65	3.04	2.85	93.75	2.03	66.78	HQ					
K-10-0320	117.65	120.70	3.05	2.83	92.79	0.94	30.82	HQ					
K-10-0320	120.70	123.75	3.05	2.79	91.48	2.00	65.57	HQ					
K-10-0320	123.75	126.80	3.05	2.75	90.16	1.29	42.30	HQ					
K-10-0320	126.80	129.84	3.04	3.02	99.34	2.52	82.89	HQ					
K-10-0320	129.84	132.89	3.05	2.65	86.89	1.10	36.07	HQ					
K-10-0320	132.89	135.94	3.05	2.83	92.79	1.35	44.26	HQ					
K-10-0320	135.94	138.99	3.05	2.97	97.38	2.51	82.30	HQ					
K-10-0320	138.99	142.04	3.05	2.98	97.70	2.34	76.72	HQ					
K-10-0320	142.04	145.08	3.04	3.01	99.01	2.67	87.83	HQ					
K-10-0320	145.08	148.13	3.05	2.95	96.72	2.56	83.93	HQ					
K-10-0320	148.13	151.18	3.05	2.86	93.77	2.03	66.56	HQ					
K-10-0320	151.18	154.23	3.05	2.97	97.38	2.09	68.52	HQ					
K-10-0320	154.23	157.28	3.05	3.02	99.02	1.98	64.92	HQ					
K-10-0320	157.28	160.32	3.04	2.98	98.03	2.31	75.99	HQ					
K-10-0320	160.32	163.37	3.05	3.04	99.67	2.01	65.90	HQ					
K-10-0320	163.37	166.42	3.05	2.97	97.38	2.32	76.07	HQ					
K-10-0320	166.42	169.47	3.05	3.00	98.36	1.58	51.80	HQ					
K-10-0320	169.47	172.52	3.05	3.03	99.34	1.40	45.90	HQ					
K-10-0320	172.52	175.56	3.04	2.96	97.37	1.61	52.96	HQ					
K-10-0320	175.56	178.61	3.05	3.02	99.02	1.82	59.67	HQ					
K-10-0320	178.61	181.05	2.44	2.41	98.77	1.32	54.10	HQ					
K-10-0320	181.05	181.66	0.61	0.56	91.80	0.29	47.54	HQ					
K-10-0320	181.66	182.88	1.22	0.62	50.82	0.35	28.69	HQ					
K-10-0320	182.88	184.40	1.52	1.22	80.26	0.00	0.00	HQ					
K-10-0320	184.40	184.71	0.31	0.31	100.00	0.00	0.00	HQ					
K-10-0320	184.71	186.84	2.13	1.85	86.85	0.27	12.68	HQ					
K-10-0320	186.84	187.76	0.92	0.88	95.65	0.00	0.00	HQ					
K-10-0320	187.76	189.43	1.67	1.31	78.44	0.11	6.59	HQ					
K-10-0320	189.43	190.81	1.38	1.32	95.65	0.63	45.65	HQ					
K-10-0320	190.81	192.48	1.67	1.53	91.62	0.64	38.32	HQ					
K-10-0320	192.48	193.85	1.37	1.19	86.86	0.42	30.66	HQ					
K-10-0320	193.85	195.38	1.53	1.35	88.24	0.48	31.37	HQ					
K-10-0320	195.38	196.90	1.52	1.47	96.71	0.34	22.37	HQ					
K-10-0320	196.90	197.21	0.31	0.31	100.00	0.00	0.00	HQ					
K-10-0320	197.21	199.95	2.74	2.51	91.61	0.57	20.80	HQ					
K-10-0320	199.95	203.00	3.05	2.79	91.48	0.83	27.21	HQ					
K-10-0320	203.00	206.05	3.05	2.91	95.41	0.72	23.61	HQ					
K-10-0320	206.05	207.57	1.52	1.52	100.00	0.50	32.89	HQ					
K-10-0320	207.57	209.09	1.52	1.52	100.00	0.38	25.00	HQ					
K-10-0320	209.09	212.14	3.05	2.91	95.41	1.68	55.08	HQ					
K-10-0320	212.14	215.19	3.05	2.92	95.74	2.28	74.75	HQ					
K-10-0320	215.19	216.87	1.68	1.58	94.05	0.78	46.43	HQ					
K-10-0320	216.87	218.24	1.37	1.08	78.83	0.43	31.39	HQ					
K-10-0320	218.24	221.29	3.05	3.05	100.00	2.03	66.56	HQ					
K-10-0320	221.29	224.33	3.04	2.78	91.45	1.83	60.20	HQ					
K-10-0320	224.33	226.47	2.14	2.10	98.13	0.66	30.84	HQ					

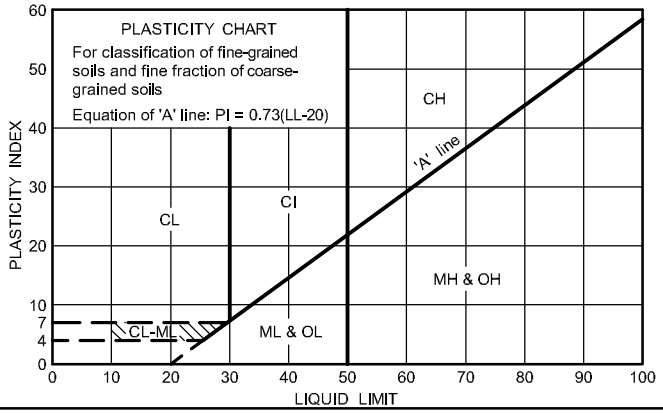
Hole_ID	mFrom	mTo	Interval m	Recovery m	Recovery %	RQD m	RQD %	Core_Size	No. Fractures	Rock Strength	No. Cemented Joint/Vein	Cemented Joint/Vein Strength	Vein %
K-10-0320	226.47	227.38	0.91	0.79	86.81	0.31	34.07	HQ					
K-10-0320	227.38	230.43	3.05	3.05	100.00	1.54	50.49	HQ					
K-10-0320	230.43	232.41	1.98	0.66	33.33	0.00	0.00	HQ					
K-10-0320	232.41	233.48	1.07	1.07	100.00	0.00	0.00	HQ					
K-10-0320	233.48	233.78	0.30	0.29	96.67	0.10	33.33	HQ					
K-10-0320	233.78	236.52	2.74	2.63	95.99	0.11	4.01	HQ					
K-10-0320	236.52	238.35	1.83	1.04	56.83	0.00	0.00	HQ					
K-10-0320	238.35	239.57	1.22	0.66	54.10	0.00	0.00	HQ					
K-10-0320	239.57	239.87	0.30	0.21	70.00	0.00	0.00	HQ					
K-10-0320	239.87	241.25	1.38	1.12	81.16	0.00	0.00	HQ					
K-10-0320	241.25	242.32	1.07	0.59	55.14	0.00	0.00	HQ					
K-10-0320	242.32	242.62	0.30	0.28	93.33	0.00	0.00	HQ					
K-10-0320	242.62	243.84	1.22	0.88	72.13	0.00	0.00	HQ					

APPENDIX C

FLAME AND MOTH SITE GEOTECHNICAL BOREHOLE LOGS

MODIFIED UNIFIED SOIL CLASSIFICATION

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	CLASSIFICATION CRITERIA	
COARSE - GRAINED SOILS More than 50% retained on No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines Less than 5% pass No. 200 sieve GW, GP, SW, SP More than 12% pass No. 200 sieve GM, GC, SM, SC 5% to 12% pass No. 200 sieve Borderline classification requiring use of dual symbols	$C_u = D_{60}/D_{10}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			GP	Poorly-graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW
		GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits plot below 'A' line or plasticity index less than 4 — Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits plot above 'A' line and plasticity index greater than 7 — Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands, little or no fines		$C_u = D_{60}/D_{10}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			SP	Poorly-graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures		Atterberg limits plot below 'A' line or plasticity index less than 4 — Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits plot above 'A' line and plasticity index greater than 7 — Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
FINE - GRAINED SOILS 50% or more passes No. 200 sieve*	SILTS AND CLAYS Liquid Limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	PLASTICITY CHART For classification of fine-grained soils and fine fraction of coarse-grained soils Equation of 'A' line: PI = 0.73(LL-20)	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays silty clays, lean clays		
			OL	Organic silts and organic silty clays of low plasticity		
	SILTS AND CLAYS Liquid Limit greater than50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts		
			CH	Inorganic clay of high plasticity, fat clays		
			OH	Organic clays of medium to high plasticity		
HIGHLY ORGANIC SOILS			PT	Peat, muck and other highly organic soils		



* Based on the material passing the 3 in. (75 mm) sieve
† ASTM Designation D 2487, for identification procedure see D 2488

GROUND ICE DESCRIPTION

ICE NOT VISIBLE

GROUP SYMBOLS	SYMBOLS	SUBGROUP DESCRIPTION	
N	Nf	Poorly-bonded or friable	
	Nbn	No excess ice, well- bonded	
	Nbe	Excess ice, well- bonded	

VISIBLE ICE LESS THAN 50% BY VOLUME

GROUP SYMBOLS	SYMBOLS	SUBGROUP DESCRIPTION	
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 50% BY VOLUME

ICE	ICE + Soil Type	Ice with soil inclusions	
	ICE	Ice without soil inclusions (greater than 25 mm (1 in.) thick	

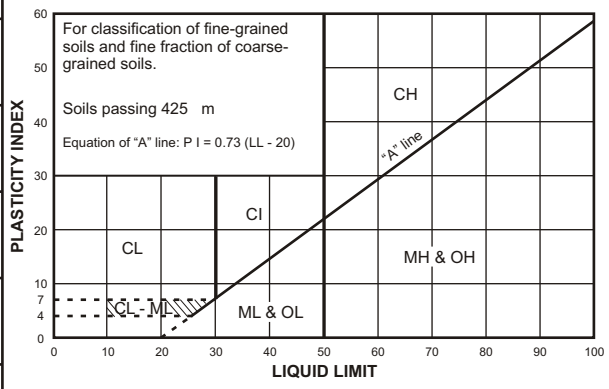
NOTES:
1. Dual symbols are used to indicate borderline or mixed ice classifications.
2. Visual estimates of ice contents indicated on borehole logs ± 5%
3. This system of ground ice description has been modified from NRC Technical Memo 79, Guide to the Field Description of Permafrost for Engineering Purposes.

LEGEND:

Soil ☐ Ice ■

MODIFIED UNIFIED SOIL CLASSIFICATION †

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	CLASSIFICATION CRITERIA		
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines: Less than 5% Pass No. 200 sieve; GW, GP, SW, SP	$C_U = D_{60}/D_{10}$ Greater than 4; $C_U = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW	
		GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures	More than 12% Pass No. 200 sieve; GM, GC, SM, SC	Atterburg limits plot below "A" line or plasticity index less than 4	Atterburg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures	5% to 12% Pass No. 200 sieve; Bordering Classification requiring use of dual symbols	Atterburg limits plot above "A" line or plasticity index greater than 7	
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands,little or no fines		$C_U = D_{60}/D_{10}$ Greater than 6; $C_U = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			SP	Poorly graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW	
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures		Atterburg limits plot below "A" line or plasticity index less than 4	Atterburg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterburg limits plot above "A" line or plasticity index greater than 7	
FINE-GRAINED SOILS 50% or more passes No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	PLASTICITY CHART		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	SILTS AND CLAYS Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity			
HIGHLY ORGANIC SOILS			PT	Peat, muck and other highly organic soils	*Based on the material passing the 3 in. (75 mm) sieve †ASTM Designation D 2487, for identification procedure see D2488		



SOIL COMPONENTS

FRACTION	SIEVE SIZE		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS	
	PASSING	RETAINED	PERCENTAGE	DESCRIPTOR
GRAVEL				
coarse	75 mm	19 mm	>35 %	"and"
fine	19 mm	4.75 mm	21 to 35 %	"y-adjective"
SAND				
coarse	4.75 mm	2.00 mm	10 to 20 %	"some"
medium	2.00 mm	425 m		
fine	425 m	75 m	>0 to 10 %	"trace"
SILT (non plastic) or CLAY (plastic)	75 m		as above but by behavior	

OVERSIZE MATERIAL

Rounded or subrounded

COBBLES	75 mm to 200 mm
BOULDERS	> 200 mm

Not rounded

ROCK FRAGMENTS	>75 mm
ROCKS	> 0.76 cubic metre in volume

Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Lower Diversion Stucture	DRILL: Mini-Sonic	W14101178.003-BH15
Keno City, YT		ELEVATION: 896.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	SPT (N)	GROUND ICE DESCRIPTION	Thermistor	Elevation (m)
0	PEAT - amorphous, granular, dark brown, damp					UNFROZEN		
	GRAVEL AND SAND - trace silt, compact (est.), medium grained, well graded, damp, light brown							
1			SA01	-0.5				896.0
2			SA02	0				895.0
3	GRAVEL AND SILT (TILL) - sandy, non-plastic, gap graded, massive, olive grey, contains cobbles		SA03	0	94	FROZEN - no visible ice in cuttings		894.0
	ICE AND SILT - some sand, some gravel, trace clay, low plastic		SA04			Vs(65%)		
4	ICE - massive ice		SA05	-0.1		MASSIVE ICE - cloudy, white, stratified		893.0
	SILT (TILL) - gravelly, sandy, trace clay, low plastic					25075		
5			SA06			1202		892.0
	ICE - massive ice					oriented		
6								891.0
	SILT (TILL) - sandy, gravelly, trace clay, low plastic, olive grey		SA07			Vr, Vx (15%) Nbe (25%)		
7			SA08	-0.2				890.0
			SA09			becomes Vx (10%) Nbe (50%)		
8			SA10			Vs (10%)		889.0
			SA11					
9			SA12					888.0
			SA13	-0.2				
10			SA14					887.0

STANDARD PENETRATION (N) 20 40 60 80

POCKET PEN. (kPa) 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Lower Diversion Stucture	DRILL: Mini-Sonic	W14101178.003-BH15
Keno City, YT		ELEVATION: 896.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	SPT (N)	STANDARD PENETRATION (N) 20 40 60 80; POCKET PEN. (kPa) 100 200 300 400; PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Thermistor	Elevation (m)
10			SA15						
11			SA16						886.0
			SA17						
12			SA18	-0.2					885.0
	ICE - massive ice						MASSIVE ICE - cloudy, stratified crystals		
			SA19						
13									884.0
	SILT AND GRAVEL - sandy, trace clay, low plastic, gap graded, massive, olive grey						(Vs, Vx 10%), ice stratification is vertical		
14			SA20	-0.2					883.0
15			SA21						882.0
				-0.2					
			SA22						
16	BOULDERS AND COBBLES - gravelly, some sand, gap graded, lens of fine gravel						- no visible ice but may be thawed by drilling, sample wet		881.0
	- slough at borehole at completion			-0.1					
	SAND - some silt, trace gravel, fine grained, well sorted, wet, grey/yellow								
17	SILT (TILL) - gravelly, sandy, trace clay, soft, non-plastic, massive, wet, brownish-grey								880.0
				-0.2					
18	SAND - some gravel, coarse grained, well graded, moist, grey								879.0
	- becomes fine grained, well sorted		SA23						
	SILT AND GRAVEL (TILL) - sandy, non-plastic, massive, firm, moist, olive grey								
			SA24						
19	GRAVEL - cobbly, sandy, trace silt, dense, well graded, damp, light grey								878.0
20	SILT AND GRAVEL - sandy, non-plastic, firm, massive,								877.0

Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Lower Diversion Stucture	DRILL: Mini-Sonic	W14101178.003-BH15
Keno City, YT		ELEVATION: 896.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	SPT (N)	STANDARD PENETRATION (N) 20 40 60 80; POCKET PEN. (kPa) 100 200 300 400; PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Thermistor	Elevation (m)
20	damp, olive grey		SA25						
21	GRAVEL - sandy, cobbles, trace silt, dense, well graded, dry to damp, light brown, subrounded to subangular		SA26						876.0
	END OF BOREHOLE 21.3 m								
22									875.0
23									874.0
24									873.0
25									872.0
26									871.0
27									870.0
28									869.0
29									868.0
30									867.0

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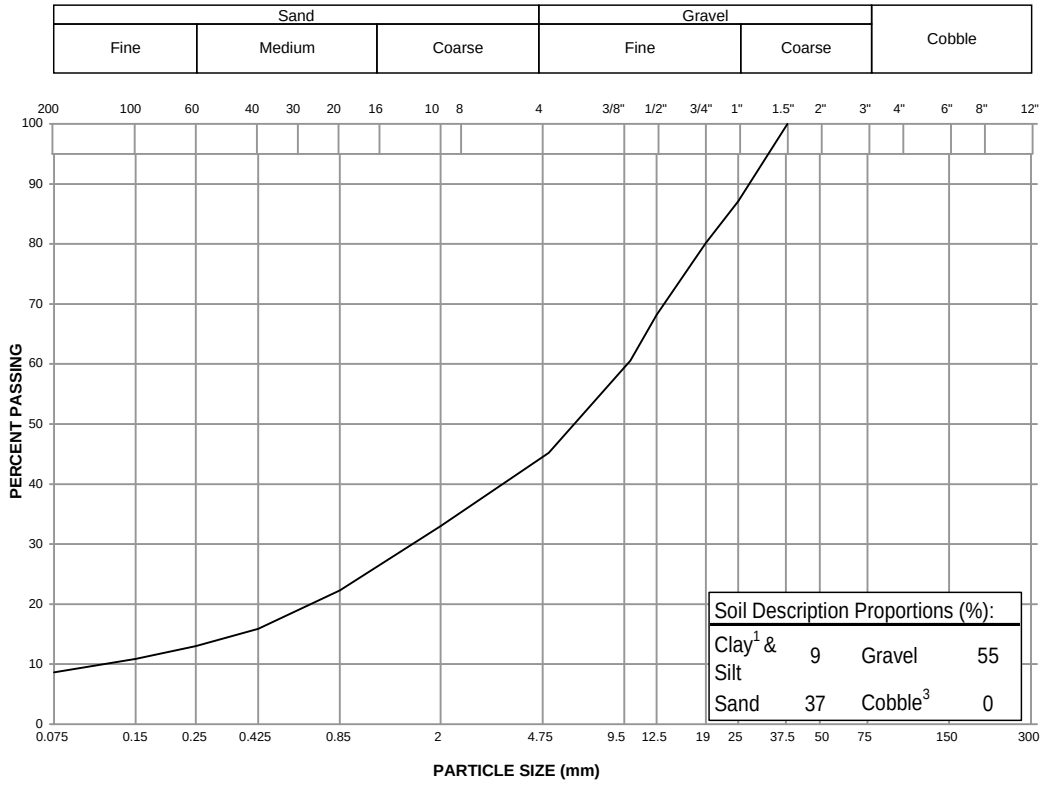
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REVIEWED BY:	COMPLETE: 8/30/2009
DRAWING NO:	Page 3 of 3

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	20-Oct-2009 By: SMS
Sample No.:	SA01	Soil Description[2]:	GRAVEL AND SAND - trace silt
Sample Loc.:	BH15		
Sample Depth:	1.0 - 1.2 m	USC Classification:	Cu: 81.0
Sampling Method:			Cc: 2.4
Date sampled:	Sep-09 By: Client	Moisture Content:	7.4

Particle Size (mm)	Percent Passing
300	
200	
150	
100	
75	
50	
38	100
25	87
19	80
12.5	68
10	61
5	45
2	33
0.85	22
0.425	16
0.25	13
0.15	11
0.075	9



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

[3] If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: C.J. Dixon

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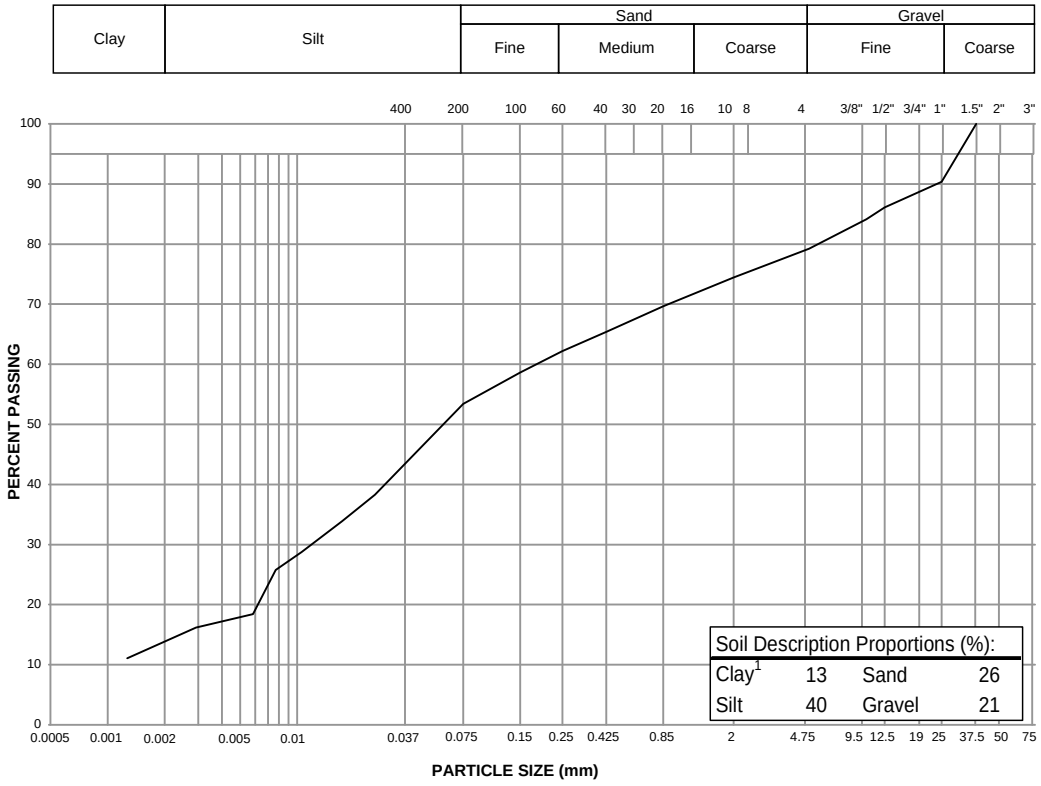
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA08	Soil Description[2]:	SILT - sandy, gravelly, trace clay
Sample Loc.:	BH15		
Sample Depth:	6.3 - 6.4 m	USC Classification:	Cu:
Sampling Method:			Cc:
Date sampled:	Sep-09 By: Client	Moisture Content:	70.2

Particle Size (mm)	Percent Passing
75	
50	
38	100
25	90
19	
12.5	86
10	84
5	79
2	74
0.85	70
0.425	65
0.25	62
0.15	59
0.075	53
0.0256	38.3
0.0172	33.9
0.0105	28.7
0.0077	25.8
0.0058	18.4
0.0029	16.2
0.0013	11.1



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

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Remarks: _____

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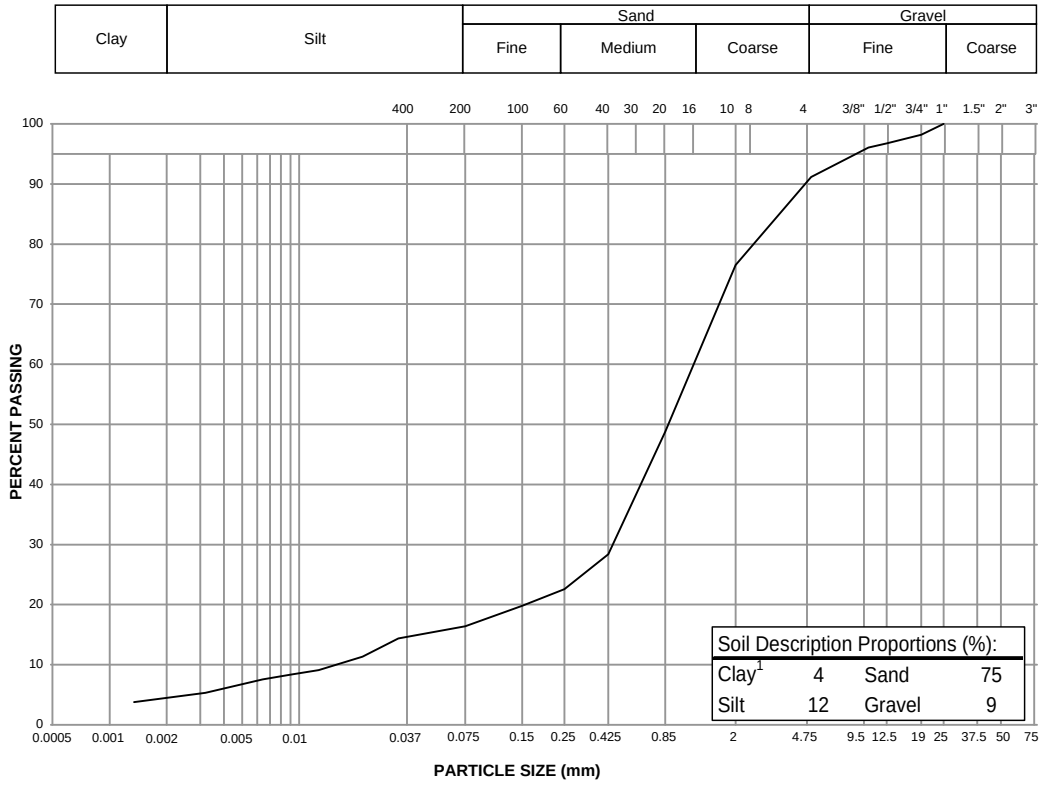
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA23	Soil Description[2]:	SAND - some silt, trace gravel, trace clay
Sample Loc.:	BH15		
Sample Depth:	18.2 - 18.3 M	USC Classification:	Cu: 81.2
Sampling Method:			Cc: 9.9
Date sampled:	Sep-09 By: Client	Moisture Content:	1.3

Particle Size (mm)	Percent Passing
75	
50	
38	
25	100
19	98
12.5	97
10	96
5	91
2	77
0.85	49
0.425	28
0.25	23
0.15	20
0.075	16
0.0333	14.4
0.0215	11.4
0.0127	9.1
0.0090	8.3
0.0064	7.6
0.0032	5.3
0.0013	3.8



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification: _____

Remarks: _____

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Lower Diversion Stucture	DRILL: Mini-Sonic	W14101178.003-BH16
Keno City, YT		ELEVATION: 895.8m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	MOSS COVER - peat, black				UNFROZEN	
	GRAVEL AND SAND - some silt, well graded, subrounded gravel, medium to coarse sand, compact, moist, brown		SA01			895.0
1	- colour changes to mottled grey around 1.0 m		SA02		FROZEN - visible ice inclusions <5%, poorly bonded, partial thaw during drilling	
			SA03			
	SAND (TILL) - some gravel, some silt, trace clay, medium to coarse sand, well graded, subrounded gravel, grey					894.0
2			SA04			
			SA05	H	Vs, Vr (30%)	893.0
3						
			SA06			892.0
4			SA07			
						891.0
5			SA08			
						890.0
6			SA09			
			SA10			
	ICE - massive ice				MASSIVE ICE	889.0
7						
						888.0
8						
						887.0
9						
						886.0
10						

Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Lower Diversion Stucture	DRILL: Mini-Sonic	W14101178.003-BH16
Keno City, YT		ELEVATION: 895.8m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
10						885.0
11						
	SAND (TILL) - some gravel, some silt, trace clay, medium to coarse sand, well graded, sub rounded gravel, grey				- visible ice inclusions <5%, well bonded	884.0
12						
						883.0
13						
						882.0
14			SA11			
			SA12		UNFROZEN	881.0
15			SA13			
	END OF BOREHOLE 15.2 m					
16						880.0
17						879.0
18						878.0
19						877.0
20						876.0

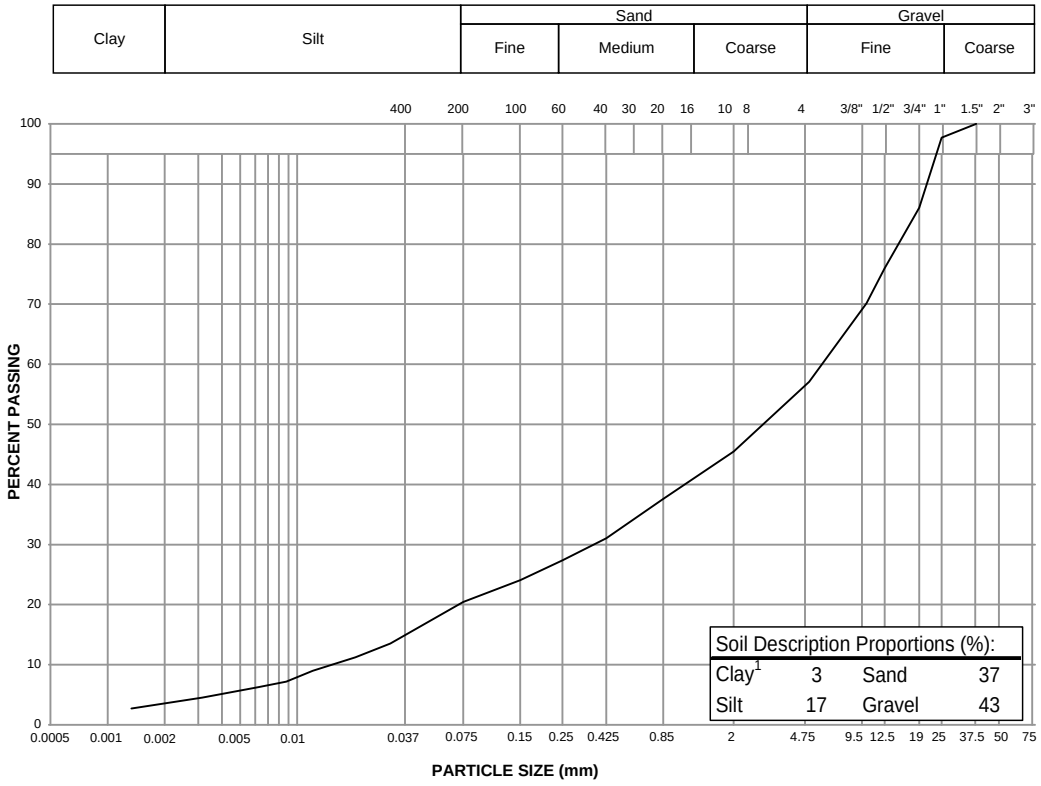
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	REVIEWED BY:	COMPLETE: 9/7/2009
	DRAWING NO:	Page 2 of 2

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA02	Soil Description[2]:	GRAVEL AND SAND - some silt, trace clay
Sample Loc.:	BH16		
Sample Depth:	0.2 - 0.4 m	USC Classification:	Cu: 389.9
Sampling Method:			Cc: 1.5
Date sampled:	Sep-09 By: Client	Moisture Content:	10.0

Particle Size (mm)	Percent Passing
75	
50	
38	100
25	98
19	86
12.5	76
10	70
5	57
2	45
0.85	38
0.425	31
0.25	27
0.15	24
0.075	20
0.0310	13.5
0.0203	11.3
0.0121	9.0
0.0088	7.2
0.0063	6.3
0.0031	4.5
0.0013	2.7



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C.J. Dicken

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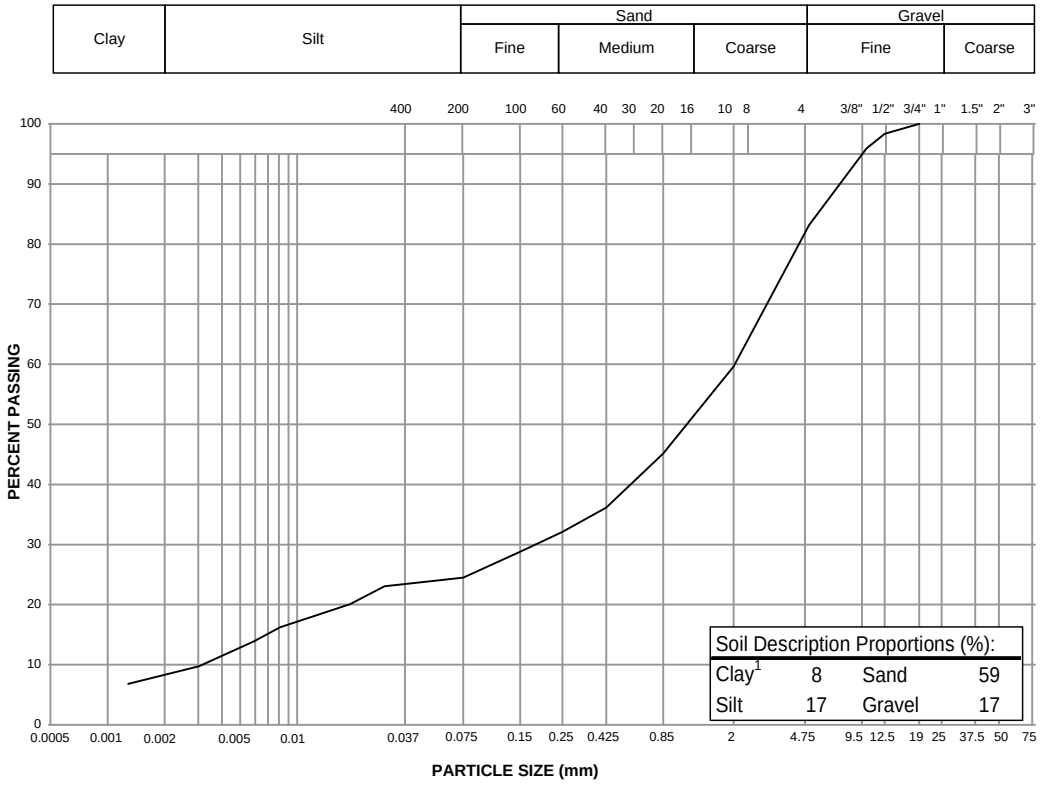
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA05	Soil Description[2]:	SAND - some gravel, some silt, trace clay
Sample Loc.:	BH16		
Sample Depth:	2.7 - 3.0 m	USC Classification:	Cu: 638.2
Sampling Method:			Cc: 5.3
Date sampled:	Sep-09 By: Client	Moisture Content:	37.6

Particle Size (mm)	Percent Passing
75	
50	
38	
25	
19	100
12.5	98
10	96
5	83
2	60
0.85	45
0.425	36
0.25	32
0.15	29
0.075	25
0.0289	23.0
0.0190	20.1
0.0113	17.7
0.0081	16.2
0.0059	13.9
0.0030	9.7
0.0013	6.8



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C.J. Dicken

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Dry Stack Tailings Facility	DRILL: Mini-Sonic	W14101178.003-BH17
Keno City, YT		ELEVATION: 899.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	SPT (N)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Monitoring well	Thermistor	Elevation (m)
0	GRAVEL (FILL) - sandy, trace silt, loose, coarse grained, well graded, damp, brown						UNFROZEN			
	PEAT - amorphous granular									
	GRAVEL - sandy, some cobbles, trace silt, compact, coarse grained, well graded, damp, brown, subrounded									
1			SA01	-0.1						899.0
	8/30/2009									8/30/2009
2			SA02	0						898.0
	SILT (TILL) - gravelly, some sand, trace clay, firm, non-plastic, massive, damp, olive grey		SA03							
3				0						897.0
			SA04		19					
			SA05							
4				0						896.0
	- becomes stiff, low plastic		SA06							
	ICE AND SILT - some gravel, some sand, trace clay, low plastic, grey						3318 FROZEN Vs (40%), Vr (15%)			
5			SA07	0						895.0
			SA08							
6			SA09				1643			894.0
	ICE - massive ice						MASSIVE ICE - randomly oriented crystals, trace silt (90% ICE/10% SILT)			
	- no recovery from 6.2 - 7.2 m									
7										893.0
			SA10	-0.1						
8			SA11				2379			892.0
			SA12				14391			
			SA13				19396			
9			SA14							891.0
	- no recovery from 9.2 - 10.1 m									
10										890.0

Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Dry Stack Tailings Facility	DRILL: Mini-Sonic	W14101178.003-BH17
Keno City, YT		ELEVATION: 899.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	SPT (N)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Monitoring well	Thermistor	Elevation (m)
10	ICE AND SILT - sandy, some gravel, trace clay, low plastic, massive, grey			-0.1			Vs (25%), Vr (15%)			
	SILT (TILL) - sandy, gravelly, trace clay, non-plastic, massive, grey						Vr (5%)			
11			SA15	-0.1						889.0
			SA16							
12			SA17	-0.1						888.0
			SA18							
13				0						887.0
14				0.1						886.0
	BEDROCK (quartzite)		SA19	0.1						
15										885.0
	END OF BOREHOLE - target depth 15.25 m									
16										884.0
17										883.0
18										882.0
19										881.0
20										880.0

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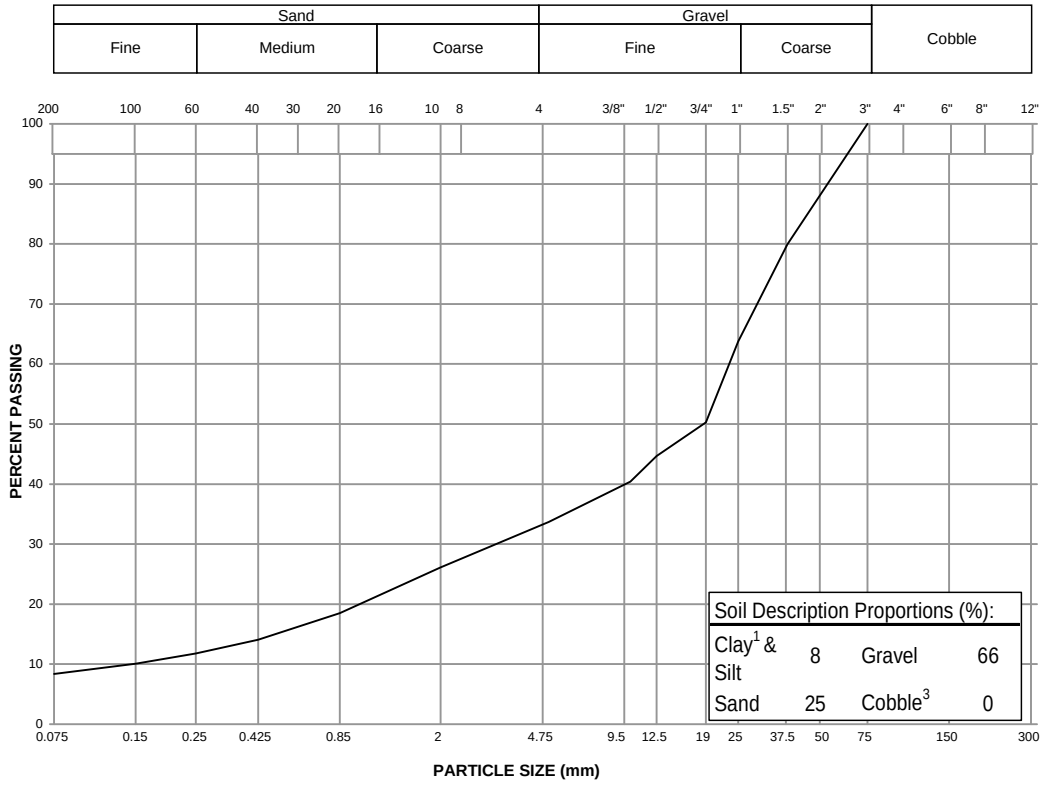
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REVIEWED BY:	COMPLETE: 8/30/2009
DRAWING NO:	Page 2 of 2

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA01	Soil Description[2]:	GRAVEL - sandy, trace silt
Sample Loc.:	BH17		
Sample Depth:	0.9 - 1.2 m	USC Classification:	Cu: 158.7
Sampling Method:			Cc: 3.6
Date sampled:	Sep-09 By: Client	Moisture Content:	4.6

Particle Size (mm)	Percent Passing
300	
200	
150	
100	
75	100
50	
38	80
25	64
19	50
12.5	45
10	40
5	34
2	26
0.85	18
0.425	14
0.25	12
0.15	10
0.075	8



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

[3] If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: C.J. Dixon

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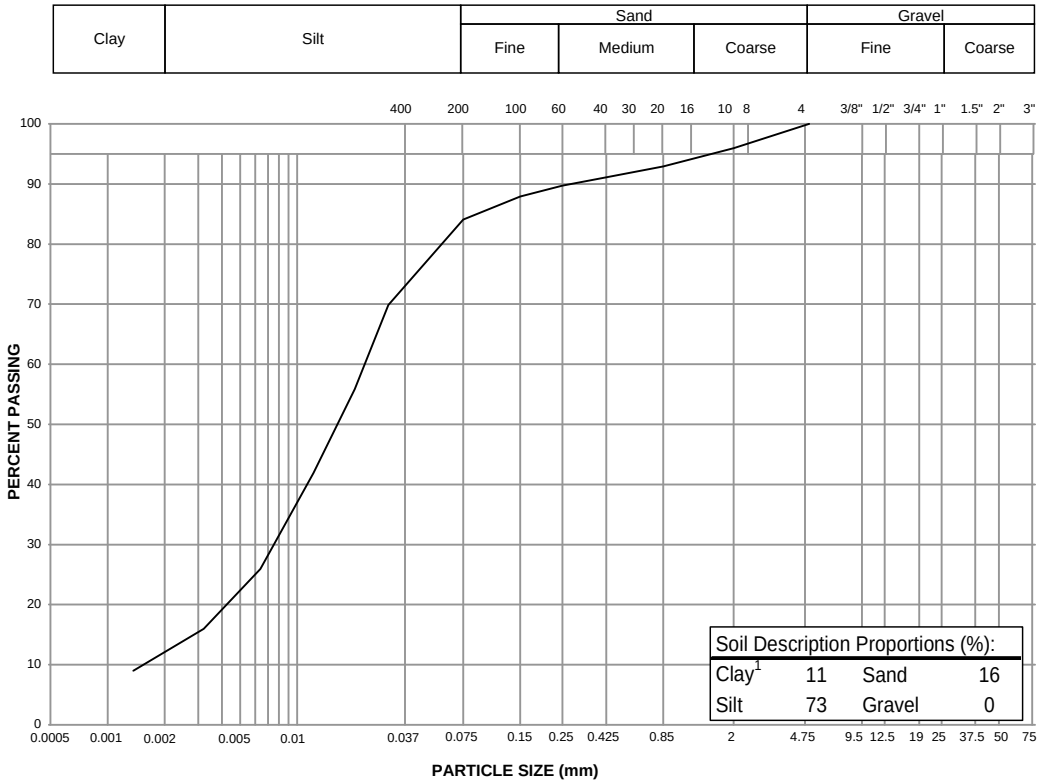
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	2-Nov-2009 By: SMS
Sample No.:	SA08	Soil Description[2]:	SILT - some sand, some clay
Sample Loc.:	BH17		
Sample Depth:	5.4 - 5.5	USC Classification:	Cu: 14.1
Sampling Method:			Cc: 1.5
Date sampled:	Sep-09 By: Client	Moisture Content:	

Particle Size (mm)	Percent Passing
75	
50	
38	
25	
19	
12.5	
10	
5	100
2	96
0.85	93
0.425	91
0.25	90
0.15	88
0.075	84
0.0302	69.8
0.0201	55.9
0.0122	41.9
0.0088	33.9
0.0064	25.9
0.0032	16.0
0.0014	9.0



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C.J. Dixon

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Lower Diversion Stucture	DRILL: Mini-Sonic	W14101178.003-BH18
Keno City, YT		ELEVATION: 898.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Thermistor	Elevation (m)
0	MOSS COVER					UNFROZEN		
	GRAVEL - sandy, some silt, well graded, subrounded gravel, medium to coarse sand, compact, brown, damp - cobbles, some boulders throughout gravel layer - becomes trace silt around 0.5 m							
1			SA01	-1.1				898.0
	- becomes very coarse at 1.5 m - colour changes to grey at 1.5 m - becomes silty around 1.5 m - possible boulder around 1.8m - gravel becomes coarser around 1.8 m							
2			SA02	0				897.0
3			SA03	0				896.0
			SA04					
4	SAND AND SILT (TILL) - some gravel, trace clay, well graded, subrounded gravel and sand, grey		SA05	-0.1				895.0
						FROZEN - Nbn, well bonded		
5	- less gravel, become fine to medium grained at 4.8 m		SA06	-0.2		Vs, Vx (15%)		894.0
6			SA07	-0.2				893.0
			SA08		527			
7				-0.2		Vs, 5mm thick		892.0
	ICE - massive ice		SA09		280	MASSIVE ICE		
8			SA10	-0.2	835			891.0
			SA11					
	END OF BOREHOLE 8.5 m - terminated due to schedule							
9								890.0
10								889.0

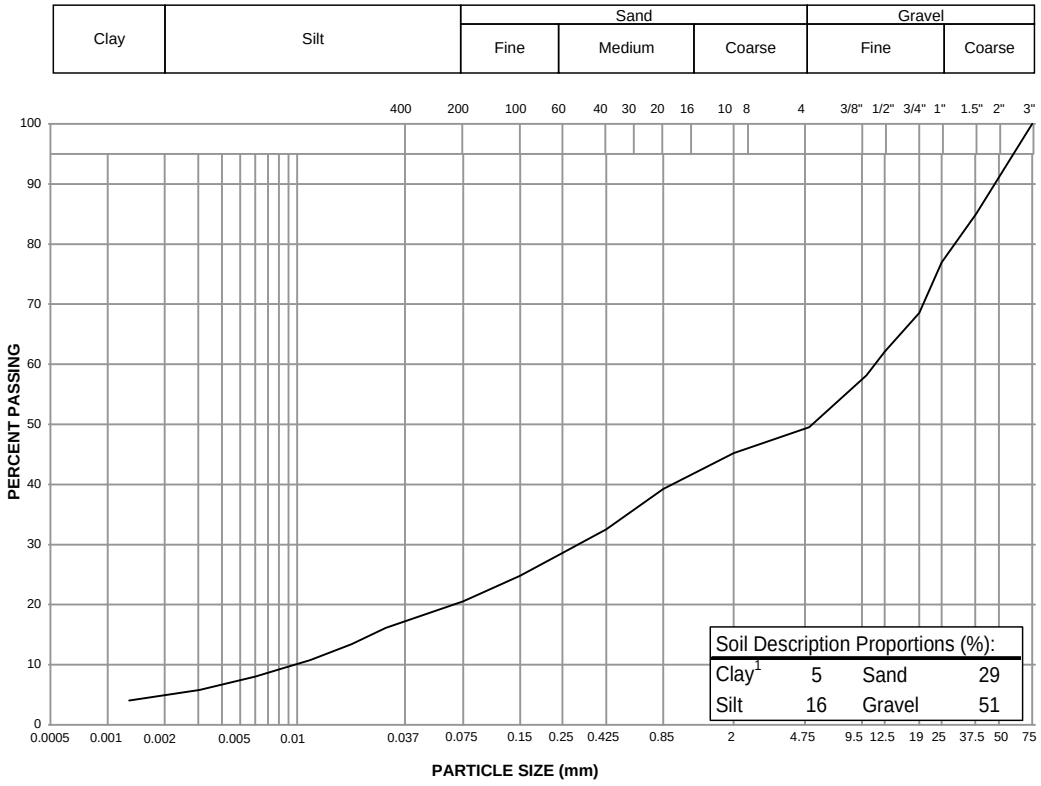
EBA Engineering Consultants Ltd.	LOGGED BY: JSB	COMPLETION DEPTH: 8.5m
	REVIEWED BY:	COMPLETE: 9/2/2009
	DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA02	Soil Description[2]:	GRAVEL - sandy, some silt, trace clay
Sample Loc.:	BH18		
Sample Depth:	2.2 - 2.4 m	USC Classification:	Cu: 1133.5
Sampling Method:			Cc: 0.9
Date sampled:	Sep-09 By: Client	Moisture Content:	0.0

Particle Size (mm)	Percent Passing
75	100
50	
38	85
25	77
19	69
12.5	62
10	58
5	50
2	45
0.85	39
0.425	33
0.25	29
0.15	25
0.075	21
0.0292	16.1
0.0194	13.4
0.0117	10.7
0.0084	9.4
0.0060	8.1
0.0031	5.8
0.0013	4.0



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification: _____

Remarks: _____

Reviewed By: C. J. Dixon

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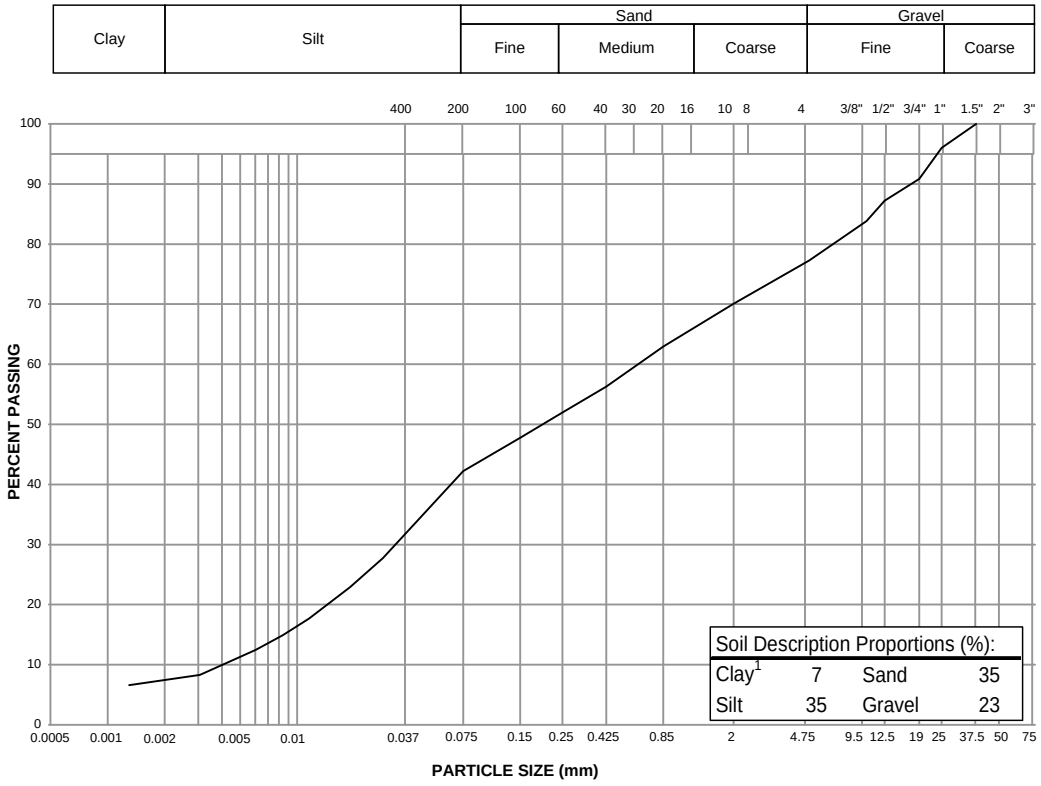
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA06	Soil Description[2]:	SAND AND SILT - some gravel, trace clay
Sample Loc.:	BH18		
Sample Depth:	5.1 - 5.4	USC Classification:	Cu: 155.7
Sampling Method:			Cc: 0.4
Date sampled:	Sep-09 By: Client	Moisture Content:	27.1

Particle Size (mm)	Percent Passing
75	
50	
38	100
25	96
19	91
12.5	87
10	84
5	77
2	70
0.85	63
0.425	56
0.25	52
0.15	48
0.075	42
0.0282	27.7
0.0189	22.9
0.0115	17.7
0.0084	14.9
0.0060	12.5
0.0031	8.3
0.0013	6.6



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By:

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Dry Stack Tailings Facility	DRILL: Mini-Sonic	W14101178.003-BH19
Keno City, YT		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Depth (ft)
0	MOSS COVER - peat, black				UNFROZEN	0
	SILT (TILL) - sandy, some gravel, trace clay, non-plastic, massive grey		SA01		FROZEN Vr (10%)	
1			SA02		Vr (40%)	5
			SA03			
2						
	END OF BOREHOLE 2.4 m (REFUSAL)					
3						10
4						
						15
5						
6						20
7						
						25
8						
9						30
10						33

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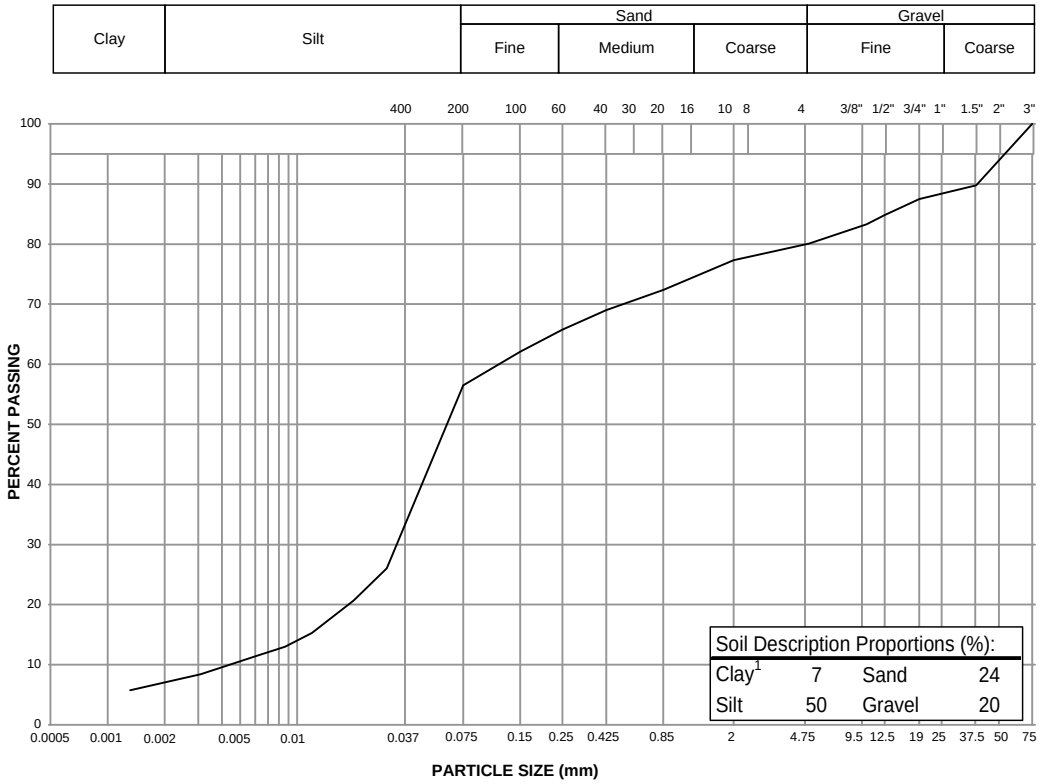
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REVIEWED BY:	COMPLETE: 9/2/2009
DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA02	Soil Description[2]:	SILT - sandy, some gravel, trace clay
Sample Loc.:	BH19		
Sample Depth:	1.0 - 1.2	USC Classification:	Cu: 26.2
Sampling Method:			Cc: 2.2
Date sampled:	Sep-09 By: Client	Moisture Content:	47.4

Particle Size (mm)	Percent Passing
75	100
50	
38	90
25	
19	87
12.5	85
10	83
5	80
2	77
0.85	72
0.425	69
0.25	66
0.15	62
0.075	57
0.0297	26.0
0.0198	20.7
0.0119	15.3
0.0086	13.0
0.0061	11.5
0.0031	8.4
0.0013	5.7



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C.J. Dixon

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Dry Stack Tailings Facility	DRILL: Mini-Sonic	W14101178.003-BH20
Keno City, YT		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Depth (ft)
0	GRAVEL - sandy, trace silt, well graded, sand and gravel angular to subangular, compact, damp, brown		SA01		UNFROZEN	0
1	- gravel content increases from 0.5 to 1.2 m - becomes moist around 0.8 m - shale particles below 1.2 m to 1.7 m		SA02			5
2	SILT (TILL) - sandy, some gravel, trace clay, well graded sand, fine to medium grained, subrounded gravel, stiff, moist, grey		SA03 SA04			
3	END OF BOREHOLE 2.4 m - hard drilling at 2.4 m, possible boulder or bedrock					10
4						
5						15
6						20
7						
8						25
9						30
10						33

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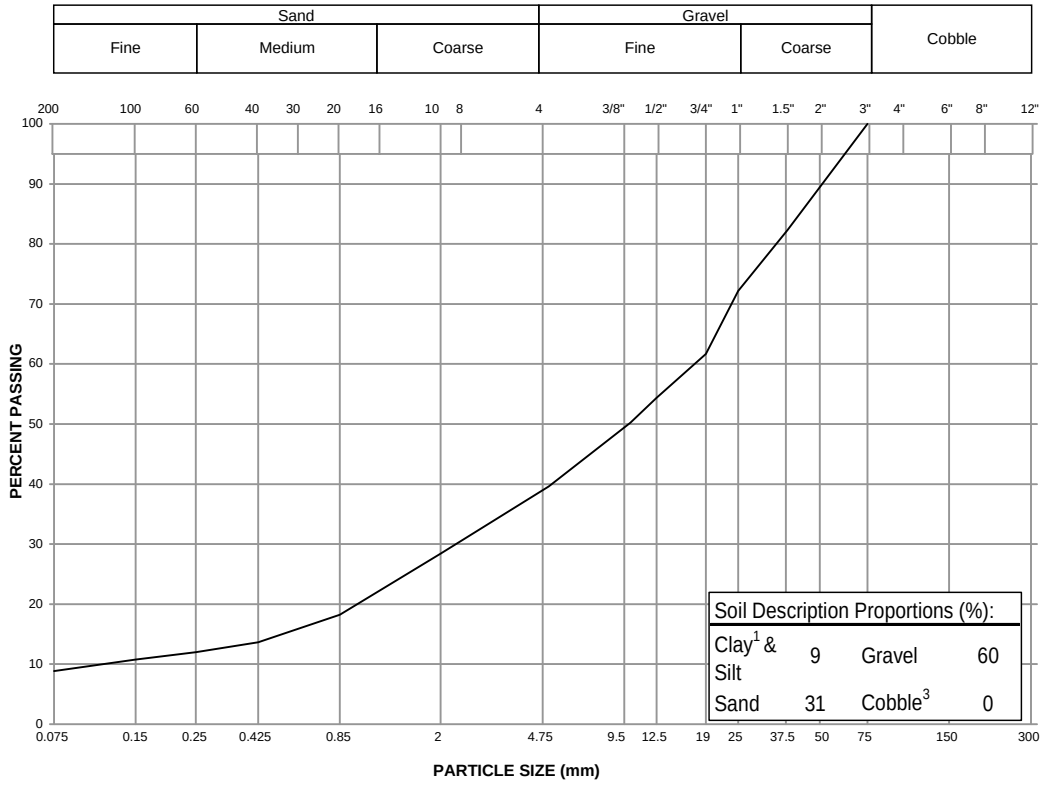
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REVIEWED BY:	COMPLETE: 9/1/2009
DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA01	Soil Description[2]:	GRAVEL - sandy, trace silt
Sample Loc.:	BH20		
Sample Depth:	0.3 - 0.5 m	USC Classification:	Cu: 145.6
Sampling Method:			Cc: 2.8
Date sampled:	Sep-09 By: Client	Moisture Content:	5.7

Particle Size (mm)	Percent Passing
300	
200	
150	
100	
75	100
50	
38	82
25	72
19	62
12.5	54
10	50
5	40
2	28
0.85	18
0.425	14
0.25	12
0.15	11
0.075	9



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

[3] If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification:

Remarks:

Reviewed By: C.J. Dixon

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Dry Stack Tailings Facility	DRILL: Mini-Sonic	W14101178.003-BH21
Keno City, YT		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Depth (ft)
0	SILT - sandy, some gravel, trace clay, stiff, fine grained, gap graded, damp, light brown, organic inclusions, subrounded to subangular		SA01		UNFROZEN	0
	GRAVEL - sandy, trace silt, coarse grained, well graded, damp, brown, subrounded to subangular					
1			SA02			5
2	- cobbles and boulders from 2.0 to 3.0 m					
3	SAND AND GRAVEL (TILL) - silty, compact, damp, brown					10
	NOTE: Very slow drilling, bit replaced, still very slow. 1.5 hrs to retrieve bit, skid steer, also back on site					
4	END OF BOREHOLE 4.2 m - very slow drilling					15
5						
6						20
7						
8						25
9						30
10						33

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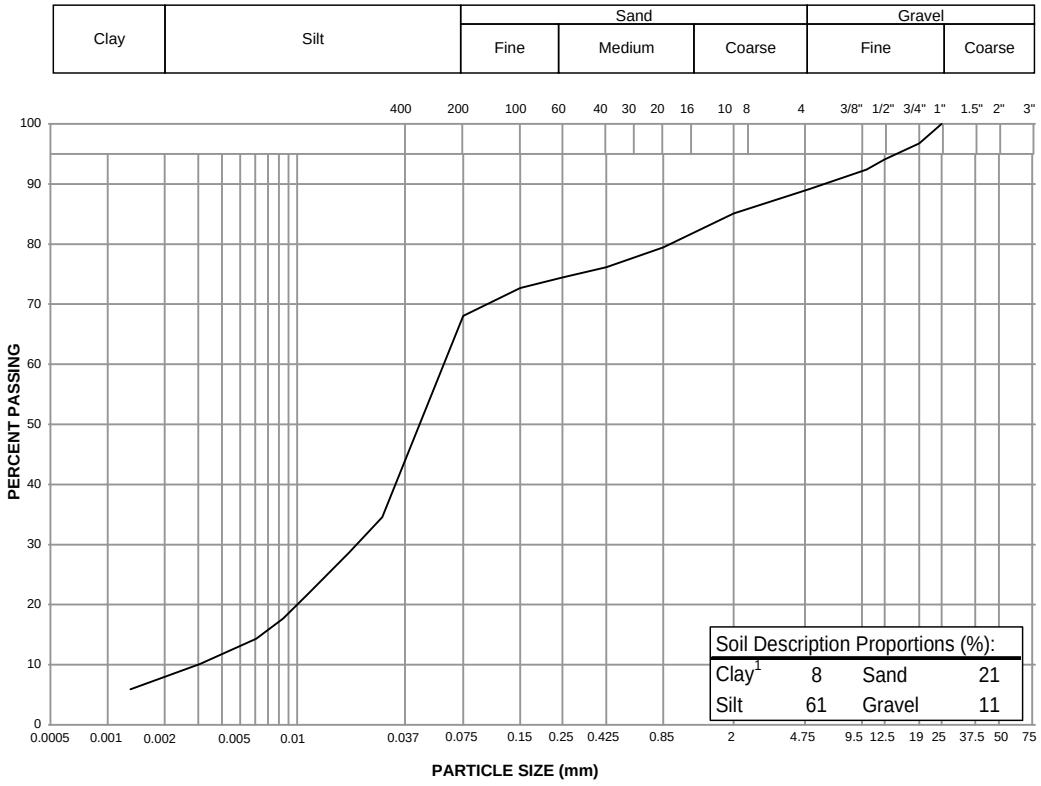
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DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	22-Oct-2009 By: SMS
Sample No.:	SA01	Soil Description[2]:	SILT - sandy, some gravel, trace clay
Sample Loc.:	BH21		
Sample Depth:	0.2 - 0.4 m	USC Classification:	Cu: 21.1
Sampling Method:			Cc: 2.3
Date sampled:	Sep-09 By: Client	Moisture Content:	17.9

Particle Size (mm)	Percent Passing
75	
50	
38	
25	100
19	97
12.5	94
10	92
5	89
2	85
0.85	79
0.425	76
0.25	74
0.15	73
0.075	68
0.0281	34.5
0.0188	28.6
0.0115	21.9
0.0084	17.7
0.0061	14.3
0.0031	10.1
0.0013	5.9



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C. J. Dixon

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Dry Stack Tailings Facility	DRILL: Mini-Sonic	W14101178.003-BH22
Keno City, YT		

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Depth (ft)
0	MOSS COVERED - peat, black				UNFROZEN	0
	SILT -sandy, trace clay, brownish black		SA01	286	FROZEN - Nbe (25%), well bonded	
1			SA02		- visible ice inclusions, < 5 %	
	SAND (TILL) - gravelly, silty, compact (est.), well graded, brown frozen		SA03		- visible ice inclusions 50%, well bonded - visible ice inclusions 50%, poorly bonded	5
2	- very hard slow drilling 2.4 m					
	END OF BOREHOLE 2.4 m					
3						10
4						
						15
5						
6						20
7						
						25
8						
9						30
10						33

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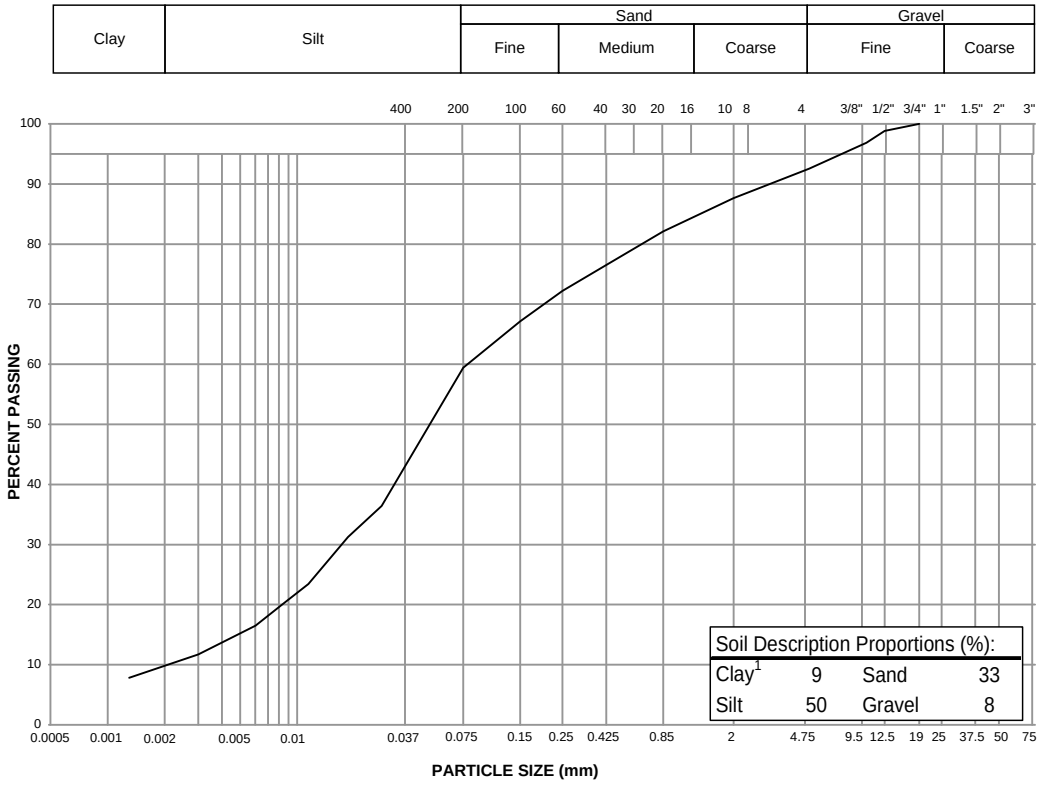
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	23-Oct-2009 By: SMS
Sample No.:	SA03	Soil Description[2]:	SILT - sandy, trace clay, trace gravel
Sample Loc.:	BH22		
Sample Depth:	1.3 - 1.5 m	USC Classification:	Cu: 35.7
Sampling Method:			Cc: 1.7
Date sampled:	Sep-09 By: Client	Moisture Content:	71.5

Particle Size (mm)	Percent Passing
75	
50	
38	
25	
19	100
12.5	99
10	97
5	93
2	88
0.85	82
0.425	77
0.25	72
0.15	67
0.075	59
0.0278	36.4
0.0185	31.2
0.0114	23.4
0.0083	20.0
0.0060	16.5
0.0030	11.7
0.0013	7.8



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C.J. Dicken

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Dry Stack Tailings Facility	DRILL: Mini-Sonic	W14101178.003-BH23
Keno City, YT		ELEVATION: 908.2m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	GROUND ICE DESCRIPTION	Thermistor	Elevation (m)
0	PEAT - amorphous, granular, moist to wet		SA01	-3.4	UNFROZEN		908.0
	SILT AND SAND (TILL) - trace gravel , trace clay, low plastic, olive grey		SA02		FROZEN - Vr (20%)		
1				-0.2			907.0
			SA03		Vr (10%)		
2					Vr (15%)		906.0
			SA04	-0.4			
			SA05		Vr (35%)		
3	SAND - silty, trace gravel, trace clay, well graded, brown				Vc (10%)		
					Vr (10%), becomes Vs		905.0
			SA06	-0.4			
4			SA07				904.0
				-0.4			
			SA08				
5			SA09				903.0
	SILT AND SAND (TILL) - trace clay, low plastic, olive grey				Vs 10%		
				-0.4			
6			SA10				902.0
			SA11	-0.4			
7			SA12				901.0
			SA13	-0.4			
	GRAVEL - silty, some cobbles, some sand, well graded, greyish brown						
8	SILT (TILL) - sandy, gravelly, trace clay, non plastic, damp, olive grey (not frozen in core)		SA14				900.0
				-0.3			
9			SA15				899.0
	GRAVEL - some sand, trace silt, compact (est.), well graded, coarse grained, damp, brown		SA16	-0.3			
	SILT (TILL) - gravelly, sandy, trace clay, stiff, low to non-plastic, massive, damp, olive grey						
10							

STANDARD PENETRATION (N) 20 40 60 80

POCKET PEN. (kPa) 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

130

Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Dry Stack Tailings Facility	DRILL: Mini-Sonic	W14101178.003-BH23
Keno City, YT		ELEVATION: 908.2m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

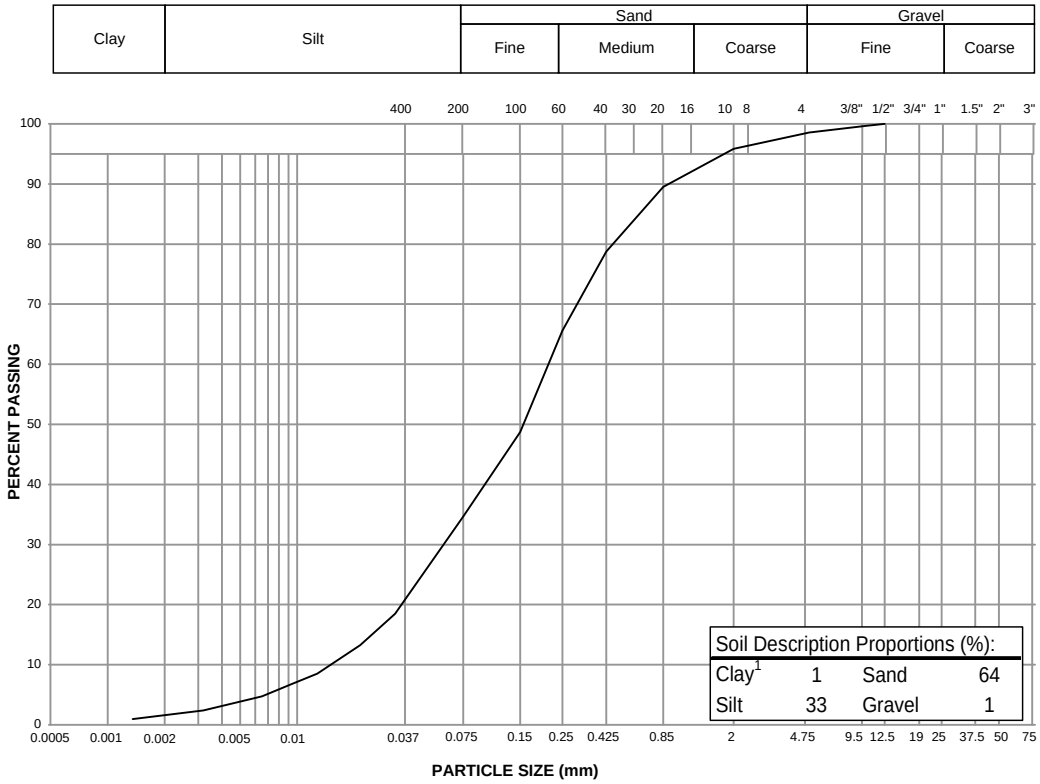
Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Thermistor	Elevation (m)
10	GRAVEL - silty, sandy, some cobbles, dense (est.), well graded, coarse grained, damp, brownish grey		SA17					898.0
	END OF BOREHOLE - refusal in cobbly soil							
11								897.0
12								896.0
13								895.0
14								894.0
15								893.0
16								892.0
17								891.0
18								890.0
19								889.0
20								

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	23-Oct-2009 By: SMS
Sample No.:	SA07	Soil Description[2]:	SAND - silty, trace clay, trace gravel
Sample Loc.:	BH23		
Sample Depth:	4.0 - 4.15 m	USC Classification:	Cu: 14.1
Sampling Method:			Cc: 1.2
Date sampled:	Sep-09 By: Client	Moisture Content:	22.6

Particle Size (mm)	Percent Passing
75	
50	
38	
25	
19	
12.5	100
10	100
5	99
2	96
0.85	90
0.425	79
0.25	66
0.15	49
0.075	35
0.0328	18.5
0.0215	13.3
0.0127	8.5
0.0091	6.6
0.0065	4.7
0.0032	2.4
0.0014	0.9



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C.J. Dixon

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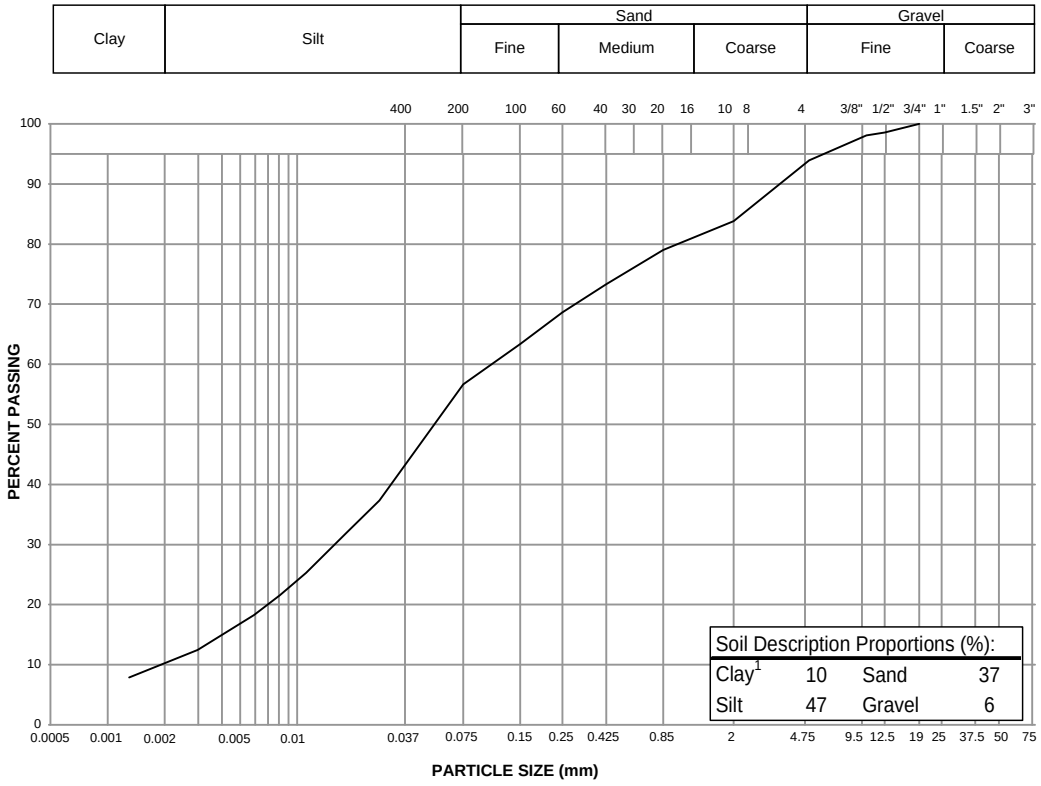
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	23-Oct-2009 By: SMS
Sample No.:	SA11	Soil Description[2]:	SILT AND SAND - trace clay, trace gravel
Sample Loc.:	BH23		
Sample Depth:	6.4 - 6.55	USC Classification:	Cu: 54.1
Sampling Method:			Cc: 1.1
Date sampled:	Sep-09 By: Client	Moisture Content:	17.1

Particle Size (mm)	Percent Passing
75	
50	
38	
25	
19	100
12.5	99
10	98
5	94
2	84
0.85	79
0.425	73
0.25	69
0.15	63
0.075	57
0.0270	37.3
0.0181	31.9
0.0111	25.3
0.0081	21.6
0.0059	18.3
0.0030	12.4
0.0013	7.9



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

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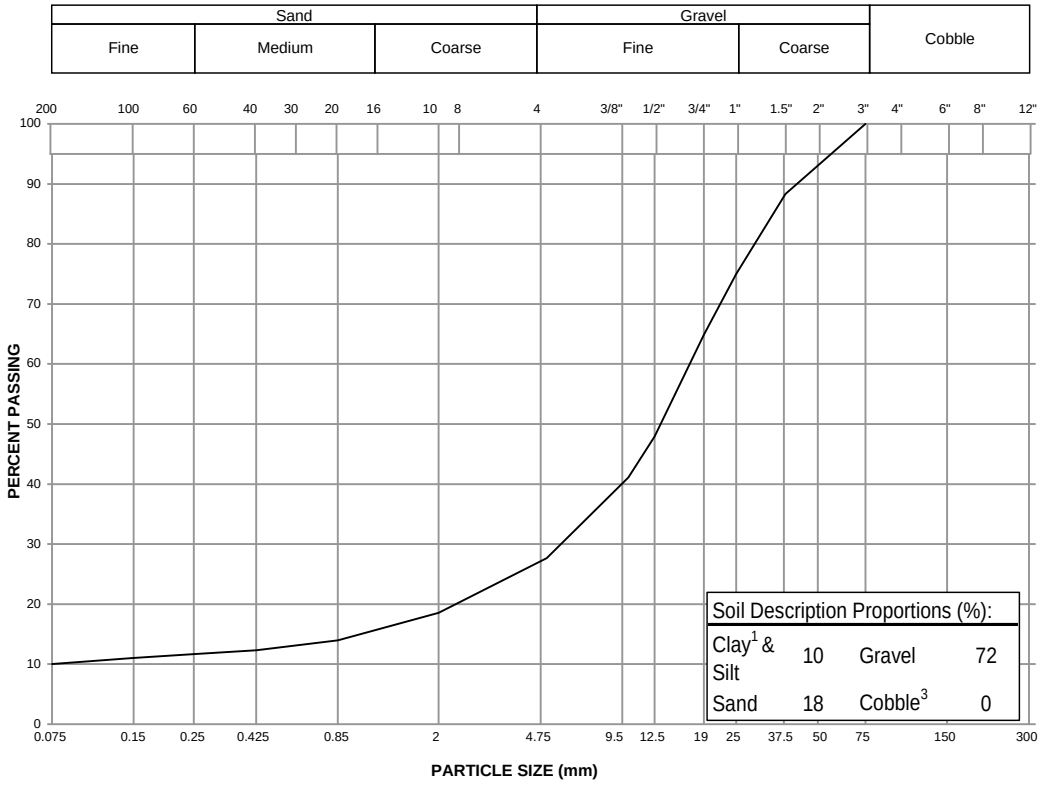
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	23-Oct-2009 By: SMS
Sample No.:	SA16	Soil Description[2]:	GRAVEL - some sand, trace silt
Sample Loc.:	BH23		
Sample Depth:	9.3 - 9.5 m	USC Classification:	Cu: 229.0
Sampling Method:			Cc: 26.9
Date sampled:	Sep-09 By: Client	Moisture Content:	4.0

Particle Size (mm)	Percent Passing
300	
200	
150	
100	
75	100
50	
38	88
25	75
19	65
12.5	48
10	41
5	28
2	19
0.85	14
0.425	12
0.25	12
0.15	11
0.075	10



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

[3] If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: C.J. Dixon

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Water Retention Pond	DRILL: Mini-Sonic	W14101178.003-BH24
Keno City, YT		ELEVATION: 894.1m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Monitoring well	Elevation (m)
0	SILT (FILL) - gravelly, sandy, non-plastic, damp, dark brown, organic inclusions		SA01					894.0
1	GRAVEL (FILL) - sandy, some silt, loose to compact (est.), fine grained, well graded, damp, light brown to grey, subangular		SA02					893.0
2	- no recovery from 1.7 - 2.8 m							892.0
3	SILT (TILL) - gravelly, some sandy, trace clay, very stiff, low to non-plastic, massive, damp to moist, olive grey, gravel particles, subangular			36				891.0
4								890.0
5								889.0
6			SA03					888.0
			SA04	48				
	SAND - fine sand lens							
	BOULDER AND SILT TILL (as above)							
7	- no recovery from 6.6 - 6.9 m		SA05					887.0
	GRAVEL - sandy, some silt, compact, fine grained, well graded, damp to moist, greyish brown, oxide staining							
8			SA06					886.0
	SILT (TILL) - sandy, gravelly, some cobbles, trace clay, stiff (est.), non-plastic, massive, damp, olive grey							
9			SA07					885.0
	END OF BOREHOLE 9.15 m - target depth							
10								

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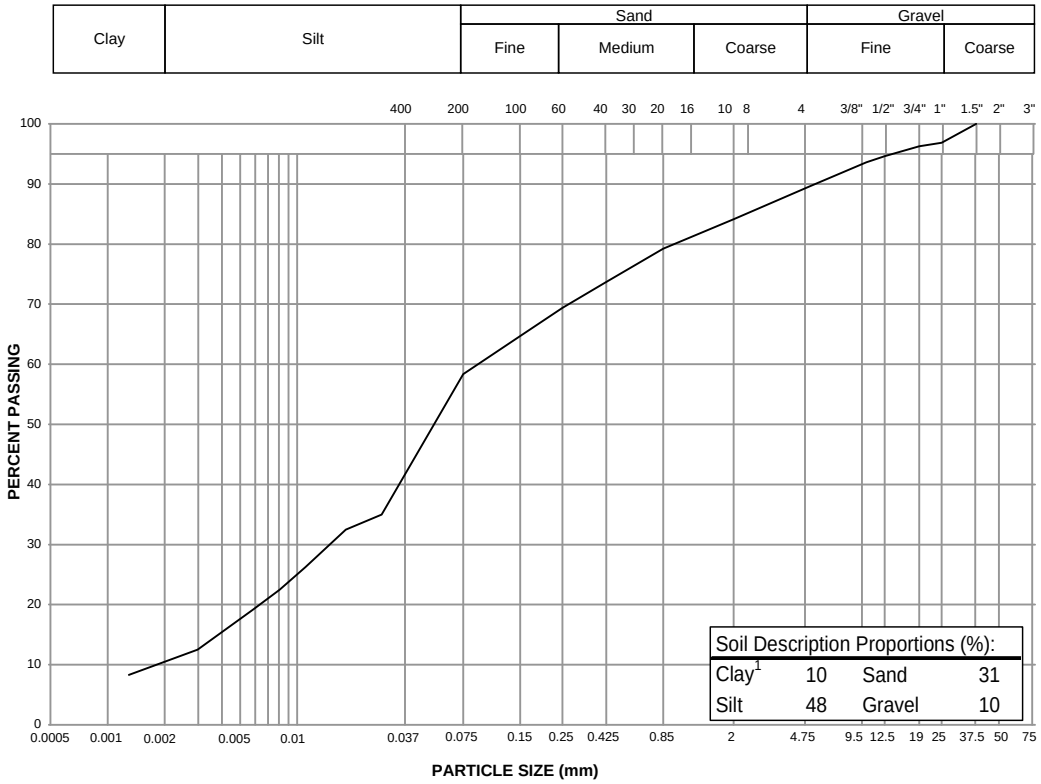
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REVIEWED BY:	COMPLETE: 8/29/2009
DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	23-Oct-2009 By: SMS
Sample No.:	SA03	Soil Description[2]:	SILT - sandy, trace clay, trace gravel
Sample Loc.:	BH24		
Sample Depth:	5.4 - 5.6 m	USC Classification:	Cu: 47.9
Sampling Method:			Cc: 1.3
Date sampled:	Sep-09 By: Client	Moisture Content:	10.5

Particle Size (mm)	Percent Passing
75	
50	
38	100
25	97
19	96
12.5	95
10	94
5	90
2	84
0.85	79
0.425	74
0.25	69
0.15	65
0.075	58
0.0278	35.0
0.0180	32.5
0.0111	26.2
0.0081	22.5
0.0059	19.2
0.0030	12.5
0.0013	8.3



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C.J. Dixon

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Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Water Retention Pond	DRILL: Mini-Sonic	W14101178.003-BH25
Keno City, YT		ELEVATION: 894.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL (FILL) - silty, some sand, loose, gap graded, damp, brown/green, organic inclusions		SA01				
1							894.0
	GRAVEL (glaciofluvial) - sandy, some silt, compact, medium grained, well graded, damp, brown, subrounded to subangular						
2			SA02				893.0
	SAND AND GRAVEL (glaciofluvial) - trace silt, compact, medium grained, well graded, damp, brown, rounded to sub rounded						
3			SA03				892.0
				21			
			SA04				
4							891.0
	- no recovery from 7.4 - 6.3 m						
	GRAVEL - sandy, some cobbles, trace silt, dense, coarse grained, well graded, moist, brown, subangular to subrounded						
5							890.0
6							889.0
	- SPT on boulder						
7			SA05				888.0
	SILT (TILL) - gravelly, some sand, trace clay, very stiff to hard, low-non plastic, massive, moist, olive grey						
8			SA06				887.0
9			SA07				886.0
				28			
10							885.0

EBA Engineering Consultants Ltd.	LOGGED BY: CJD	COMPLETION DEPTH: 15.25m
	REVIEWED BY:	COMPLETE: 8/28/2009
	DRAWING NO:	Page 1 of 2

Flame & Moth DSTF Drilling	CLIENT: Alexco Resources	PROJECT NO. - BOREHOLE NO.
Water Retention Pond	DRILL: Mini-Sonic	W14101178.003-BH25
Keno City, YT		ELEVATION: 894.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
10			SA08				
	SILT (TILL) - gravelly, some sand, trace clay, stiff to hard, massive, damp grey						
11	GRAVEL - cobbly, sandy, trace silt, compact, coarse grained, gap graded, damp, rust to grey, oxidation		SA09				884.0
12			SA10				883.0
	- no recovery from 12.5 - 15.0 m			39			
13							882.0
14							881.0
15	- boulder of possible bedrock						880.0
	END OF BOREHOLE 15.25 m - target depth						
16							879.0
17							878.0
18							877.0
19							876.0
20							875.0

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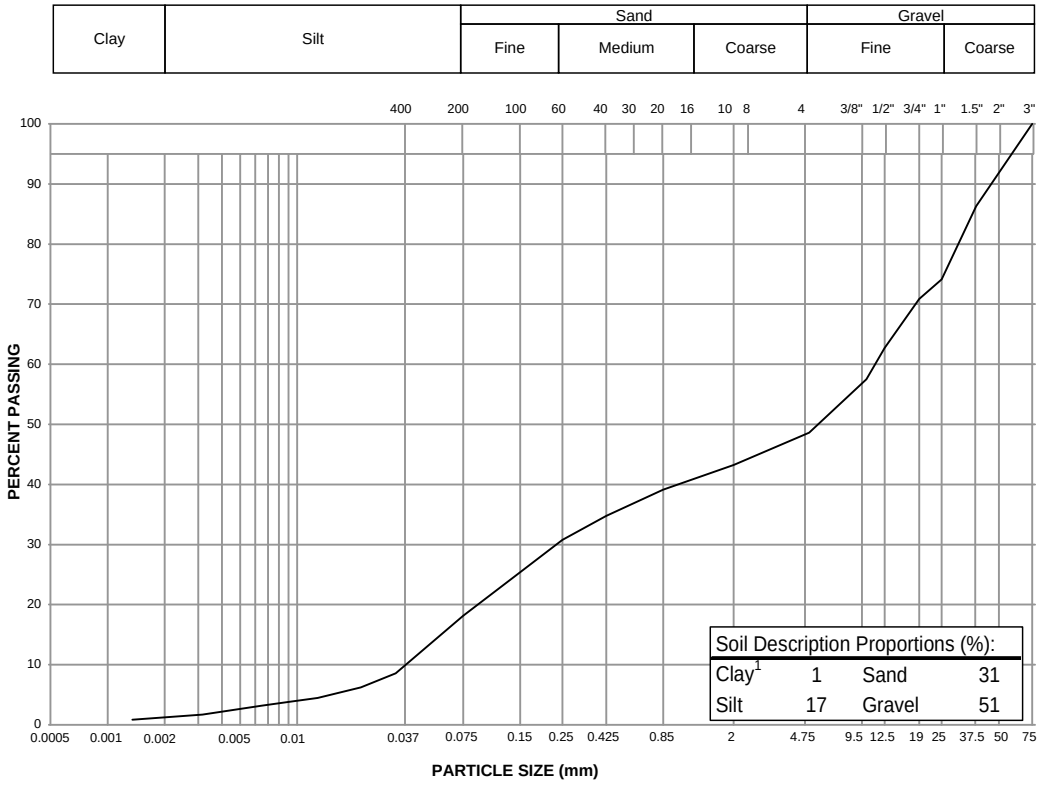
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REVIEWED BY:	COMPLETE: 8/28/2009
DRAWING NO:	Page 2 of 2

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	25-Oct-2009 By: SMS
Sample No.:	SA02	Soil Description[2]:	GRAVEL - sandy, some silt, trace clay
Sample Loc.:	BH25		
Sample Depth:	1.8 - 2.1 m	USC Classification:	Cu: 284.4
Sampling Method:			Cc: 0.1
Date sampled:	Sep-09 By: Client	Moisture Content:	3.6

Particle Size (mm)	Percent Passing
75	100
50	
38	86
25	74
19	71
12.5	63
10	58
5	49
2	43
0.85	39
0.425	35
0.25	31
0.15	25
0.075	18
0.0331	8.6
0.0216	6.2
0.0128	4.5
0.0091	3.9
0.0065	3.2
0.0032	1.7
0.0014	0.9



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C.J. Dixon

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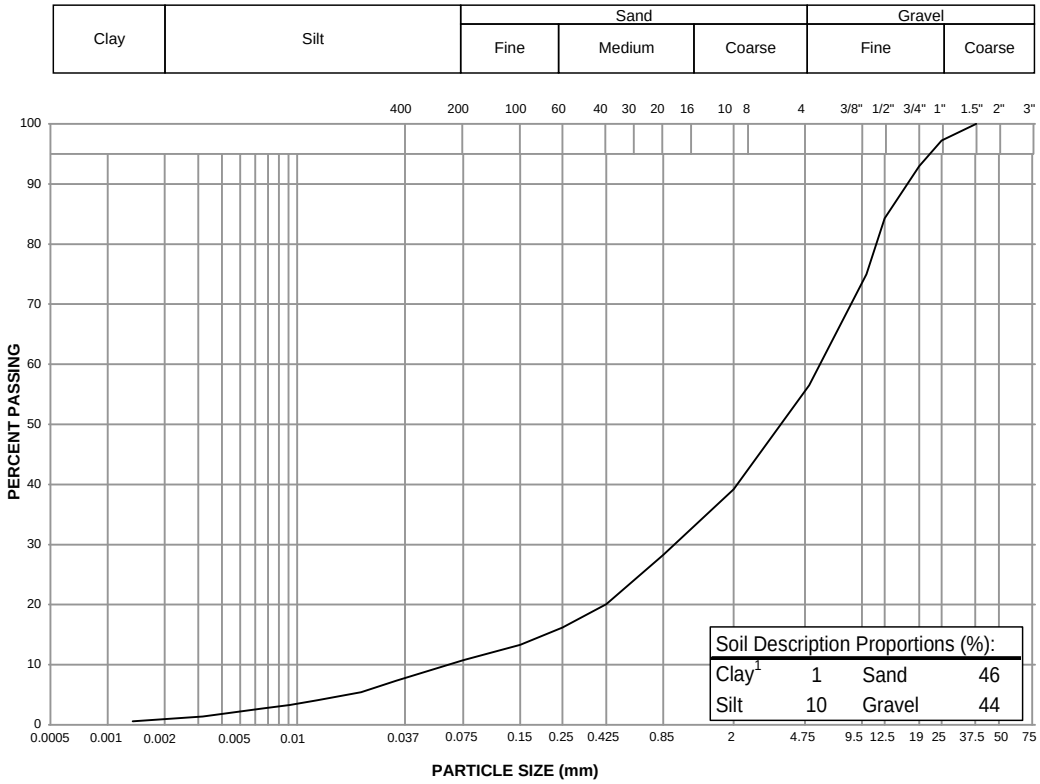
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	25-Oct-2009 By: SMS
Sample No.:	SA04	Soil Description[2]:	SAND AND GRAVEL - trace silt, trace clay
Sample Loc.:	BH25		
Sample Depth:	3.3 - 3.7	USC Classification:	Cu: 90.3
Sampling Method:			Cc: 2.7
Date sampled:	Sep-09 By: Client	Moisture Content:	2.5

Particle Size (mm)	Percent Passing
75	
50	
38	100
25	97
19	93
12.5	84
10	75
5	57
2	39
0.85	28
0.425	20
0.25	16
0.15	13
0.075	11
0.0333	7.4
0.0217	5.4
0.0128	4.1
0.0091	3.3
0.0065	2.7
0.0032	1.4
0.0014	0.6



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

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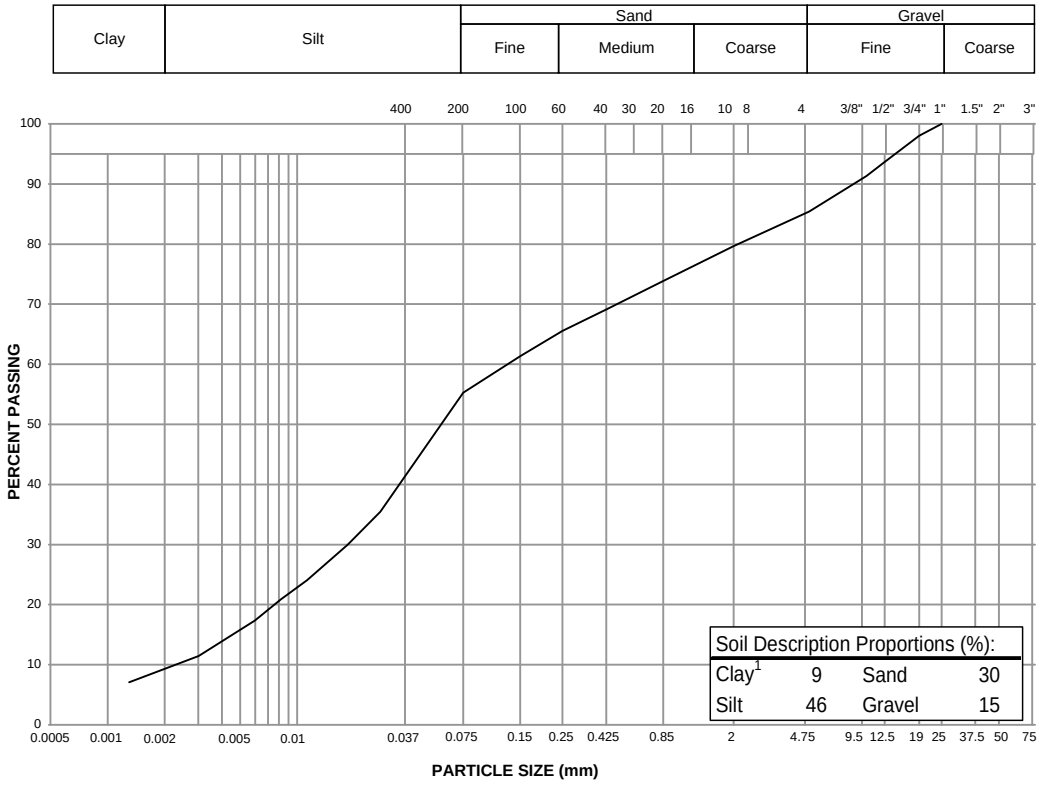
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PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Flame & Moth DSTF Drilling	Client:	Alexco Resource Corp
Project No.:	W14101178.003	Client Rep.:	
Site:	Keno City, YT		
Material Type:		Date Tested:	25-Oct-2009 By: SMS
Sample No.:	SA07	Soil Description[2]:	SILT - sandy, some gravel, trace clay
Sample Loc.:	BH25		
Sample Depth:	8.7 - 8.95 m	USC Classification:	Cu: 54.4
Sampling Method:			Cc: 1.0
Date sampled:	Sep-09 By: Client	Moisture Content:	9.7

Particle Size (mm)	Percent Passing
75	
50	
38	
25	100
19	98
12.5	94
10	91
5	85
2	80
0.85	74
0.425	69
0.25	66
0.15	61
0.075	55
0.0274	35.5
0.0184	30.0
0.0113	24.1
0.0082	20.9
0.0060	17.3
0.0030	11.4
0.0013	7.1



Notes:

[1] The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

[2] The description is visually based & subject to EBA description protocols

Specification:

Remarks:

Reviewed By: C.J. Dixon

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Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
DSTF	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP01
near Keno City, YT	7086907N; 483901E; Zone 8	ELEVATION: 906.4m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - woody, some silt, roots, organics				Frozen	
	GRAVEL (FILL) - sandy - some silt, compact (est.), medium grained, well graded, frozen, sub-rounded, brown				Nbe	906.0
			SA01	●		
1					Unfrozen	
	GRAVEL - sandy, some cobbles, trace silt, compact (est.), coarse grained, well graded, damp, brown, sub-rounded					905.0
2			SA02	●		904.0
	- becomes loose					
3						903.0
	SILT - sandy, some gravel, some clay, stiff, low plastic, massive, damp, olive grey					
4			SA03	●H▲		902.0
5	EOH - refusal, possible bedrock (quartzite)					901.0
6						

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LOGGED BY: CJD	COMPLETION DEPTH: 5m
REVIEWED BY: JRT	COMPLETE: 5/6/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
DSTF	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP02
near Keno City, YT	7086862N; 483957E; Zone 8	ELEVATION: 908.3m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - silty, woody, fibrous, roots, organics					Frozen	
	SAND - silty, some gravel, trace clay, loose (est.), low plastic, massive, frozen, organic inclusions					Vr, Vs (35%) ice lens up to 10cm thick	908.0
1			SA01		141		907.0
	-becomes some clay		SA02	-0.6		Vx (5%)	
2						Vx, Vs (10%)	906.0
			SA03				
3	EOH - target depth						905.0
4							904.0
5							903.0
6							

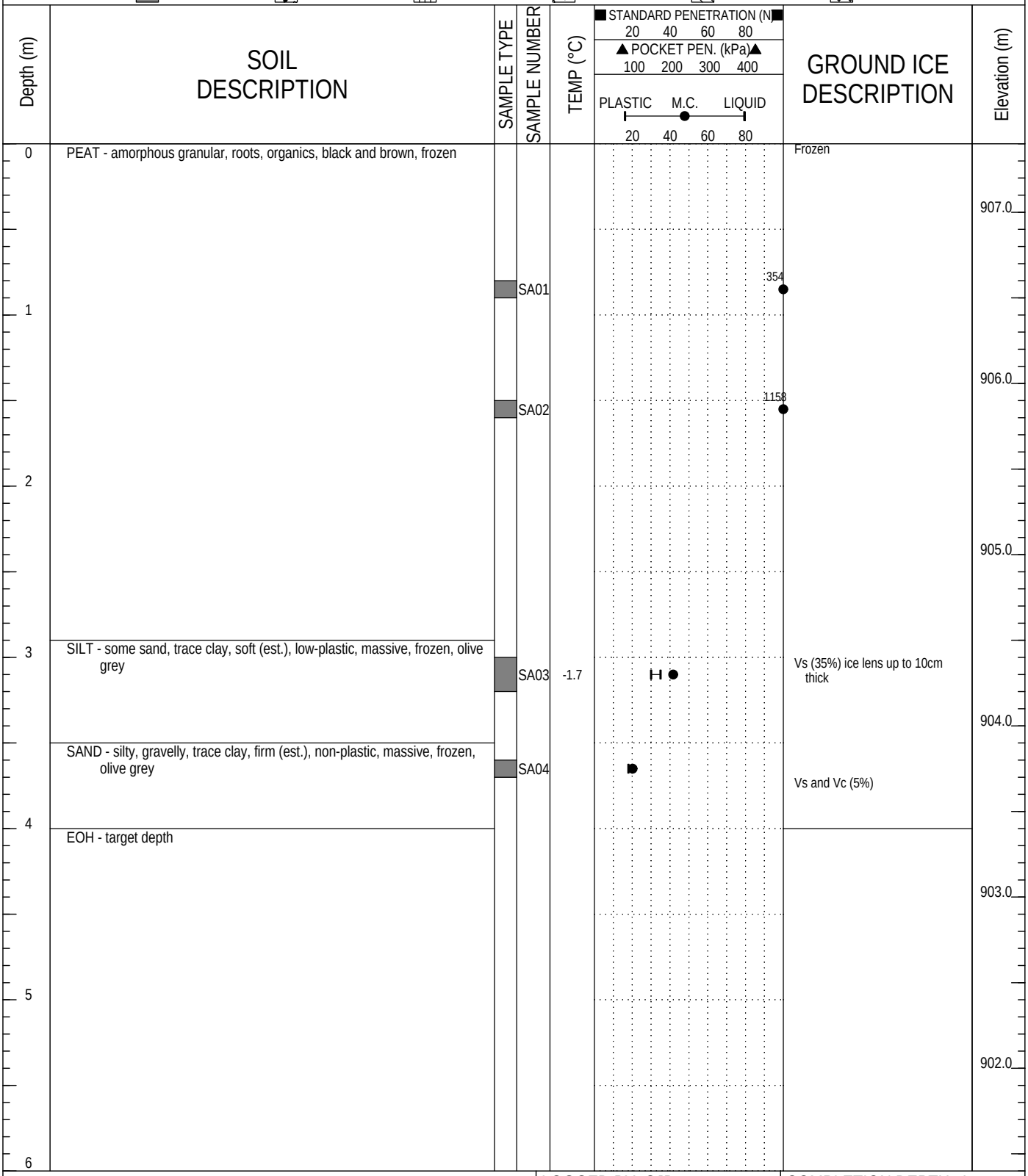
EBA Engineering Consultants Ltd.

LOGGED BY: CJD	COMPLETION DEPTH: 3.1m
REVIEWED BY: JRT	COMPLETE: 5/6/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Pad	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP03
near Keno City, YT	7086760N; 484004E; Zone 8	ELEVATION: 907.4m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND



EBA Engineering Consultants Ltd.	LOGGED BY: CJD	COMPLETION DEPTH: 4m
	REVIEWED BY: JRT	COMPLETE: 5/6/2009
	DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Pad	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP04
near Keno City, YT	7086712N; 483906E; Zone 8	ELEVATION: 903.8m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - roots, organic mat, woody, black					Frozen	
	SAND - silty, some gravel, compact (est.), medium grained, well graded, frozen, light brown, sub-rounded						
	GRAVEL - sandy, silty, some cobbles, compact (est.), coarse grained, well graded, moist, dark brown, pockets of silt, sub-rounded					Unfrozen	903.0
1			SA01				
			SA02				902.0
2						Frozen Nbn	
							901.0
3						Vc (10%)	
			SA03	-0.3			
	EOH - refusal in frozen gravel						900.0
4							
							899.0
5							
							898.0
6							

EBA Engineering Consultants Ltd.

LOGGED BY: CJD	COMPLETION DEPTH: 3.5m
REVIEWED BY: JRT	COMPLETE: 5/6/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Pad	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP05
near Keno City, YT	7086736N; 483899E; Zone 8	ELEVATION: 903.4m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - roots, organics				Frozen	
	SAND AND GRAVEL - silty, trace cobbles, compact (est.), coarse grained, well graded, frozen, medium brown, sub-rounded		SA01			903.0
1						
	0.1 m thick silt lens - frozen, light brown		SA02		Unfrozen	902.0
2	SAND - some gravel, some silt, trace cobbles, loose (est.), coarse grained, well graded, damp, dark brown, sub-angular					901.0
	SAND AND GRAVEL - trace silt, trace cobbles, compact (est.), medium grained, well graded, damp, dark brown, sub-rounded		SA03			900.0
3						
4			SA04			899.0
	EOH - target depth					
5						898.0
6						

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LOGGED BY: CJD	COMPLETION DEPTH: 4.5m
REVIEWED BY: JRT	COMPLETE: 5/3/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Pad	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP06
near Keno City, YT	7086719N; 483925E; Zone 8	ELEVATION: 905.1m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - wood, roots, organic					Frozen	905.0
	SAND - silty, some gravel, compact (est.), gap graded, coarse grained, moist, brown, organic inclusions, frozen		SA01		●		
	GRAVEL AND SAND - some silt, trace cobbles, compact to dense (est), coarse grained, well graded, frozen, dark brown, sub-rounded					Nbn	
1							904.0
			SA02		●		
2							903.0
3			SA03	-0.2	●		902.0
						Unfrozen	
			SA04	0.7	●		
4							901.0
5			SA05		●		900.0
	EOH - target depth						
6							

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LOGGED BY: CJD	COMPLETION DEPTH: 5.5m
REVIEWED BY: JRT	COMPLETE: 5/6/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Pad	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP07
near Keno City, YT	7086712N; 483955E; Zone 8	ELEVATION: 906.7m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - some silt, woody, roots, black					Frozen	
	SILT - sandy, some gravel, medium, non-plastic, frozen, brown, organics, roots		SA01				906.0
	SAND - gravelly, trace cobbles, trace silt,, compact (est.), medium grained, well graded, damp to moist, brown, sub-rounded						
1			SA02			Unfrozen	
							905.0
	- seepage						
2						Frozen Nbn	
	SILT - sandy, some gravel, trace clay, stiff (est.), low plastic, massive, olive grey						904.0
3			SA03	-0.1	H	Vx, Vc (<5%)	
							903.0
						Unfrozen	
4							
			SA04	1.5	▲		902.0
5							
	EOH - refusal at probable bedrock (quarzite)						901.0
6							

EBA Engineering Consultants Ltd.	LOGGED BY: CJD	COMPLETION DEPTH: 5.4m
	REVIEWED BY: JRT	COMPLETE: 5/6/2009
	DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Pad	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP08
near Keno City, YT	7086741N; 483974E; Zone 8	ELEVATION: 908.6m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - silty, woody, organics, roots, frozen					Frozen	
	SAND - gravelly, some silt, loost (est.), well graded, coarse grained, frozen						908.0
1			SA01	-0.5	●	Vc, Vr (25%)	
							907.0
	BEDROCK - laminated, moderately weathered						
2			SA02		●	Vs (10%)	
			SA03		●		
	EOH refusal, frozen bedrock						906.0
3							
							905.0
4							
							904.0
5							
							903.0
6							

EBA Engineering Consultants Ltd.

LOGGED BY: CJD	COMPLETION DEPTH: 2.2m
REVIEWED BY: JRT	COMPLETE: 5/6/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Detention Berm	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP09
near Keno City, YT	7086737N; 483797E; Zone 8	ELEVATION: 895.8m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - woody, organic, dark brown, frozen				Frozen	895.0
	GRAVEL AND SAND - some cobbles, trace silt, compact to dense (est.), coarse grained, well graded, damp, medium brown, sub-rounded					
1	- unfrozen		SA01		Unfrozen	894.0
2						
	BOULDERS - cobbley, some gravel, some silt, dense (est.), coarse grained, gap graded, damp, bluish grey, sub-rounded					893.0
	SILT (till) - gravelly, sandy, trace clay, stiff, low plastic, damp, olive grey, massive		SA02			
3						892.0
4			SA03			
						891.0
5			SA04			
	EOH - target depth					890.0
6						

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Runoff Collection Pond	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP10
near Keno City, YT	7086754N; 483834E; Zone 8	ELEVATION: 896m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL - sandy, some cobbles, trace silt, dense (est.), coarse grained, well graded, damp, medium brown, frozen				Frozen	896.0
					Unfrozen	
1			SA01			895.0
2						894.0
3			SA02			893.0
4			SA03			892.0
	- water					
5			SA04			891.0
	EOH - target depth					
6						890.0

EBA Engineering Consultants Ltd.	LOGGED BY: CJD	COMPLETION DEPTH: 5.1m
	REVIEWED BY: JRT	COMPLETE: 5/5/2009
	DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Pad	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP11
near Keno City, YT	7086737N; 484046E; Zone 8	ELEVATION: 912.4m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - silty, woody, organic, roots, silt is brown, peat is black -seepage					Unfrozen	
						Frozen	912.0
	SILT - some sand, some gravel, trace clay, soft (est), high plastic, massive, frozen, olive grey					Vs, Vc (25%)	
1			SA01	-0.6			
							911.0
			SA02				
2						Vs, Vc (20%)	
							910.0
			SA03			Vs, Vc (30%)	
3	EOH- target depth						
							909.0
4							
							908.0
5							
							907.0
6							

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LOGGED BY: CJD	COMPLETION DEPTH: 3m
REVIEWED BY: JRT	COMPLETE: 5/6/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
DSTF	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP12
near Keno City, YT	7086942N; 483955E; Zone 8	ELEVATION: 913.8m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - woody, roots, organics					Frozen	
	SILT - sandy, some gravel, trace clay, stiff (est.), non-plastic, frozen, light brown, organic, roots						
	GRAVEL AND SAND - some cobbles, trace silt, compact (est.), medium grained, well graded, brown						913.0
1						unfrozen	
			SA01		●		
							912.0
2	SILT and BOULDERS - sandy, trace clay, trace gravel, non-plastic, bedded, frozen, brown		SA02	-0.3	●	Frozen, Vs (<5%)	
	EOH - refusal at possible bedrock (quartzite)						
							911.0
3							
							910.0
4							
							909.0
5							
							908.0
6							

EBA Engineering Consultants Ltd.	LOGGED BY: CJD	COMPLETION DEPTH: 2.1m
	REVIEWED BY: JRT	COMPLETE: 5/7/2009
	DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP13
near Keno City, YT	7086811N; 483912E; Zone 8	ELEVATION: 905m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL - (waste rock) - cobbley, some sand, trace silt, loose to compact (est.), coarse grained, well graded, damp to moist, reddish-brown, angular				Unfrozen	905.0
			SA01	●		
1	-hole sloughing					904.0
	BEDROCK (quartzite), moderately weathered, oxidized, blocky					
2						903.0
3	EOH - target depth and sloughing					902.0
4						901.0
5						900.0
6						899.0

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LOGGED BY: CJD	COMPLETION DEPTH: 3m
REVIEWED BY: JRT	COMPLETE: 5/7/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
DSTF	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP14
near Keno City, YT	7086986N; 483897E; Zone 8	ELEVATION: 901.4m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - amorphous granular, organic, roots and rootlets					Frozen	901.0
1	SILT - sandy, some gravel, non-plastic, massive, frozen, olive grey		SA01			Vs (10%)	
	SAND - gravelly, some cobbles, trace silt, dense (est.), well graded, coarse grained, sub-rounded, brown, frozen						900.0
			SA02			Vc, Vx (10%)	
2			SA03	-0.2		Vc, Vx (5%)	899.0
			SA04			Nbn	
3	EOH - target depth						898.0
4							897.0
5							896.0
6							

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LOGGED BY: CJD	COMPLETION DEPTH: 3m
REVIEWED BY: JRT	COMPLETE: 5/7/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
DSTF	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP15
near Keno City, YT	7086939N; 483873E; Zone 8	ELEVATION: 900.4m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - organic, rootlets, black, frozen				Frozen	900.0
	GRAVEL - sandy, some cobbles, some silt, compact (est.), medium grained, well graded, frozen, brown					
1			SA01	●	Nbn	899.0
2						
	EOH - refusal at possible bedrock (quartzite)					898.0
3						897.0
4						896.0
5						895.0
6						

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LOGGED BY: CJD	COMPLETION DEPTH: 2.3m
REVIEWED BY: JRT	COMPLETE: 5/7/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
DSTF	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP16
near Keno City, YT	7086887N; 483836E; Zone 8	ELEVATION: 900.1m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT -amorphous granular, some silt, frozen				Frozen, visible ice wedges 10 cm wide at top	900.0
	SAND - gravelly, silty, some cobbles, dense (est.), medium grained, well graded, frozen, brown				Nbn	
1			SA01	●		899.0
	BOULDERS - some cobbles, some gravel, trace sand, trace silt, frozen				Vc (5%)	
2	EOH - refusal in frozen boulders					898.0
3						897.0
4						896.0
5						895.0
6						

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LOGGED BY: CJD	COMPLETION DEPTH: 2m
REVIEWED BY: JRT	COMPLETE: 5/7/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
DSTF	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP17
near Keno City, YT	7086807N; 483838E; Zone 8	ELEVATION: 902.5m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL AND SAND (fill) - some cobbles, some silt, coarse grained, well graded, sub-rounded, damp, brown, roots, trees, peat inclusions, frozen				Frozen	902.0
	- becomes loose to compact (est.), damp				Unfrozen	
1			SA01			901.0
2			SA02			
	PEAT - woody, roots, black					
	SILT - sandy, some gravel, firm (est.), non-plastic, massive, damp, brown					
	GRAVEL AND SAND- some cobbles, trace silt, coarse grained, compact (est.), well graded, sub-rounded, damp, brown					900.0
3						
			SA03			899.0
4						
			SA04			898.0
	EOH - target depth					
5						897.0
6						

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LOGGED BY: CJD	COMPLETION DEPTH: 4.8m
REVIEWED BY: JRT	COMPLETE: 5/7/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Pad	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP18
near Keno City, YT	7086816N; 483953E; Zone 8	ELEVATION: 908.7m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	TEMP (°C)	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - woody, fine fibrous, some silt, roots, rootlets, organics					Frozen	908.0
1	SILT AND SAND - some gravel, trace clay, non-plastic, massive, frozen, gravel angular, light brown		SA01			Vx (<5%)	
			SA02	-0.3		Vs, Vc (5%)	907.0
2	EOH - target depth						906.0
3							905.0
4							904.0
5							903.0
6							

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LOGGED BY: CJD	COMPLETION DEPTH: 1.8m
REVIEWED BY: JRT	COMPLETE: 5/7/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Case Rubber Tired Backhoe	W14101178.002-TP19
near Keno City, YT	7086795N; 483932E; Zone 8	ELEVATION: 905.4m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL (FILL/WASTE ROCK) - sandy, some silt, well graded sub-rounded gravel, coarse to medium grained sand, brown				905.0
	- cobbles, trace of silt below 0.3 m				
1					904.0
2					903.0
	END OF TESTPIT @ 2.5 m (REFUSAL) - hard solid ground, probable bedrock				
3					902.0
4					901.0
5					900.0
6					

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LOGGED BY: JSB	COMPLETION DEPTH: 2.5m
REVIEWED BY: JRT	COMPLETE: 6/29/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Case Rubber Tired Backhoe	W14101178.002-TP20
near Keno City, YT	7086798N; 483942E; Zone 8	ELEVATION: 905.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL (FILL/WASTE ROCK) - sandy, some silt, well graded rounded to angular particles, coarse to medium grained sand, compact, dark, damp, greyish brown				
	BEDROCK - highly fractured, some weathering, friable stratified				
1					905.0
	END OF TESTPIT @ 1.2 m (REFUSAL)				
2					904.0
3					903.0
4					902.0
5					901.0
6					900.0

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LOGGED BY: JSB	COMPLETION DEPTH: 1.2m
REVIEWED BY: JRT	COMPLETE: 6/29/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Case Rubber Tired Backhoe	W14101178.002-TP21
near Keno City, YT	7086816N; 483930E; Zone 8	ELEVATION: 905.7m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL (FILL/WASTE ROCK) - sandy, trace of silt, well graded angular gravel, coarse to medium grained sand, compact, mottled reddish brown and grey				
	BEDROCK - moderately weathered, highly fractured, friable to competent particles				
					905.0
1	- becomes more competent with depth				
					904.0
2	END OF TESTPIT @ 2.0 m (REFUSAL)				
					903.0
3					
					902.0
4					
					901.0
5					
					900.0
6					

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LOGGED BY: JSB	COMPLETION DEPTH: 2m
REVIEWED BY: JRT	COMPLETE: 6/29/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Case Rubber Tired Backhoe	W14101178.002-TP22
near Keno City, YT	7086801N; 483914E; Zone 8	ELEVATION: 904.8m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	BEDROCK - highly fractured, weathered, friable to competent particles, blocky stratigraphy				904.0
1	- becomes more competent with depth				
	END OF TESTPIT @ 1.2 m (REFUSAL)				903.0
2					902.0
3					901.0
4					900.0
5					899.0
6					

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LOGGED BY: JSB	COMPLETION DEPTH: 1.2m
REVIEWED BY: JRT	COMPLETE: 6/29/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Case Rubber Tired Backhoe	W14101178.002-TP23
near Keno City, YT	7086808N; 483906E; Zone 8	ELEVATION: 904.6m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	ORGANIC ROOT MATERIAL				
	GRAVEL (FILL) - sandy, trace of silt, well graded angular gravel, coarse to medium grained gravel, compact, damp, dark brown and grey - cobbles, some boulders below 0.3 m				904.0
1	becomes coarser with depth				903.0
2					902.0
	END OF TESTPIT @ 2.5 m NOTE: Possible bedrock, but could not confirm due to sloughing sidewalls of testpit				
3					901.0
4					900.0
5					899.0
6					

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Case Rubber Tired Backhoe	W14101178.002-TP24
near Keno City, YT	7086827N; 483902E; Zone 8	ELEVATION: 904m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	ORGANIC ROOT MATERIAL				904.0
	GRAVEL (FILL/WASTE ROCK) - sandy, trace to some silt, well graded sub-rounded and angular particles, compact, damp, dark brownish and grey				
1					903.0
2	- organic layer, rootlets, black				902.0
	GRAVEL - sandy, some silt, well graded sub-rounded gravel, medium to coarse grained sand, damp, brownish grey				
	BEDROCK - friable, weathered - becomes more competent with depth				
	END OF TESTPIT @2.8 m (REFUSAL)				
3					901.0
4					900.0
5					899.0
6					898.0

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LOGGED BY: JSB	COMPLETION DEPTH: 2.8m
REVIEWED BY: JRT	COMPLETE: 6/29/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP25
near Keno City, YT	7086790N; 483933E; Zone 8	ELEVATION: 904.5m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL - sandy, some silt, compact, damp, sub-rounded to sub-angular, well graded, brown				904.0
1					903.0
2	SILT (TILL) - gravelly, sandy, trace clay, firm (est.), organic inclusions, damp, olive grey				902.0
	EOH - Target Depth				
3					901.0
4					900.0
5					899.0
6					

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LOGGED BY: CJD	COMPLETION DEPTH: 2.4m
REVIEWED BY: JRT	COMPLETE: 7/16/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP26
near Keno City, YT	7086788N; 483951E; Zone 8	ELEVATION: 903.4m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	PEAT - amorphous, granular, roots, organics, black				903.0
	SILT (TILL) - gravelly, sandy, trace clay, firm, organic inclusions, damp, olive grey				
1	GRAVEL - sandy, some silt, compact, sub-rounded to sub-angular, brown				902.0
	EOH - Target Depth				
2					901.0
3					900.0
4					899.0
5					898.0
6					

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LOGGED BY: CJD	COMPLETION DEPTH: 1.2m
REVIEWED BY: JRT	COMPLETE: 7/16/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP27
near Keno City, YT	7086783N; 483947E; Zone 8	ELEVATION: 902.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL - sandy, some silt, compact, well graded, sub-rounded to sub-angular, damp, brown				
	- becomes silty				
					902.0
1					
	- becomes some silt				
	EOH -Refusal, probable quartzite bedrock				901.0
2					
					900.0
3					
					899.0
4					
					898.0
5					
					897.0
6					

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LOGGED BY: CJD	COMPLETION DEPTH: 1.8m
REVIEWED BY: JRT	COMPLETE: 7/16/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP28
near Keno City, YT	7086795N; 483934E; Zone 8	ELEVATION: 903.8m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL - sandy, some silt, compact, well graded, sub-rounded to sub-angular, damp, brown				903.0
1	EOH - Target Depth				902.0
2					901.0
3					900.0
4					899.0
5					898.0
6					

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LOGGED BY: CJD	COMPLETION DEPTH: 1m
REVIEWED BY: JRT	COMPLETE: 7/16/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP29
near Keno City, YT	7086797N; 483912E; Zone 8	ELEVATION: 902.3m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL - sandy, some silt, compact, well graded, sub-rounded to sub-angular, damp, brown				902.0
	Refusal, probable weathered quartzite bedrock				
1					901.0
2					900.0
3					899.0
4					898.0
5					897.0
6					

EBA Engineering Consultants Ltd.

LOGGED BY: CJD	COMPLETION DEPTH: 0.5m
REVIEWED BY: JRT	COMPLETE: 7/16/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Mill Building	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP30
near Keno City, YT	N; E; Zone 8	ELEVATION: 903.2m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL - sandy, some silt, compact, well graded, sub-rounded to sub-angular, damp, brown				903.0
1	SILT (TILL) - gravelly, sandy, trace clay, firm, organic inclusions, damp, olive grey				902.0
	EOH - Target Depth Note: End of bedrock knob				
2					901.0
3					900.0
4					899.0
5					898.0
6					

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LOGGED BY: CJD	COMPLETION DEPTH: 1.3m
REVIEWED BY: JRT	COMPLETE: 7/16/2009
DRAWING NO: Figure 2	Page 1 of 1

Flame and Moth Mill & DSTF	CLIENT: Alexco	PROJECT NO. - TESTPIT NO.
Borrow Pit	EXCAVATOR: Hitachi 270 LC	W14101178.002-TP31
near Keno City, YT	7086832N; 483866E; Zone 8	ELEVATION: 903.9m

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	STANDARD PENETRATION (N) 20 40 60 80 / POCKET PEN. (kPa) 100 200 300 400 / PLASTIC M.C. LIQUID 20 40 60 80	GROUND ICE DESCRIPTION	Elevation (m)
0	GRAVEL - cobbly, sandy, some to trace silt, compact, well graded, sub-rounded to sub-angular, damp, brown					903.0
1			1			902.0
2	EOH - Target Depth					901.0
3						900.0
4						899.0
5						898.0
6						

EBA Engineering Consultants Ltd.

LOGGED BY: CJD	COMPLETION DEPTH: 2m
REVIEWED BY: JRT	COMPLETE: 7/16/2009
DRAWING NO: Figure 2	Page 1 of 1

YELLOWKNIFE W14101178.002.GPJ EBA.GDT 09/08/07

Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH26
Keno City, YT	7086870N; 484037E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT
0	SAND - silty, some gravel, damp, loose, dark grey, organics near surface				
1			SA01		7.6
			SA02	12	9.7
2	GRAVEL and SAND (TILL) - some silt, damp, compact, grey				
			SA03		2.8
3					
4			SA04		4.6
	BEDROCK - weathered, grey with quartz and staining - soft rock seems 0.2 m thick, easy drilling		SA05		2.4
5	BEDROCK - hard drilling				
			SA06		0.1
6	END OF BOREHOLE @ 6.0 m (Target Depth) NOTE: Hole grouted to surface; Bentonite plug installed on surface.				
7					
8					
9					
10					

PLASTIC — M.C. — LIQUID (20 40 60 80)

STANDARD PENETRATION (N) (20 40 60 80)

UNCONFINED (kPa) (50 100 150 200)

POCKET PEN. (kPa) (100 200 300 400)

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 33

EBA Engineering Consultants Ltd.	LOGGED BY: JTP	COMPLETION DEPTH: 6m
	REVIEWED BY: JRT	COMPLETE: 8/18/2010
	DRAWING NO:	Page 1 of 1

GEOTECHNICAL W14101178.011.GPJ EBA.GDT 2/8/11

Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH27
Keno City, YT	7086920N; 484082E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT
0	SILT - sandy, trace gravel, moist, firm, non-plastic, olive brown, organics near surface				
1			SA07		13.3
	- becomes sandier		SA08	18	12.6
2	SAND and GRAVEL - some silt, dry, light grey				
	BEDROCK - grey, hard drilling		SA09		2.1
3	END OF BOREHOLE @ 3.0 m (Target Depth)				
	NOTE: hole filled with bentonite chips				
4					
5					
6					
7					
8					
9					
10					

PLASTIC M.C. LIQUID (20 40 60 80)

STANDARD PENETRATION (N) (20 40 60 80)

UNCONFINED (kPa) (50 100 150 200)

POCKET PEN. (kPa) (100 200 300 400)

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 33

EBA Engineering Consultants Ltd.

LOGGED BY: JTP	COMPLETION DEPTH: 3m
REVIEWED BY: JRT	COMPLETE: 8/18/2010
DRAWING NO:	Page 1 of 1

Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH28
Keno City, YT	7086985N; 484026E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT	PLASTIC / M.C. / LIQUID (20 40 60 80)	STANDARD PENETRATION (N) 20 40 60 80; UNCONFINED (kPa) 50 100 150 200; POCKET PEN. (kPa) 100 200 300 400	Depth (ft)
0	ORGANIC MOSS COVER							0
	SILT - some sand, uniform, moist, soft, dark brown, some organics		SA10		59			
1								5
2	SILT (TILL) - gravelly, trace sand, frozen (Vx), firm, grey		SA11	42	45.3			
			SA12		43.2			
3	- ICE and SILT		SA13	57	25.7			10
4								
	- attempted SPT - spoon refusal		SA14		13.5			15
5	SAND and GRAVEL (TILL) - gravelly, moist, firm, grey							
6	MASSIVE ICE							20
7								
	- attempted SPT - spoon refusal		SA15		22.6			25
8	SILT (TILL) - gravelly, moist, firm, grey							
9								30
10								
	MASSIVE ICE							35
11								
12								40
13								
	GRAVEL (TILL) - some silt, frozen (Vx), compact, grey with other minerals							45
14	MASSIVE ICE - occasional gravel							
15								49

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LOGGED BY: JTP	COMPLETION DEPTH: 27.5m
REVIEWED BY: JRT	COMPLETE: 8/20/2010
DRAWING NO:	Page 1 of 2

Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH28
Keno City, YT	7086985N; 484026E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT (PLASTIC — M.C. — LIQUID; 20 40 60 80)	STANDARD PENETRATION (N) 20 40 60 80; UNCONFINED (kPa) 50 100 150 200; POCKET PEN. (kPa) 100 200 300 400	Depth (ft)
15							50
16							
17							55
18							
19							60
20							
21	GRAVEL (TILL) - silty, some sand, dry, dense, grey						65
	SILT (TILL) - gravelly, dry, stiff, grey with staining						
22							70
23							
24	SAND and GRAVEL (TILL) - trace silt, dry, dense, grey - grey rock seem 0.3 m thick - sand seem 0.2 m thick, tan						75
25	- sand seem 0.2 m thick, tan - becomes damp - becomes some silt						80
26							85
27	BEDROCK - hard drilling, light grey						
	END OF BOREHOLE @ 27.5 m (Target Depth)						90
28	NOTES: Installed SI casing to 89' (27.13 m). Grouted hole to surface with tremie line (approx. 60 gal.)						
29							95
30							98

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LOGGED BY: JTP	COMPLETION DEPTH: 27.5m
REVIEWED BY: JRT	COMPLETE: 8/20/2010
DRAWING NO:	Page 2 of 2

Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH29
Keno City, YT	7087010N; 483944E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT	PLASTIC M.C. LIQUID (20 40 60 80)	STANDARD PENETRATION (N) 20 40 60 80 / UNCONFINED (kPa) 50 100 150 200 / POCKET PEN. (kPa) 100 200 300 400	Depth (ft)
0	MOSS COVER						0
	SAND and GRAVEL - some silt, medium grained, well graded, sub-rounded, moist, compact (est.), dark brown, trace organics		SA16	12.6			
1	ROCK - fractured angular cuttings returned, various colours, some staining						5
	SILT - some sand, trace gravel, damp, firm (est.), non-plastic, olive grey hint of green		SA17	16.5			
2	BEDROCK - hard drilling						
			SA18	1.7			10
3	END OF BOREHOLE @ 3.0 m (Target Depth)						
4							15
5							
6							20
7							
8							25
9							30
10							33

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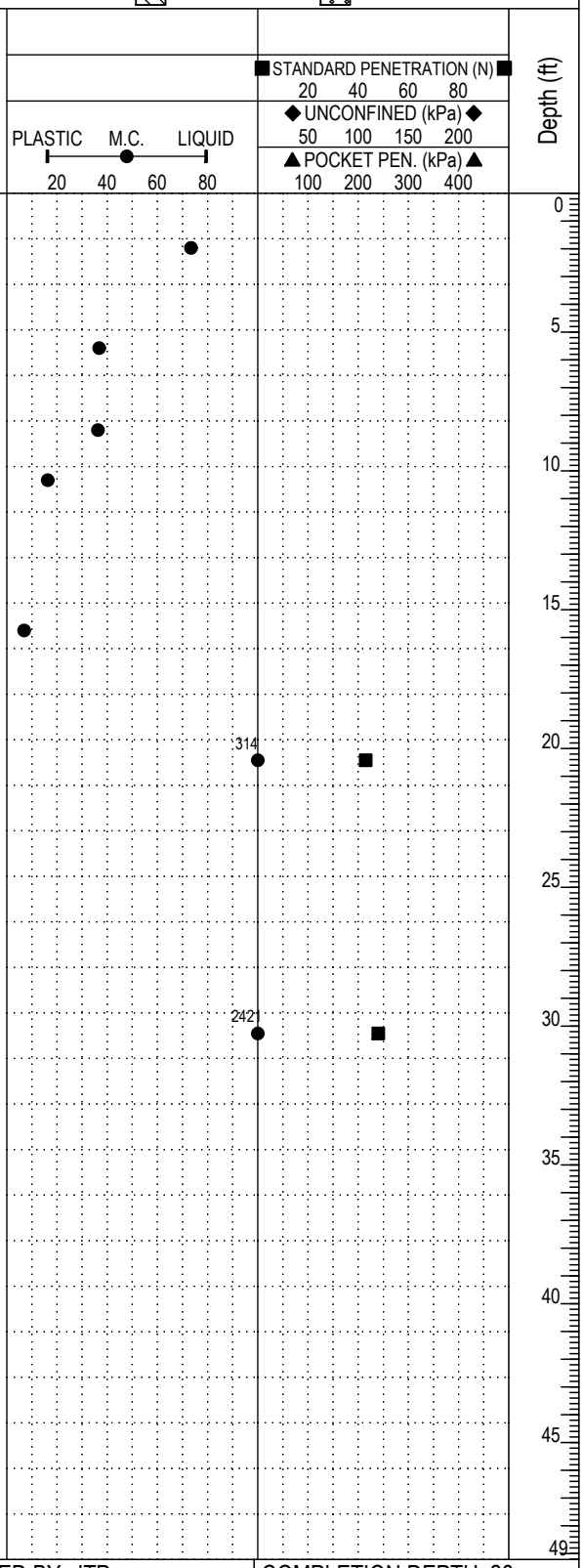
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REVIEWED BY: JRT	COMPLETE: 9/7/2010
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Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH30
Keno City, YT	7087032N; 483969E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT
0	SAND and GRAVEL (FILL) - trace silt, well graded, damp, brown				
	PEAT and ORGANICS - frozen, dark brown		SA19		73.4
1	SILT (TILL) - some gravel, frozen (Nbn), brown				
	- becomes Vx				
	- attempted SPT - spoon refusal		SA20		36.8
2	SAND and GRAVEL - trace silt, well graded, medium grained, sub-angular, frozen (Vx), grey				
			SA21		36.3
3			SA22		16.3
4	- less silt, sub-rounded				
	ROCK - fractured, angular, multi coloured		SA23		
5			SA24		6.9
	SILT (TILL) - some gravel, frozen (Vx)				
	ICE - massive ice with little or no soil				
6			SA25	43	313.5
7					
8					
9			SA26	48	2421.1
10					
11					
12					
13					
14	- contains some gravel for 0.3 m				
15					



Depth (ft): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 49

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REVIEWED BY: JRT	COMPLETE: 9/8/2010
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Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH30
Keno City, YT	7087032N; 483969E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT	PLASTIC M.C. LIQUID (20 40 60 80)	STANDARD PENETRATION (N) (20 40 60 80) / UNCONFINED (kPa) (50 100 150 200) / POCKET PEN. (kPa) (100 200 300 400)	Depth (ft)
15								50
16								
17								55
18	- contains some silt for 0.3 m							60
19								
20								65
21								
22	GRAVEL - some sand, some silt, frozen (Nbn), grey		SA27		10.4	●		70
23	- becomes Vx - becomes damp		SA28		6.9	●		75
24	- sand seem 0.2 m thick							
25	ROCK - easy drilling, dry, shiny black/grey BEDROCK - hard drilling, grey							80
26	END OF BOREHOLE @ 26.0 m (Target Depth)							85
27								
28								90
29								95
30								98

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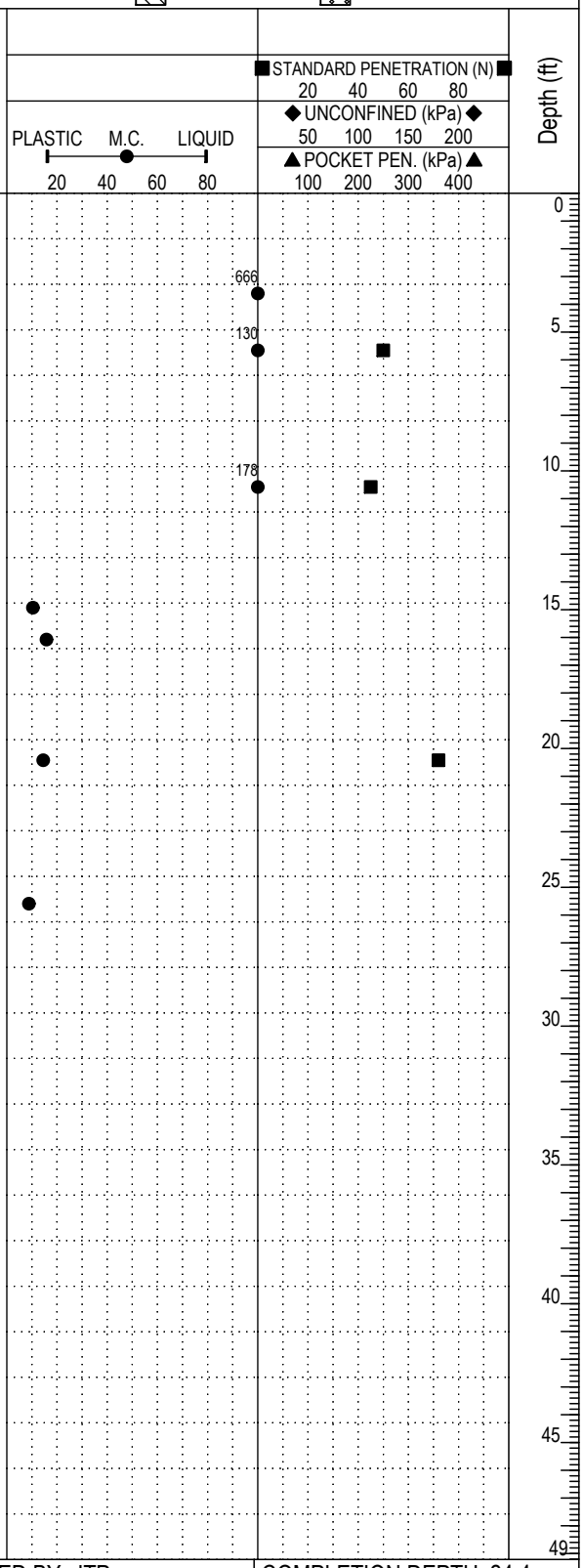
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REVIEWED BY: JRT	COMPLETE: 9/8/2010
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Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH31
Keno City, YT	7078058N; 484016E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT
0	PEAT - frozen, black/dark brown				
1			SA29		666.2
2	SILT - trace gravel, frozen (Vx), brown		SA30	50	130.1
3	- organics (wood) for 1.5 m		SA31	45	177.6
4	SILT (TILL) - gravelly, trace sand, frozen (Vx), grey				
			SA32		10.4
5			SA33		15.8
6			SA34	72	14.5
	- becomes some gravel				
7					
	SAND and GRAVEL - trace silt, well graded, medium grained, sub-angular, frozen (Vx), multi-coloured		SA35		8.8
8	SILT (TILL) - some gravel, frozen, grey				
9					
10					
11	MASSIVE ICE - trace silt				
12					
13					
	SAND and GRAVEL - some silt, frozen (Vx), grey				
14					
15					



Depth (ft): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 49

EBA Engineering Consultants Ltd.	LOGGED BY: JTP	COMPLETION DEPTH: 24.4m
	REVIEWED BY: JRT	COMPLETE: 9/10/2010
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Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH31
Keno City, YT	7078058N; 484016E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT	PLASTIC M.C. LIQUID (20 40 60 80)	STANDARD PENETRATION (N) (20 40 60 80) / UNCONFINED (kPa) (50 100 150 200) / POCKET PEN. (kPa) (100 200 300 400)	Depth (ft)
15	MASSIVE ICE - trace silt							50
16								
17								55
18			SA36		977.9		978	60
19								
20								65
	SILT (TILL) - some gravel, frozen (Vx), grey							
21			SA37		10.3			70
22								
	ROCK - fractured, angular, damp, multi-coloured							
23	BEDROCK - hard drilling, grey							75
24								
	END OF BOREHOLE @ 24.4 m (Target Depth)							80
25								
26								85
27								
28								90
29								95
30								98

EBA Engineering Consultants Ltd.	LOGGED BY: JTP	COMPLETION DEPTH: 24.4m
	REVIEWED BY: JRT	COMPLETE: 9/10/2010
	DRAWING NO:	Page 2 of 2

Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH32
Keno City, YT	7086999N; 484077E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT	PLASTIC M.C. LIQUID (20 40 60 80)	STANDARD PENETRATION (N) (20 40 60 80) / UNCONFINED (kPa) (50 100 150 200) / POCKET PEN. (kPa) (100 200 300 400)	Depth (ft)
0	SAND and GRAVEL (FILL) - some silt, medium grained, well graded, sub-round, damp, loose, brown						0
1							
	PEAT - frozen, black/dark brown						5
2							
	SILT - some sand, frozen (Vx), grey						
3			SA38	109		109	10
4							
			SA39				
	- hard drilling for 0.3 m		SA40	12.8			15
	- attempted SPT - spoon refusal						
5							
6							
	- gravel content increases		SA41	8.6			20
7							
	BEDROCK - hard drilling, grey		SA42	7.8			
							25
8							
			SA43	1.2			
9							
	END OF BOREHOLE @ 9.0 m (Target Depth)						30
10							33

EBA Engineering Consultants Ltd.	LOGGED BY: JTP	COMPLETION DEPTH: 9m
	REVIEWED BY: JRT	COMPLETE: 9/10/2010
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Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH33
Keno City, YT	7086956N; 484029E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT
0	SAND and GRAVEL (FILL) - some silt, medium grained, well graded, sub-round, damp, loose, brown				
	PEAT - frozen, dark brown				
1					
	SILT (TILL) - gravelly, frozen (Vx), grey				
			SA44	73	18.5
2	- becomes trace gravel				
3			SA45	71	41.3
4					
	- becomes some gravel with visible staining - becomes damp		SA46		13.8
5	SAND and GRAVEL - silty, fine grained, dense, dry, tan		SA47		12.2
6	BEDROCK - hard drilling, grey		SA48		
			SA49		1.9
7					
	END OF BOREHOLE @ 7.5 m (Target Depth)				
8					
9					
10					

PLASTIC — M.C. — LIQUID (20 40 60 80)

STANDARD PENETRATION (N) (20 40 60 80)

UNCONFINED (kPa) (50 100 150 200)

POCKET PEN. (kPa) (100 200 300 400)

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 33

EBA Engineering Consultants Ltd.	LOGGED BY: JTP	COMPLETION DEPTH: 7.5m
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Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH34
Keno City, YT	7086915N; 484024E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT	PLASTIC M.C. LIQUID (20 40 60 80)	STANDARD PENETRATION (N) 20 40 60 80 / UNCONFINED (kPa) 50 100 150 200 / POCKET PEN. (kPa) 100 200 300 400	Depth (ft)
0	SAND and GRAVEL (FILL) - trace silt, medium grained, well graded, sub-rounded, damp, loose, brown						0
	PEAT - frozen, dark brown						
1							
	SILT (TILL) - gravelly, frozen (Vx), grey						
	- attempted SPT - spoon refusal		SA50	16.4			5
	BEDROCK - hard drilling, light grey		SA51	4.1			
2							
3	END OF BOREHOLE @ 3.0 m (Target Depth)						10
4							
							15
5							
6							20
7							
							25
8							
9							30
10							33

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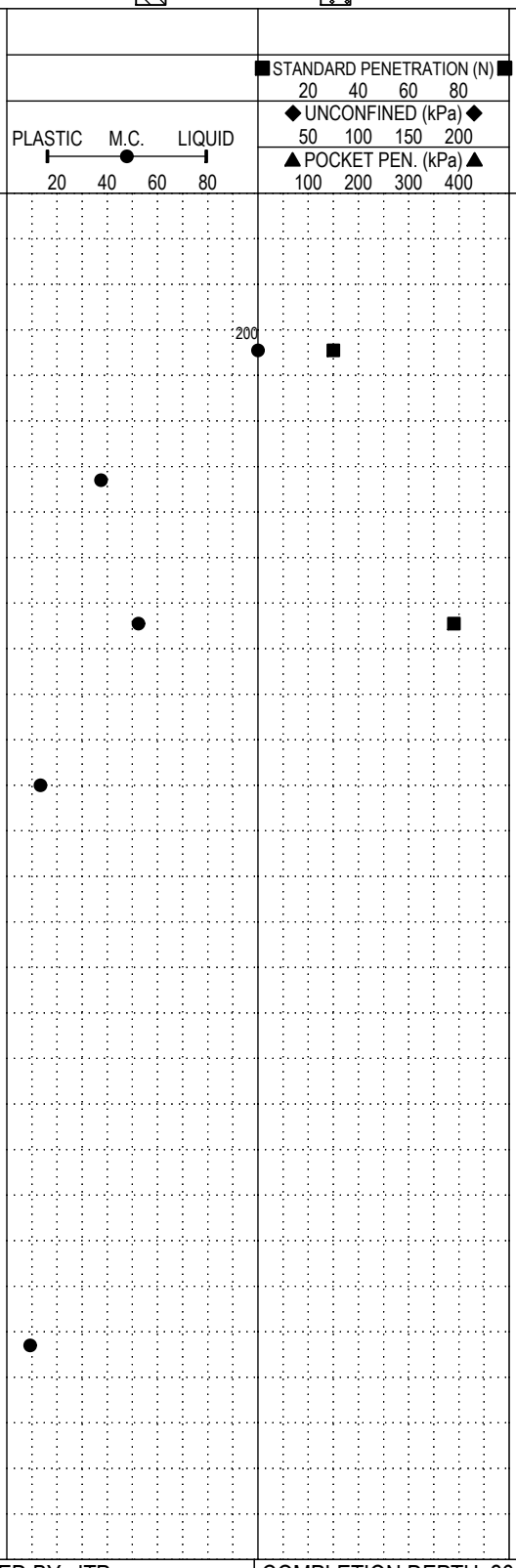
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Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH35
Keno City, YT	7086941N; 483996E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT
0	SAND and GRAVEL (FILL) - trace silt, medium grained, well graded, sub-rounded, damp, loose, brown				
1	PEAT - frozen, dark brown				
2			SA52	30	199.6
	SILT (TILL) - some gravel, frozen (Vx), grey				
3			SA53		37.5
4					
5			SA54	78	52.4
	- becomes gravelly		SA55		
6					
			SA56		13.4
7	- becomes some gravel				
8					
9	- becomes trace				
10					
11	- becomes SILT and GRAVEL				
12	MASSIVE ICE - trace silt				
	SILT and GRAVEL (TILL) - frozen (Vx), grey		SA57		9.3
13					
14					
15	MASSIVE ICE - some gravel				



Depth (ft): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 49

EBA Engineering Consultants Ltd.	LOGGED BY: JTP	COMPLETION DEPTH: 26m
	REVIEWED BY: JRT	COMPLETE: 9/11/2010
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Detailed DSTF Drilling	CLIENT: Alexco Resource Corporation	PROJECT NO. - BOREHOLE NO.
Keno Hill District Mill Site	DRILL: M5 Air Rotary	W14101178.011-BH35
Keno City, YT	7086941N; 483996E; Zone 8	

SAMPLE TYPE: DISTURBED | NO RECOVERY | SPT | A-CASING | SHELBY TUBE | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SPT (N)	MOISTURE CONTENT	PLASTIC M.C. LIQUID (20 40 60 80)	STANDARD PENETRATION (N) 20 40 60 80 / UNCONFINED (kPa) 50 100 150 200 / POCKET PEN. (kPa) 100 200 300 400	Depth (ft)
15	- becomes trace silt							50
16								
17	GRAVEL seem - frozen (Vx), hard drilling							55
18								
19								60
20	SILT and GRAVEL (TILL) - frozen (Vx), grey		SA58		15.2	●		65
21	- hard drilling for 1.0 m, possible rock							
22								70
	SAND - some silt, trace gravel, fine grained, compact (est.), dry, dark tan							
23								75
	BEDROCK - hard drilling							
	- soft black rock seem, 0.3 m		SA59		4.5	●		
24								80
25								
26	END OF BOREHOLE @ 26.0 m (Target Depth)							85
27								
28								90
29								95
30								98

EBA Engineering Consultants Ltd.

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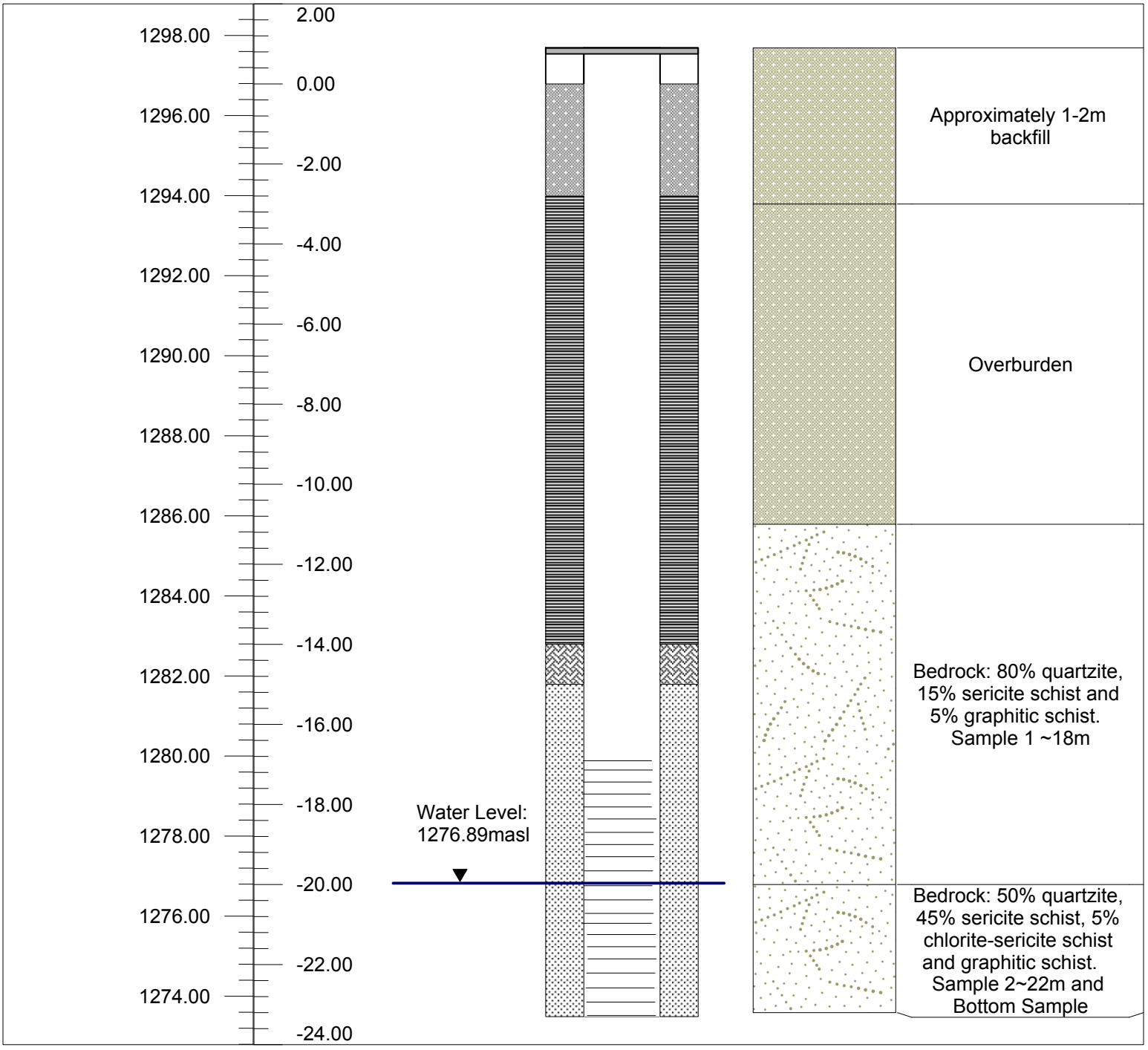
APPENDIX D

ONEK AND LUCKY QUEEN BOREHOLE LOGS

Access Consulting

Bore Hole ID: LQ-MW-01 Well Completion Date: August 5, 2012

Elevation (masl)	Depth (m) BGS	Well Construction	Lithology



Easting: 486425.62	Northing: 7090576.40	Elevation (Ground): 1296.79masl	Stick-up: 0.97m TOC Elevation: 1297.76masl Screen Length: 6.1m

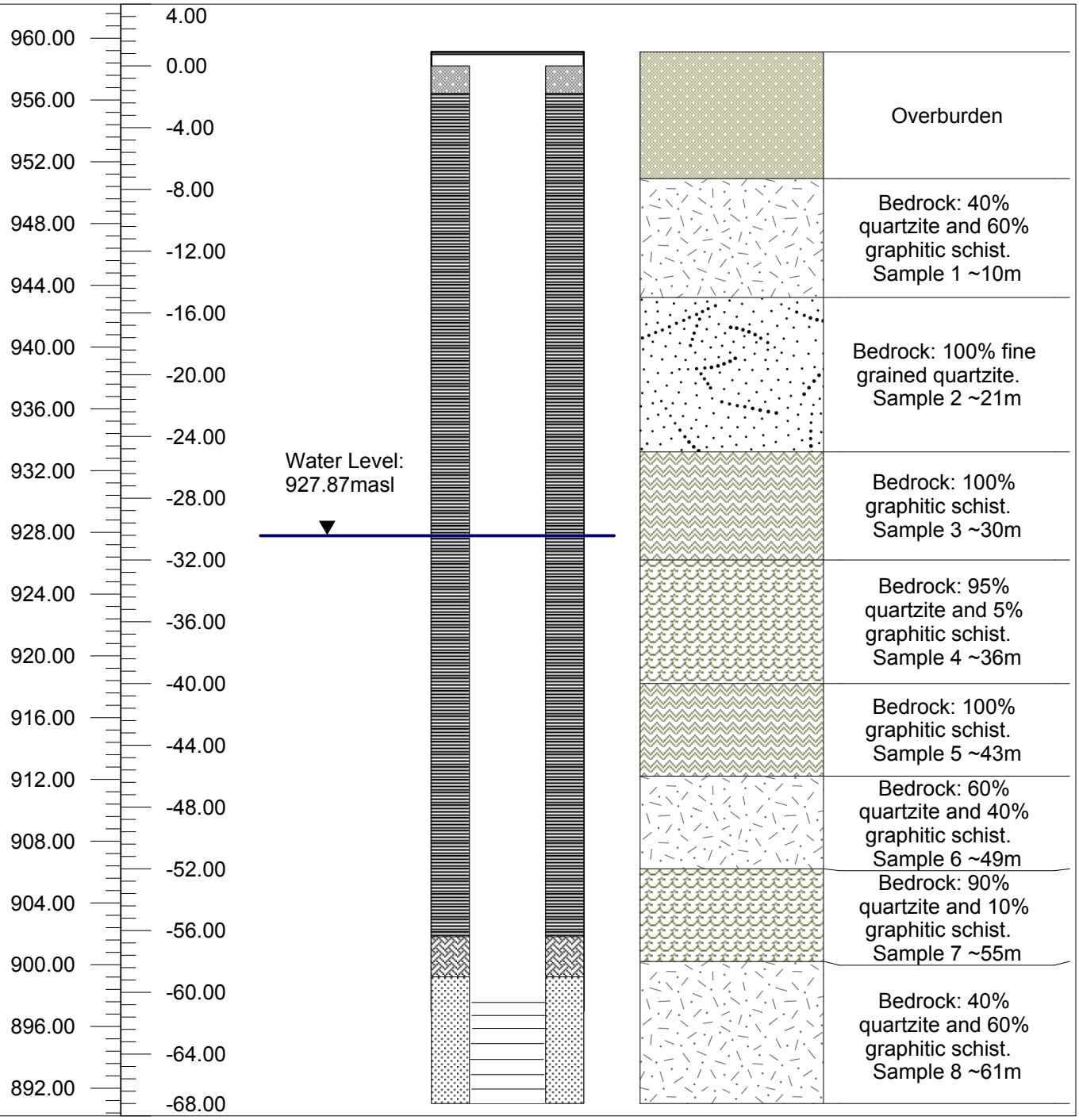
Project: Onek/ Lucky Queen Water Licensing
Date: August 24, 2012

Drilled By: Midnight Sun
Supervised By: Leia Fougere, Access Consulting

Access Consulting

Bore Hole ID: ON-MW-02 Well Completion Date: August 4, 2012

Elevation (masl)	Depth (m) BGS	Well Construction	Lithology



Easting: 485243.71	Northing: 7087082.87	Elevation (Ground): 958.21masl	Stick-up: 0.94m TOC Elevation: 959.15masl Screen Length: 6.0m

Project: Onek/ Lucky Queen Water Licensing
Date: August 24, 2012

Drilled By: Midnight Sun
Supervised By: Leia Fougere, Access Consulting

APPENDIX C

BELLEKENO MINE CYCLE 1 ENVIRONMENTAL EFFECTS MONITORING STUDY DESIGN (SEPT 2011)

AKHM
ALEXCO KENO HILL MINING CORP.

BELLEKENO MINE CYCLE 1

ENVIRONMENTAL EFFECTS MONITORING

STUDY DESIGN



September 2011

Prepared by

ACCESS

minnow environmental inc.



Bellekeno Mine Project

Environmental Effects Monitoring Program

Cycle 1 Study Design

September 2011

Report Prepared for:

Alexco Keno Hill Mining Corporation
Suite 1150, 200 Granville Street
Vancouver, B.C
V6C 1S4

Report Prepared by:

Access Consulting Group
3 Calcite Business Centre
151 Industrial Road
Whitehorse, YK
Y1A 2V8

and

Minnow Environmental Inc.
2 Lamb Street
Georgetown, Ontario
L7G 3M9

Bellekeno Mine Cycle 1

Environmental Effects Monitoring

Study Design

September 2011

Report Prepared for:

Alexco Keno Hill Mining Corporation
Suite 1150, 200 Granville Street
Vancouver, B.C
V6C 1S4

Report Prepared by:

Access Consulting Group
3 Calcite Business Centre
151 Industrial Road
Whitehorse, YK
Y1A 2V8

and

Minnow Environmental Inc.
2 Lamb Street
Georgetown, Ontario
L7G 3M9

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1.0 INTRODUCTION

Alexco Resources Corp. and its wholly owned subsidiary Alexco Keno Hill Mining Corporation (AKHMC), own 1,563 claims and leases that span an area of approximately 24, 262 ha within the Keno Hill Silver District (KHSD), including the Bellekeno Mine. This area is located directly 354 km north of Whitehorse, Yukon, 45 km northeast of Mayo, and 3 km east of Keno City (Figure 1.1). The KHSD is located within the traditional territory of the Nacho Nyak Dun First Nation (NNDFN) and is centrally located at 63°55'N, 135°29'W within the McQuesten River Valley. Access to the property is via a paved, two-lane highway from Whitehorse to Mayo (407 km.) and an all weather gravel road northeast from Mayo to Elsa (45 km).

Bellekeno is a silver, lead, zinc mining operation consisting of an underground mine and supporting infrastructure (waste rock dumps, maintenance facility, water treatment and office), Mill (Flame and Moth Mill) and tailings facility, and main camp known as the Flat Creek Camp (Figure 1.2). The Bellekeno mine site is located near the confluence of Thunder Gulch and Lightning Creek (Figure 1.3). Lightning Creek flows into Duncan Creek, which then drains into the Mayo River. The Mill is located approximately 500 m south and upstream of Christal Lake and 1.0 km east of Keno City. Christal Lake drains into Christal Creek, which is fed by Erikson Gulch and eventually drains into the South McQuesten River

The total life of the Bellekeno project is expected to be 15 years, including 6 years of construction and mine operation, and 7-15 years for decommissioning and reclamation, closure, and post closure. There is, however, potential to extend the Bellekeno Mine life as well as potential for development at additional mines within the Keno Hill Silver District. Based on current Preliminary Economic Assessment, estimated annual production includes 3,300,000 oz. Silver, 30,000,000 lbs. Lead, and 24, 500, 000 lbs. Zinc. Estimated ore production rate is 250 tonnes/ day for years 1-2 and 400 tonnes/ day for years 3-5, leaving 500,000 tonnes of waste rock produced from underground development. There is expected to be ore mining for 360 days/ year; mill operation 360 days/ year; with 100, 000 tonnes of waste material placed on the surface each year.

1.1 BACKGROUND

Federal effluent regulations for the metal mining industry (Metal Mining Effluent Regulations; MMER) were updated in the Canada Gazette in June 2002 and in February 2009 (Government of Canada 2002; 2010). These regulations, administered under the federal *Fisheries Act*, apply to mining and milling operations that discharge effluent(s) at a rate greater than 50m^3/day and therefore apply to the Bellekeno Mine project. The MMER outline requirements for routine effluent monitoring, acute lethality testing, and Environmental Effects Monitoring (EEM). The objective of EEM is to determine whether mining activity is causing an effect on fish, benthic invertebrate communities and/or the use of fisheries resources (based on mercury accumulation in fish tissues). On the 20th of August 2010, a Type A Water License QZ09-092 was issued to Alexco





ALEXCO KENO HILL MINING CORP.

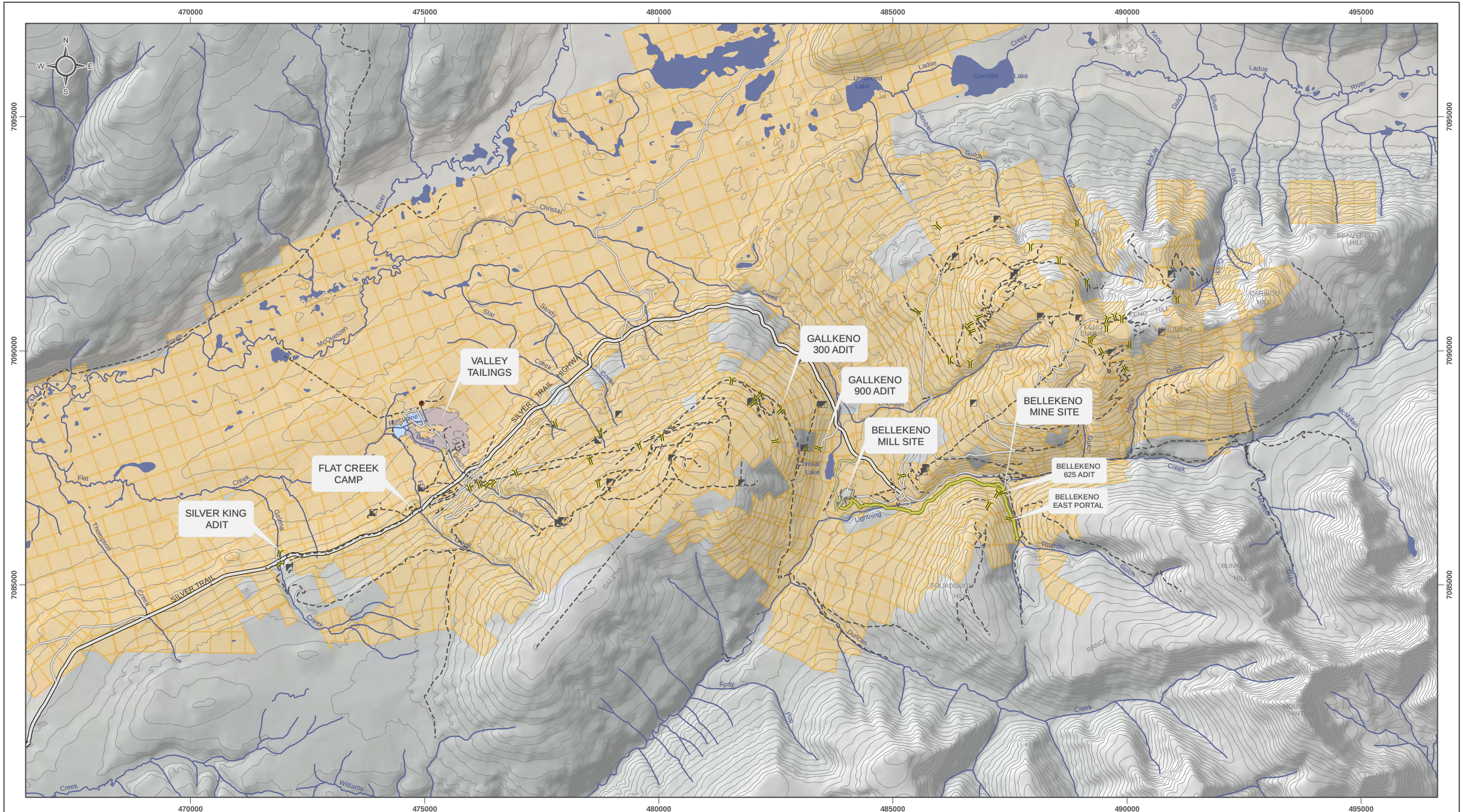
AKHM

BELLEKNO MINE PROJECT
ENVIRONMENTAL EFFECTS MONITORING PROGRAM - CYCLE I STUDY DESIGN

FIGURE 1.1
PROJECT LOCATION

DRAWN BY MD	VERIFIED BY DP

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(Last edited by: mducharme; 07/09/2011/14:34 PM)



National Topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000. Cadastral data compiled by Natural Resources Canada. Reproduced underlicense from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved. Quartz claim boundaries and ownership current as of February 24th, 2011. Data source: http://geomaticsyukon.ca.

Datum: NAD 83; Map Projection: UTM Zone 8N

1:75,000 (when printed on 11 x17 inch paper)

0 0.5 1 2 3 Kilometers

- Adit
- Shaft
- Alexco Quartz Claims
- Haul Road
- Mill Access
- Highway
- Local
- Trail
- Contour (100 ft)
- Watercourse
- Waterbody

AKHM

ACCESS

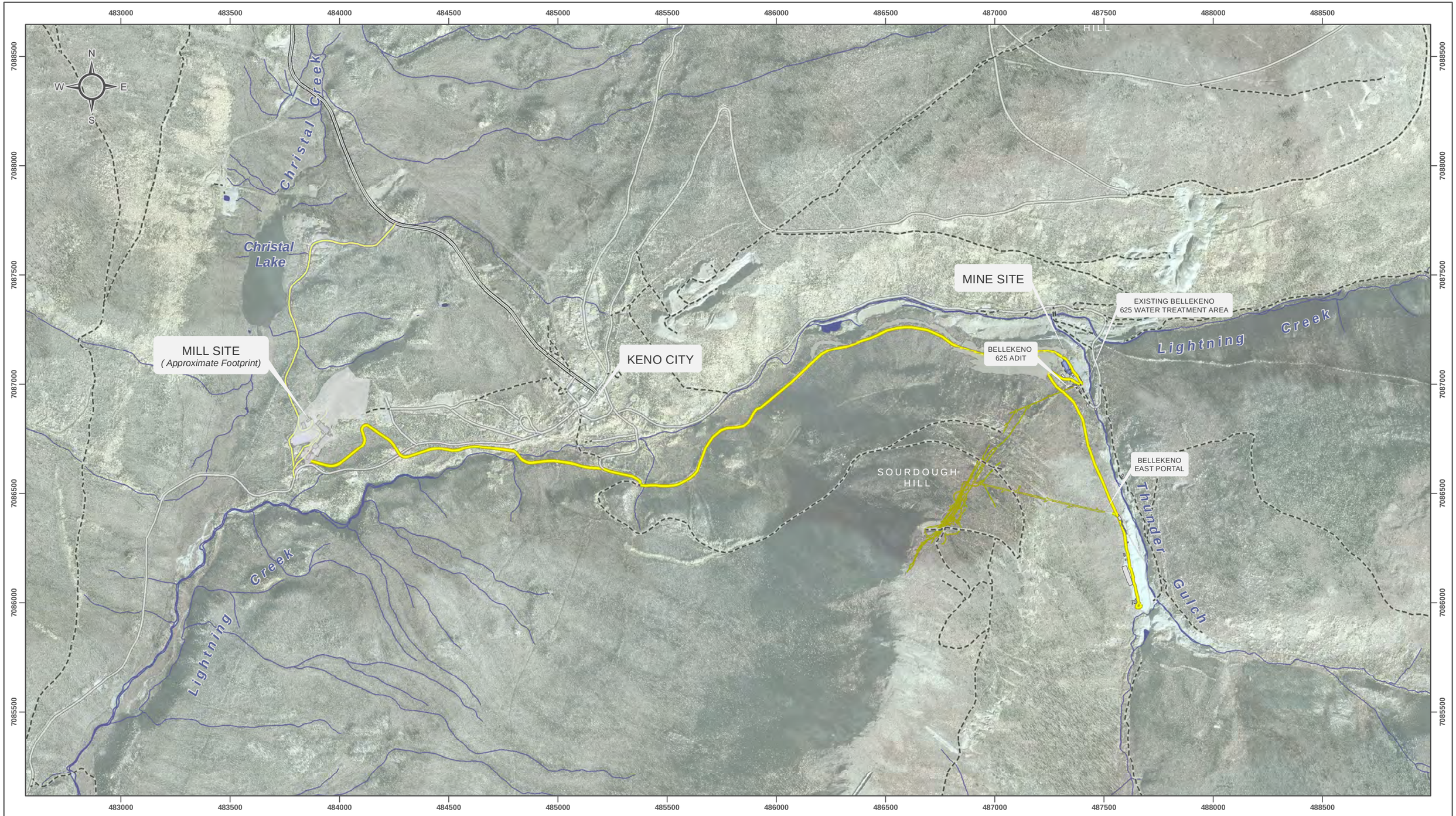
BELLEKNO MINE PROJECT - ENVIRONMENTAL EFFECTS MONITORING PROGRAM - CYCLE I STUDY DESIGN

FIGURE 1.2

KENO HILL PROPERTY OVERVIEW

DRAWN BY MD	SEPTEMBER 2011	VERIFIED BY SD

I:\ALEX-05-01\Bellekeno\GIS\mxd\Development\Construction_Site_Plan\Fig1.2_KenoHillProperty_20110907.mxd
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Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13 and 14 2006. Site hydrography and contours provided by Aero Geometrics LTD, derived from aerial photograph.

Datum: NAD 83; Map Projection: UTM Zone 8N

1:16,000 (when printed on 11 x17 inch paper)

Meters
0 125 250 500 750 1,000

- Silver Trail Highway
- Haul Road
- Mill Access
- Local
- Track
- Underground workings

AKHM
ACCESS

BELLEKNO MINE PROJECT - ENVIRONMENTAL EFFECTS MONITORING PROGRAM - CYCLE I STUDY DESIGN

FIGURE 1.3
BELLEKENO PROJECT OVERVIEW

DRAWN BY MD	SEPTEMBER 2011	VERIFIED BY VB

I:\ALEX-05-01\Bellekeno\GIS\mxd\Development\Construction_Site_Plan\Fig1.3_Bellekeno_Overview_20110907.mxd
(Last edited by: mduchame;07/09/2011/14:35 PM)

Keno Hill Mining Corp. (AKHM) for operation of the Bellekeno Mine and Mill complexes. The Bellekeno Mine and Mill Development and Operations Program triggered the MMER on September 7th, 2010 (see Appendix A). This cycle 1 EEM Study Design Report has been prepared collaboratively by Access Consulting Group and Minnow Environmental Inc., with Access taking primary responsibility for Site Characterization and Minnow taking responsibility for Study Design (Section 4.0).

The Bellekeno mining and milling operation are located at two different sites and on two distinct watersheds:

- Lightning Creek – Mining operations
- Christal Creek – Milling Operations

However since no water has been discharged from the Mill site to date and the plan is to discharge very little to no water during future operations at the mill, AKHMC has elected to conduct the EEM program on the Lightning Creek watershed where the likelihood of operational impact on the aquatic environment is greatest. Much of the background data presented in this document is in support of the program on Lightning Creek however; certain mill activities are also described herein.

1.2 OBJECTIVE

The objective of this Cycle 1 EEM Study Design is to provide a comprehensive overview of the characteristics of the mine and its local environment (site characterization) based on information collected to date, and to describe how chemical and biological monitoring will be conducted to meet the objectives of the EEM program in accordance with the MMER. In accordance with technical guidance (Environment Canada 2011), the Phase 1 EEM Study Design will be formulated to take into account all relevant site characterization information, previous biological monitoring data, and comments and/or recommendations stemming from previous monitoring efforts in the area.

1.3 REPORT ORGANIZATION

The content of this report reflects the requirements outlined under the EEM portion of the MMER (Government of Canada 2002; 2010) and in the Technical Guidance Document for Metal Mining EEM (Environment Canada, 2011). A detailed site characterization and history is provided in Section 2.0. Section 3.0 provides a summary of information relevant to the receiving environment. A detailed EEM study design including a benthic invertebrate community survey, a fish survey, a fish tissue survey, supporting environmental measures, sub-lethal effluent toxicity testing, effluent characterization, and receiving water quality monitoring is presented in Section 4.0. Section 5.0 describes the schedule of activities and expected effort involved in future monitoring. References cited throughout the document are provided in Section 6.0.

1.4 CONTACTS

Please contact the Bellekeno Mine and Mill Operation *Site Environmental Coordinator*, Ms. Vanessa Benwood if there are any questions or comments regarding this report.

Ms. V. Benwood, Site Environmental Coordinator
Bellekeno Mine site, YK
Tel: (867) 996 2330, ext. 5909
Fax: (867) 995 2600
E-mail: vbenwood@alexcoresource.com

In the event that Alexco Keno Hill Mining Corporation personnel should be unavailable to address technical questions or comments, Mr. Paul LePage of Minnow Environmental Inc. or Mr. David Petkovich of Access Consulting Group may also be contacted as follows:

Mr. Paul LePage, Aquatic Scientist
Minnow Environmental Inc.
2 Lamb Street
Georgetown, Ontario
L7G 3M9
Email: plepage@minnow-environmental.com

Mr. D. Petkovich, Senior Environmental Manager
Access Consulting Group
#3 Calcite Business Centre
151 Industrial Road
Whitehorse, Yukon Y1A 2V3
Telephone: (867) 668-6463
Fax: (867) 667-6680
Email: david@accessconsulting.ca

2.0 SITE CHARACTERIZATION

United Keno Hill Mines Limited and UKH Minerals Ltd. were the previous owners of the properties located on and around Galena Hill, Keno Hill and Sourdough Hill, collectively known as the Keno Hill Mining Property. For the purposes of this report these mining areas are referred to as the Keno Hill District. The Keno Hill District is located in north-central Yukon Territory (Figure 1.1) and is comprised of approximately 1,563 mineral claims that cover an area of approximately 15,000 ha (about 29 km long and 8 km wide). With the exception of the Bellekeno Mine on Sourdough Hill, the mine has not operated since 1989, and abandoned adits, buildings/ structures, and waste material associated with the site represent sources of contaminants to the downstream watersheds. The most significant of these sources include the lime-treated discharge from the Elsa Tailings pond system, Galkeno 900 Adit, Galkeno 300 Adit, Bellekeno 600 Adit, Silver King Adit and Valley Tailings (Figure 1.2). The influence from these sources is largely limited to the tributaries that drain the properties (Christal, Flat and Lightning Creeks), although some influence on water and sediment quality can be measured further downstream in the South McQuesten River. In addition to the historical mining activities, the area is currently host to a number of placer mining operations which cause extensive alteration of the watercourses and impacts to habitat and water quality downstream.

In June 2005, Alexco Resources Corp. was selected as the preferred purchaser of the UKHM assets. As required in the purchase agreement, Alexco formed a company – Elsa Reclamation and Development Company Ltd. (ERDC), to own and manage the site. In order to support activities relating to care and maintenance of the historic mine workings prior to mine closure, the Yukon Water Board granted a “Type B” Water Licence to ERDC pursuant to the *Waters Act* (licence number QZ06-074). The scope of monitoring (sample types, substances, sampling frequency and locations) as well as reporting requirements (e.g., annual reports) are also outlined in the licence.

In 2006, Alexco Resources Corp. formed Alexco Keno Hill Mining Corp. (AKHM) to mine the Bellekeno deposit on the Keno Hill District property. AKHM obtained a Quartz Mining Licence pursuant to the *Quartz Mining Act* (QML-0009) and a Type A Water Licence (licence number QZ09-092). The mine operates under the provisions of these licences and those prescribed by the Metal Mining Effluent Regulations (MMER).

2.1 BELLEKENO MINE HISTORY

Various mineralized zones within the Bellekeno ore deposit have seen commercial production from different operators over the years. Access to early production was from adits at the 100 and 200 levels, and later from the 625 adit. Operators have included Bellekeno Mines Ltd., Mayo Mines Ltd., and United Keno Hill Mines Ltd. Much of the ore from early mining was shipped out to smelters as direct-shipping ore, and in 1953 Mackeno Mines Ltd. constructed a flotation mill at Christal Lake to further concentrate the ore prior to shipping to smelters, including over 10,000 tons of ore produced from the Bellekeno Mine between 1953-1954.

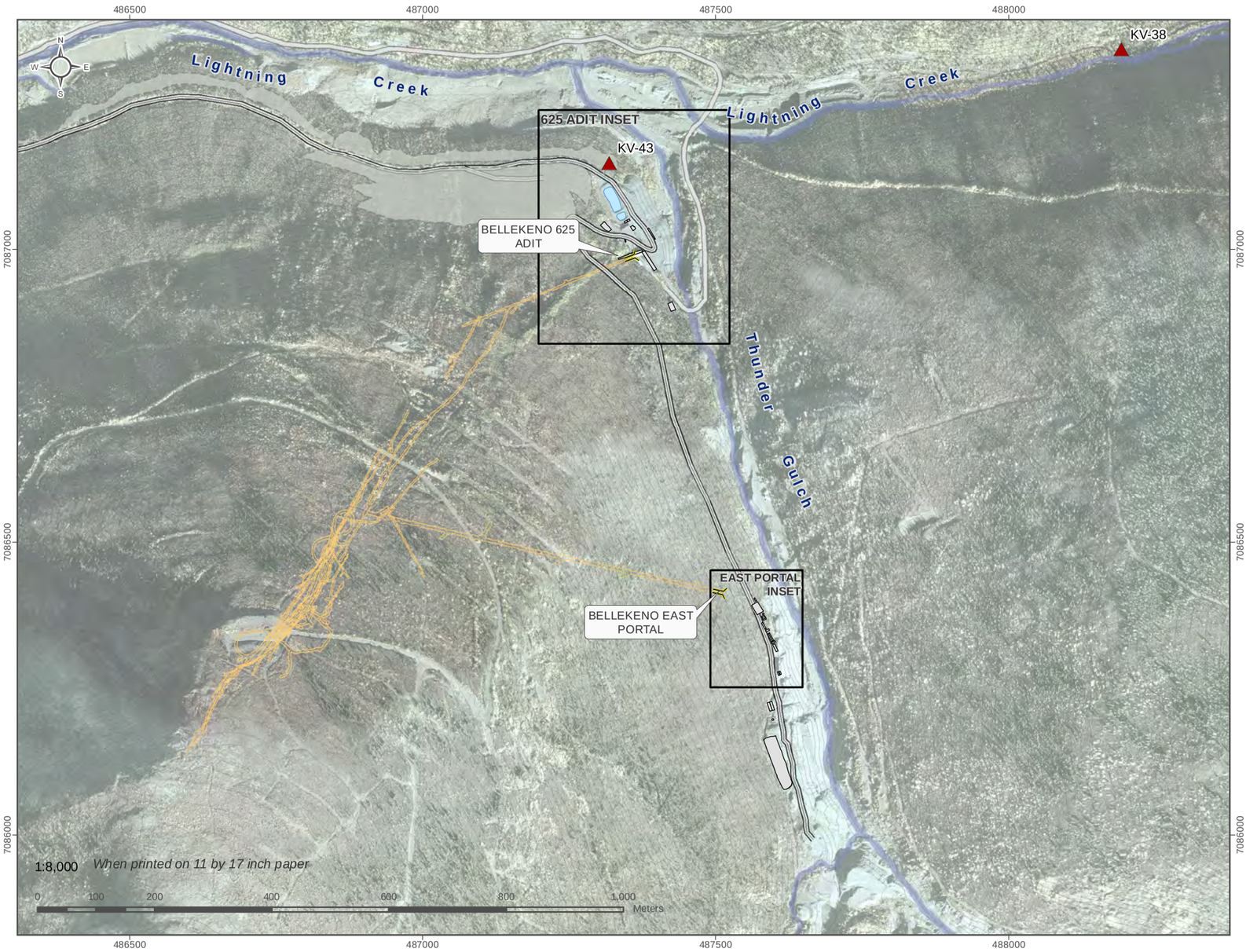
The Bellekeno deposits' modern mining era began in 1984 with the development of the adit at the 625 level, which was collared and driven to cross-cut approximately 200 meters to the "48" vein. Over the years, the 625 level workings were connected to the 400 level and the 500 level. This was used to mine ore from the 500, 625, 700, 750 and 800 levels from 1984 through to 1989. Dewatering and rehabilitation of the 700 through 800 levels, from the 625 adit, began in 1994. Internal mechanized ramps were developed to reach the 700 and 800 levels and a mechanized ramp was driven towards but stopped short of the 500 level. The property was maintained until 2001, when it was declared abandoned. The lower Bellekeno workings were allowed to flood in 2003.

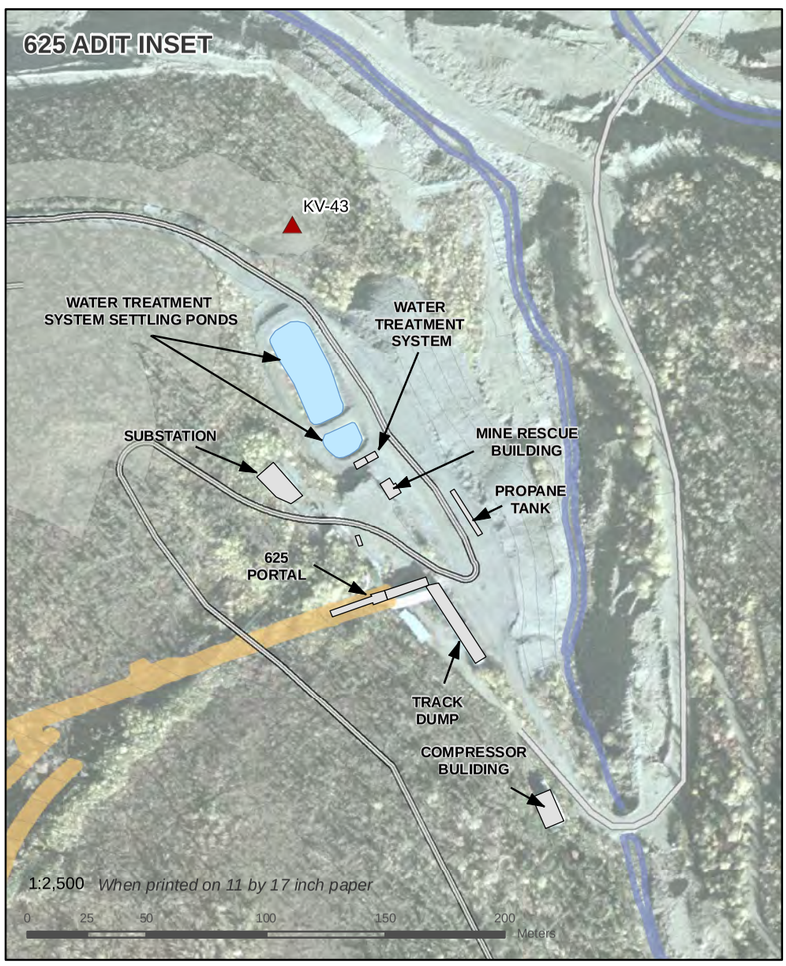
2.2 BELLEKENO MINE OPERATIONS

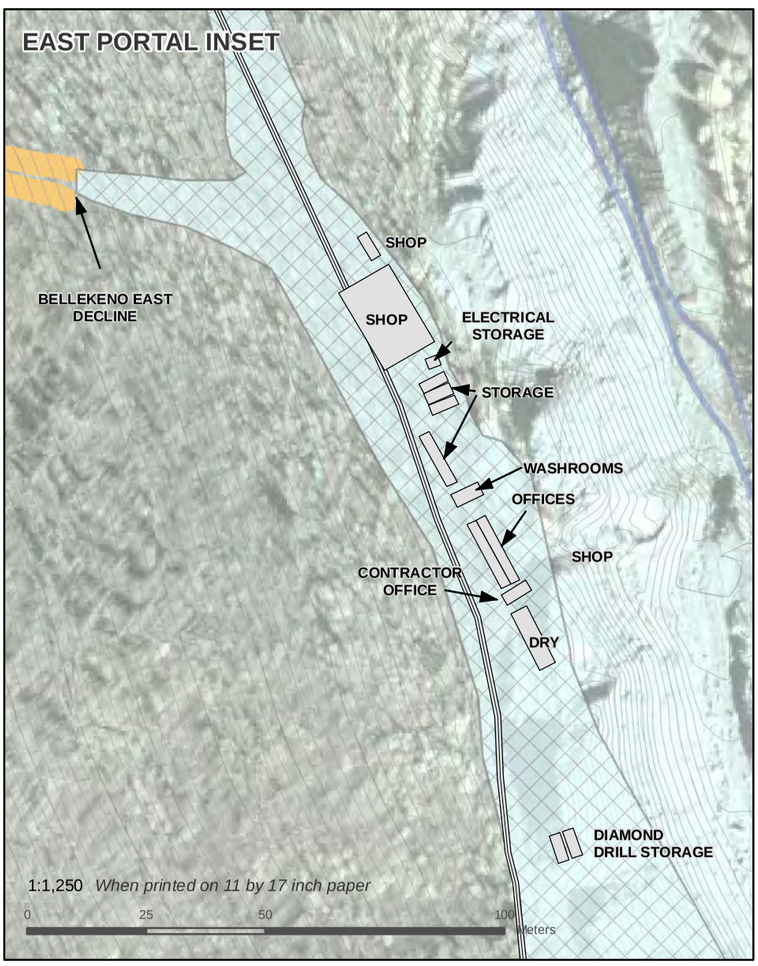
In 2006, Alexco initiated a broad surface exploration program (Class 3 Mining Land Use Approval LQ00186) in the historic Keno Hill silver district with surface diamond drilling focused primarily toward systematic testing of numerous targets, validating and expanding historic mineral resources and acquiring a better understanding of the local geology and ore controls. Based on broadly successful 2006 results, Alexco in 2007 expanded its exploration to a two phase district exploration program; the first phase focused on following up prior results in the area of the historic Bellekeno mine and the second phase continuing the broad information gathering drill program elsewhere across the district. In 2008 Alexco conducted surface exploration at a number of targets throughout the district and proceeded with advanced underground exploration and development at Bellekeno (Mining Land Use Approval LQ00240, and Water Licence QZ07-078). On July 9, 2008, Alexco released a Preliminary Economic Assessment (PEA) of Bellekeno prepared by SRK Consulting (SRK, 2008). The economics suggested by the PEA led Alexco to proceed with a positive production decision.

The Bellekeno mine is comprised of one primary vein, the 48 vein, a subsidiary structure, the 49 vein and at least 9 other ancillary structures present in the Southwest, 99, and East zones. Supporting surface infrastructure consists of office, dry, shop etc. and water treatment facilities (Figure 2.1). Most of the historical mining (totalling approximately 40,000t) at Bellekeno occurred on the 48 vein in the 99 zone, intermittently between the 1950s and mid 1980s. The veins have variable dip, strike, and thickness. Dips range from 60° to 80° to the east or west. The average strike direction is approximately 030 azimuth. Vein thickness varies from a few centimetres to several meters in an apparent "shoot-like" configuration.

Initial mine development began in 2010 and consisted of excavating central remucks in the Bellekeno East Decline and widening and heightening the existing ramps down to the Southwest Zone. By March 2010 the majority of this work was completed and a new incline and decline had been driven from a central location in the Southwest portion of the mine, from which various ore accesses were also driven. At the bottom of the mine the existing 850 Decline was







Adit

Surface Water Quality Station of Interest

Underground Workings

Building

Pond

Portal Area

Conceptual design of waste rock disposal Area

Haul Road

Local Road

Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13th and 14th 2006. Site hydrography and contours derived from 2006 aerial imagery obtained from Aero Geometrics, Calgary Alberta.

Datum: NAD 83; Projection: UTM Zone 8N

AKHM

ACCESS

BELLEKENO MINE PROJECT
ENVIRONMENTAL EFFECTS MONITORING PROGRAM - CYCLE I STUDY DESIGN

FIGURE 2.1

BELLEKENO MINE SITE LAYOUT

DRAWN BY MD	SEPTEMBER 2011	VERIFIED BY VB

I:\ALEX-05-01\Bellekeno\GIS\mxd\Overview_Maps\Overviews\Mine Site\MineSite_2_Inset_20110906.mxd
(Last edited by: mdurcharme;07/09/2011/16:00 PM)

extended and an exploration drilling platform was excavated. During this time, minor ore access development in the 99 Zone was ongoing. Pre-production mining of mineralized vein material commenced in September 2010 and continued through December 2010 in stopes located throughout the mine. Based on the geotechnical and physical characteristics of the veins, cut-and-fill mining methods were selected as the most appropriate for Bellekeno. Cut-and-fill and shrinkage stopping methods typically offer a high degree of selectivity that generally translates into high mineralization extraction and low waste dilution. Significant geotechnical study and design has been completed by SRK and a ground control management plan has been developed to address potential unstable ground conditions encountered in the vein material. Backfill of mined out stopes will be accomplished through cemented rock and tailings fill. Filtered tailings from the mill process will be backhauled underground and used as backfill.

Waste rock produced by the mine that is not potentially acidic or metal leaching or “non-AML” is used for general construction including repairs and surface capping of the existing Power Line Road that runs along the north slope of Sourdough Hill, above the left limit of Lightning Creek and as fill and construction for the mill and ancillary facilities. Additional non-AML waste rock will be deposited along the northeast flank of Sourdough Hill, northwest of the current Bellekeno 625 waste rock storage areas, if necessary.

Potentially acid-generating and/or metal leaching not suitable for general construction purposes is stored in a waste containment facility near the Bellekeno mine portal area or underground in the Bellekeno mine below the previous static water level (defined as the Bellekeno 625 portal elevation). The waste containment facility design includes a geosynthetic liner to allow for collection of drainage and is surface graded to divert any water flow around the storage area. The HDPE liner is covered by a 0.3 m protective sand and gravel overliner/drainage layer to permit rock dumping by truck or loader. Sumps are built into the low points of these storage facilities to allow for collection of any drainage or meteoric accumulation, which is conveyed to the Bellekeno 625 treatment facility. All waste rock is immediately classified and moved to the appropriate disposal area or storage facility depending on type.

2.3 CURRENT BELLEKENO MINE WATER USE

The Bellekeno mine is a zinc-rich mine which produces moderately zinc rich mine drainage. Adit discharge flow is also moderate and therefore untreated Bellekeno water produces moderate loads to the receiving environment. The Bellekeno mine requires continual dewatering through the Bellekeno 625 portal, with flows typically ranging between 3.0 to 8.0 litres per second (lps), generally less than 2 mg/L zinc, and suspended solids from mining activities. Treatment in the first part of 2010 consisted of lime slurry mixing into the adit water, addition of a small amount of iron in the form of ferric chloride, and settling in sludge settling ponds.

The quality of effluent from the mine fails to comply with water licence QZ09-092; therefore water treatment is required on an ongoing basis. Treatment operations employ a simple lime-addition and sludge settling circuit. The treatment objective is to reduce zinc effluent concentrations to less than 0.50 mg/L, as required under Water Licence QZ09-092. Historic correlations between

zinc concentrations and other metals (i.e. arsenic, lead and cadmium) indicate that the zinc discharge treatment objective ensures that other metals are also managed. For the management of ammonia and suspended solids, there are other measures that have been employed at the treatment facility.

After the issuance of WL QZ09-092 in late August 2010, AKHM began production drilling and removal of ore from the mine in early October. The water source for underground mine operations is recirculated underground mine water, plus any additional fresh water that leaks into the mine workings.

Water is collected in the underground in sumps located throughout the various mine levels and pumped up to the main water storage sumps at the underground 600 level. Here, a transfer process occurs to settle solids from the water. Water is first collected in a 'dirty' water sump with a capacity large enough to allow suspended solids to settle out. When the water has been polished, it flows into a 'clean' water sump where it is then returned to various working headings though piping, and may at this point be used in underground mine operations. Excess water from the clean water sump which is not returned to the underground is discharged through piping to the water treatment system. None of the water in the underground is discharged to the treatment facility before it travels through the main settling sumps.

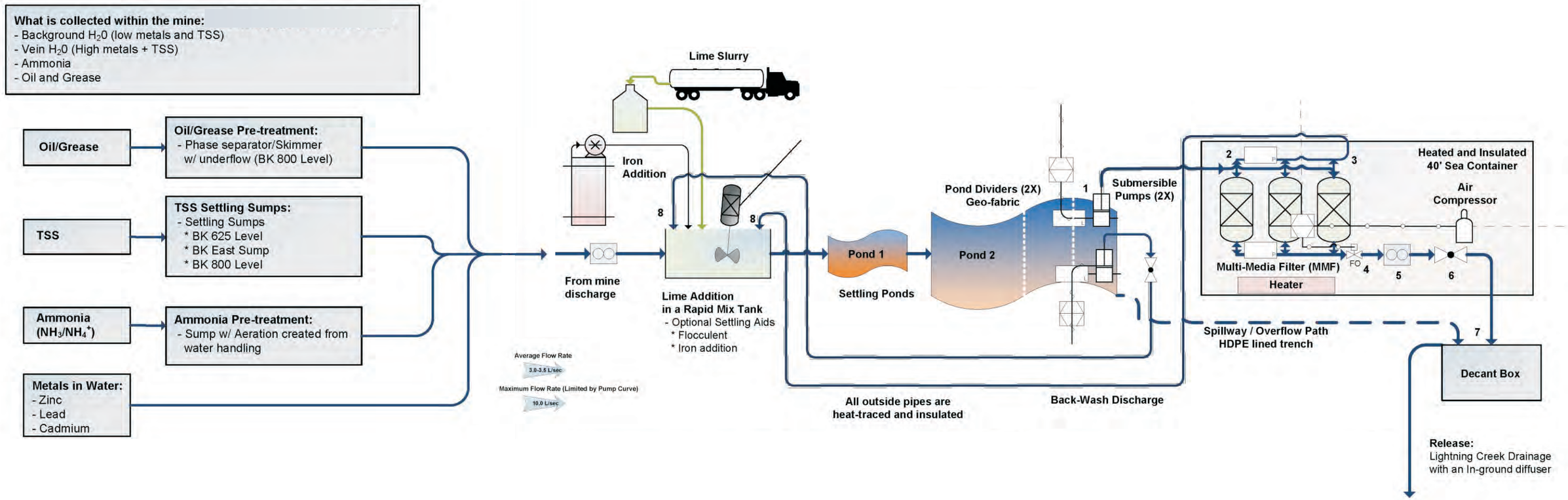
2.4 BELLEKENO MINE WATER TREATMENT SYSTEM

The Bellekeno 625 treatment system consists of the mechanical application of lime slurry ($CaO_{(s)}$ + $H_20_{(l)}$) to the mine discharge waters. Ferric chloride is sometimes added to the lime mix tank to improve particle flocculation and settling. The slurry acts to raise the pH, causing zinc and other metals to co-precipitate out of solution, forming solid metal hydroxide sludge. Two precipitate retention ponds are located at the treatment facility to assist metals precipitation and clarification of effluent prior to release into the receiving environment. Discharge to the environment occurs via a gravity-fed system through pond decants. Sludge is periodically removed from the primary settling pond and transported to a storage cell in the Valley Tailings.

Water is dewatered from the mine and gravity flows into a rapid mix tank (Figure 2.2). There the water is agitated and mixed with lime slurry from a lime slurry tank. By raising the pH, ammonia in the mine water is transformed into a dissolved gas form allowing for volatilization to occur. Some additional treatment of ammonia occurs in the rapid mix tank and subsequent settling ponds.

Water flows from the rapid mix tank into pond 1, which provides residence time for the water to calm, thereby allowing larger particles to settle out. As the larger particles settle, they collect on the bottom of pond 1 as sludge. This sludge is then removed on a routine basis, typically weekly, by a vacuum truck. Water is then decanted from pond 1 and flows into pond 2, a larger pond that allows additional settling time. Alexco has divided pond 2 into three sections by

Figure 2.2 BELLEKENO 625 WATER TREATMENT SYSTEM



PRIME MOVERS FOR MOTOR DRIVEN EQUIPMENT

- SUBMERSIBLE PUMP
- AGITATOR OR MIXER
- METERING PUMP

INSTRUMENT LINE SYMBOLS

- PNEUMATIC LINE
- 120V A/C 1-PHASE
- 240V A/C 1-PHASE
- 575V A/C 3-PHASE
- HEAT TRACE / INSULATION

PIPE LINE DESIGNATIONS

- = IRON ADDITION TUBE
- = 2" HDPE
- = 3" HDPE
- = LIME SLURRY

PIPING ACCESSORIES AND DETAILS

- 45° IPS Fab Lateral

SYMBOLS FOR VALVE ACTION IN THE EVENT OF ACTUATOR POWER FAILURE

FO — SYMBOL LOCATED BY VALVE – USED ONLY WHERE NECESSARY TO INCREASE UNDERSTANDING OF THE SYSTEM.

FO = FAIL OPEN
FC = FAIL CLOSED
FL = FAIL LOCKED
FI = FAIL INDETERMINATE (LAST POSITION)

INSTRUMENTATION

- LEVEL SENSOR/ FLOAT SWITCH
- FLOW METER
- CONTROL PANEL
- PROGRAMMABLE LOGIC CONTROLLER
- PRESSURE GAUGE

VALVE SYMBOLS

- GATE
- GLOBE
- BALL
- BUTTERFLY
- CHECK

ADDITIONAL COMPONENTS

- AIR COMPRESSOR 70 psig @ 2 CFM min.
- LIME MIX TANK
- LIME SLURRY STORAGE TANK
- INSULATED 40' SEA CONTAINER

extending two geo-fabrics across the pond, thereby limiting "short-circuiting" of larger particles which aids in settling.

Both open ponds allow for ammonia treatment by off-gassing in the higher pH mine water, and for variable amounts of sorptive removal in the treatment sludge. From the end of pond 2, water is pumped via a submersible pump into a three-tank Multi-media Filter (MMF) system, where the majority of particles are removed prior to release. These collected particles are then washed from the MMF tanks via a backwash system and re-deposited in the rapid mix tank for retreatment and settlement in Pond 1. A flow meter and totalizer has been installed after the MMF to measure instantaneous flow and track total discharge of water as it passes through the system.

Finally, water is discharged into a decant box and released towards Lightning Creek. The effluent goes to ground prior to reaching the creek but it is assumed that most of it eventually seeps into the system. This system is designed to operate and release up to a maximum flow rate of 10 1ps. There has been no reportable spills at the mine site to date.

2.5 MILL OPERATIONS

In 2010, a conventional flotation mill was constructed at the historic Flame and Moth Site for processing ore and producing concentrate.

Construction of the mill included:

- Two stage crushing & screening plant
- Fine ore stacker conveyor and stockpile cover
- Fine ore reclaim tunnel

A 180m by 60m pre-engineered steel building to house processing equipment, including:

- Primary ball mill
- Lead flotation circuit
- Zinc flotation circuit
- Reagent preparation area
- Thickeners and pressure filters for lead concentrates, zinc concentrates, high pyrite tailing and low pyrite tailings
- Concentrate loading dock with truck scale
- Office trailers and wash room facilities
- Process water pond
- Dry-stack tailing facility

The mill is designed to run at an annualized average 250 tonnes per day in 2011, increasing to 400 tonnes per day thereafter. An increase in tonnage beyond an annualized average 250 tpd

may require a QML and WL amendment. Commissioning of the mill occurred throughout most of November and December 2010, therefore production volumes varied from those quoted.

The mill process employs conventional crushing, grinding, flotation, and dewatering processes. The primary valuable sulphides in the mill feed are recovered by conventional differential flotation with a cyanide-free zinc suppressing regime. Silver and lead minerals are recovered together to produce a silver-lead concentrate and zinc minerals with some silver value are recovered to a separate zinc concentrate.

Reagents used in the mill for processing include:

- Copper Sulphate
- Zinc Sulphate
- 3418A (aerophine)
- MIBC (Methyl Isobutyl Carbinol)
- SIPX (Xanthate)
- Sodium Sulphite
- Floc (changing to the same type as used in water treatment)

Storage and disposal of mill tailings is in a dry-stack tailings facility (DSTF) located adjacent to the mill.

2.6 TAILINGS HANDLING

The Tailings Management Plan was designed for approximately 50% of final flotation tailings to be stored on surface by dry stacking and approximately 50% to be stored underground, most likely as cemented or paste backfill. This design allows final flotation tailings to be used as backfill to provide support for the excavated underground voids and to reduce surface environmental impact.

The mill was designed to produce a high and low pyrite tailings product, in the event high pyrite ore material was encountered during mining. If an appreciable amount of pyrite is contained in the mill ore it would be substantially removed and report to the zinc cleaner scavenger tailings stream which has been referred to as the high pyrite tailings product.

Since the mill was commissioned, no appreciable amount of pyrite has been encountered and consequently the mill is producing a single tailings product.

2.7 DRY STACK TAILINGS DISPOSAL PROCEDURE

Tailings are placed in 300 mm lifts and compacted with a 10-tonne vibratory compactor. Tailings are compacted to at least 95% of the maximum dry density using standards effort (as per American Society for Testing and Materials [ASTM] D698). The organic soils have been left in place beneath the DSTF to provide some insulation and slow the rate of permafrost thaw.

Construction of the DSTF will occur within a five year period, as the tailings are generated by the mill. A total of 8,061 tonnes of tailings were placed in the DSTF in 2010 at 11% water retention volume (~887 tonnes). No tailings have yet been placed underground.

The DSTF is designed with an impermeable cemented base layer for the purpose of collecting pore water and meteoric runoff that has come in contact with the tailings. The water is channelled to a sedimentation pond.

2.8 CURRENT MILL WATER USE

Mill water is retained in a sedimentation pond at the mill site, for the dual purpose of settling out sludge solids from treated water at times when treatment is necessary, and as a source of water storage for the mill. The mill pond also collects pore water and runoff from the DSTF, as mentioned above (Figure 2.3).

Currently, mill water is drawn from both the Galkeno 900 and Bellekeno 625 treatment facilities, operated under WL QZ06-074 and QZ09-092, respectively. Water is pumped from the treatment pond into a vacuum truck and transported to the mill pond where it is stored for use in the mill. It is anticipated that during times of high meteoric runoff and net water production by the mill, water in the sedimentation pond will have to be treated and excess water will be discharged to the environment via the land application system. To date there has not been a discharge from the mill pond.

In the event that the mill should produce a net surplus of water, a water treatment and land applicator system will be employed for effluent discharge to the Christal Creek drainage.

2.9 CURRENT MILL WATER USE

Water is also retained in a sedimentation pond at the Flame and Moth Mill Site, for the dual purpose of settling out sludge solids from treated water at times when treatment is necessary, and as a source of water storage for the mill. Currently, mill water is drawn from both the Galkeno 900 and Bellekeno 625 treatment facilities, operated under WL QZ06-074 and QZ09-092, respectively. Water is pumped from the treatment pond into a vacuum truck and transported to the mill pond where it is stored for use in the mill. It is anticipated that during times of high meteoric runoff and net water production by the mill, water in the sedimentation pond will have to be treated and excess water will be discharged to the environment via the land application system. However, to date there has not been a discharge from the mill pond nor has there been any reportable spills.

In the event that the mill should produce a net surplus of water, a water treatment and land applicator system will be employed for effluent discharge to the Christal Creek drainage.

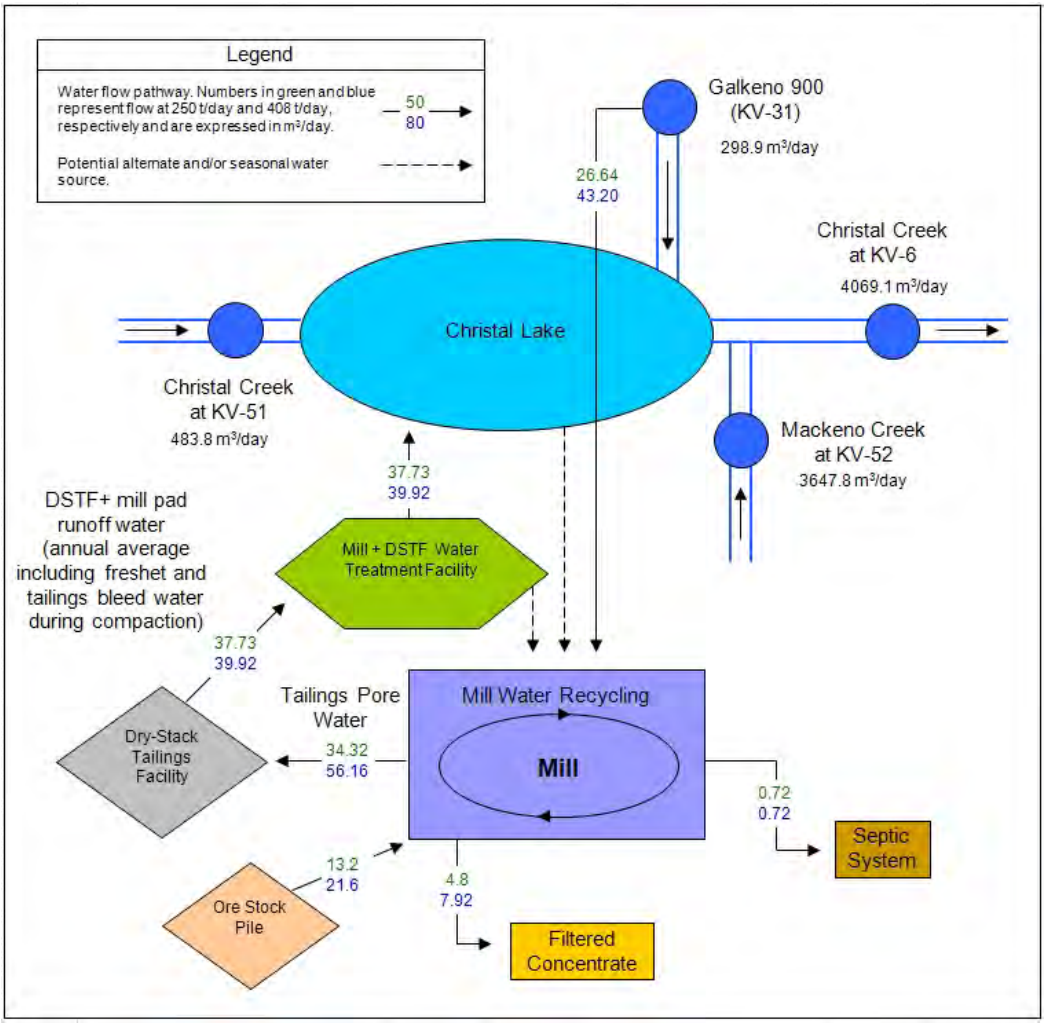


Figure 2.3 Bellekeno Mill Water Feed Process

2.10 EFFLUENT DISCHARGE POINT

Effluent quality monitoring is conducted at the point of compliance located at station KV-43, the Bellekeno 625 Treatment Pond Decant (7087147N, 487318E)[1]. A second compliance point will be established at KV-83 Flame and Moth Mill treatment plant when or if there is discharge at the mill . No water has been discharged from the mill to date.

[1] These coordinates are UTM Zone 8, NAD 83.

2.11 APPLICABLE REGULATIONS

With respect to regulations that apply to the discharge of effluent from the Bellekeno Mine and Mill site, and in addition to the Federal MMER under the Fisheries Act, the Yukon Water Board issued a Type A Water Use Licence (QZ09-092) that came into effect on August 20th, 2010 and is due to expire on August 1st, 2020. This Type A Water Use Licence is a requirement under the Yukon Waters Act within Schedule 7 (Licensing Criteria for Quartz Mining Undertakings) of the Waters Regulations as follows:

- Direct water use for milling at a rate of 100 or more tonnes of ore per day
- Deposit of waste water from milling at a rate of 100 tonnes or more of ore per day

The limits in a Type A Water Use licence are generally more restrictive than those in the MMER (Table 2.1), and separate monitoring and reporting for effluent discharge and receiving water quality is required under the Water Licence's Water Quality Surveillance Program.

The points of compliance at the Bellekeno Mine and the Flame and Moth Site for the effluent quality standards included in this licence are the final points of control at stations KV-43 and KV-83 respectively (Figure 2.4). All test results for the effluent water quality parameters listed in this licence shall be provided by a laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA). Effluent Characterization and water quality monitoring is undertaken as required under MMER.

To date, effluent quality monitoring as prescribed by the Yukon Water Board has been conducted through all three operational periods:

- Care and Maintenance (Nov. 14, 2007 to Oct. 2nd, 2008)
- Advanced Exploration (Oct. 3rd, 2008 to Sept. 6th, 2010) and
- Production (Sept. 7th, 2010 to July 31st, 2011).

The production period has also been subject to MMER and monitored accordingly.

The existing water quality surveillance network at the Keno Hill Property includes surface receiving waters in the Bellekeno, Onek and Christal Lake area. Most of the monitoring stations have been sampled extensively in the past. Past water quality monitoring was required under Water Licence QZ06-074, Schedule A as well as under Water Licence QZ07-078, Schedule A (Flow Monitoring Plan).

Additional monitoring stations that have been established and will continue to track receiving water quality from the Bellekeno mine/mill development and operations program. Water stations will be sampled weekly, monthly and quarterly during periods of discharge. This will include the two points of compliance at stations KV-43 and KV-83, located at Lightning Creek and Christal Creek, respectively (Figure 2.4).

2.12 EFFLUENT CHEMISTRY

Table 2.2 provides a summary of Bellekeno Mine effluent quality (station KV-43) between November 14, 2007 and July 31, 2011. During this time three different water licenses were in effect in recognition of the activities being undertaken at the site:

- November 14, 2007 Water License QZ06-074 came into effect in support of care and maintenance activities;
- October 3, 2008 Water License QZ07-078 came into effect in support of advanced exploration and preliminary development activities;
- August 19, 2010 Water Licence QZ09-092 came into effect to support mine production.

Effluent quality data has been summarized for each of these phases and compared with MMER standards and Water License QZ09-092 effluent quality standards (Table 2.2). Actual results from sampling events where these numbers were derived from are appended (Appendix B)

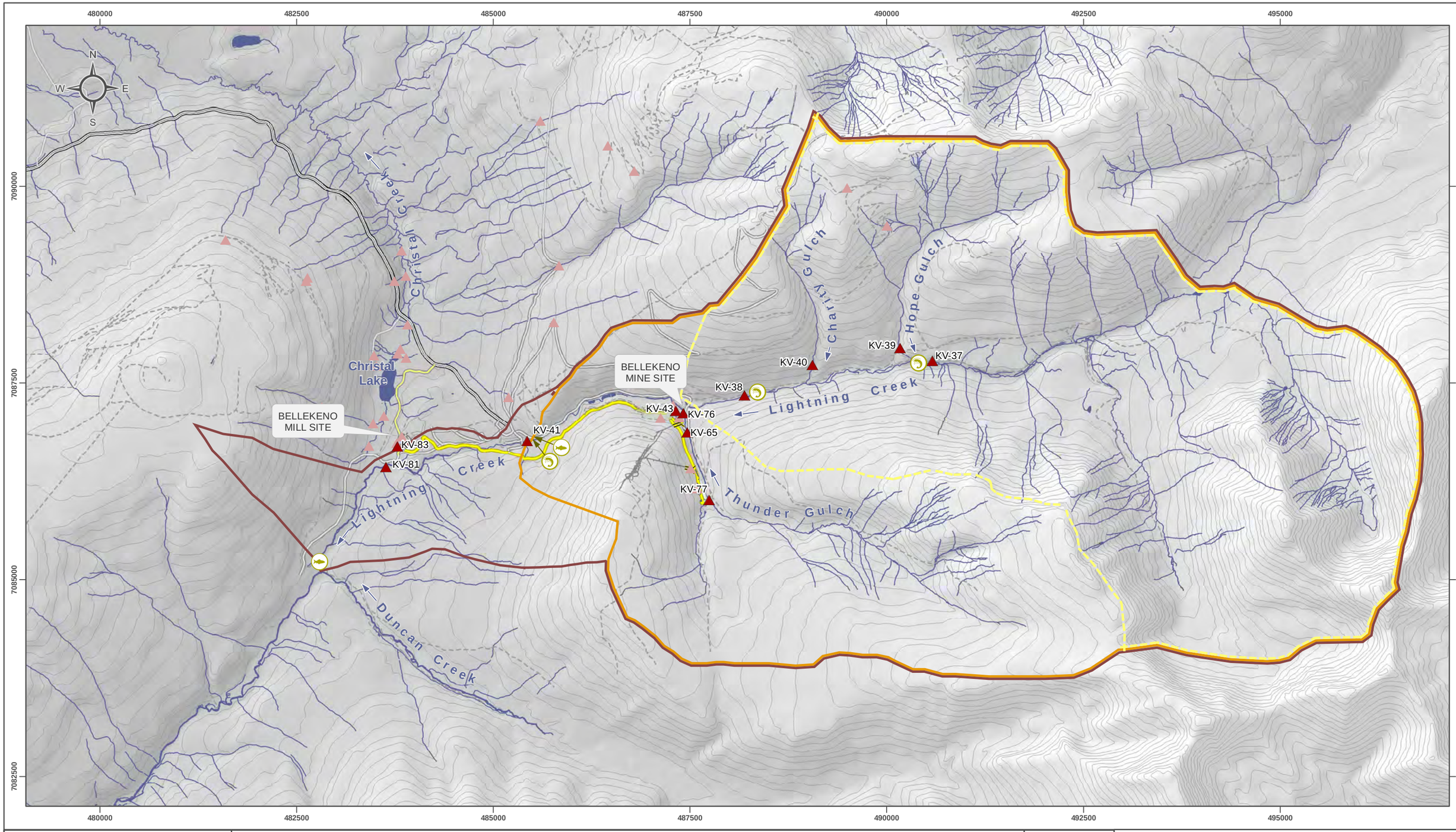
Sampling for Radium 226 was initiated in September 2011. Weekly sampling results have been consistently below 0.037 Bq/L (see Appendix B) and therefore AKHMC has submitted a letter to Environment Canada indicating that sampling frequency for Radium 226 would be reduced to quarterly as set out in the MMER.

Sampling for mercury has been ongoing at the final discharge point (KV-43) over a number of years however the method detection limit (MDL) for samples analysed to date has been 0.2 ug/l.

Although all samples have returned below detection (see Appendix B) the MDL was not set low enough (i.e. 0.1 ug/l or less) to determine if it is necessary to conduct a fish tissue analysis. Therefore as described in section 4.0 AKHMC will conduct a tissue fish tissue analysis program as part of this study and will also sample for mercury at the effluent discharge point (KV-43) using a detection limit of 0.1 ug/l or better.

2.12.1 Effluent Mixing and Discharge

Effluent discharged from the Bellekeno water treatment system reports to Lightning Creek (Figure 2.4). The discharged effluent goes to ground prior to reaching the creek but it is assumed that most of it eventually seeps into the creek. Therefore, effluent mixing here assumes that 100% of effluent discharged ends up mixing with Lightning Creek surface flow. Discharge from the mine and through the treatment system varies from about 2.0 lps to a maximum of 10 lps whereas Lightning Creek discharge at KV-41 varies from under 100 lps during winter months to over 2,000 lps during high flow periods in the open water season (Figure 2.5), therefore flow throughout most of the year Effluent contribution to the flow in Lightning creek is less than 1%. However during low flow periods such as in the month of January, effluent contribution to flows in Lightning Creek could be over 10% based on lowest actual flow recorded in Lightning Creek to date and average discharge from the Bellekeno mine operation during the month of January (see Table 2.3).



Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13 and 14 2006. Site hydrography provided by Aero Geometrics LTD, derived from aerial photograph. Contour data compiled by Natural Resources Canada at a scale of 1:50,000.Reproduced under license from Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources Canada. All rights reserved.

Datum: NAD 83; Map Projection: UTM Zone 8N

1:45,000 (when printed on 11 x17 inch paper)

0 0.5 1 2 Kilometers

- Surface Water Quality Station of Interest
- Other Surface Water Quality Monitoring Station
- Previous Benthic and Invertebrate Study
- Previous Fisheries Study
- Lightning Creek to Thunder Gulch confluence
- Lightning Creek to water quality monitoring station "KV-41"
- Lightning Creek up to Duncan Creek confluence
- Silver Trail Highway
- Local Road
- Haul Road
- Mill Access Road
- Contour (100 ft)
- Watercourse

AKHM ACCESS

BELLEKNO MINE PROJECT - ENVIRONMENTAL EFFECTS MONITORING PROGRAM - CYCLE I STUDY DESIGN

FIGURE 2.4

LIGHTNING CREEK CATCHMENTS AND ENVIRONMENTAL MONITORING STATIONS

DRAWN BY MD	SEPTEMBER 2011	VERIFIED BY DP

I:\ALEX-05-01\Bellekeno\GIS\mxd\Studies\EEM_Cycle_1\Fig2.4_LightningCreek_Catchments_and_WQ Monitoring20110907.mxd
(Last edited by: mduchame;07/09/2011/14:34 PM)

Table 2.1 Compliance Monitoring frequency and limits applicable to the Bellekeno Mine

Parameter[1]	Units	MMER Effluent Quality standards			Water Use Licence QZ09-092 Effluent Quality Standards from Water Treatment Systems		
		Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Composite Sample	Maximum Authorized Concentration in a Grab Sample (~10 x MDL)	Frequency	Maximum Authorized Concentration in Grab Sample from Bellekeno 625 Adit	Maximum Authorized Concentration in Grab Sample from Flame and Moth Site
pH	pH units	-	-	6.0-9.5	weekly	6.0-9.5	6.0-9.5
Suspended Solids	mg/L	15	22.50	30.0	weekly	25	25
Ammonia Nitrogen	mg/L	-	-	-	weekly	5	5
Arsenic (total)	mg/L	0.50	0.75	1.0	-	0.1	0.1
Cadmium (total)	mg/L	-	-	-	-	0.01	0.01
Copper (total)	mg/L	0.30	0.45	0.6	weekly	0.1	0.1
Lead (total)	mg/L	0.20	0.30	0.4	weekly	0.2	0.2
Nickel	mg/L	0.50	0.75	1.0	weekly	0.5	0.5
Radium-226	BQ/L	0.37	0.74	1.11	quarterly	0.37	0.37
Silver (total)	mg/L	-	-	-	weekly	0.01	0.02
Zinc	mg/L	0.50	0.75	1.0	weekly	0.5	0.5
Oil and Grease	Visibility	-	-	-	weekly	-	-
Acute Toxicity Testing							
96-hour Rainbow Trout		$Pass_{50}$[1]			monthly	Non-toxic, LC_{50} (100%)	Non-toxic, LC_{50} (100%)

[1]A pass results is <50% mortality in 100% effluent

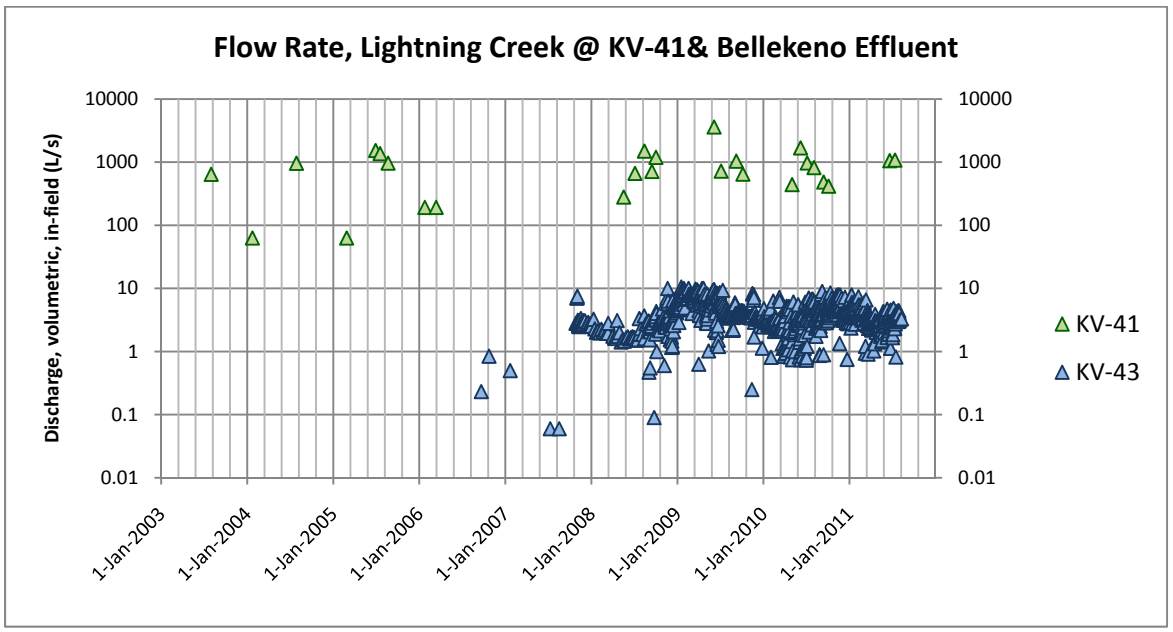


Figure 2.5 Effluent discharge rate at KV-43 vs flow at KV-41(Lightning Creek) 2003 through 2011

Table 2.2 Summary of Bellekeno Mine Effluent Quality (Station KV-43)[a]

Parameter	Units	MMER Authorized Monthly Mean	MMER Authorized in Grab	WUL QZ09-092 Effluent Quality Standard	Averages			Count			Count<DL			Count & %>MMER Grab Limit		
					care and maintenance[b]	advanced exploration[c]	production[d]	care and maintenance	advanced exploration	production	care and maintenance	advanced exploration	production	care and maintenance	advanced exploration	production
MMER Parameters																
pH (field)	pH units	-	**6.0-9.5**	**6.5-9.5**	8.19	8.49	8.44	9	18	54	0	0	0	0	0	n = 1; 2%
pH (lab)	pH units	-	**6.0-9.5**	**6.5-9.5**	8.67	8.32	7.93	11	61	55	0	0	0	0	0	0
Total Suspended Solids	mg/L	**15**	**30**	**25**	11	27	9	11	68	54	2	7	28	n = 1; 9%	n = 16; 24%	n = 4; 7%
Arsenic (total)	mg/L	**0.5**	**1**	**0.1**	0.0018	0.013	0.0039	11	58	56	0	0	4	0	0	0
Copper (total)	mg/L	**0.3**	**0.6**	**0.1**	0.001	0.0041	0.0022	11	58	56	10	28	29	0	0	0
Lead (total)	mg/L	**0.2**	**0.4**	**0.2**	0.0022	0.0227	0.0464	11	58	56	0	2	1	0	0	0
Nickel (total)	mg/L	**0.5**	**1**	**0.5**	0.0107	0.0213	0.006	11	58	56	0	0	3	0	0	0
Zinc (total)	mg/L	**0.5**	**1**	**0.5**	0.205	0.2	0.044	11	58	56	0	3	27	0	0	0
Radium-226	Bq/L	**0.37**	**1.11**	**0.37**	-	-	0.006	-	1	48	-	1	30	-	0	0
Additional Effluent Quality Characterization Parameters																
Hardness (total)	mg/L	-	-	-	-	859	707	-	40	56	-	0	0	-	-	-
Alkalinity (total)	mg/L	-	-	-	-	51	52	-	3	55	-	0	0	-	-	-
Ammonia Nitrogen (total)	mg/L	-	-	**5**	-	1.328	1.724	-	62	55	-	0	0	-	-	-
Nitrate (as N)	mg/L	-	-	-	-	-	2.91	-	-	53	-	-	2	-	-	-
Nitrite (as N)	mg/L	-	-	-	-	-	0.608	-	-	53	-	-	2	-	-	-
Aluminum (total)	mg/L	-	-	-	0.031	0.054	0.039	11	58	56	0	11	17	-	-	-
Cadmium (total)	mg/L	-	-	**0.01**	0.00102	0.00065	0.00034	11	58	56	0	16	25	-	-	-
Chromium (total)	mg/L	-	-	-	0.0007	0.0016	0.002	11	58	56	2	30	41	-	-	-
Iron (total)	mg/L	-	-	-	0.07	1.252	1.265	11	58	56	8	5	8	-	-	-
Mercury (total)	mg/L	-	-	-	-	0.0001	0.00009	-	39	55	-	39	54	-	-	-
Molybdenum (total)	mg/L	-	-	-	0.0006	0.00242	0.005	11	58	56	8	3	0	-	-	-
Selenium (total)	mg/L	-	-	-	0.0022	0.0019	0.0014	11	58	56	0	14	25	-	-	-
Silver (total)	mg/L	-	-	**0.01**	0.00006	0.00104	0.00037	11	58	56	7	30	27	-	-	-
Thallium (total)	mg/L	-	-	-	0.00003	0.00009	0.00011	11	55	56	10	6	13	-	-	-

[a] Internal daily site data not included in data summary.

[b] Care and maintenance data from November 14, 2007 to October 2, 2008.

[c] Advanced exploration data from October 3, 2008 to September 6, 2010.

[d] Production data from September 7, 2010 to July 31, 2011.

Table 2.3 Minimum expected dilution of effluent in Lightning Creek based on minimum winter flows recorded to date

			10-Day Average, Jan 19-29, 2008[1]	10-Day Average, Jan 19-29, 2009[2]	10-Day Average, Jan 19-29, 2010[3]	10-Day Average, Jan 19-29, 2011[3]
		KV-43 Flow rate (Lps)	2.02	7.94	3.22	4.38
KV-41 Flow rate, Jan 24, 2004	63 lps	KV-43 as percent of KV-41 discharge	3.21%	12.61%	5.12%	6.95%
KV-41 Flow Rate, Jan 25, 2005	192 lps	KV-43 as percent of KV-41 discharge	1.05%	4.14%	1.68%	2.28%

1. Pre mine-dewatering conditions
2. Mine dewatering conditions
3. Post mine-dewatering

2.12.2 Effluent Sublethal Toxicity Testing

As required under the MMER, sublethal toxicity testing has been initiated and will occur semi-annually on water taken at KV-43, the final discharge point from the Bellekeno Mine. The first test was conducted on water collected on December 13, 2010. Results from the test are presented below (Table 2.4). This first test indicates that the effluent is non-toxic to Early life stage Rainbow trout and *Lemna minor.* Some toxicity was noted for *C. Dubia* and *P. Subcapitata* but at concentrations of effluent much greater than what is expected in Lightning Creek following mixing.

Table 2.4 First Sub-lethal Toxicity Test Results (Sample taken December 2010)

Analysis	Results	95% Confidence Interval
Rainbow Trout Early life stage[1] 7 Day LC_{25}	>100%	-
Rainbow Trout Early life stage[1] 7 Day LC_{50}	>100%	-
Ceriodaphnia dubia[2] LC_{50}	>100%	-
Ceriodaphnia dubia[2] IC_{25}	70.81%	56.19% - 97.8%
Ceriodaphnia dubia[2] IC_{50}	>100%	-
Pseudokirshneriella subcapitata[3] 72 Hour IC_{25}	88.9%	54.26% - 100%
Pseudokirshneriella subcapitata[3] 72 Hour IC_{50}	>90.9%*	-
Lemna minor[4] *7 Day* IC_{25}	>97%*	-
Lemna minor [4] 7 Day IC $_{50}$	>97%*	-

*Highest concentration tested

LC_{25}= Concentration which would cause a 25% mortality
LC_{50}= Concentration which would cause a 50% mortality
IC_{25}= Concentration which would cause a 25% inhibition in reproduction or growth
IC_{50}= Concentration which would cause a 50% inhibition in reproduction or growth

1. Standard Operating Procedure for Rainbow Trout Early Life Testing
2. Standard Operating Procedure for *Ceriodaphnia dubia* Testing and Culturing
3. Standard Operating Procedure for *Pseudokirshneriella subcapitata* Testing and Culturing
4. Environment Canada protocol for conducting toxicity tests using *Lemna minor*

A second test was scheduled for spring of 2011 however the lab that was to run the tests did not have viable rainbow trouts eggs available. The second test is now scheduled for September 17, 2011.

2.12.3 Toxicity Testing

As required under the MMER and WUL applicable to the site acute toxicity testing has been conducted on a monthly basis using water collected at KV-43, the final discharge point at the Bellekeno Mine. Specifically bioassay tests for acute toxicity have been conducted monthly using

rainbow trout (Onchorhynchus mykiss, 96h pass/fail) and Daphnia magna (48 h pass/fail) since January 2011. All 7 received to date have returned non-toxic results. As the discharge point has been subject to WUL's over the years an additional 30 acute toxicity tests have been conducted using rainbow trout and water collected at KV-43. All of these previous tests passed (i.e. < 50% mortality). Monthly results are presented in Appendix B.

2.13 OTHER AREA CHARACTERISTICS

2.13.1 Climate and Weather Monitoring

The location in the interior of Yukon, south of the Wernecke Mountains, is semi-arid but subject to occasional heavy rainstorms. Precipitation is common throughout the year, with the wettest months being July and August and the driest month usually being April. Snow cover is light and blankets the area from October to May. Temperature extremes are characteristic of the area. Winters are long, cold and dark. Summers are mild to cool, often rainy and grey but occasionally interrupted by hot, dry, clear spells. Stream flows generally peak in May with the spring snow melt, but heavy flows also occur in summer and fall during thunderstorms. Long daylight hours in summer are conducive to lush plant growth but the short growing season limits the overall growth rate and size of most vegetation.

2.13.2 Historical Data Collection

The climate data has been collected in the vicinity of the Bellekeno Mine Site using a Campbell Scientific weather station that was established, as part of the mine closure plan for the Keno Hill Property on Galena Hill, in June 2007 by Alexco. The station measures air temperature, relative humidity, barometric pressure, rainfall, wind speed and direction, solar radiation, and soil temperature.

The region around the Keno Hill Silver District has been served by a network of climate monitoring stations (Table 2.5). At least three climate stations have been operated within the boundaries of the silver district. Two of these stations were maintained by the Atmospheric Environment Service (AES) and were located at the Elsa town site and on the southern flank of Keno Hill. The third station was operated on a seasonal basis by DIAND at a site in the Flat Creek catchment near the Elsa town site. In addition to these stations, the AES operate a principal climate station at the Mayo Airport, located some 40 km southwest of Elsa. The data from the Mayo Airport can be combined with that of two discontinued stations in the near vicinity of the airport (i.e. Mayo Landing and Mayo) to construct a long-term climate record.

Mean annual precipitation (MAP) within a mountainous region typically increases with a rise in elevation. The region around the Keno Hill Silver District is no exception to this rule as illustrated by the graph of MAP versus elevation shown on Figure 2.6. The data points on this graph were obtained from the information assembled in Table 2.5 for the regional AES climate stations. The Keno Hill Silver District is in an area of significant relief. Accordingly, MAP can be expected to vary considerably within the boundaries of the district. Figure 2.xx shows the relationship between

MAP and elevation. The slope of this line indicates that MAP increases by an average of 27 mm for every 100 m of ascent, a value not too dissimilar from that observed in other regions of the Yukon interior.

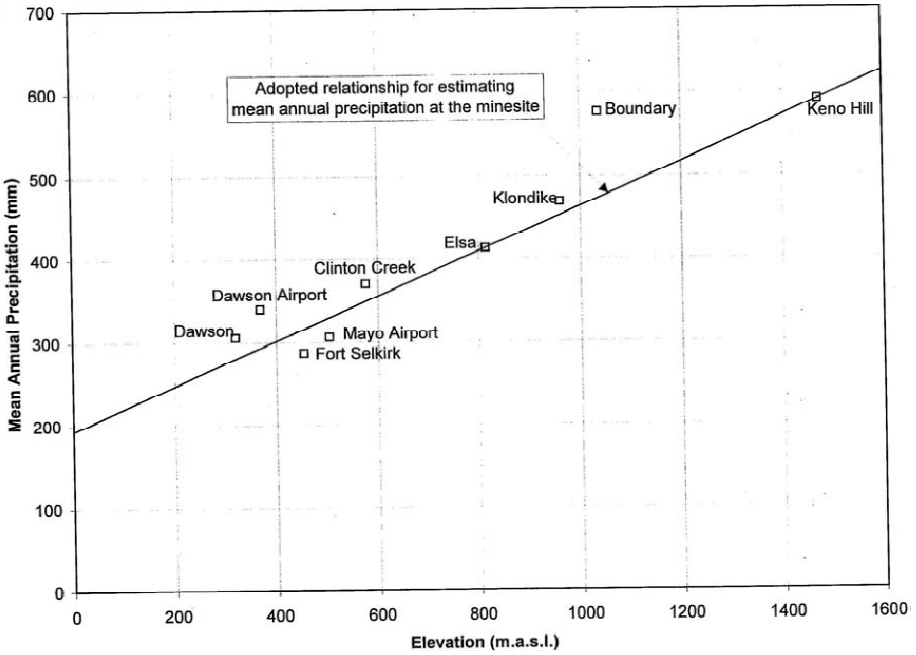


Figure 2.6 Mean Annual Precipitation as a Function of Elevation

Table 2.5 Precipitation and Evapotranspiration at Select Keno Hill District Locations

Site	Mean Annual Precipitation (mm)	Mean Annual Evapotranspiration (mm)	Annual Net Precipitation (mm)	Data Source
Keno Hill (1472 m elevation)	585	205	380	AES Climate Station, UKHM Site Characterization Report, 1996
Elsa Townsite (814m Elevation	420	230	190	AES Climate Station, UKHM Site Characterization Report, 1996
Bellekeno Mine (1050 m Elevation)	479	221	258	Calculated based on site elevation-precipitation relationship
Flame and Moth mill site (901 m Elevation)	443	227	215	Calculated based on site elevation-precipitation relationship

2.13.3 Geological Setting

The Keno Silver District lies within the Yukon Plateau, just south of the rugged Wernecke Mountains. The terrain consists of concordant, rolling, upland areas separated by wide valleys. Alpine mountain peaks extend above the uplands locally. The area has been influenced by the latest glaciation but shows more subtle evidence of an earlier event as well. The Keno Hill Silver District is located in the western part of the Selwyn Basin in an area dominated by deformed and metamorphosed Upper Proterozoic to Mississippian sedimentary rocks formed at the edge of a continental margin. During the Jurassic and Cretaceous, the area was subjected to compressional tectonic forces producing two major thrust sheets (*Robert Service* and *Tombstone*) and widespread folding. Early large scale deformation produced recumbent folds, resulting in local structural thickening of strata. A second (and possibly third) deformational event produced gentle south westerly plunging syn- and antiform pairs.

The Robert Service Thrust Sheet in the south is composed of Late Proterozoic to Cambrian sandstone, locally with inter-bedded limestone and argillite, a Cambrian to Middle Devonian succession of siltstone, limestone and chert, and Upper Devonian argillite, chert, and chert pebble conglomerate. The latter unit uncomfortably overlies the lower units.

The Tombstone Thrust Sheet to the north consists of Devonian phyllite, felsic meta-tuffs and metaclastic rocks, overlain by Carboniferous quartzite. This latter rock unit is locally thickened due to folding and or thrusting and hosts the mineralization of the Keno Hill Silver District. Intrusive rocks formed during four episodes of plutonism.

Early Palaeozoic fine-grained diabase occurs as metre-scale dikes and sills in the Upper Proterozoic to Lower Cambrian rocks. During the Mid-Triassic, gabbros to diorites formed pods of various sizes, primarily in the Devonian and Mississippian rocks of the Tombstone thrust sheet. A third phase of plutonism took place around ninety-two million years ago in the early Cretaceous and resulted in widespread and voluminous Tombstone intrusions of commonly granitic to granodioritic composition. The youngest magmatic activity occurred around sixty-five million years ago in the Upper Cretaceous and resulted in the formation of peraluminous megacrystic potassium feldspar granite. In addition to where polymetallic veins were exploited, the area hosts a number of occurrences, and showings of tungsten, copper, gold, lead, zinc, antimony and barite. Tin, tungsten, and molybdenite occurrences are possibly related to the suite of Cretaceous intrusion, whereas lead, zinc, and barite occur in stratiform calcareous sedimentary rocks of early to mid-Palaeozoic age typical of sediment-hosted deposits.

3.0 RECEIVING ENVIRONMENT

Lightning Creek (Figure 2.4) encompasses both the reference and receiving environment aquatic habitat where both the fish and benthic invertebrate EEM studies will occur (see section 4.0). The following describes the physical and water quality characteristics of Lightning Creek and factors influencing that quality. Specific details regarding both the reference and receiving areas are presented and include water quality relevant to MMER and this EEM study design. Also included in this section is a summary of previous benthic invertebrate and fish studies conducted in the creek.

3.1 PHYSICAL CHARACTERISTICS

Lightning Creek is situated within a narrow valley with a steep gradient flowing from the north side of Sourdough Hill into Duncan Creek, which drains into the Mayo River. Hope and Thunder Gulches flow into Lightning Creek within the bounds of the Keno Hill Silver District (KHSD). Using the Cowardin et al. (1979) classification, Lightning Creek is an upper perennial riverine system with a sand-gravel-cobble substrate. No natural water storage basins occur along the system.

Lightning Creek is approximately 17.2 km in length (Table 3.1) with an approximate catchment area of 6,200 Ha. from its headwaters to Duncan Creek (Figure 2.4). Mean annual runoff (MAR) was determined to be 0.645 m^3/s based on data collected between 2004 -2007 (McCreath and Bryan 2008). Table 3.1 shows relative lengths of the creek and relevant catchment areas within the Lighting Creek catchment basin.

Table 3.1 Stream length and catchment for specific areas within Lightning Creek

Area Description	Basin Area (ha)[a]	Stream Length (m)[b]
Lightning Creek to Thunder Gulch Confluence (not including Thunder Gulch Catchment)	3,796	11,481
Lightning Creek to SWQ Station KV-41	5,695	13,651
Lightning Creek to Duncan Creek Confluence (not including Duncan Creek Catchment)	6,209	17,209
a. Catchment tracing (manual) based on 5 meter contour and hydrology data derived from 2006 aerial imagery (version obtained in 2009) b. measurements based on National Hydrological Network data; data derived from the aerial imagery contained too many intermittent stream. This measurement is the length of the creek from its "most distance" source, which is somewhat arbitrary. See map for more information		

Water is swift flowing in much of the creek which has a gradient ranging from 7.4 % in the upper reaches (source to Thunder Gulch confluence) to 3.3 % between Thunder Gulch and the Water quality sampling site at KV-41 (see Figure 3.1). The gradient between KV-41 and Duncan Creek averages 5.13%.

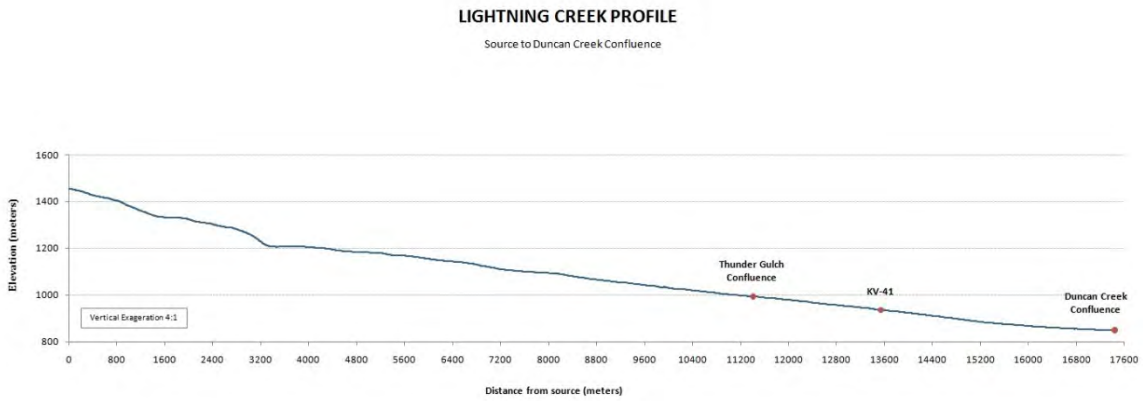


Figure 3.1Lightning Creek Gradient Profile

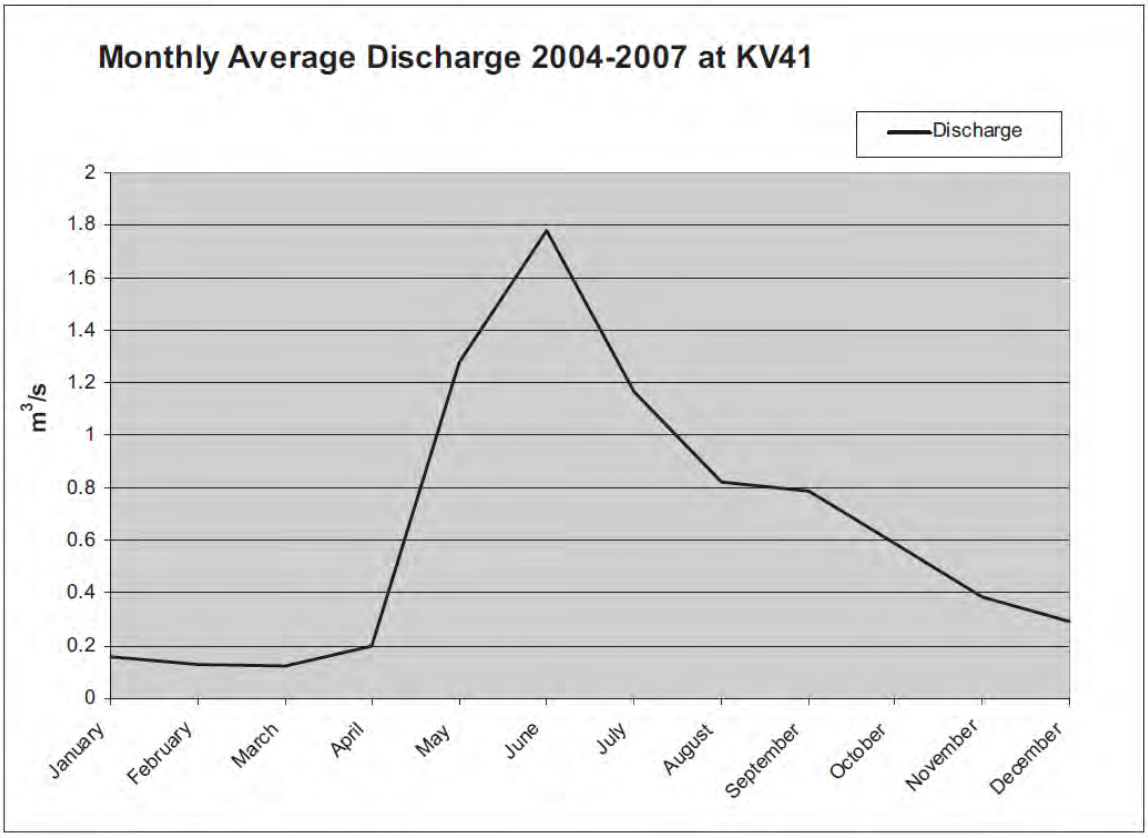


Figure 3.2 Lightning Creek Monthly Average Discharge 2004-2007 at KV41

Discharge in Lightning Creek measured at KV-41 varies from an average low of 0.1 m^3/s during winter months to approximately a 1.8 m^3/s average during spring/early summer (Figure 3.2). The system is responsive to high rainfall events and can experience very high flows during freshet.

In addition to current and previous quartz mining activity over the years Lightning Creek has also been the site of extensive placer mining upstream of Keno City both historically and at present time. Mine adit drainages from Bellekeno 625 (north side of Sourdough Hill) and Keno 700 (south side of Keno Hill) eventually report to the Lightning Creek drainage.

3.2 HISTORICAL WATER QUALITY

Lightning Creek is notable as it is the only large watershed in the KHSD not connected to the South McQuesten River. There are 9 regularly monitored sites between the background baseline station at KV-37, to the station at the Lightning Creek Bridge near Keno (KV-41), and now the recently added downstream station KV-81, southwest of the Flame and Moth mill (Table 3.2).

Table 3.2 Lightning Creek Catchment Water Quality Monitoring Sites

SITE	SITE DESCRIPTION	MONITORING FREQUENCY
KV-37	Lightning Creek u/s Hope Gulch	Q
KV-38	Lightning Creek u/s Thunder Gulch	Q
KV-39	Hope Gulch u/s Lightning Creek	Q
KV-40	Charity Gulch u/s Lightning Creek	Q
KV-41	Lightning Creek u/s bridge at Keno City	M
KV-65	Thunder Gulch upstream of Bellekeno	M
KV-76	Thunder Gulch d/s of Bellekeno 625 Adit	Q*
KV-77	Thunder Gulch u/s of Bellekeno East	Q
KV-81	Lightning Creek Southwest of Mill Site	Q

* Monthly bioassay

Background water quality data on Lightning Creek is collected at station KV-37. Two creeks, Hope Gulch and Charity Gulch, flow from the south side of Keno Hill into Lightning Creek upstream of Thunder Gulch and the Bellekeno 625 adit flow.

Of these stations, data were investigated for KV-37, KV-38, KV-39, KV-40 and KV-41 during Minnow's water quality assessment (Minnow, 2008). Data for the 4 downstream stations were examined to determine which parameters regularly exceed background concentrations and applicable water quality guidelines. Parameters that exceeded the highest benchmark (background or guideline) in more than 50% of samples included:

- KV-39 – arsenic, cadmium, zinc;
- KV-40 – selenium.

Additional parameters that exceeded both the background concentrations and water quality guideline (if available) in more than 10% of samples collected at each station include:

- KV-38 – silver;
- KV-39 – lead;
- KV-40 – sulphate;
- KV-41 – aluminum, arsenic, chromium, iron, lead, nitrite, silicon, silver, total suspended solids and zinc.

Table 3.3 summarizes total zinc and cadmium levels for the period between 2004 and 2010. while Table 3.4 provides a data summary for 2010 only. Trends for Arsenic and Selenium are charted (Figures 3.3 and 3.4).

Table 3.3 Lightning Creek Catchment 2004 to 2010 Water Quality Summary Statistics

	KV-37	KV-38	KV-39	KV-40	KV-41	KV-65	KV-76	KV-77	KV-81
Zinc, Total (mg/L)									
Average	0.0134	0.024	0.264	0.0078	0.0262	0.0079	0.0192	1.2985	0.0073
Count	23	23	15	12	46	23	13	8	1
Minimum	0.0005	0.0037	0.133	0.0023	0.0074	0.0015	0.003	0.0004	0.0073
Maximum	0.239	0.051	0.468	0.019	0.144	0.065	0.098	9.42	0.0073
Count <DL	3	0	0	0	0	0	0	0	0
Standard Deviation	0.0493	0.0114	0.086	0.0057	0.0219	0.0138	0.0266	3.2876	0
1st Quartile	0.0011	0.0151	0.214	0.003	0.0137	0.0022	0.0052	0.0025	0.0073
Median	0.002	0.0203	0.256	0.0066	0.0202	0.004	0.0061	0.0995	0.0073
3rd Quartile	0.005	0.03	0.29	0.0097	0.0304	0.0054	0.019	0.2722	0.0073
Count Over Standard	1	5	15	0	12	1	3	5	0
% Over Standard	4.3	21.7	100	0	26.1	4.3	23.1	62.5	0
Cadmium, Total (mg/L)									
Average	0.000125	0.00022	0.00312	0.000062	0.000188	0.000068	0.000197	0.013074	0.000075
Count	23	23	15	12	46	23	13	8	1
Minimum	0.000005	0.000033	0.00153	0.00003	0.00004	0.000005	0.000031	0.000005	0.000075
Maximum	0.00255	0.000476	0.00606	0.00016	0.000695	0.0007	0.0009	0.0916	0.000075
Count <DL	11	0	0	0	1	2	0	1	0
Standard Deviation	0.000529	0.000117	0.00104	0.000039	0.000157	0.000144	0.00026	0.031903	0
1st Quartile	0.000005	0.000146	0.00255	0.000037	0.000069	0.000019	0.000045	0.000009	0.000075
Median	0.000012	0.00019	0.00284	0.000045	0.000121	0.000023	0.000074	0.000865	0.000075
3rd Quartile	0.00002	0.000295	0.00359	0.000073	0.000268	0.000043	0.00023	0.003485	0.000075
Count Over Standard	19	23	15	9	46	12	12	6	1
% Over Standard	82.6	100	100	75	100	52.2	92.3	75	100

Table 3.4 Lightning Creek Catchment 2010 Water Quality Summary Statistics

	KV-37	KV-38	KV-39	KV-40	KV-41	KV-65	KV-76	KV-77	KV-81
Zinc, Total (mg/L)									
Average	0.0017	0.0124	0.161	0.0037	0.0118	0.0032	0.0092	9.42	0.0073
Count	4	4	3	2	13	9	3	1	1
Minimum	0.0012	0.0037	0.133	0.0029	0.0074	0.0015	0.005	9.42	0.0073
Maximum	0.0024	0.0203	0.191	0.0045	0.0204	0.0057	0.0167	9.42	0.0073
Count <DL	0	0	0	0	0	0	0	0	0
Standard Deviation	0.0005	0.0068	0.029	0.0011	0.0037	0.0015	0.0065	0	0
1st Quartile	0.0014	0.0104	0.146	0.0033	0.0085	0.0017	0.0055	9.42	0.0073
Median	0.0016	0.0129	0.158	0.0037	0.0112	0.0028	0.006	9.42	0.0073
3rd Quartile	0.002	0.015	0.174	0.0041	0.0141	0.004	0.0113	9.42	0.0073
Count Over Standard	0	0	3	0	0	0	0	1	0
% Over Standard	0	0	100	0	0	0	0	100	0
Cadmium, Total (mg/L)									
Average	0.000013	0.000147	0.00212	0.000051	0.000093	0.000026	0.00016	0.0916	0.000075
Count	4	4	3	2	13	9	3	1	1
Minimum	0.000007	0.000033	0.00153	0.000037	0.000041	0.000018	0.000065	0.0916	0.000075
Maximum	0.000017	0.000242	0.00254	0.000065	0.000267	0.00005	0.000342	0.0916	0.000075
Count <DL	0	0	0	0	0	0	0	0	0
Standard Deviation	0.000004	0.000087	0.00053	0.00002	0.000064	0.000011	0.000157	0	0
1st Quartile	0.000012	0.000115	0.00191	0.000044	0.000049	0.000019	0.000069	0.0916	0.000075
Median	0.000015	0.000157	0.00229	0.000051	0.00006	0.00002	0.000074	0.0916	0.000075
3rd Quartile	0.000016	0.000189	0.00242	0.000058	0.000113	0.000027	0.000208	0.0916	0.000075
Count Over Standard	1	4	3	1	13	2	3	1	1
% Over Standard	25	100	100	50	100	22.2	100	100	100

The Lightning Creek watershed is largely impacted by the Keno 700 adit (and associated waste rock dump). Treatment is not carried out at Keno 700 due to a number of factors, not least of which is the site's extremely remote location. Analysis of data from the Keno 700 adit shows variability in seasonal flows, and a large margin of error in terms of the predicted impacts to Lightning Creek (Minnow 2008).

Zinc concentrations at the background station on Lightning Creek (KV-37) are a small percentage of what they are downstream of mining influences at KV-38 (Table 3.5). Mine related influences from Hope Gulch enter Lightning Creek upstream of KV-38, with the primary source being the Keno 700 adit, which drains directly into Hope Gulch. At KV-38, zinc concentrations are more than four times the background concentration. Cadmium concentrations are also higher at KV-38 by more than ten times. At KV-41, cadmium concentrations fluctuate relative to the concentrations upstream at KV-38. The data suggest that cadmium is generally stable or decreasing between KV-38 and KV-41 (Table 3.5). Zinc between these two stations is also comparable, suggesting that impacts from Thunder Gulch between these sites is minimal relative to the large influence of Hope Gulch (and the Keno 700 Adit) on the overall chemistry of Lightning Creek. It should be noted that the relative impacts of COCs from Hope and Thunder Gulches are not fully understood as a result of the impacts of placer mining activities on Thunder Gulch and mainstem Lightning Creek. The relative impact of the Bellekeno mine has not thus far been discretely detected in Lightning Creek. Treatment of effluent is effective and upstream concentrations/loads of metals are relatively high and variable. Ammonia is the only parameter which is produced solely from Bellekeno Mine operations, because of its origin in blasting.

Figure 3.3 Lightning Creek Catchment, Total As

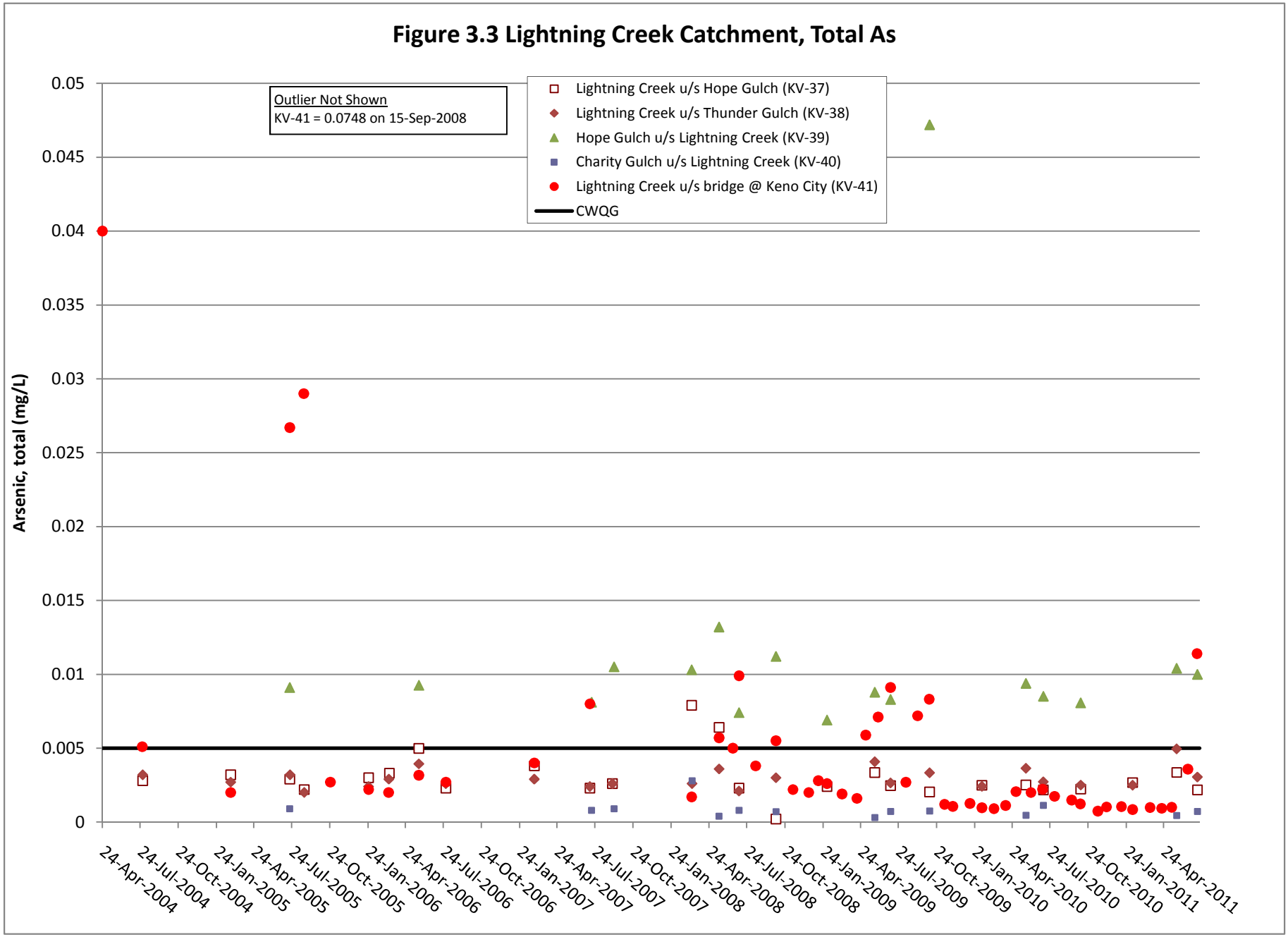


Figure 3.4 Lightning Creek Catchment, Total Se

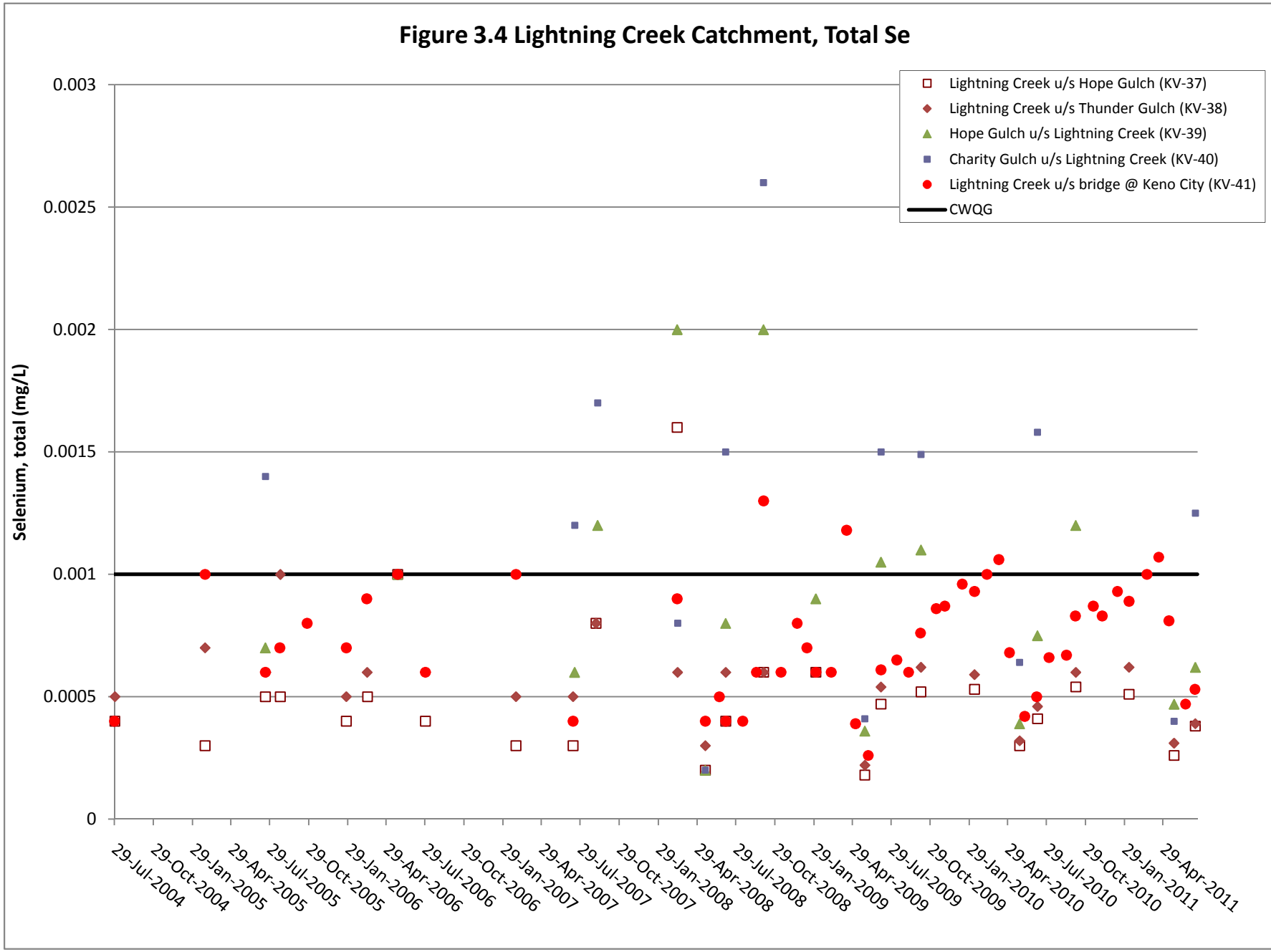


Table 3.5 Change in Zinc, Cadmium and TSS Concentrations along Lightning Creek

Parameter	Year	KV-37	KV-38	KV-41	% change in conc. between KV-37 and KV-38	% change in conc. between KV-38 and KV-41
Zn, total (mg/L)						
	2004	0.008	0.051	0.04	538	-22
	2005	0.001	0.03	0.03	2900	0
	2006	0.006	0.025	0.021	353	-14
	2007	0.006	0.021	0.032	250	52
	2008[2]	0.005	0.026	0.043	478	65
	2009	0.001	0.025	0.026	1854	2
	2010	0.002	0.012	0.012	629	-5
Cd, total (mg/L)						
	2004	0.00001	0.00044	0.00051	4300	16
	2005	0.00001	0.00023	0.00021	2200	-9
	2006	0.00002	0.00023	0.00017	927	-27
	2007	0.00001	0.00016	0.00016	1500	0
	2008	0.00004	0.00022	0.00022	450	0
	2009	0.00002	0.00027	0.00024	1300	-8
	2010	0.00001	0.00015	0.00009	1031	-37
TSS *(mg/L)						
	2004	5	5	20		
	2005	2	2	25		
	2006	6	4	8		
	2008	7	4	72		
	2009	4	5	76		
	2010	2	3	9		

* TSS is not presented showing % change in conc. between the two sites as it fluctuates according to conditions at the time of sampling (i.e. rainfall events).

The lowest levels of cadmium and zinc in Lightning Creek were generally observed in 2010, likely due to the decreasing trend in these contaminants from Hope Gulch (Table 3. 5). Although the influence of the tributaries to Lightning Creek is significant, they do not singularly control the level of metals and total suspended solids in Lightning Creek; placer mining upstream of the property in Lightning Creek contributes significantly to the amount of contaminants entering the creek, particularly total metals.

[2] 2008 dataset contains an outlier greater than 3 standard deviations from the mean and has been removed from analysis.

Placer mining has taken place on Lightning Creek and Thunder Gulch since at least the 1960s. Placer mining has a significant effect on water quality; however, the extent to which Lightning Creek is impacted by placer mining on the mainstem and tributary is not known, but it can be reasonably accepted that natural water quality has been altered as a result.

Total zinc loading to the watershed from the Keno 700 Adit is approximately 420 kilograms of zinc per year calculated using a hydrologically-based loading model. According to the hydrology model of the KHSD developed in 1996, loadings over the last 10 years have fallen in the range of 320-420 kg/year. In 2010, loading from Keno 700 adit was 323 kg (367 kg in 2009).

3.3 EFFLUENT EXPOSED AREA

For the purposes of this study The Lightning Creek effluent exposed area (EEA) is considered extending from Thunder Gulch to Duncan Creek confluence or approximately 6.0 km of the creek (Figure 2.4). Stream gradient varies from about 3.3 % to 5.13 %. At KV-41 (located approximately midway in the receiving environment) the wetted width of the creek on May 15, 2009 was 4.5 meters. The Ordinary High Water Mark (OHWM) is estimated to be about 10 meters at this location. Substrate within the EEA generally consists of sand, gravel, cobble and boulders with little aquatic vegetation present

Table 3.6 provides a summary of the Lightning Creek exposure station (KV-41) water quality between November 14, 2007 and July 31, 2011. Data are presented for the three phases of activity during this timeframe: care and maintenance, advanced exploration and production. Although no standards are in effect at this location, data are compared with CCME. Actual results from sampling events where these numbers were derived from are appended (Appendix C).

3.4 REFERENCE AREA

The Lightning Creek reference station is located at KV 37 (Figure 2.4) upstream of Hope Gulch and any historical quartz or placer mining activities. The creek at this location is characterized by a relatively steep gradient (> 7%) with swift flows. According to Cowardin et al (1979) this section of Lightning Creek is is an upper perennial riverine system with a sand-gravel-cobble substrate. Little or no aquatic vegetation is present in the creek in this upper reach.

Water Quality (Table 3.7) provides a summary of the Lightning Creek reference station (KV-37) water quality between November 14, 2007 and July 31, 2011. Actual results from sampling events where these numbers were derived from are appended (Appendix D).

Table 3.6 Lightning Creek Exposure Station KV-41 Summary of Water Quality

Parameter	Units	CWQG	Averages			Count			Count<DL			Count & %>CWQG		
			care and maintenance[a]	advanced exploration[b]	production[c]	care and maintenance	advanced exploration	production	care and maintenance	advanced exploration	production	care and maintenance	advanced exploration	production
MMER Parameters														
pH (field)	pH units	**6.5-9.0**	7.89	7.87	7.86	6	15	10	0	0	0	n = 1; 17%	0	0
pH (lab)	pH units	**6.5-9.0**	7.76	7.86	7.7	7	22	11	0	0	0	0	0	0
Total Suspended Solids	mg/L	**-**	91	46	12	7	22	11	1	3	1	-	-	-
Arsenic (total)	mg/L	**0.005**	0.0152	0.00309	0.00211	7	22	12	0	0	0	n = 4; 57%	n = 5; 23%	n = 1; 8%
Copper (total)	mg/L	**0.002 - 0.004**[d]	0.013	0.00262	0.00304	7	22	12	1	3	0	n = 6; 86%	n = 7; 32%	n = 2; 17%
Lead (total)	mg/L	**0.001 - 0.007**[d]	0.041	0.004984	0.002738	7	22	12	0	0	0	n = 6; 86%	n = 13; 59%	n = 2; 17%
Nickel (total)	mg/L	**0.025 - 0.15**[d]	0.0061	0.0013	0.00169	7	22	12	0	4	0	0	0	0
Zinc (total)	mg/L	**0.03**	0.048	0.0217	0.0123	7	22	12	0	0	0	n = 4; 57%	n = 3; 14%	n = 1; 8%
Radium-226	Bq/L	**-**	-	-	-	-	-	-	-	-	-	-	-	-
Additional Effluent Quality Characterization Parameters														
Hardness (total)	mg/L	-	-	92.7	108	-	17	12	-	0	0	-	-	-
Alkalinity (total)	mg/L	-	-	-	51	-	-	11	-	-	0	-	-	-
Ammonia Nitrogen (total)	mg/L	**0.239**[e]	-	0.04	0.027	-	2	11	-	1	2	-	0	0
Nitrate (as N)	mg/L	**2.935**	-	-	0.19	-	-	11	-	-	1	-	-	0
Nitrite (as N)	mg/L	**0.06**	-	-	0.007	-	-	11	-	-	9	-	-	0
Aluminum (total)	mg/L	**0.1**	1.91	0.2791	0.3959	7	22	12	0	0	0	n = 6; 86%	n = 10; 46%	n = 3; 25%
Cadmium (total)	mg/L	**0.000017**[d]	0.00025	0.000182	0.000112	7	22	12	0	0	0	n = 7; 100%	n = 22; 100%	n = 12; 100%
Chromium (total)	mg/L	**0.001**	0.0041	0.0007	0.0011	7	22	12	0	1	0	n = 6; 86%	n = 4; 18%	n = 2; 17%
Iron (total)	mg/L	**0.3**	4.71	0.506	0.698	7	22	12	1	0	0	n = 6; 86%	n = 8; 36%	n = 2; 17%
Mercury (total)	mg/L	**0.000026**	-	0.00001	0.00001	-	14	12	-	7	8	-	0	n = 1; 8%
Molybdenum (total)	mg/L	**0.073**	0.00051	0.00024	0.00028	7	22	12	5	2	0	0	0	0
Selenium (total)	mg/L	**0.001**	0.0006	0.00067	0.00082	7	22	12	1	3	0	n = 1; 14%	n = 2; 9%	n = 1; 8%
Silver (total)	mg/L	**0.0001**	0.00075	0.000046	0.000061	7	22	12	1	7	4	n = 5; 71%	n = 4; 18%	n = 2; 17%
Thallium (total)	mg/L	**0.0008**	0.00004	0.000007	0.000007	7	21	12	5	12	7	0	0	0

[a] Care and maintenance data from November 14, 2007 to October 2, 2008.

[b] Advanced exploration data from October 3, 2008 to September 6, 2010.

[c] Production data from September 7, 2010 to July 31, 2011.

[d] Cadmium, copper, lead and nickel guidelines more accurately determined when taking into consideration water hardness.

[e] Conservative ammonia guideline based on pH and temperature not exceeding 8.5 and 15°C respectively.

Table 3.7 Lightning Creek Reference Station KV-37 Summary of Water Quality

Parameter	Units	CWQG	Averages			Count			Count<DL			Count & %>CWQG		
			care and maintenance[a]	advanced exploration[b]	production[c]	care and maintenance	advanced exploration	production	care and maintenance	advanced exploration	production	care and maintenance	advanced exploration	production
MMER Parameters														
pH (field)	pH units	**6.5-9.0**	7.38	7.57	7.82	4	6	4	0	0	0	0	0	0
pH (lab)	pH units	**6.5-9.0**	7.48	7.68	7.47	4	7	4	0	0	0	0	0	0
Total Suspended Solids	mg/L	**-**	5	3	4	4	7	4	2	2	0	-	-	-
Arsenic (total)	mg/L	**0.005**	0.0042	0.00249	0.00261	4	7	4	1	0	0	n = 2; 50%	0	0
Copper (total)	mg/L	**0.002 - 0.004**[d]	0.001	0.00057	0.00073	4	7	4	3	1	0	n = 1; 25%	0	0
Lead (total)	mg/L	**0.001 - 0.007**[d]	0.0006	0.0002	0.000734	4	7	4	1	1	0	n = 1; 25%	0	n = 1; 25%
Nickel (total)	mg/L	**0.025 - 0.15**[d]	0.0013	0.00042	0.00054	4	7	4	1	1	0	0	0	0
Zinc (total)	mg/L	**0.03**	0.062	0.0014	0.0023	4	7	4	1	1	0	n = 1; 25%	0	0
Radium-226	Bq/L	**-**	-	-	-	-	-	-	-	-	-	-	-	-
Additional Effluent Quality Characterization Parameters														
Hardness (total)	mg/L	-	-	50.4	50.4	-	6	4	-	0	0	-	-	-
Alkalinity (total)	mg/L	-	-	-	27	-	-	4	-	-	0	-	-	-
Ammonia Nitrogen (total)	mg/L	**0.239**[e]	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (as N)	mg/L	**2.935**	-	-	-	-	-	-	-	-	-	-	-	-
Nitrite (as N)	mg/L	**0.06**	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (total)	mg/L	**0.1**	0.204	0.0239	0.0286	4	7	4	1	0	0	n = 1; 25%	0	0
Cadmium (total)	mg/L	**0.000017**[d]	0.00066	0.000016	0.000026	4	7	4	1	1	0	n = 4; 100%	n = 4; 57%	n = 1; 25%
Chromium (total)	mg/L	**0.001**	0.0007	0.0003	0.0004	4	7	4	2	1	0	n = 1; 25%	0	0
Iron (total)	mg/L	**0.3**	0.28	0.063	0.077	4	7	4	1	0	0	n = 1; 25%	0	0
Mercury (total)	mg/L	**0.000026**	-	0.00001	0.00001	-	5	4	-	5	4		0	0
Molybdenum (total)	mg/L	**0.073**	0.00038	0.00009	0.00011	4	7	4	4	1	0	0	0	0
Selenium (total)	mg/L	**0.001**	0.0006	0.00039	0.00042	4	7	4	2	1	0	n = 1; 25%	0	0
Silver (total)	mg/L	**0.0001**	0.00002	0.000005	0.000008	4	7	4	3	5	3	0	0	0
Thallium (total)	mg/L	**0.0008**	0.00002	0.000002	0.000001	4	7	4	4	7	3	0	0	0

[a] Care and maintenance data from November 14, 2007 to October 2, 2008.

[b] Advanced exploration data from October 3, 2008 to September 6, 2010.

[c] Production data from September 7, 2010 to July 31, 2011.

[d] Cadmium, copper, lead and nickel guidelines more accurately determined when taking into consideration water hardness.

[e] Conservative ammonia guideline based on pH and temperature not exceeding 8.5 and 15°C respectively.

3.5 BENTHIC INVERTEBRATE COMMUNITY SURVEY

Benthic invertebrate sampling has taken place sporadically over the years in the KHSD, dating back to 1975. Environmental Protection Services carried out biological monitoring in the area in 1975, 1985 and 1990. In compliance with past water licences, various consultants have carried out annual benthic sampling (between 1986 and 1990) at four separate locations. As part of a biological monitoring survey conducted in 1994 by Laberge Environmental Services (LES), benthic invertebrate sampling was also conducted. On behalf of ERDC, Access Consulting Group (ACG) contracted Laberge Environmental Services (LES) to conduct stream sediment and benthic invertebrate monitoring in the summer of 2007. Stream sediment samples and benthic invertebrates were collected from each of the receiving water sites during the August sampling period.

In general, from surveys of the Lightning Creek drainage, benthic invertebrate communities have been found to be both robust and healthy, being comprised of a good representation of pollution sensitive insects, indicating healthy environments in these areas (Table 3.8;Laberge Environmental Services, 2008).

The following data was collected in Lightning Creek, at sites KV37, KV38, and KV41, in 2007. All supporting information may be found in Keno Valley Stream Sediment and Benthic Invertebrate Programs, 2007 Report. Triplicate samples for benthic invertebrates were collected at each site with attempts made to collect samples representative of that site. The number of organisms of the triplicates was summed to give a total abundance value for that site.

Table 3.8 Taxonomic Richness Index of Benthic Invertebrates

Lightning Creek Sites	Total benthic invertebrates collected	Community Diversity	Taxonomic Richness Index
KV 37	2392	39	4.9
KV 38	8684	49	5.3
KV 41	3800	47	5.6

(LES, 2008: Keno Valley Stream Sediment and Benthic Invertebrate Monitoring Programs, 2007)

Many variables contribute to invertebrate productivity, such as water temperature, air temperature, rainfall, canopy cover, substrate type and size, stream depth and velocity, as well as water and sediment quality. The life cycles of various organisms can dictate population size if an emergence is captured during the time of sampling.

The communities on Lightning Creek were diverse with good representation of sensitive taxa (Table 3.9). Water quality and stream sediment metal concentrations were relatively similar to those of the South McQuesten River, and do not appear to be causing any adverse effects to the benthic communities. The sites on Lightning Creek had good representation with 9 or 10 sensitive groups present. The table below classifies taxa with respect to their dominance within the community.

Table 3.9 Taxa community occurrence

Site	KV 37	KV 38	KV 41
Dominant (≥25%)	Diptera Plecoptera	Diptera	Hydracarina
Subdominant (10% - 24.9%)	Hydracarina	Plecoptera Hydracarina	Diptera Plecoptera
Common (1.0% - 9.9%)	Ephemeroptera Trichoptera	Ephemeroptera	Trichoptera Ephemeroptera
Rare (0.1% - 0.9%)		Trichoptera	-

(LES, 2008: Keno Valley Stream Sediment and Benthic Invertebrate Monitoring Programs, 2007)

All study methodologies used artificial substrate samplers with a colonization period of five to six weeks with triplicate samples collected at each site. As the same methodologies were employed for the various sample events, legitimate comparisons can be made.

3.6 FISH SURVEYS ON LIGHTNING CREEK

Fisheries resource data for Lightning Creek and surrounding drainages is limited to information collected by Access Consulting Group (Access) in September 2008 and White Mountain Environmental Consulting (WMEC) in 1995 and 2006. Investigations of fish and fish habitat at numerous sites, including two sites located on Lightning Creek has confirmed the presence of slimy sculpins (*Cottus cognatus*), Arctic grayling (*Thymallus arcticus*)(Access, 2008), and round whitefish (*Prosopium cylindraceum*)(WMEC, 2006). It is suspected that these fish likely winter in downstream of Duncan Creek where flows are higher and more likely to be suitable to sustain the fish.

It was determined by WMEC that Lightning Creek had undergone significant channel changes during the 12 year span between sampling events (1995 and 2006) as a result of placer mining. The locations of the sample sites used in 1995 were no longer available for sampling as the creek channel had recently been altered and active placer mining was occurring adjacent to the old site. Two new sample locations downstream of the original sites were selected; each site provided different habitat types allowing more representative sampling for Lightning Creek.

Access Consulting Group's fisheries investigations in 2008 were conducted at the two sampling sites that WMEC had re-established in 2006. These investigations were comprised of fish sampling, habitat assessments and fish surveys to identify the presence of species and utilization of the area. Fish and fish habitat investigations were conducted on September 18, 2008 at the two previously established sampling sites on Lightning Creek. The primary method of assessment was via minnow trapping. Electrofishing was conducted at only three sites due to the lack of suitable electrofishing habitat and potentially unsafe conditions. These sites included two locations on Lightning Creek and one site on Christal Creek. Seining was also conducted by White Mountain Environmental Consulting in 2006.

During the 2008 sampling event completed by Access, the sample area had just experienced a considerable period of above normal precipitation and, as a result, most sample locations were exhibiting elevated discharge rates and increased turbidity. These two factors limited the extent of electrofishing attempted during this investigation, and likely had a negative effect minnow trapping results.

Both Gee minnow trapping and electrofishing methods were employed at two sites on Lightning Creek. One site (LgT K) is located adjacent to the Keno City campground which is located in the heart of Keno City and the second site (LgT D) is located downstream of LgT K, just above the confluence of Lightning Creek and Duncan Creek.

3.6.1 Results of Previous Investigations

Lightning Creek – LgT K (near KV-41): no fish were captured via the minnow trapping. Electrofishing was conducted (100 s.) however no fish were captured or observed (Table 3.10; Access, 2008). Site LgT K consists of fast flowing rapids v= >1.5 m/sec) over highly compacted boulders with plunge pools associated with both the culvert and the old bridge. A pool upstream of the culvert creates the widest section of this reach.

Lightning Creek – LgT D (at Duncan Creek Confluence): four (4) slimy sculpins (*Cottus cognatus*) were captured via minnow trapping (Access 2008). Electrofishing was conducted (402 s) resulting in the capture of four juvenile Arctic grayling (*Thymallus arcticus*) and two slimy sculpins (*Cottus cognatus*) (WMEC, 2006). The lower reach, site LgT D has a much slower flow (v= <1 m/sec) with unconsolidated gravel substrates.

As stated in the White Mountain Environmental Consulting report issued for 2006, the Lightning Creek sites differed in fish species composition (Table 3.10). Site LgT K had only Arctic grayling, both adults and juveniles during June, August and September. Site LgT D had a greater diversity of speciation with slimy sculpins, round whitefish and Arctic grayling common during both August and September. Electrofishing at site LgT D was not conducted during the spring investigation due to high water.

Table 3.10 Previous fish sampling effort and results on Lightning Creek

Year, Study	Month	Stream /Site	Method	Effort		Round Whitefish	Slimy Sculpin	Arctic Grayling
White Mountain Environmental Consulting 2006	Jun	LgT K	Electrofishing	497s	number	-	-	7
					#/min	-	-	0.84
			Minnow Trap	3	number	-	-	-
		LgT D	Electrofishing	270	number	-	-	-
					#/min	-	-	-
			Minnow Trap	NR	number	-	-	-
	Aug	LgT K	Electrofishing	659s	number	-	-	25
					#/min	-	-	2.3
			Minnow Trap	3	number	1	1	
		LgT D	Electrofishing	340s	number	-	2	-
					#/min	-	0.35	-
			Minnow Trap	3	number		1	
	Sept	LgT K	Electrofishing	265s	number	-	-	11
					#/min	-	-	2.6
			Minnow Trap	NR	number	-	-	-
		LgT D	Electrofishing	NA	number	-	-	
					#/min	-	-	
Access Consulting Group 2008	Sept	LgT K	Electrofishing	100	number	-	-	-
					#/min	-	-	-
			Gee Trap	2	number	-	-	-
					#/min	-	-	-
		LgT D	Electrofishing	402	number	-	2	4
					#/min	-	0.3	0.6
			Gee Trap	3	number	-	-	-
					#/min	-	4	-

4.0 EEM STUDY DESIGN – CYCLE ONE

The Bellekeno Mine Cycle 1 EEM will include benthic invertebrate community and fish population surveys together with supporting measures required in data interpretation. Other EEM components implemented by the Bellekeno Mine are briefly discussed as part of this study design (sublethal toxicity testing, effluent characterization and water quality monitoring). A fish usability assessment is also required at the Bellekeno Mine because mercury concentrations in final effluent were less than the detection limit but the detection limit was greater than 0.10 g/L (Section 2.3.3; per Environment Canada 2002a).

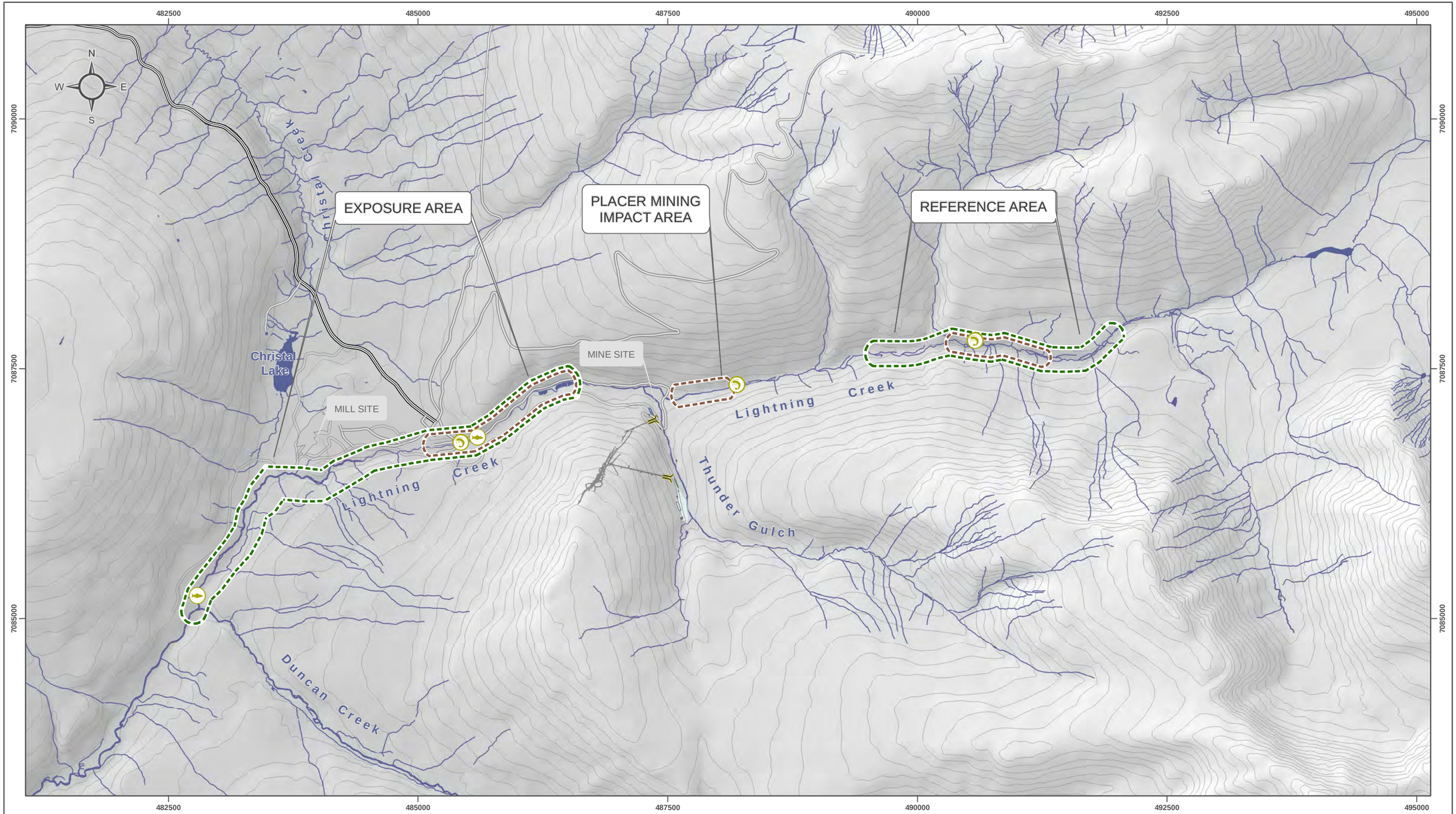
Lightning Creek is the immediate receiver of the Bellekeno Mine effluent, and therefore biological monitoring study areas will be established in this watercourse. Three EEM study areas are proposed, including one effluent-exposed area located downstream of the mine discharge and two reference areas located upstream of the Bellekeno Mine discharge in Lightning Creek (Figure 4.1). Placer mining is conducted immediately upstream of the Bellekeno Mine discharge in Lightining Creek and in Thunder Gulch (i.e., a tributary that discharges into Lighting Creek immediately upstream of the mine). Therefore, the reference areas will be located within and upstream of the area of placer mine disturbance (Figure 4.1) in order to distinguish any Bellekeno Mine effluent biological influences from those potentially associated with the placer mine operations. Benthic invertebrate community sampling will be conducted in erosional habitat at all three proposed study areas (Figure 4.1). Because no physical barriers separate the effluent-exposed and reference areas and fish densities are expected to be low (see section 3.5), fish population sampling will only be conducted at the effluent-exposed area and upstream-most (i.e., uninfluenced by placer mining) reference area (i.e. area uninfluenced by placer mining; Figure 4.1). Detail on all components of the Bellekeno Mine Cycle 1 EEM is provided in the following sections.

4.1 BENTHIC INVERTEBRATE COMMUNITY SURVEY

The Bellekeno Mine Cycle 1 EEM benthic invertebrate community survey will follow a multiple-Control/Impact (MCI) design with quantitative sampling to be conducted in erosional habitat of the Lightning Creek effluent-exposed area and two upstream reference areas (i.e., at placer mining influenced and uninfluenced areas; Table 4.1). The benthic invertebrate community survey will be conducted in late August/early September 2012, which is consistent with the seasonal timing of previous studies (e.g., Laberge 2008).

4.1.1 Sample Collection

Benthic samples will be collected using a 0.1 m^2 Hess Sampler outfitted with 250-µm mesh. Five stations will be sampled at each study area to provide adequate statistical power to detect differences of ± two standard deviations at an α and β of 0.10 (Environment Canada 2002a). Stations will be established at a minimum distance of three bankfull widths from adjacent stations at each study area, consistent with the spacing suggested by Environment Canada (2002a).



Aerial photograph obtained from Geodesy Remote Sensing Inc., Calgary Alberta. Imagery acquired September 13 and 14 2006. Site hydrography and contours provided by Aero Geometrics LTD, derived from aerial photograph.

Datum: NAD 83; Map Projection: UTM Zone 8N

1:35,000 (when printed on 11 x17 inch paper)

Kilometers
0 0.5 1 2

Proposed Benthic and Invertebrate

Proposed Fisheries Survey

Previous Benthic and Invertebrate Study

Previous Fisheries Study

AKHM
ACCESS

BELLEKNO MINE PROJECT - ENVIRONMENTAL EFFECTS MONITORING PROGRAM - CYCLE I STUDY DESIGN

FIGURE 4.1

BENTHIC, INVERTABRATE AND FISHERIES SAMPLING AREAS

DRAWN BY MD	SEPTEMBER 2011	VERIFIED BY VB

I:\ALEX-05-01\Bellekeno\GIS\mxd\Studies\EEM_Cycle_1\Fig4.1_LightningCreek_Study Area_20110907.mxd
(Last edited by: mduchame;07/09/2011/14:42 PM)

At each station, one sample representing a composite of three sub-samples (i.e., 0.3 m^2 total area) will be collected to ensure that each sample is representative of the resident benthic invertebrate community. Each sub-sample will be collected by carefully inserting the base of the Hess sampler into undisturbed substrate to a depth of approximately 10 cm. All gravel and cobble contained within the sampler will be carefully washed, allowing the current to carry dislodged organisms into the collection net. After all substrate within the sampler has been completely washed and all organisms have been rinsed into the collection net, the sampler will be moved to the next sub-sample location and the procedure repeated. Following collection of the third sub-sample using the above procedure, all material and organisms retained in the collection net will be carefully transferred into pre-labeled wide-mouth plastic jars. As a precautionary measure, internal sample labels will also be used to ensure correct sample identification at the lab. All samples will then be preserved to a level of 10% buffered formalin in ambient water.

Substrate size, water depth and water velocity will be carefully controlled among areas, stations and sub-samples to minimize natural influences on benthic invertebrate community variability. All sampling stations will be marked using a handheld global positioning system (GPS), with coordinates recorded in latitude and longitudes to nearest decimal second using the North America Datum (NAD) of 1983. A number of additional supporting measures will be recorded at each benthic invertebrate sampling station as outlined in Section 4.4.

4.1.2 Sample Processing

Benthic invertebrate samples will be shipped to and processed by a qualified laboratory using standard sorting methods which adhere to EEM Quality Assurance/Quality Control (QA/QC) protocols (i.e., Environment Canada 2002, 2011). Sample material greater than 250 μm in diameter will be examined under a stereomicroscope at a magnification of at least ten times by a technician. All benthic organisms will be removed from the sample debris and placed into vials containing 70% ethanol according to major taxonomic groups (i.e., phyla and orders). A senior taxonomist will then enumerate and identify the benthic organisms to the lowest practical level (typically genus or species) using the most up-to-date taxonomic keys, which exceeds minimum "family level" requirements of Environment Canada (2011). Following identification, representative specimens of each taxon will be preserved in a 75% ethanol-3% glycerol solution in separately labeled vials to create a Bellekeno Mine voucher benthic invertebrate collection that will be retained for possible future reference.

4.1.3 Data Analysis

Benthic invertebrate communities will be compared using EEM primary metrics of mean taxon richness (as identified to the lowest practical level), mean invertebrate density (average number of organisms per m^2), Simpson's Evenness Index (E) and the Bray-Curtis Index of Dissimilarity as required by Environment Canada (2011). Additional comparisons may be conducted based on EPT taxa (i.e., number of taxa represented by the insect orders Ephemeroptera, Plecoptera and Trichoptera), percent composition of dominant/indicator taxa (calculated as the abundance of each respective taxon group relative to the total number of organisms in the sample) and/or

correspondence analysis. All required and selected benthic invertebrate community endpoints will be summarized by separately reporting mean, median, minimum, maximum, standard deviation, standard error and sample size for each study area.

For each of the benthic invertebrate community endpoints, statistical comparisons between effluent-exposed and reference areas will be conducted using Analysis of Variance (ANOVA) and post-hoc tests. Data will be assessed for normality and transformed as required to stabilize variances and satisfy assumptions of ANOVA. Non-parametric techniques will be used in instances in which transformation is unsuccessful in normalizing data or homogenizing variances. All benthic indices will be plotted to explore spatial patterns and illustrate differences between effluent-exposed and reference areas as part of the data interpretation. For each benthic invertebrate metric in which a significant difference is found between effluent-exposed and reference area means, the magnitude of difference between areas will be calculated based on the number of reference area mean SDs as follows:

(effluent-exposed area mean – reference mean) / SD of the reference mean

If a significant difference between areas is not detected for a benthic metric, then the minimum effect size that could be detected will be calculated using the mean square error generated from the ANOVA as an estimate of variability, with alpha and beta equal to 0.10. The minimum detectable effect size will be based on the minimum number of reference area standard deviations, according to the following equation:

$$\delta = [(t_{\alpha}+t_{\beta})(\sqrt{MSE})(\sqrt{2/n})]/SD_{ref}$$

where, δ = minimum detectable effect size,

MSE = mean square error

n = sample size per area (in this case = 5), and

SD_{ref} = standard deviation of the reference area mean

Correlation analysis will then be used to determine significant relationships between benthic invertebrate community metrics and supporting physical and chemical measures. Lastly, data from the Cycle 1 EEM benthic invertebrate community survey will be compared to any applicable historical information for Lightning Creek.

4.2 FISH POPULATION SURVEY

The Bellekeno Mine Cycle 1 EEM fish population survey will follow a lethal design targeting one small-bodied sentinel fish species collected at the Lightning Creek effluent-exposed area and the upstream-most reference area (Figure 4.1). Based on available historical data, slimy sculpin (*Cottus cognatus*) is the only species likely to be found in relatively high abundance and at a suitable life-history stage (i.e., adult) for evaluation of all EEM endpoints in Lightning Creek, and therefore will serve as the sentinel species for the fish population survey. Slimy sculpin are demersal benthivores with relatively short age-to-maturation (Scott and Crossman 1998) and

small home range size, making them an ideal sentinel species for EEM studies. At each of the effluent-exposed and upstream-most reference study areas, 20 sexually mature male and 20 sexually mature female slimy sculpin will be targeted to support a lethal EEM fish population survey. Although the technical guidance for the EEM program (Environment Canada 2011) stipulates two species be evaluated as part of the fish population survey, arctic grayling (*Thymallus arcticus*) and round whitefish (*Prosopium cylindraceum*), the only two other species historically captured in Lightning Creek are not likely to be present in sufficient numbers and/or at a suitable life stage for evaluation of EEM fish population endpoints. Moreover, adult arctic grayling typically overwinter in large water bodies and thus individuals are unlikely to be resident to Lightning Creek (i.e., a relatively small watercourse) throughout the year. Therefore, this species would not likely be exposed to mine effluent for substantial periods, precluding their usage for the fish population assessment.

The proposed timing for the fish population survey is late-May to early-June 2012, corresponding to the period prior to freshet and to slimy sculpin spawning. Slimy sculpin generally spawn at a water temperature of approximately 10°C (Scott and Crossman 1998) and therefore the proposed survey timing should allow collection of reproductive endpoint data for this species.

4.2.1 Sample Collection

Fish communities of each study area will primarily be sampled semi-quantitatively using a battery-powered backpack electrofishing unit. An electrofishing team, consisting of the electrofisher operator and a single netter, will conduct passes (or “sweeps”) within each sampling area as required to yield the targeted numbers. All fish captured during each pass will be placed in aerated buckets of water. At the conclusion of each pass, total shocking effort (i.e., electrofishing seconds) will be recorded. Additional fishing methods, including use of minnow traps, will be used should electrofishing not yield sufficient numbers of mature slimy sculpin to meet EEM requirements. For each sampling method, all captured fish will be identified and enumerated, with all non-target fish species subsequently released to the waters from which they were captured and all sentinel species retained in aerated buckets of water for further processing. The study will target 20 mature male and 20 mature female slimy sculpin (for lethal measurements) from each study area. A reasonable fishing effort will be employed to collect the requisite number of fish, however based low fish abundance documented in previous studies (Sparling 2006, Sparling and Connor 1996) a full complement of male and female slimy sculpin are not expected in either the reference or exposure area.

Supporting information collected for each fish sampling method will include duration of sampling, mean sampling depth, distance/area sampled, habitat features of the area sampled (see Section 4.4) and GPS coordinates (latitude and longitude recorded in decimal seconds) of each net set or at the upstream and downstream boundary of each sampled reach.

4.2.2 Fish Processing

Physiological measurements collected from each fish will include all those recommended for the EEM program (Environment Canada 2011). Specifically, body length, fresh body weight, external condition, sex, fresh gonad and liver weight, fecundity and egg-size (females only), and age will be measured/assessed from freshly sacrificed, sexually mature slimy sculpin (total of 20 males and 20 females) from each study area as part of the lethal survey. Total length of all mature slimy sculpin will be measured to the nearest hundredth of a millimetre using digital calipers. Fresh body-weight will then be measured using an analytical balance with an accuracy of 0.001 g. For slimy sculpin subject to lethal measures, the visceral cavity of each sacrificed fish will be opened and the gender and/or sexual maturity level determined and recorded. Whole gonads and livers will subsequently be excised and weighed to the nearest milligram (0.001 g) using an analytical balance with a surrounding draft shield. Following removal and weighing, whole ovaries from each female will be placed in individually labeled sampling jars, preserved with 10% buffered formalin, and subsequently submitted to a qualified laboratory for determination of fecundity and egg size. Whole carcasses of sacrificed individuals will then be placed separately into labeled plastic bags and frozen prior to laboratory submission for age analysis using extracted otoliths. For all sampled slimy sculpin, any visible external or internal abnormalities will also be noted and recorded on data sheets.

4.2.3 Laboratory Processing

All ageing structures will be processed by a qualified fish age determination laboratory. Otoliths will be removed from each fish, sectioned using a crack-and-burn method, mounted on a glass slide and aged under a compound microscope using transmitted light. For each otolith sample, the age and edge condition will be recorded along with a confidence rating for the age determination.

All fish ovary samples will be processed by a qualified biological laboratory. Methods utilized for fecundity estimation will be fully consistent with available technical guidance (Environment Canada 2011), with the number of eggs in each sample enumerated using stereo-microscopes and ten percent of egg samples re-counted to verify the precision of fecundity estimates. For quality control purposes, fecundity re-counts will be conducted on 10% of the processed fecundity samples.

4.2.4 Data Analysis

Data analysis methods will follow those recommended for EEM fish surveys (Environment Canada 2011). All catch data will be tabulated, and catch-per-unit-effort (CPUE) will be calculated for each study area and fish collection method. Variables measured on the sacrificed sentinel species (Section 4.2.2) will be summarized by separately calculating the mean, standard deviation, standard error, minimum, maximum and sample size by study area (effluent-exposed and reference) and sex (male and female). These variables will be used to evaluate endpoints associated with survival, energy use (growth and reproduction) and energy storage between

effluent-exposed and reference populations (Table 4.1). Each data set will be assessed for normality and equality of variance in order to determine the suitability of parametric statistical procedures. If data significantly violate the assumption of normality following transformation, non-parametric statistics will be applied. For each of the calculated endpoints, statistical differences between effluent-exposed and reference study areas by fish sex will be made using Analysis-of-Variance (ANOVA), Mann-Whitney U-tests or Analysis-of-Covariance (ANCOVA) as appropriate and following technical guidance (Table 4.1; Environment Canada 2011). An effect on the fish population will be evaluated for each of the calculated endpoints, which is defined as a statistically significant difference between the effluent-exposed area and the reference area (sharing like-habitat) at an alpha level of 0.10 (Environment Canada 2011).

4.3 FISH TISSUE SURVEY

A fish tissue survey is required as part of the EEM program for the Bellekeno Mine because while effluent mercury concentrations are below the detection limit, the detection limit was above the trigger level of 0.10 µg/L. The fish tissue assessment will be conducted to document and compare fish tissue mercury concentrations between the effluent-exposed area and upstream-most reference area in Lightning Creek to evaluate whether human consumption of fish is (or should be) limited by tissue mercury concentrations (Environment Canada 2011). Fish tissue samples will be collected from the effluent-exposed area and upstream-most reference area (Figure 4.1). The proposed timing for the fish tissue survey is late-May to early-June 2012, corresponding to the same period used for the fish population survey. Arctic grayling will be targeted for the fish tissue assessment, mainly due to its regional importance as a sport fish, but also because this species represents a top predator (i.e., likely to incorporate highest contaminant body burdens within aquatic ecosystem). Given that densities of arctic grayling are expected to be low (see Section 3.5), non-lethal collection of fish tissue samples is proposed.

4.3.1 Field Collection

Fish tissue samples will be taken from arctic grayling by-catch collected during sampling for the fish population assessment based on the methods described previously (Section 4.2.1). To the extent possible given potentially low fish abundances, eight arctic grayling will be retained from each study area for non-lethal muscle tissue sampling with attempts made to sample fish reflecting a similar size range from both study areas.

4.3.2 Fish Processing

Catch results permitting, eight juvenile arctic grayling from each area will be subjected to a non-lethal sampling technique (Baker et al. 2004). Specimens used for sampling will be maintained in a dilute anaesthetic clove oil-based bath until stage five of anaesthesia is reached (i.e., when fish reactivity and reflexes are absent and opercular movements are slow and irregular; Summerfelt and Smith 1990). Once each individual fish is sufficiently anaesthetized, each individual will be subject to measurement of length (fork and total) and weight, examination for any abnormalities, and collection of ageing structures (scales). The fish will then be placed onto a

Table 4.1 Endpoints to be examined as part of the Bellekeno Mine Cycle 1 EEM fish population survey

Response		Endpoint	Statistical Procedure[c,d,e]
Effects on Fish[a]	Survival	Age	ANOVA
	Energy Use	Size-at-age (body weight against age)	ANCOVA
		Relative gonad size (gonad weight against body weight)	ANCOVA
	Energy Storage	Condition (body weight against length)	ANCOVA
		Relative liver size (liver weight against body weight)	ANCOVA
Supporting Response Variables[b]	Survival	Age-frequency distribution	K-S Test
	Energy Use	Body weight (whole)	ANOVA
		Length	ANOVA
		Size-at-age (length against age)	ANCOVA
		Relative fecundity (# of eggs/female against body weight)	ANCOVA
		Relative fecundity (# of eggs/female against age)	ANCOVA
		Fecundity	ANOVA
		Relative egg size (mean egg weight against body weight)	ANCOVA
		Relative egg size (mean egg weight against age)	ANCOVA
		Egg weight	ANOVA

[a] Endpoints to be used for determining "effects" as designated by statistically significant differences between exposure and reference areas (Environment Canada 2002).

[b] These analyses are for informational purposes and significant differences between exposure and reference areas are not necessarily used to designate an effect (Environment Canada 2002).

[c] ANOVA - Analysis of Variance

[d] ANCOVA - Analysis of Covariance; For the ANCOVA analyses, the first term in parentheses is the endpoint (dependent variable Y) that is analyzed for an effluent effect. The second term in parentheses is the covariate, X (age, weight, or length).

[e] K-S Test - Kolmogorov-Smirnov test.

secure fish board and a small area of scales above the lateral line posterior to the dorsal fin will be cleared using a scalpel and retained for subsequent reattachment. A 4-mm diameter biopsy punch will be inserted into the cleared area to remove the tissue sample. After the punch is removed, the skin will then be removed from the musculature using a scalpel. The resulting skinless, boneless tissue plug sample will be placed into a pre-labelled vial, stored on ice while in the field and subsequently frozen. A biological adhesive will be used to seal the biopsy hole and re-attach the scales to the underlying muscle and skin tissues in the biopsy area of the fish. The fish will then be placed into a recovery tub filled with fresh aerated water and, once the fish regains equilibrium (holding an upright position), it will then be released back into the watercourse at the area in which it was captured.

4.3.3 Laboratory Analysis

The analysis of total mercury in fish tissue will be completed by a qualified laboratory capable of low-level mercury analysis in small samples using a variant of "EPA Method 1631-Mercury in Water by Oxidation, Purge and Trap, and Cold Vapour Atomic Fluorescence Spectrometry". Method detection limits will be approximately 1 ng mercury per gram wet tissue weight. Laboratory QA/QC will include spike and reference recoveries to a level of ± 10%.

4.3.4 Data Analysis

Fish tissue mercury concentrations will be statistically compared between effluent-exposed and reference areas and relative to applicable human health consumption guidelines (Environment Canada 2011). ANOVA and ANCOVA (mercury concentrations relative to fish age) will be used to assess for any significant differences in tissue mercury levels between study areas, with each data set assessed for normality and equality of variance (transformed as required) prior to applying any parametric statistical procedures. Significantly higher mercury concentrations at the effluent-exposed area *or* tissue mercury levels exceeding the human health consumption guidelines would indicate an effect on the usability of the fisheries resource (Environment Canada 2011). As indicated by Environment Canada (2011), the arctic grayling tissue mercury data will be compared to a tissue consumption restriction limit of 450 µg mercury/kilogram wet weight (ww).

4.4 SUPPORTING ENVIRONMENTAL VARIABLES

A number of environmental measures and/or observations will be collected to support the benthic invertebrate community and fish population surveys. At each benthic invertebrate sampling station, substrate characteristics (e.g., type and approximate size), water velocity and sampling depth will be assessed. For each fish sampling location, the dimensions (length, wetted and bankfull width) and mean depth of the sampled reach will be determined. Habitat descriptions, including general stream morphology, substrate features, riparian vegetation species, percent canopy coverage, available in-stream cover and any other observations relevant to the biological surveys will be recorded at each station/study area.

Supporting water quality measures will include *in-situ* water temperature, dissolved oxygen, pH and conductivity measured at the sediment-water interface at each benthic invertebrate station and fish sampling reach. One water sample for chemical analysis will also be collected from each study area (i.e., the effluent-exposed area and both reference areas) during both the spring fish population/tissue survey and the late summer benthic invertebrate community survey. During each sampling event, one duplicate water sample will be collected as a quality control and quality assurance measure. All water samples will be collected from approximately mid-depth with care taken to ensure that the collection bottle faces upstream to avoid any potential influence of the sampler. Any required sample preservatives will be added immediately following collection. The samples will then be placed into a cooler and later transported to and stored in a refrigerator. Water samples will be shipped to an accredited laboratory for analysis of EEM-related variables including hardness, alkalinity, aluminum, arsenic, cadmium, copper, iron, lead, mercury, molybdenum, nickel, zinc, total suspended solids, ammonia, nitrate and ^{226}radium (Environment Canada 2011).

Statistical comparisons between respective effluent-exposed and reference areas for all *in-situ* water quality measures will be conducted using ANOVA and post-hoc testing as required, with all necessary transformations completed to satisfy assumptions of normality and homogeneity of variance prior to analysis. *In-situ* and analytical water quality data from the effluent-exposed area will be compared to reference area values as well as to applicable Canadian Environmental Quality Guidelines for the protection of aquatic life (CCME 1999). All *in-situ* measures will also be used in correlation analysis with the benthic invertebrate community results (Section 4.1.3).

4.5 EFFLUENT AND WATER QUALITY MONITORING

Effluent and water quality monitoring studies consist of effluent characterization, sublethal toxicity testing and water quality monitoring. The Bellekeno Mine continues to conduct effluent characterization at least four times per calendar year at the discharge location in accordance with MMER requirements (see Section 2.3). Effluent characterization samples will continue to be shipped to a CALA accredited laboratory for analysis of the same suite of EEM parameters outlined above (Section 4.4) using appropriate method detection limits and quality assurance protocols as stipulated by Environment Canada (20ll).

Bellekeno Mine staff has been conducting and will continue to conduct annual sublethal toxicity testing on final effluent to fulfill EEM requirements as outlined by Environment Canada (2011). Testing is completed using fathead minnow (7-day survival and growth test; Environment Canada 2011), the invertebrate *Ceriodaphnia dubia* (7-day survival and reproduction test; Environment Canada 2007a), the alga *Pseudokirchneriella subcapitata* (3-day growth inhibition test; Environment Canada 2007b) and the plant *Lemna minor* (7-day growth inhibition test; Environment Canada 2007c). Effluent samples are collected as specified by Environment Canada (2001, 2011). All sub-lethal toxicity tests are performed by a qualified laboratory. Sub-lethal toxicity data are reported to Environment Canada as part of Bellekeno Mine annual reporting and will be synthesized in the Cycle 1 EEM Interpretive Report.

Bellekeno Mine staff has been conducting and will continue to conduct water quality monitoring in Lightning Creek effluent-exposed and reference areas four times per year as part of their EEM requirements. During the implementation of the Cycle 1 EEM, water samples will be collected from areas of biological sampling as described in Section 4.4. All water quality sampling methods, analytical parameters, quality assurance/quality control sampling and analysis, sample storage and shipping methods will be conducted in accordance with Environment Canada (2011). Routine water quality monitoring data are reported to Environment Canada as part of the Bellekeno Mine's annual reporting. Similar to effluent characterization samples, water quality monitoring samples will continue to be shipped to a CALA accredited laboratory and analyzed for the same suite of variables outlined above. All water quality monitoring results collected up to the time of preparation of the Cycle 1 EEM Interpretive Report will be summarized and discussed therein.

5.0 SCHEDULE

The Bellekeno Mine Cycle 1 EEM biological survey will be conducted in two stages, with the fish population/tissue survey being undertaken after river ice-out in late-May/early-June 2012 and the benthic invertebrate community survey conducted in late August/early September 2012. An early spring fish survey will allow the collection of slimy sculpin with gonadal development that is sufficiently advanced to allow an assessment of all EEM reproductive endpoints in addition to fish survival, growth and condition endpoints outlined under a lethal sampling design (refer to Table 4.1). The seasonal timing associated with the Cycle 1 EEM benthic invertebrate community survey will maintain consistency with the previous studies and will ensure that the benthic invertebrate communities are relatively stable and that organisms are sufficiently developed to allow identification to reasonable levels (i.e., genus or species). With submission of benthic invertebrate community samples for analysis shortly following completion of the fieldwork, all laboratory results should be available by early 2013. This will provide adequate time for data compilation, analysis and preparation of a Cycle 1 EEM Interpretive Report to be submitted to Environment Canada by March 7, 2013 within 30 months of the date in which the Bellekeno Mine became subject to the MMER as required (Government of Canada 2010).

6.0 REFERENCES

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Appendix A Letter from Environment Canada on Bellekeno Subject to MMER

ENVIRONMENT CANADA
Pacific & Yukon Region

ENVIRONNEMENT CANADA
Région du Pacifique et du Yukon

ENVIRONMENTAL STEWARDSHIP BRANCH
Environmental Protection Operations Directorate
91782 Alaska Highway
Whitehorse, Yukon
Y1A 5B7

September 7, 2010

File no: 4484-37/U65

Clynton R. Nauman, President
Alexco Keno Hill Mining Corporation
1150 – 200 Granville Street
Vancouver, BC
V6C 1S4

RE: Bellekeno Mine now subject to the *Metal Mining Effluent Regulations.*

Dear Mr. Nauman,

Environment Canada has noted that Alexco Keno Hill Mining Corporation has provided the Yukon Government notice of intent to commence with start-up of the Bellekeno Mine mill by October 8, 2010, and will commence pre-production commissioning of the mill by mid September. The recent construction of the mill and the mine effluent flow rate which exceeds 50 m^3 per day has caused the Bellekeno Mine to become a "mine under development" as defined in subsection 1(1) and subsection 1(2) of the Metal Mining Effluent Regulations (MMER). Please be advised that, as the owner of Bellekeno Mine, you are now required to comply with these regulations and submit identifying information and information regarding the mine effluent Final Discharge Points to Environment Canada within the timelines specified in sections 8 and 9 of the Regulations. This information is required to be submitted in writing to the authorization officer for the Pacific and Yukon Region:

Daniel Wolfish
Director, Environmental Protection Operations Directorate
Pacific and Yukon Region, Environment Canada
401 Burrard Street, Vancouver, BC
V6C 3S5

This office should be copied on any correspondence to the Director, as we will continue to be the lead contact for operational concerns in the Yukon Territory.

A copy of the Metal Mining Effluent Regulations and copies of guidance documents concerning sampling and analysis, and flow measuring can be found at the following websites:

http://laws.justice.gc.ca/en/F-14/SOR-2002-222/index.html

http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=30EE2CC9-5118-4D47-A14B-B109294FCABA

http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=986B5D3F-CB81-4B85-A17A-46B5D5CCAA37

For detailed information on these regulations, please contact Steve Arrell at 867-393-6847 (or Steve.Arrell@ec.gc.ca). For information on filing compliance data using the Regulatory Information System (RISS) referred to in section 23 of the Regulations, please contact Bob More at (604) 666-8329 (or Bob.More@ec.gc.ca). For information concerning environmental effects monitoring requirements referred to in section 7, please contact Denis Lacroix at (867) 667-3401 (or Denis.Lacroix@ec.gc.ca).

Yours truly,

Steve Arrell
Senior Environmental Technician
Environmental Protection Operations Directorate
Phone (867) 393-6847

Appendix B KV-43 Water Quality Data

Bellekeno Mine Effluent Quality (Station KV-43) - Care and Maintenance

Sample Date	Sample Class	pH-F pH units	pH-L pH units	TSS mg/L	As-T mg/L	Cu-T mg/L	Pb-T mg/L	Ni-T mg/L	Zn-T mg/L	R-226 Bq/L	Hard-T mg/L	Alk-T /L	N-NH3 mg/L	N-NO3 mg/L	N-NO2 mg/L	Al-T mg/L	Cd-T mg/L	Cr-T mg/L	Fe-T mg/L	Hg-T mg/L	Mo-T mg/L	Se-T mg/L	Ag-T mg/L	Tl-T mg/L
MMER		**6.0-9.5**	**6.0-9.5**	**30**	**1**	**0.6**	**0.4**	**1**	**1**	**1.11**														
11/27/2007	P	8.66	8.52	8	0.004	0.002	0.0108	0.0244	0.806							0.178	0.0036	0.0016	0.3		0.001	0.0013	0.0001	<0.00005
12/27/2007	P	8.13	8.4	34	0.001	<0.001	0.0006	0.0161	0.033							0.016	0.00014	0.0005	<0.1		<0.001	0.0003	<0.0001	<0.00005
1/23/2008	P	8.97	9.3	11	0.0011	<0.001	0.0012	0.0021	0.098							0.037	0.00053	0.0009	<0.1		<0.001	0.0003	<0.0001	<0.00005
2/29/2008	P	8.23	8.23	21	0.0006	<0.001	0.0005	0.0108	0.07							0.006	0.00086	<0.0005	<0.1		<0.001	0.0016	<0.00001	<0.00005
3/13/2008	P	7.89	8.94	<5	0.0014	<0.001	0.0021	0.0283	0.427							0.018	0.00326	0.0006	<0.1		<0.001	0.0008	<0.00001	<0.00005
4/20/2008	P	8.46	8.67	15	0.0014	<0.001	0.001	0.0135	0.31							0.007	0.00083	0.0012	<0.1		<0.001	0.0009	<0.00001	<0.00005
5/18/2008	P		8.19	3	0.0007	<0.001	0.0004	0.0093	0.121							0.01	0.00049	0.0005	<0.1		<0.001	0.001	<0.00001	<0.00005
6/21/2008	P		8.71	4	0.0013	<0.001	0.0009	0.0051	0.23							0.013	0.0006	0.0008	<0.05		<0.001	0.0033	0.00026	<0.00005
7/24/2008	P	7.52	8.58	<3	0.0029	<0.001	0.0025	0.0037	0.089							0.019	0.00037	<0.0005	<0.05		<0.001	0.0038	<0.00001	<0.00005
8/14/2008	P	7.62	8.62	8	0.0042	<0.001	0.0028	0.0023	0.041							0.028	0.00046	0.0007	0.09		0.001	0.0046	0.0001	<0.00005
9/19/2008	P	8.25	9.19	9	0.0012	<0.001	0.0013	0.002	0.032							0.008	0.00008	0.0007	0.02		0.00064	0.0062	0.00008	0.00003
Average		8.19	8.67	11	0.0018	0.001	0.0022	0.0107	0.205							0.031	0.00102	0.0007	0.07		0.0006	0.0022	0.00006	0.00003
Count		9	11	11	11	11	11	11	11							11	11	11	11		11	11	11	11
Minimum		7.52	8.19	2	0.0006	0.001	0.0004	0.002	0.032							0.006	0.00008	0.0003	0.02		0.0005	0.0003	0.00001	0.00003
Maximum		8.97	9.3	34	0.0042	0.002	0.0108	0.0283	0.806							0.178	0.0036	0.0016	0.3		0.001	0.0062	0.00026	0.00003
Sum		73.73	95.35	117	0.0198	0.007	0.0241	0.1176	2.257							0.34	0.01122	0.008	0.76		0.00664	0.0241	0.00067	0.00028
Count <DL		0	0	2	0	10	0	0	0							0	0	2	8		8	0	7	10
Standard Deviation		0.47	0.36	10	0.0013	0	0.003	0.0091	0.236							0.05	0.00122	0.0004	0.08		0.0002	0.002	0.00008	0
1st Quartile		7.89	8.46	4	0.0011	0.001	0.0008	0.003	0.056							0.009	0.00042	0.0005	0.04		0.0005	0.0009	0.00001	0.00003
Median		8.23	8.62	8	0.0013	0.001	0.0012	0.0093	0.098							0.016	0.00053	0.0007	0.05		0.0005	0.0013	0.00005	0.00003
3rd Quartile		8.46	8.82	13	0.0022	0.001	0.0023	0.0148	0.27							0.024	0.00085	0.0009	0.05		0.00057	0.0036	0.00009	0.00003
Count Over MMER		0	0	1	0	0	0	0	0							0	0	0	0		0	0	0	0
% Over MMER		0	0	9.1	0	0	0	0	0							0	0	0	0		0	0	0	0

Bellekeno Mine Effluent Quality (Station KV-43) - Advanced Exploration

Sample Date	Sample Class	pH-F pH units	pH-L pH units	TSS mg/L	As-T mg/L	Cu-T mg/L	Pb-T mg/L	Ni-T mg/L	Zn-T mg/L	R-226 Bq/L	Hard-T mg/L	Alk-T L	N-NH3 mg/L	N-NO3 mg/L	N-NO2 mg/L	Al-T mg/L	Cd-T mg/L	Cr-T mg/L	Fe-T mg/L	Hg-T mg/L	Mo-T mg/L	Se-T mg/L	Ag-T mg/L	Tl-T mg/L
MMER		**6.0-9.5**	**6.0-9.5**	**30**	**1**	**0.6**	**0.4**	**1**	**1**	**1.11**														
10/5/2008	P	9.41	8.4	48	0.0088	0.006	0.0251	0.016	0.312							0.352	0.00164	0.0013	1.01		0.00068	0.0064	0.00103	0.00013
11/13/2008	P		8.06	7	0.0055	0.001	0.0015	0.021	0.028				3.9			0.068	0.00013	0.0006	0.16		0.00302	0.0045	<0.00001	<0.00001
11/18/2008	IR		8.05		0.0025	<0.001	0.0011	0.0283	0.406							0.046	0.00204	0.0006	0.06		0.002	0.0043	0.00006	<0.00005
11/18/2008	QD		8.41	29																				
11/18/2008	P		8.34	28	0.0023	0.001	0.001	0.026	0.349							0.029	0.00156	<0.0004	0.06		0.00133	0.0037	<0.00001	0.00003
12/20/2008	P		8.19	22	0.0044	<0.001	0.0003	0.0284	0.34				3.1			0.009	0.00153	<0.0005	<0.05		0.001	0.0018	<0.00001	
12/28/2008	P		8.21	7	0.0022	<0.001	0.0007	0.0318	0.282				1.89			0.008	0.00064	0.0012	<0.05		0.001	0.0019	<0.00001	
1/4/2009	P		7.88	26	0.002	<0.001	0.0009	0.0179	0.258				1.21			0.007	0.00047	0.0006	<0.05		0.001	0.0018	0.00001	0.00014
1/9/2009	P		8.1	3	0.0019	<0.001	0.0002	0.0407	0.074				1.5			<0.005	0.0001	0.0007	<0.05		0.001	0.0015	<0.00001	0.00015
1/13/2009	P	7.57	8.08	6	0.002	<0.001	0.0004	0.0483	0.152				1.03			0.007	0.00031	<0.0005	<0.05		0.001	0.0017	0.00002	
2/1/2009	P		8.04	30	0.0017	<0.001	0.0008	0.039	0.663				0.72			0.011	0.00146	0.0007	0.1		0.0009	<0.0006	0.00003	0.00013
2/3/2009	P		8.4	23									0.63											
2/12/2009	P		8.73	20	0.0015	<0.001	0.0012	0.014	0.368			32	0.5			0.006	0.0003	0.0007	0.1		0.00112	<0.0006	<0.00001	0.00005
2/20/2009	P		8.48	16	0.0024	<0.001	0.0012	0.018	0.16				0.41			0.011	0.00014	0.0005	0.09		0.00151	<0.0006	<0.00001	0.00008
3/1/2009	P		8.92	21	0.0057	0.003	0.0152	0.017	0.801			43	0.59			0.057	0.00064	0.0008	1.13		0.00158	<0.0006	0.00038	0.00009
3/10/2009	P		8.82	19	0.0041	0.001	0.0087	0.024	0.531				1.2			0.025	0.00039	0.0006	0.7		0.00229	<0.0006	0.00019	0.00012
3/19/2009	P		8.56	11	0.0042	<0.001	0.0006	0.02	0.203				1.03			<0.005	0.00012	0.0005	0.23		0.0031	<0.0006	<0.00001	0.00012
3/29/2009	P		8.57	19	0.0088	0.002	0.0057	0.025	0.424							0.018	0.00064	0.0007	0.79		0.00336	0.0006	0.00022	0.00009
4/2/2009	P		8.63	<5	0.0102	0.001	0.0086	0.02	0.368				2.4			0.017	0.0007	0.0008	1.06		0.0027	0.0006	0.00021	0.00009
4/10/2009	P		8.38	<5	0.0108	0.002	0.0082	0.024	0.271			78	1.2			0.018	0.00053	0.0016	2.03		0.00242	<0.0006	0.00006	0.00006
4/16/2009	P		8.6	18	0.0297	0.0037	0.0303	0.023	0.305		907		2.2			0.031	0.00058	0.003	2.37	<0.00002	0.003	0.0004	0.00015	0.00011
4/23/2009	P		8.6	8	0.0338	0.0018	0.0074	0.024	0.18		906		2			0.051	0.00029	<0.001	0.849	<0.00002	0.003	0.0003	0.00048	0.00009
4/30/2009	P		8.4	110	0.0236	0.003	0.0135	0.0237	0.138		967		1.3			0.087	0.0006	<0.002	1.07	<0.0002	0.003	<0.0008	0.0007	0.00007
5/7/2009	P		8.3	40	0.0421	0.015	0.0463	0.0442	0.556		1080		0.227			0.132	0.0025	<0.002	1.99	<0.0002	0.004	<0.0008	0.0024	0.00011
5/7/2009	M	8.26	8.4	97	0.0278	0.009	0.0329	0.0255	0.254		904		0.5			0.103	0.0012	<0.002	1.45	<0.0002	0.004	<0.0008	0.0021	0.00009
5/14/2009	P		8.3	170	0.029	0.007	0.0352	0.0318	0.387		1100		0.41			0.153	0.0013	<0.002	2.26	<0.0002	0.004	<0.0008	0.0015	0.00009
5/21/2009	P		8.1	110	0.0151	0.009	0.0267	0.0268	0.335		1130		0.31			0.186	0.0006	0.004	7.06	<0.0002	0.004	<0.0008	0.0015	0.00006
5/28/2009	P		8.3	33	0.0128	0.0043	0.0205	0.029	0.254		1120		0.26			0.162	0.00041	0.0007	2.49		0.0036	0.0009	0.00185	0.00005
6/4/2009	P		8.3	11	0.0053	0.001	0.0022	0.0276	0.095		1120		0.33			0.014	0.0001	<0.002	1.01	<0.0002	0.005	0.0015	<0.0001	0.00006
6/6/2009	P	8.1	8.1	28	0.0148	0.003	0.008	0.0315	0.276		1190		0.19			0.029	0.0004	0.002	3.69	<0.0002	0.003	0.0015	0.0002	0.00007
6/11/2009	P		8.3	65	0.0224	0.015	0.0893	0.0323	0.336		1090		0.35			0.116	0.0011	0.005	4.9	<0.0002	0.005	0.0021	0.0044	0.0001
6/18/2009	P		8.4	38	0.0232	0.007	0.156	0.022	0.135		785		0.2			0.072	0.0009	0.005	4.89	<0.0002	0.004	0.003	0.0012	0.00014
6/25/2009	P		8.3	17	0.0376	0.013	0.134	0.022	0.452		678		0.26			0.267	0.0035	0.005	5.46	<0.0002	0.003	0.0031	0.0037	0.00008
7/2/2009	P		8.4	140	0.0322	0.029	0.0757	0.022	0.256		693		0.26			0.197	0.0014	0.006	4.64	<0.0002	0.004	0.0029	0.0075	0.00008
7/8/2009	P	9.34	8.6	110	0.0288	0.026	0.207	0.022	0.256		709		0.18			0.133	0.0014	0.004	5.02	<0.0002	0.002	0.0028	0.008	0.00014
7/10/2009	P		8.4	140	0.0341	0.037	0.244	0.024	0.457		715		0.21			0.307	0.0037	0.006	7.38	<0.0002	0.003	0.0028	0.0159	0.00015
7/16/2009	P		8.3	37	0.0297	0.013	0.065	0.021	0.242		814		0.23			0.105	0.0016	0.003	5.05	<0.0002	0.002	0.0027	0.005	0.0001
7/24/2009	P		8	35	0.0199	0.002	0.0076	0.017	0.076		786		0.13			0.029	0.0002	<0.002	0.709	<0.0002	0.002	0.0025	0.0003	0.00005
7/30/2009	P		8.6	7	0.0161	0.001	0.0016	0.015	0.046		810		0.14			<0.01	<0.0001	<0.002	0.191	<0.0002	0.001	0.0023	<0.0001	0.00006
8/6/2009	P		8.1	5	0.0139	0.003	0.0018	0.012	0.051		747		0.13			<0.01	<0.0001	<0.002	0.142	<0.0002	0.001	0.002	<0.0001	<0.00005
8/12/2009	P		8	<4	0.0141	<0.001	0.0016	0.016	0.036		800		0.12			<0.01	<0.0001	<0.002	0.193	<0.0002	0.001	0.0023	<0.0001	0.00011
8/13/2009	P		8.4	6	0.0142	<0.001	0.0016	0.017	0.035		826		0.17			0.014	<0.0001	<0.002	0.145	<0.0002	0.001	0.002	<0.0001	0.00006
8/20/2009	P		7.9	7	0.0118	<0.001	0.0012	0.015	0.032		783		0.12			0.016	0.0001	<0.002	0.075	<0.0002	0.001	0.0016	<0.0001	0.00006
8/27/2009	P		8.1	5	0.0115	<0.001	0.0009	0.012	0.019		759		0.1			0.011	<0.0001	<0.002	0.045	<0.0002	0.001	0.0018	<0.0001	<0.00005
9/3/2009	P		8.2	5	0.0119	<0.001	0.0006	0.012	0.02		725		0.13			0.012	<0.0001	<0.002	0.063	<0.0002	0.001	0.0021	<0.0001	<0.00005
9/10/2009	P		8.1	3	0.0117	<0.001	0.0009	0.014	0.017		792		0.13			0.037	<0.0001	<0.002	0.089	<0.0002	<0.001	0.003	<0.0001	0.00005
9/11/2009	P	8.21	8	3	0.0115	<0.001	0.0002	0.013	<0.01		741		0.1			<0.01	<0.0001	<0.002	0.038	<0.0002	0.001	0.0032	<0.0001	0.00009
9/18/2009	P		8	4	0.0122	<0.001	<0.0002	0.015	0.013		760		0.08			0.013	<0.0001	<0.002	0.029	<0.0002	0.001	0.0038	<0.0001	<0.00005
10/9/2009	P	8.51	8.1	3	0.0117	<0.001	<0.0002	0.018	0.026		763		0.06			<0.01	0.0001	<0.002	0.066	<0.0002	<0.001	0.0037	<0.0001	0.00006
11/13/2009	P	8.1	8.2	<1	0.0104	<0.001	0.0003	0.016	0.014		831		0.06			0.016	<0.0001	<0.002	0.04	<0.0002	<0.001	0.0022	<0.0001	0.00007
12/2/2009	P	9.1	8.3	2	0.0114	<0.001	0.0005	0.016	0.028		866		0.07			<0.01	<0.0001	<0.002	0.049	<0.0002	0.001	0.0014	<0.0001	0.00007

Bellekeno Mine Effluent Quality (Station KV-43) - Advanced Exploration

Sample Date	Sample Class	pH-F pH units	pH-L pH units	TSS mg/L	As-T mg/L	Cu-T mg/L	Pb-T mg/L	Ni-T mg/L	Zn-T mg/L	R-226 Bq/L	Hard-T mg/L	Alk-T L	N-NH3 mg/L	N-NO3 mg/L	N-NO2 mg/L	Al-T mg/L	Cd-T mg/L	Cr-T mg/L	Fe-T mg/L	Hg-T mg/L	Mo-T mg/L	Se-T mg/L	Ag-T mg/L	Tl-T mg/L
MMER		**6.0-9.5**	**6.0-9.5**	**30**	**1**	**0.6**	**0.4**	**1**	**1**	**1.11**														
1/12/2010	P	7.8	8.4	4	0.0104	<0.001	0.0093	0.016	0.041		936		0.14			0.012	0.0002	<0.002	0.041	<0.0002	0.002	0.001	<0.0001	0.00006
2/11/2010	P	8.9	8.7	4	0.0125	0.001	0.0055	0.016	0.066		895		0.24			0.037	0.0002	<0.002	0.27	<0.0002	0.002	0.0009	0.0003	0.00006
2/19/2010	M		8.5	72																				
3/11/2010	P	9.01	8.5	4	0.0162	0.003	0.0018	0.024	0.105		1040		0.59			0.027	0.0007	0.003	0.516	<0.0002	0.002	<0.0008	<0.0001	0.00008
4/8/2010	P	8.91	8.6	2	0.0062	<0.001	0.0009	0.012	0.031		846		0.34			0.01	<0.0001	<0.002	0.272	<0.0002	0.002	<0.0008	<0.0001	0.00007
5/1/2010	M			<4																				
5/3/2010	M			<4																				
5/4/2010	M			4																				
5/4/2010	P	7.89	8.1	4	0.001	<0.001	0.0011	0.01	0.012		859		4.6			0.02	0.0002	<0.002	0.14	<0.0002	0.004	0.0009	<0.0001	0.00017
5/5/2010	M			6																				
5/6/2010	M			10																				
5/7/2010	M			11																				
5/8/2010	M			13																				
5/9/2010	M			13																				
6/8/2010	P	8.53	8.8	1	0.0008	<0.001	0.0009	0.006	<0.01		772		16			<0.01	<0.0001	<0.002	0.087	<0.0002	0.005	0.0054	<0.0001	0.00017
6/23/2010	P												3.3											
7/1/2010	P												1.5											
7/7/2010	P												5.8											
7/9/2010	QD				0.0009	<0.001	0.0007	0.011	0.015		800					0.019	<0.0001	<0.002	0.096	<0.0002	0.007	0.0034	<0.0001	0.00021
7/9/2010	P	8.29	7.96	1	0.0006	<0.001	0.0005	0.012	0.013		756		3.8			<0.01	<0.0001	<0.002	0.058	<0.0002	0.006	0.0031	<0.0001	0.00019
7/13/2010	P												2.1											
7/14/2010	P												1.8											
7/21/2010	M												0.86											
7/27/2010	M	8.38	8.26	61									2											
8/4/2010	P	8.56	8.24	<1	0.0007	<0.001	0.0005	0.009	<0.01	<0.005	553		2.5			<0.01	<0.0001	0.007	0.06	<0.0002	0.006	0.0047	<0.0001	0.00014
8/18/2010	M												4.5											
Average		8.49	8.32	27	0.013	0.0041	0.0227	0.0213	0.2	0.003	859	51	1.328			0.054	0.00065	0.0016	1.252	0.0001	0.00242	0.0019	0.00104	0.00009
Count		18	61	68	58	58	58	58	58	1	40	3	62			58	58	58	58	39	58	58	58	55
Minimum		7.57	7.88	0	0.0006	0.0005	0.0001	0.006	0.005	0.003	553	32	0.06			0.003	0.00005	0.0002	0.025	0.00001	0.0005	0.0003	0.00001	0.00001
Maximum		9.41	8.92	170	0.0421	0.037	0.244	0.0483	0.801	0.003	1190	78	16			0.352	0.0037	0.007	7.38	0.0001	0.007	0.0064	0.0159	0.00021
Sum		152.87	507.41	1814	0.7546	0.2378	1.3156	1.2358	11.615	0.003	34354	153	82.337			3.157	0.03742	0.0928	72.638	0.00372	0.14011	0.111	0.06053	0.00483
Count <DL		0	0	7	0	28	2	0	3	1	0	0	0			11	16	30	5	39	3	14	30	6
Standard Deviation		0.53	0.24	38	0.0108	0.0074	0.0497	0.0087	0.187	0	149	24	2.308			0.078	0.00082	0.0016	1.932	0.00002	0.00158	0.0015	0.00262	0.00005
1st Quartile		8.13	8.1	4	0.0041	0.0005	0.0008	0.0152	0.031	0.003	760	38	0.182			0.008	0.00005	0.0007	0.061	0.0001	0.001	0.0004	0.00005	0.00006
Median		8.45	8.3	11	0.0115	0.001	0.0016	0.0205	0.156	0.003	812	43	0.455			0.018	0.0003	0.001	0.192	0.0001	0.002	0.0018	0.00005	0.00008
3rd Quartile		8.91	8.48	29	0.0162	0.003	0.0148	0.0254	0.329	0.003	914	60	1.725			0.065	0.00085	0.0011	1.37	0.0001	0.0033	0.0029	0.00046	0.00012
Count Over MMER		0	0	16	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0
% Over MMER		0	0	23.5	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0

Bellekeno Mine Effluent Quality Data (Station KV-43) - Production Phase

Sample Date	Sample Class	pH-F pH units	pH-L pH units	TSS mg/L	As-T mg/L	Cu-T mg/L	Pb-T mg/L	Ni-T mg/L	Zn-T mg/L	R-226 Bq/L	Hard-T mg/L	Alk-T mgCaCO3/L	N-NH3 mg/L	N-NO3 mg/L	N-NO2 mg/L	Al-T mg/L	Cd-T mg/L	Cr-T mg/L	Fe-T mg/L	Hg-T mg/L	Mo-T mg/L	Se-T mg/L	Ag-T mg/L	Tl-T mg/L	LC50 %
MMER		**6.0-9.5**	**6.0-9.5**	**30**	**1**	**0.6**	**0.4**	**1**	**1**	**1.11**															
9/8/2010	P	8.37	7.87	<1	0.0049	<0.001	0.0003	0.014	<0.01		727	50	3.7	6.3	2.03	0.024	<0.0001	<0.002	<0.02	<0.0002	0.007	0.0025	<0.0001	0.0002	
9/15/2010	QD		7.9		0.0009	<0.001	0.0003	0.01	<0.01		776	46				<0.01	<0.0001	<0.002	<0.02	<0.0002	0.007	0.0024	<0.0001	0.00022	
9/15/2010	M	7.98	7.85	<1	0.0004	0.001	0.0003	0.011	<0.01		780	43	5.7	8.5	1.84	0.011	<0.0001	<0.002	<0.02	<0.0002	0.007	0.0024	<0.0001	0.00023	
9/15/2010	P	7.98	7.93	<1	0.0007	<0.001	0.0002	0.009	<0.01	0.008	730	54	5.5	8	1.76	<0.01	<0.0001	<0.002	<0.02	<0.0002	0.006	0.0023	<0.0001	0.00022	20
9/17/2010	E				0.0005	0.0013	0.0055	0.01	0.065		784		4.8			0.025	0.00038	0.001	0.062	0.00003	0.005	0.0019	0.00034	0.00022	
9/22/2010	P	7.91	8	2	0.0013	<0.001	0.0022	0.01	0.012		562	53	3.7	5.2	1.12	0.013	<0.0001	<0.002	0.053	<0.0002	0.004	0.0016	0.0001	0.00014	
9/29/2010	P	8.42	8.22	**47**	0.0128	0.007	0.116	0.022	0.302	0.02	943	110	2.3	<20	<5	0.198	0.0021	0.006	6.11	<0.0002	0.008	0.0017	0.0013	0.00024	
10/7/2010	P	9.18	8.39	19	0.0073	0.004	0.0472	0.016	0.114	<0.005	882	68	2.1	3.2	0.89	0.027	0.0003	0.003	3.21	<0.0002	0.008	0.0016	0.0001	0.00016	0
10/13/2010	P	8.59	8.14	26	0.0078	0.004	0.0643	0.01	0.139	0.01	769	86	2.4	3.8	1.07	0.05	0.0005	0.003	4.5	<0.0002	0.007	0.001	0.0002	0.0001	
10/20/2010	P	7.99	7.66	<1	0.0009	<0.001	0.0015	0.003	<0.01	0.01	758	28	1.9	3.2	0.81	0.011	<0.0001	<0.002	0.064	<0.0002	0.008	0.001	<0.0001	0.00009	
10/27/2010	P	7.75	8.41	25	0.0072	0.005	0.236	0.01	0.12	0.006	801	60	1.5	2.4	0.81	0.076	0.0008	0.005	4.67	<0.0002	0.007	0.0011	0.001	0.00032	
11/2/2010	P	8.44	8.27	**58**	0.0176	0.009	0.242	0.016	0.265	<0.005	859	120	1.4	2.27	0.58	0.233	0.0015	0.006	11.2	<0.0002	0.006	0.0013	0.0035	0.00031	
11/10/2010	P	8.73	8.44	18	0.0045	0.003	0.0535	0.011	0.051	<0.005	785	64	1	2.28	0.56	0.039	0.0002	<0.002	2.7	<0.0002	0.006	0.0015	0.0003	0.00011	
11/17/2010	P	8.62	8.73	11	0.0079	0.003	0.0748	0.005	0.08	<0.005	743	51	1.3	1.91	0.6	0.069	0.0006	<0.002	1.76	<0.0002	0.006	0.0012	0.0006	<0.00005	0
11/24/2010	P	**9.64**	9.33	2	0.0068	0.024	0.0705	0.004	0.185	<0.005	695	35	1.3	1.79	0.52	0.189	0.001	0.009	0.366	<0.0002	0.009	0.0013	<0.0001	0.00011	
12/1/2010	P	8.97	8.13	<1	0.0062	<0.001	0.0065	0.003	<0.01	0.008	718	17	1.6	2.48	0.8	<0.01	0.0005	0.003	0.035	<0.0002	0.006	0.0011	0.0002	0.00006	
12/8/2010	P	8.69	7.75	<1	0.0041	<0.001	0.0062	0.006	<0.01	0.01	773	28	1.5	1.95	0.477	<0.01	<0.0001	0.006	0.061	<0.0002	0.006	0.0009	<0.0001	0.00007	
12/9/2010	P	9.41	8.3	2	0.0055	0.001	0.0268	0.005	0.02	0.01	736	37	1.6			0.012	0.0001	0.008	1.02	<0.0002	0.007	0.0011	<0.0001	0.00008	0
12/15/2010	P	8.91	7.98	12	0.0058	0.0016	0.152	0.009	0.062	<0.005	795	63	1	1.8	0.66	0.042	0.00075	0.007	1.46	<0.00002	0.007	0.0009	0.001	0.00016	
12/22/2010	P	8.18	7.61	9	0.0036	0.001	0.118	0.006	0.049	<0.005	820	47	0.63	1.09	0.53	0.025	0.0006	<0.002	0.532	<0.0002	0.005	<0.0008	0.001	0.00007	
12/29/2010	P	8.33	7.73	<1	0.0019	<0.001	0.0223	0.004	0.013	<0.005	764	45	0.47	0.91	0.465	0.012	0.0001	<0.002	0.07	<0.0002	0.004	<0.0008	0.0002	0.00006	
1/5/2011	P	8.24	7.24	<1	0.0016	0.001	0.0253	0.003	0.01	0.007	746	36	0.35	0.79	0.397	0.018	0.0001	<0.002	0.055	<0.0002	0.003	<0.0008	<0.0001	0.00005	
1/12/2011	QD	8.34	7.12	<1	0.0029	0.0005	0.0411	0.006	0.021	<0.005	726	40	1.8	2.52	0.7	0.016	0.00021	<0.001	0.173	<0.00002	0.005	0.0005	0.00022	0.0001	
1/12/2011	P	8.82	7.63	1	0.0024	<0.001	0.0252	0.005	0.015	<0.005	739	45	1.8	2.43	0.67	<0.01	0.0002	<0.002	0.089	<0.0002	0.005	<0.0008	0.0002	0.00008	0
1/19/2011	P	8.36	7.95	1	0.0028	0.002	0.0774	0.009	0.044	0.01	738	80	3.2	4.7	0.94	0.013	0.0005	<0.002	0.146	<0.0002	0.004	<0.0008	0.0004	0.00008	
1/26/2011	P	8.24	7.85	<1	0.0037	<0.001	0.0102	0.008	<0.01	0.02	749	48	4	6.2	1.21	0.01	<0.0001	<0.002	0.04	<0.0002	0.008	<0.0008	<0.0001	0.00014	
2/2/2011	P	8.36	7.96	<1	0.0026	<0.001	0.0204	0.005	<0.01	<0.005	715	37	3.3	6.1	1.43	<0.01	0.0001	<0.002	0.049	<0.0002	0.006	<0.0008	0.0001	0.00011	
2/9/2011	P	8.08	7.59	1	0.0022	<0.001	0.0197	0.006	0.012	<0.005	768	69	3	5.3	1.31	0.033	0.0002	<0.002	0.079	<0.0002	0.006	<0.0008	0.0002	0.00012	
2/10/2011	P	8.7	7.84	<1	0.0016	<0.001	0.0105	0.005	<0.01	0.005	703	64	3.5	6	0.99	<0.01	<0.0001	<0.002	0.102	<0.0002	0.005	<0.0008	<0.0001	0.00011	0
2/16/2011	P	8.64	8.26	7	0.0067	0.002	0.195	0.004	0.06	<0.005	699	63	2.3	3.9	0.67	0.032	0.0006	<0.002	1.84	<0.00002	0.005	<0.0008	0.0007	0.00022	
2/23/2011	P	8.30	7.84	<1	0.0015	0.001	0.0054	0.004	<0.01	0.009	797	49	1.9	3.09	0.52	0.01	<0.0001	<0.002	0.065	<0.0002	0.004	<0.0008	0.0001	0.00007	
3/2/2011	P	8.97	7.4	3	0.0013	<0.001	0.019	0.001	0.01	<0.005	800	14	0.97	2.13	0.47	0.013	0.0001	<0.002	0.157	<0.0002	0.003	<0.0008	<0.0001	0.00006	
3/9/2011	P	8.47	7.76	<1	0.0006	<0.001	0.0006	0.002	<0.01	0.006	725	29	0.38	1.07	0.347	<0.01	<0.0001	<0.002	0.028	<0.0002	0.005	<0.0008	<0.0001	0.00005	
3/16/2011	P	9.07	8.69	<1	0.0057	<0.001	0.0054	<0.001	<0.01	0.02	633	15	1.9	3.3	0.494	0.011	<0.0001	<0.002	0.037	<0.0002	0.003	<0.0008	0.0002	<0.00005	
3/23/2011	QD	8.25	7.59	1	0.0007	0.001	0.0101	0.003	<0.01	0.007	706	57	1.2	2.54	0.418	0.017	<0.0001	<0.002	0.117	<0.0002	0.002	<0.0008	0.0001	0.00006	
3/23/2011	P	8.45	7.93	1	0.0009	<0.001	0.0433	0.002	0.043	0.009	640	51	1	1.93	0.399	0.013	0.0004	<0.002	0.129	<0.0002	0.002	<0.0008	0.0002	0.00007	0
3/30/2011	P	8.44	7.73	<1	0.0005	<0.001	0.0021	0.002	<0.01	<0.01	821	36	0.51	0.84	0.141	0.012	<0.0001	<0.002	0.074	<0.0002	0.002	<0.0008	<0.0001	<0.00005	
4/6/2011	P	8.44	7.74	<1	0.0006	<0.001	0.0018	0.001	<0.01	<0.01	595	31	0.29	0.43	0.082	0.018	<0.0001	<0.002	0.072	<0.0002	0.002	<0.0008	<0.0001	<0.00005	
4/13/2011	P	8.47	7.57	<1	0.0009	<0.001	0.0019	<0.001	<0.01	<0.01	655	21	0.2	0.27	0.052	<0.01	<0.0001	<0.002	0.027	<0.0002	0.002	<0.0008	<0.0001	<0.00005	
4/20/2011	QD	8.35	7.44	<1	0.0011	<0.001	0.0012	0.002	<0.01	<0.01	591	31	0.31	0.49	0.086	<0.01	<0.0001	<0.002	<0.02	<0.0002	0.002	<0.0008	<0.0001	<0.00005	
4/20/2011	P	8.35	7.83	<1	0.001	<0.001	0.0018	0.002	<0.01	0.005	591	31	0.31	0.55	0.085	<0.01	<0.0001	<0.002	0.029	<0.0002	0.002	<0.0008	<0.0001	<0.00005	0
4/27/2011	P	8.17	7.61	<1	0.0009	<0.001	0.0006	0.002	<0.01	<0.01	620	35	0.396	0.54	0.059	<0.01	<0.0001	<0.002	<0.02	<0.0002	0.002	<0.0008	<0.0001	<0.00005	
5/4/2011	P	7.97	7.83	<1	0.001	<0.001	0.0009	0.003	<0.01	<0.01	622	43	0.39	0.67	0.102	<0.01	<0.0001	<0.002	<0.02	<0.0002	0.003	<0.0008	<0.0001	<0.00005	
5/11/2011	P	8.48	8.21	17	0.0063	0.003	0.105	0.005	0.049	<0.01	680	89	3.4	4.9	0.242	0.066	0.0004	<0.002	2.46		0.004	<0.0008	0.0007	0.00017	
5/18/2011	P	8.48	8.27	22	0.0132	0.006	0.111	0.007	0.073	<0.01	608	87	0.013	<0.02	<0.005	0.095	0.0006	0.003	4.74	<0.0002	0.007	<0.0008	0.0009	0.00015	
5/25/2011	P	8.56	8.26	**74**	0.0163	0.008	0.132	0.008	0.119	<0.01	618	93	1.77	2.83	0.194	0.131	0.0011	0.004	9.16	<0.0002	0.007	0.0009	0.0021	0.00011	
5/28/2011	P	9.07	8.31	**100**	0.0224	0.012	0.341	0.009	0.204	<0.01	710	110	1.83	3.16	0.228	0.403	0.0018	0.006	8.84	<0.0002	0.008	0.0016	0.0031	0.00047	0
6/1/2011	P	8.14	8.17	11	0.0046	0.003	0.0564	0.005	0.035	<0.01	620	100	1.1	2.8	0.224	0.074	0.0003	<0.002	1.79	<0.0002	0.005	0.0032	0.0004	0.00006	
6/8/2011	P	8.48	8.02	2	0.0018	0.002	0.0081	0.002	<0.01	<0.01	557	52	0.55	1.47	0.185	0.013	<0.0001	<0.002	0.454	<0.0002	0.003	0.0036	<0.0001	<0.00005	
6/15/2011	P	7.77	7.84	<1	0.0004	0.0007	0.0013	0.007	<0.005	<0.01	625	66	0.34	1.36	0.159	0.021	0.00006	0.006	0.086	<0.00005	0.003	0.0022	<0.00002	<0.00005	
6/21/2011	P	8.54	7.46	<1	0.0007	<0.001	0.0005	<0.001	0.037	<0.01	557	12	0.21	1.15	0.109	<0.01	0.0014	<0.002	<0.02	<0.0002	0.003	0.0029	<0.0001	<0.00005	0
6/29/2011	P	7.80	7.93	<1	<0.0004	<0.001	0.0005	0.004	<0.01		681	59	0.84	2.71	0.301	0.014	<0.0001	<0.002	0.035	<0.0002	0.004	0.0022	<0.0001	0.00005	
7/6/2011	P	7.76	7.83	<1	<0.0004	<0.001	<0.0002	0.003	<0.01	<0.01	635	53	0.99	3	0.38	<0.01	<0.0001	<0.002	0.021	<0.0002	0.004	0.0032	<0.0001	0.00006	
7/13/2011	P	7.91	7.52	<1	<0.0004	<0.001	0.0004	0.002	<0.01		588	44	0.41	2.32	0.15	<0.01	<0.0001	<0.002	0.027	<0.0002	0.004	0.005	<0.0001	<0.00005	

Bellekeno Mine Effluent Quality Data (Station KV-43) - Production Phase

Sample Date	Sample Class	pH-F	pH-L	TSS	As-T	Cu-T	Pb-T	Ni-T	Zn-T	R-226	Hard-T	Alk-T	N-NH3	N-NO3	N-NO2	Al-T	Cd-T	Cr-T	Fe-T	Hg-T	Mo-T	Se-T	Ag-T	Tl-T	LC50
		pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	mgCaCO3/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	%
MMER		**6.0-9.5**	**6.0-9.5**	**30**	**1**	**0.6**	**0.4**	**1**	**1**	**1.11**															
7/19/2011	P	8.66	7.5	<1	<0.0004	<0.001	0.0003	0.001	<0.01	<0.01	591	26	0.46	1.61	0.123	<0.01	<0.0001	<0.002	0.04	<0.0002	0.003	0.0062	<0.0001	0.00005	10
7/27/2011	P	8.78	7.62	6	0.0025	0.002	0.074	0.004	0.099		546	40	4.5	4	0.308	0.031	0.0004	<0.002	1.92	<0.0002	0.003	0.0062	0.0001	0.00009	
Average		8.44	7.93	9	0.0039	0.0022	0.0464	0.006	0.044	0.006	707	52	1.724	2.91	0.608	0.039	0.00034	0.002	1.265	0.00009	0.005	0.0014	0.00037	0.00011	3
Count		54	55	54	56	56	56	56	56	48	56	55	55	53	53	56	56	56	56	55	56	56	56	56	11
Minimum		7.75	7.12	0	0.0002	0.0005	0.0001	0.001	0.003	0.003	546	12	0.013	0.01	0.003	0.005	0.00005	0.001	0.01	0.00001	0.002	0.0004	0.00001	0.00003	0
Maximum		9.64	9.33	100	0.0224	0.024	0.341	0.022	0.302	0.02	943	120	5.7	10	2.5	0.403	0.0021	0.009	11.2	0.0001	0.009	0.0062	0.0035	0.00047	20
Sum		456	435.98	492	0.2208	0.1236	2.5959	0.328	2.44	0.295	39595	2861	94.819	154.19	32.2	2.205	0.01915	0.117	70.834	0.00509	0.275	0.0765	0.02087	0.00602	30
Count <DL		0	0	28	4	29	1	3	27	30	0	0	0	2	2	17	25	41	8	54	0	25	27	13	0
Standard Deviation		0.41	0.39	19	0.0047	0.0038	0.0716	0.004	0.066	0.004	90	25	1.429	2.2	0.544	0.07	0.00047	0.002	2.489	0.00002	0.002	0.0014	0.00069	0.00009	6
1st Quartile		8.2	7.64	0	0.0009	0.0005	0.0014	0.003	0.005	0.003	624	36	0.49	1.36	0.194	0.005	0.00005	0.001	0.035	0.0001	0.003	0.0004	0.00005	0.00005	0
Median		8.44	7.85	0	0.0021	0.0005	0.0104	0.005	0.01	0.005	722	48	1.4	2.43	0.477	0.013	0.0001	0.001	0.076	0.0001	0.005	0.0009	0.0001	0.00008	0
3rd Quartile		8.66	8.19	8	0.0057	0.002	0.0658	0.009	0.053	0.007	770	64	2.3	3.8	0.81	0.032	0.0005	0.002	1.535	0.0001	0.007	0.0017	0.00031	0.00014	0
Count Over MMER		1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Over MMER		1.9	0	7.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix C KV-41 Water Quality Data

Lightning Creek Exposure Station KV-41 - Care and Maintenance

Sample Date	Sample Class	pH-F pH units	pH-L pH units	TSS mg/L	As-T mg/L	Cu-T mg/L	Pb-T mg/L	Ni-T mg/L	Zn-T mg/L	R-226 Bq/L	Hard-T mg/L	Alk-T L	N-NH3 mg/L	N-NO3 mg/L	N-NO2 mg/L	Al-T mg/L	Cd-T mg/L	Cr-T mg/L	Fe-T mg/L	Hg-T mg/L	Mo-T mg/L	Se-T mg/L	Ag-T mg/L	Tl-T mg/L
CWQG CCME-Aquatic		**6.5-9**	**6.5-9**		**0.005**	*	*	*	**0.03**				**0.239**	**2.935**	**0.06**	*	*	**0.001**	**0.3**	**0.000026**	**0.073**	**0.001**	**0.0001**	**0.0008**
3/13/2008	P	7.46	7.8	2.5	0.0017	0.0005	0.0004	0.0006	0.018							0.045	**0.00006**	0.0007	0.05		0.0005	0.0009	0.000005	0.000025
5/18/2008	P	7.40	7.36	156	**0.0057**	**0.007**	**0.0075**	0.0046	**0.043**							**2.1**	**0.00033**	**0.0039**	**2.6**		0.0005	0.0004	**0.00013**	0.000025
6/20/2008	P		7.74	44	0.005	**0.004**	**0.0039**	0.0039	0.027							**0.867**	**0.00016**	**0.0023**	**1.84**		0.0005	0.0005	**0.00051**	0.000025
7/5/2008	P	7.21	7.88	71	**0.0099**	**0.034**	**0.0076**	0.0082	**0.038**							**2.63**	**0.00025**	**0.0052**	**4.06**		0.0005	0.0004	**0.00025**	0.000025
8/14/2008	P	7.64	7.9	55	0.0038	**0.003**	**0.0036**	0.0025	0.03							**0.692**	**0.00025**	**0.0018**	**1.1**		0.0005	0.0004	0.00006	0.000025
9/15/2008	P	**10.24**	7.85	256	**0.0748**	**0.038**	**0.259**	0.02	**0.144**							**6.22**	**0.00052**	**0.0128**	**21.6**		0.00088	0.0003	**0.0042**	0.00012
10/2/2008	P	7.41	7.8	52	**0.0055**	**0.005**	**0.0052**	0.003	**0.034**							**0.813**	**0.00021**	**0.0017**	**1.71**		0.00022	**0.0013**	**0.00011**	0.00001
Average		7.89	7.76	91	0.0152	0.013	0.041	0.0061	0.048							1.91	0.00025	0.0041	4.71		0.00051	0.0006	0.00075	0.00004
Count		6	7	7	7	7	7	7	7							7	7	7	7		7	7	7	7
Minimum		7.21	7.36	2	0.0017	0.001	0.0004	0.0006	0.018							0.045	0.00006	0.0007	0.05		0.00022	0.0003	0.00001	0.00001
Maximum		10.24	7.9	256	0.0748	0.038	0.259	0.02	0.144							6.22	0.00052	0.0128	21.6		0.00088	0.0013	0.0042	0.00012
Sum		47.36	54.33	636	0.1064	0.091	0.2872	0.0428	0.334							13.367	0.00178	0.0284	32.96		0.0036	0.0042	0.00526	0.00026
Count <DL		0	0	1	0	1	0	0	0							0	0	0	1		5	1	1	5
Standard Deviation		1.16	0.19	86	0.0264	0.016	0.0961	0.0066	0.043							2.097	0.00014	0.0041	7.55		0.00019	0.0004	0.00153	0.00004
1st Quartile		7.4	7.77	48	0.0044	0.004	0.0037	0.0027	0.028							0.752	0.00018	0.0017	1.41		0.0005	0.0004	0.00009	0.00003
Median		7.44	7.8	55	0.0055	0.005	0.0052	0.0039	0.034							0.867	0.00025	0.0023	1.84		0.0005	0.0004	0.00013	0.00003
3rd Quartile		7.59	7.87	114	0.0078	0.021	0.0075	0.0064	0.04							2.365	0.00029	0.0046	3.33		0.0005	0.0007	0.00038	0.00003
Count Over CWQG		1	0	0	4	6	6	0	4							6	7	6	6		0	1	5	0
% Over CWQG		16.7	0	0	57.1	85.7	85.7	0	57.1							85.7	100	85.7	85.7		0	14.3	71.4	0

Lightning Creek Exposure Station KV-41 - Advanced Exploration

Sample Date	Sample Class	pH-F pH units	pH-L pH units	TSS mg/L	As-T mg/L	Cu-T mg/L	Pb-T mg/L	Ni-T mg/L	Zn-T mg/L	R-226 Bq/L	Hard-T mg/L	Alk-T L	N-NH3 mg/L	N-NO3 mg/L	N-NO2 mg/L	Al-T mg/L	Cd-T mg/L	Cr-T mg/L	Fe-T mg/L	Hg-T mg/L	Mo-T mg/L	Se-T mg/L	Ag-T mg/L	Tl-T mg/L
CWQG CCME-Aquatic		**6.5-9**	**6.5-9**		**0.005**	*	*	*	**0.03**				**0.239**	**2.935**	**0.06**	*	*	**0.001**	**0.3**	**0.000026**	**0.073**	**0.001**	**0.0001**	**0.0008**
11/12/2008	P		7.75	5	0.0022	0.002	**0.0018**	0.0005	0.026							0.074	**0.00011**	0.0004	0.16		0.00012	0.0003	0.000005	0.000005
12/20/2008	P		7.97	2.5	0.002	0.0005	**0.0017**	0.00025	0.027							0.095	**0.0001**	0.00025	0.2		0.0005	0.0008	0.00002	
1/12/2009	P		7.7	13	0.0028	0.002	**0.0036**	0.0009	0.023							**0.232**	**0.00011**	0.0009	**0.49**		0.0005	0.0007	0.00006	0.000025
2/2/2009	P		7.93	10	0.0026	0.0005	**0.0018**	0.0005	0.016							0.098	**0.00007**	0.0006	0.27		0.00019	0.0003	0.000005	0.000005
3/10/2009	P		7.82	2.5	0.0019	0.0005	**0.0011**	0.0005	0.017							0.05	**0.00006**	0.0004	0.16		0.00027	0.0003	0.000005	0.000005
4/15/2009	P		8	2	0.0016	0.00037	0.000576	0.00051	0.017		136					0.0123	**0.00008**	0.0002	0.025	0.00001	0.00023	**0.00118**	0.000003	0.000001
5/6/2009	P	7.16	7.7	110	**0.00589**	**0.00679**	**0.0224**	0.00358	**0.0492**		64.8		0.06			**0.801**	**0.000554**	**0.0016**	**1.28**	0.00001	0.00022	0.00039	**0.000259**	0.000018
6/5/2009	P	7.62	7.5	110	**0.00711**	**0.00497**	**0.0161**	0.00286	**0.0371**		35					**0.534**	**0.000557**	0.0009	**1.08**	0.00001	0.00014	0.00026	0.000073	0.000013
7/5/2009	P	8.13	7.9	180	**0.00911**	**0.00715**	**0.0163**	0.00426	0.0295		85.2					**0.74**	**0.000269**	**0.0011**	**1.45**	0.000005	0.00022	0.00061	**0.000137**	0.000017
8/11/2009	P		7.9	19	0.00269	0.00092	0.00152	0.00064	0.0113		92.9					0.0861	**0.000108**	0.0003	0.205		0.00023	0.00065	0.000008	0.000001
9/8/2009	P	7.39	7.8	320	**0.00719**	**0.0129**	**0.0215**	0.00496	**0.0601**		94.4					**1.82**	**0.000695**	**0.0034**	**2.84**	0.000005	0.00021	0.0006	**0.000180**	0.000025
10/6/2009	P	7.6	7.9	130	**0.00831**	**0.0074**	**0.00793**	0.00285	0.0289		88.2					**0.725**	**0.000291**	**0.0014**	**1.63**		0.00025	0.00076	**0.000125**	0.000012
11/12/2009	P	7.89	8	3	0.0012	0.00046	0.00075	0.00041	0.0121		97.7					0.0274	**0.000069**	0.0003	0.042	0.00002	0.00021	0.00086	0.000006	0.000001
12/2/2009	P	7.8	7.8	5	0.00106	0.00043	0.000824	0.0004	0.0105		109					0.0332	**0.000059**	0.0003	0.052	0.000005	0.00022	0.00087	0.000003	0.000001
1/12/2010	P	8.1	8	10	0.00126	0.00066	0.00134	0.00061	0.0141		115					0.0632	**0.000057**	0.0004	0.116	0.00001	0.0002	0.00096	0.000015	0.000001
2/10/2010	P	7.75	8	4	0.00097	0.00036	0.000719	0.00032	0.0127		121					0.0231	**0.000054**	0.0003	0.04	0.000005	0.0002	0.00093	0.000003	0.000001
3/11/2010	P	8.2	8	2	0.00091	0.00031	0.000502	0.00037	0.0136		116					0.0168	**0.000041**	0.0003	0.03	0.00001	0.00023	0.001	0.000008	0.000001
4/8/2010	P	8.17	8	2	0.00112	0.00073	0.000825	0.00056	0.0149		117					0.0266	**0.000049**	0.0004	0.048	0.000005	0.00023	**0.00106**	0.000003	0.000001
5/3/2010	P	7.94	7.9	31	0.00206	**0.00225**	**0.00375**	0.00119	0.0145		81.1					**0.197**	**0.000161**	0.0005	**0.36**		0.00025	0.00068	0.00002	0.000003
6/8/2010	P	7.91	7.7	12	0.002	0.00127	**0.00121**	0.00075	0.0109		57					**0.133**	**0.000113**	0.0005	0.175	0.000005	0.00017	0.00042	0.000006	0.000003
7/6/2010	P	8.26	7.82	18	0.00222	0.00195	**0.00256**	0.00114	0.0204		74.3					**0.23**	**0.000267**	0.0008	**0.345**	0.000005	0.0002	0.0005	0.000045	0.000005
8/4/2010	P	8.07	7.88	15	0.00174	**0.00311**	0.000853	0.00064	0.0112		91.8		0.025			**0.122**	**0.000122**	0.0006	0.14	0.00002	0.00022	0.00066	0.000023	0.000002
Average		7.87	7.86	46	0.00309	0.00262	0.004984	0.0013	0.0217		92.7		0.04			0.2791	0.000182	0.0007	0.506	0.00001	0.00024	0.00067	0.000046	0.000007
Count		15	22	22	22	22	22	22	22		17		2			22	22	22	22	14	22	22	22	21
Minimum		7.16	7.5	2	0.00091	0.00031	0.000502	0.00025	0.0105		35		0.03			0.0123	0.000041	0.0002	0.025	0.00001	0.00012	0.00026	0.000003	0.000001
Maximum		8.26	8	320	0.00911	0.0129	0.0224	0.00496	0.0601		136		0.06			1.82	0.000695	0.0034	2.84	0.00002	0.0005	0.00118	0.000259	0.000025
Sum		117.99	172.97	1006	0.06794	0.05753	0.109659	0.0287	0.477		1576.4		0.08			6.1397	0.003996	0.0158	11.138	0.00013	0.00521	0.01479	0.00101	0.000146
Count <DL		0	0	3	0	3	0	4	0		0		1			0	0	1	0	7	2	3	7	12
Standard Deviation		0.32	0.13	79	0.00258	0.00327	0.0071	0.00141	0.013		25.7		0.02			0.4264	0.000187	0.0007	0.716	0.00001	0.00009	0.00027	0.000069	0.000008
1st Quartile		7.69	7.8	3	0.00135	0.0005	0.000832	0.0005	0.0129		81.1		0.03			0.0374	0.000062	0.0003	0.068	0.00001	0.0002	0.00044	0.000005	0.000001
Median		7.91	7.9	11	0.00203	0.0011	0.00161	0.00063	0.0165		92.9		0.04			0.0965	0.000109	0.0004	0.188	0.00001	0.00022	0.00067	0.000012	0.000003
3rd Quartile		8.12	7.99	28	0.00277	0.0029	0.003712	0.00118	0.0267		115		0.05			0.2315	0.00024	0.0009	0.458	0.00001	0.00023	0.00087	0.000056	0.000012
Count Over CWQG		0	0	0	5	7	13	0	3		0		0			10	22	4	8	0	0	2	4	0
% Over CWQG		0	0	0	22.7	31.8	59.1	0	13.6		0		0			45.5	100	18.2	36.4	0	0	9.1	18.2	0

Lightning Creek Exposure Station KV-41 - Production Phase

Sample Date	Sample Class	pH-F	pH-L	TSS	As-T	Cu-T	Pb-T	Ni-T	Zn-T	R-226	Hard-T	Alk-T	N-NH3	N-NO3	N-NO2	Al-T	Cd-T	Cr-T	Fe-T	Hg-T	Mo-T	Se-T	Ag-T	Tl-T
		pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CWQG CCME-Aquatic		**6.5-9**	**6.5-9**		**0.005**	*	*	*	**0.03**				**0.239**	**2.935**	**0.06**	*	*	**0.001**	**0.3**	**0.000026**	**0.073**	**0.001**	**0.0001**	**0.0008**
9/14/2010	P	6.82	7.86	5	0.00149	0.00079	0.000686	0.00058	0.0099		97.4	48	0.0025	0.1	0.0025	0.0793	**0.000111**	0.0006	0.103	0.000010	0.00024	0.00067	0.000015	0.000002
10/5/2010	P	8.03	7.64	4	0.00123	0.0005	0.000622	0.00049	0.0085		99.4	49	0.009	0.17	0.0025	0.0434	**0.000082**	0.0003	0.064	0.000005	0.00023	0.00083	0.000015	0.000001
11/16/2010	P	7.05	7.78	0.5	0.00074	0.00028	0.000313	0.00038	0.0074		114	55	0.056	0.22	0.0025	0.0121	**0.00006**	0.0004	0.027	0.000005	0.0003	0.00087	0.000003	0.000001
12/7/2010	QD				0.00103	0.00051	0.000911	0.00044	0.0081		118					**0.0309**	**0.000043**	0.0003	0.059	0.000010	0.00035	0.0009	0.000012	0.000001
12/7/2010	P	8.25	7.68	6	0.00102	0.00052	0.00106	0.00049	0.0076		109	53	0.12	0.23	0.0025	0.034	**0.000047**	0.0002	0.067	0.000020	0.00025	0.00083	0.000003	0.000001
1/12/2011	P	7.98	7.51	4	0.00104	0.00072	0.00196	0.00053	0.0108		123	52	0.0025	0.26	0.0025	0.0324	**0.000081**	0.0008	0.075	0.000005	0.0003	0.00093	0.00004	0.000003
2/8/2011	P	7.97	7.7	3	0.00085	0.00028	0.000525	0.00042	0.0076		118	54	0.014	0.33	0.0025	0.0208	**0.000044**	0.0004	0.037	0.000005	0.00024	0.00089	0.000003	0.000001
3/22/2011	P	8.11	7.7	4	0.00098	0.00045	0.00083	0.00043	0.0079		127	60	0.013	0.27	0.0025	0.0302	**0.000051**	0.0005	0.067	0.000005	0.00025	0.001	0.00001	0.000001
4/19/2011	P		7.83	1	0.00093	0.00036	0.000529	0.00041	0.0073		127	60	0.007	0.21	0.0025	0.0182	**0.00005**	0.0004	0.034	0.000005	0.00025	**0.00107**	0.000003	0.000001
5/13/2011	P	7.92	7.64	2	0.001	0.00075	0.000834	0.00045	0.0091		116	55	0.008	0.23	0.0025	0.0392	**0.000069**	0.0004	0.058	0.000005	0.00026	0.00081	0.000011	0.000002
5/26/2011	P																							
6/21/2011	P	8.52	7.66	70	0.00358	**0.006**	**0.00509**	0.0036	0.017		69.4	33	0.032	0.01	0.033	**0.89**	**0.000193**	**0.0024**	**1.48**	0.000005	0.00024	0.00047	**0.000105**	0.000021
7/13/2011	P	7.92	7.67	29	**0.0114**	**0.0253**	**0.0195**	0.0121	**0.047**		78	37	0.037	0.03	0.021	**3.52**	**0.000515**	**0.007**	**6.31**	**0.00003**	0.00045	0.00053	**0.00052**	0.000048
Average		7.86	7.7	12	0.00211	0.00304	0.002738	0.00169	0.0123		108	51	0.027	0.19	0.007	0.3959	0.000112	0.0011	0.698	0.00001	0.00028	0.00082	0.000061	0.000007
Count		10	11	11	12	12	12	12	12		12	11	11	11	11	12	12	12	12	12	12	12	12	12
Minimum		6.82	7.51	0	0.00074	0.00028	0.000313	0.00038	0.0073		69.4	33	0.003	0.01	0.003	0.0121	0.000043	0.0002	0.027	0.00001	0.00023	0.00047	0.000003	0.000001
Maximum		8.52	7.86	70	0.0114	0.0253	0.0195	0.0121	0.047		127	60	0.12	0.33	0.033	3.52	0.000515	0.007	6.31	0.00003	0.00045	0.00107	0.00052	0.000048
Sum		78.57	84.67	128	0.02529	0.03646	0.03286	0.02032	0.1482		1296.2	556	0.301	2.06	0.076	4.7505	0.001346	0.0137	8.381	0.00011	0.00336	0.0098	0.000738	0.000083
Count <DL		0	0	1	0	0	0	0	0		0	0	2	1	9	0	0	0	0	8	0	0	4	7
Standard Deviation		0.52	0.1	21	0.00302	0.00719	0.005434	0.0034	0.0112		18.6	9	0.035	0.1	0.01	1.0143	0.000134	0.0019	1.814	0.00001	0.00006	0.00018	0.000147	0.000014
1st Quartile		7.92	7.65	2	0.00097	0.00043	0.000599	0.00043	0.0076		98.9	48	0.007	0.14	0.003	0.0278	0.000049	0.0004	0.053	0.00001	0.00024	0.00077	0.000003	0.000001
Median		7.97	7.68	4	0.00103	0.00052	0.000832	0.00047	0.0083		115	53	0.013	0.22	0.003	0.0332	0.000064	0.0004	0.066	0.00001	0.00025	0.00085	0.000012	0.000001
3rd Quartile		8.09	7.74	6	0.00129	0.00076	0.001285	0.00054	0.0101		119.2	55	0.035	0.24	0.003	0.0524	0.000089	0.0006	0.082	0.00001	0.0003	0.00091	0.000021	0.000002
Count Over CWQG		0	0	0	1	2	2	0	1		0	0	0	0	0	3	12	2	2	1	0	1	2	0
% Over CWQG		0	0	0	8.3	16.7	16.7	0	8.3		0	0	0	0	0	25	100	16.7	16.7	8.3	0	8.3	16.7	0

Appendix D KV-37-Water Quality Data

Lightning Creek Reference Station KV-37 Water Quality - Care and Maintenance

Sample Date	Sample Class	pH-F	pH-L	TSS	As-T	Cu-T	Pb-T	Ni-T	Zn-T	R-226	Hard-T	Alk-T	N-NH3	N-NO3	N-NO2	Al-T	Cd-T	Cr-T	Fe-T	Hg-T	Mo-T	Se-T	Ag-T	Tl-T
		pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CWQG CCME-Aquatic		**6.5-9**	**6.5-9**		**0.005**	*	*	*	**0.03**				**0.239**	**2.935**	**0.06**	*	*	**0.001**	**0.3**	**0.000026**	**0.073**	**0.001**	**0.0001**	**0.0008**
3/13/2008	P	7.63	7.94	<5	**0.0079**	<0.001	0.0004	0.0014	**0.239**							0.008	**0.00255**	0.0005	<0.1		<0.001	**0.0016**	<0.00001	<0.00005
5/18/2008	P	7.47	6.94	<10	**0.0064**	**0.004**	**0.0015**	0.0022	0.007							**0.75**	**0.00006**	**0.0017**	**0.9**		<0.001	<0.0002	0.00005	<0.00005
7/5/2008	P	7.03	7.46	9	0.0023	<0.001	0.0003	0.0011	0.002							0.056	**0.00002**	<0.0005	0.1		<0.001	0.0004	<0.00001	<0.00005
10/2/2008	P	7.38	7.58	4	<0.0002	<0.001	<0.0001	<0.001	<0.001							<0.005	**<0.00001**	<0.0004	0.06		<0.00002	<0.0006	<0.00001	<0.00001
Average		7.38	7.48	7	0.0042	0.002	0.0006	0.0014	0.062							0.205	0.00066	0.0008	0.29		0.00076	0.0007	0.00002	0.00004
Count		4	4	4	4	4	4	4	4							4	4	4	4		4	4	4	4
Minimum		7.03	6.94	4	<0.0002	<0.001	<0.0001	<0.001	<0.001							<0.005	<0.00001	<0.0004	0.06		<0.00002	<0.0002	<0.00001	<0.00001
Maximum		7.63	7.94	10	0.0079	0.004	0.0015	0.0022	0.239							0.75	0.00255	0.0017	0.9		0.001	0.0016	0.00005	0.00005
Sum		29.51	29.92	28	0.0168	0.007	0.0023	0.0057	0.249							0.819	0.00264	0.0031	1.16		0.00302	0.0028	0.00008	0.00016
Count <DL		0	0	2	1	3	1	1	1							1	1	2	1		4	2	3	4
Standard Deviation		0.25	0.41	3	0.0036	0.002	0.0006	0.0005	0.118							0.364	0.00126	0.0006	0.41		0.00049	0.0006	0.00002	0.00002
1st Quartile		7.29	7.33	5	0.0018	0.001	0.0002	0.0011	0.002							0.007	0.00002	0.0005	0.09		0.00076	0.0004	0.00001	0.00004
Median		7.42	7.52	7	0.0044	0.001	0.0004	0.0012	0.005							0.032	0.00004	0.0005	0.1		0.001	0.0005	0.00001	0.00005
3rd Quartile		7.51	7.67	9	0.0068	0.002	0.0007	0.0016	0.065							0.229	0.00068	0.0008	0.3		0.001	0.0008	0.00002	0.00005
Count Over CWQG		0	0	0	2	1	1	0	1							1	4	1	1		0	1	0	0
% Over CWQG		0	0	0	50	25	25	0	25							25	100	25	25		0	25	0	0

Lightning Creek Reference Station KV-37 - Advanced Exploration

Sample Date	Sample Class	pH-F pH units	pH-L pH units	TSS mg/L	As-T mg/L	Cu-T mg/L	Pb-T mg/L	Ni-T mg/L	Zn-T mg/L	R-226 Bq/L	Hard-T mg/L	Alk-T L	N-NH3 mg/L	N-NO3 mg/L	N-NO2 mg/L	Al-T mg/L	Cd-T mg/L	Cr-T mg/L	Fe-T mg/L	Hg-T mg/L	Mo-T mg/L	Se-T mg/L	Ag-T mg/L	Tl-T mg/L
CWQG CCME-Aquatic		**6.5-9**	**6.5-9**		**0.005**	*	*	*	**0.03**				**0.239**	**2.935**	**0.06**	*	*	**0.001**	**0.3**	**0.000026**	**0.073**	**0.001**	**0.0001**	**0.0008**
2/2/2009	P		7.66	5	0.0024	<0.001	<0.0001	<0.001	<0.001							0.011	**<0.00001**	<0.0004	0.04		<0.00002	<0.0006	<0.00001	<0.00001
5/28/2009	P	7.31	7.6	8	0.00335	0.00125	0.000438	0.00078	0.0021		24.2					0.0811	**0.00003**	0.0004	0.163	<0.00001	0.00006	0.00018	0.000007	<0.000002
7/5/2009	P	7.05	7.7	2	0.00246	0.00027	0.000129	0.00033	0.001		58.8					0.0125	0.000012	0.0001	0.039	<0.00001	0.00009	0.00047	<0.000005	<0.000002
10/7/2009	P	7.68	7.7	<1	0.00204	0.00035	0.00012	0.0003	0.0011		65.9					0.0065	**0.000024**	0.0004	0.035		0.00013	0.00052	<0.000005	<0.000002
2/10/2010	P	7.96	7.9	<1	0.00249	0.00028	0.000129	0.00022	0.0024		61					0.0088	0.000007	0.0005	0.034	<0.00001	0.00016	0.00053	<0.000005	<0.000002
5/27/2010	P	7.43	7.6	3	0.00251	0.0009	0.000364	0.00049	0.0014		34.1					0.0357	**0.000017**	0.0002	0.084	<0.00001	0.00008	0.0003	0.000012	<0.000002
7/8/2010	P	8	7.63	1	0.00217	0.00044	0.000169	0.00034	0.0012		58.3					0.0114	0.000014	0.0004	0.046	<0.00001	0.00009	0.00041	<0.000005	<0.000002
Average		7.57	7.68	3	0.00249	0.00064	0.000207	0.00049	0.0015		50.4					0.0239	0.000016	0.0003	0.063	0.00001	0.00009	0.00043	0.000007	0.000003
Count		6	7	7	7	7	7	7	7		6					7	7	7	7	5	7	7	7	7
Minimum		7.05	7.6	<1	0.00204	0.00027	<0.0001	0.00022	<0.001		24.2					0.0065	0.000007	0.0001	0.034	<0.00001	<0.00002	0.00018	<0.000005	<0.000002
Maximum		8	7.9	8	0.00335	0.00125	0.000438	0.001	0.0024		65.9					0.0811	0.00003	0.0005	0.163	0.00001	0.00016	0.0006	0.000012	0.00001
Sum		45.43	53.79	21	0.01742	0.00449	0.001449	0.00346	0.0102		302.3					0.167	0.000114	0.0024	0.441	0.00005	0.00063	0.00301	0.000049	0.000022
Count <DL		0	0	2	0	1	1	1	1		0					0	1	1	0	5	1	1	5	7
Standard Deviation		0.38	0.1	3	0.00042	0.0004	0.000136	0.00029	0.0006		17					0.0271	0.000008	0.0001	0.047	0	0.00005	0.00015	0.000003	0.000003
1st Quartile		7.34	7.62	1	0.00228	0.00031	0.000124	0.00031	0.0011		40.1					0.0099	0.000011	0.0003	0.037	0.00001	0.00007	0.00035	0.000005	0.000002
Median		7.55	7.66	2	0.00246	0.00044	0.000129	0.00034	0.0012		58.5					0.0114	0.000014	0.0004	0.04	0.00001	0.00009	0.00047	0.000005	0.000002
3rd Quartile		7.89	7.7	4	0.0025	0.00095	0.000267	0.00063	0.0017		60.5					0.0241	0.000021	0.0004	0.065	0.00001	0.00011	0.00052	0.000008	0.000002
Count Over CWQG		0	0	0	0	0	0	0	0		0					0	4	0	0	0	0	0	0	0
% Over CWQG		0	0	0	0	0	0	0	0		0					0	57.1	0	0	0	0	0	0	0

Lightning Creek Reference Station KV-37 - Production Phase

Sample Date	Sample Class	pH-F	pH-L	TSS	As-T	Cu-T	Pb-T	Ni-T	Zn-T	R-226	Hard-T	Alk-T	N-NH3	N-NO3	N-NO2	Al-T	Cd-T	Cr-T	Fe-T	Hg-T	Mo-T	Se-T	Ag-T	Tl-T
		pH units	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CWQG CCME-Aquatic		**6.5-9**	**6.5-9**		**0.005**	*	*	*	**0.03**				**0.239**	**2.935**	**0.06**	*	*	**0.001**	**0.3**	**0.000026**	**0.073**	**0.001**	**0.0001**	**0.0008**
10/6/2010	P	7.83	7.52	1	0.00223	0.00036	0.000266	0.00028	0.0019		61.9	34				0.0066	0.000015	0.0006	0.038	0.000005	0.00013	0.00054	0.000003	0.000001
2/8/2011	P	7.98	7.52	2	0.00267	0.00041	0.00028	0.00073	0.0011		58	38				0.0078	0.000008	0.0003	0.047	0.000005	0.00015	0.00051	0.000003	0.000003
5/25/2011	P	7.75	7.3	11	0.00336	0.00127	**0.00228**	0.00067	0.0049		27.8	11				0.0711	**0.000067**	0.0004	0.165	0.000005	0.00008	0.00026	0.000023	0.000001
7/14/2011	P	7.71	7.55	1	0.00217	0.00089	0.000111	0.00047	0.0014		53.8	26				0.0288	0.000012	0.0003	0.059	0.000005	0.00009	0.00038	0.000003	0.000001
Average		7.82	7.47	4	0.00261	0.00073	0.000734	0.00054	0.0023		50.4	27				0.0286	0.000026	0.0004	0.077	0.00001	0.00011	0.00042	0.000008	0.000001
Count		4	4	4	4	4	4	4	4		4	4				4	4	4	4	4	4	4	4	4
Minimum		7.71	7.3	1	0.00217	0.00036	0.000111	0.00028	0.0011		27.8	11				0.0066	0.000008	0.0003	0.038	0.00001	0.00008	0.00026	0.000003	0.000001
Maximum		7.98	7.55	11	0.00336	0.00127	0.00228	0.00073	0.0049		61.9	38				0.0711	0.000067	0.0006	0.165	0.00001	0.00015	0.00054	0.000023	0.000003
Sum		31.27	29.89	15	0.01043	0.00293	0.002937	0.00215	0.0093		201.5	109				0.1143	0.000102	0.0016	0.309	0.00002	0.00045	0.00169	0.00003	0.000006
Count <DL		0	0	0	0	0	0	0	0		0	0				0	0	0	0	4	0	0	3	3
Standard Deviation		0.12	0.12	5	0.00055	0.00043	0.001033	0.0002	0.0017		15.4	12				0.0301	0.000028	0.0001	0.059	0	0.00003	0.00013	0.00001	0.000001
1st Quartile		7.74	7.46	1	0.00221	0.0004	0.000227	0.00042	0.0013		47.3	22				0.0075	0.000011	0.0003	0.045	0.00001	0.00009	0.00035	0.000003	0.000001
Median		7.79	7.52	2	0.00245	0.00065	0.000273	0.00057	0.0016		55.9	30				0.0183	0.000013	0.0003	0.053	0.00001	0.00011	0.00045	0.000003	0.000001
3rd Quartile		7.87	7.53	4	0.00284	0.00098	0.00078	0.00069	0.0027		59	35				0.0394	0.000028	0.0004	0.085	0.00001	0.00013	0.00052	0.000008	0.000002
Count Over CWQG		0	0	0	0	0	1	0	0		0	0				0	1	0	0	0	0	0	0	0
% Over CWQG		0	0	0	0	0	25	0	0		0	0				0	25	0	0	0	0	0	0	0

APPENDIX D

PHYSICAL INSPECTION AND REPORTING PLAN (OCT 2010), WATER LICENCE QZ09-092



Alexco Keno Hill Mining Corp
1150-200 Granville Street
Vancouver BC V6C 1S4

October 19, 2010

Yukon Water Board
Suite 106, 419 Range Road
Whitehorse, Yukon Y1A 3V1

Attention: Ms. Carola Scheu, Manager

Dear Ms. Scheu:

Re: Bellekeno Mine Water Licence QZ09-092, Physical Inspections and Reporting Plan

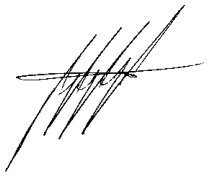
Pursuant to Clause 92 of QZ09-092, please see attached Physical Inspections and Reporting Plan. This plan describes the physical inspections and reporting which will be carried out for all water retaining structures, water conveying structures, and mine waste structures related to the project.

Several of the structures for which physical inspections and reporting are to be undertaken have not yet been constructed (e.g. water conveyance pipeline from Galkeno 900 to the mill site, Non-AML Waste Rock Disposal Area). Until these

structures have been constructed, it will be noted as such in routine reporting to the Board.

Should you have any questions, please contact our office at (604)-663-4888.

Sincerely,
Alexco Keno Hill Mining Corp



Robert L. McIntyre, R.E.T.
Vice President, Business Development
Alexco Keno Hill Mining Corp

cc. external D. Buyck, FNNND, R. Holmes, YG EM&R, R. Lamb, YG Environment, S. Arell, Environment Canada
cc. internal C.Nauman, B.Thrall, T.Hall, T. Fudge, J. Harrington, Alexco Resource Corp.
E. Allen, T. Lunday, R. Schneider, S. Davidson, Access Consulting Group

Attachments:

A. *QZ09-092 Physical Inspections and Reporting Plan*

Alexco Keno Hill Mining Corp.
Bellekeno Mine Operations

Physical Inspection and Reporting Plan

Water Use Licence QZ09-092

October 2010

Prepared by:

ACCESS CONSULTING GROUP

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Appendix A Physical Inspection Weekly Checklist

Appendix B Physical Inspection Monthly Checklist

Appendix C DSTF OMS Manual Section 9 -- Surveillance

1.0 INTRODUCTION

1.1 *Purpose of Plan*

This plan is submitted to fulfill the conditions set out in Part H, Clauses 92, 93 of Water Licence QZ09-092 issued to Alexco Keno Hill Mining Corp on August 19th 2010:

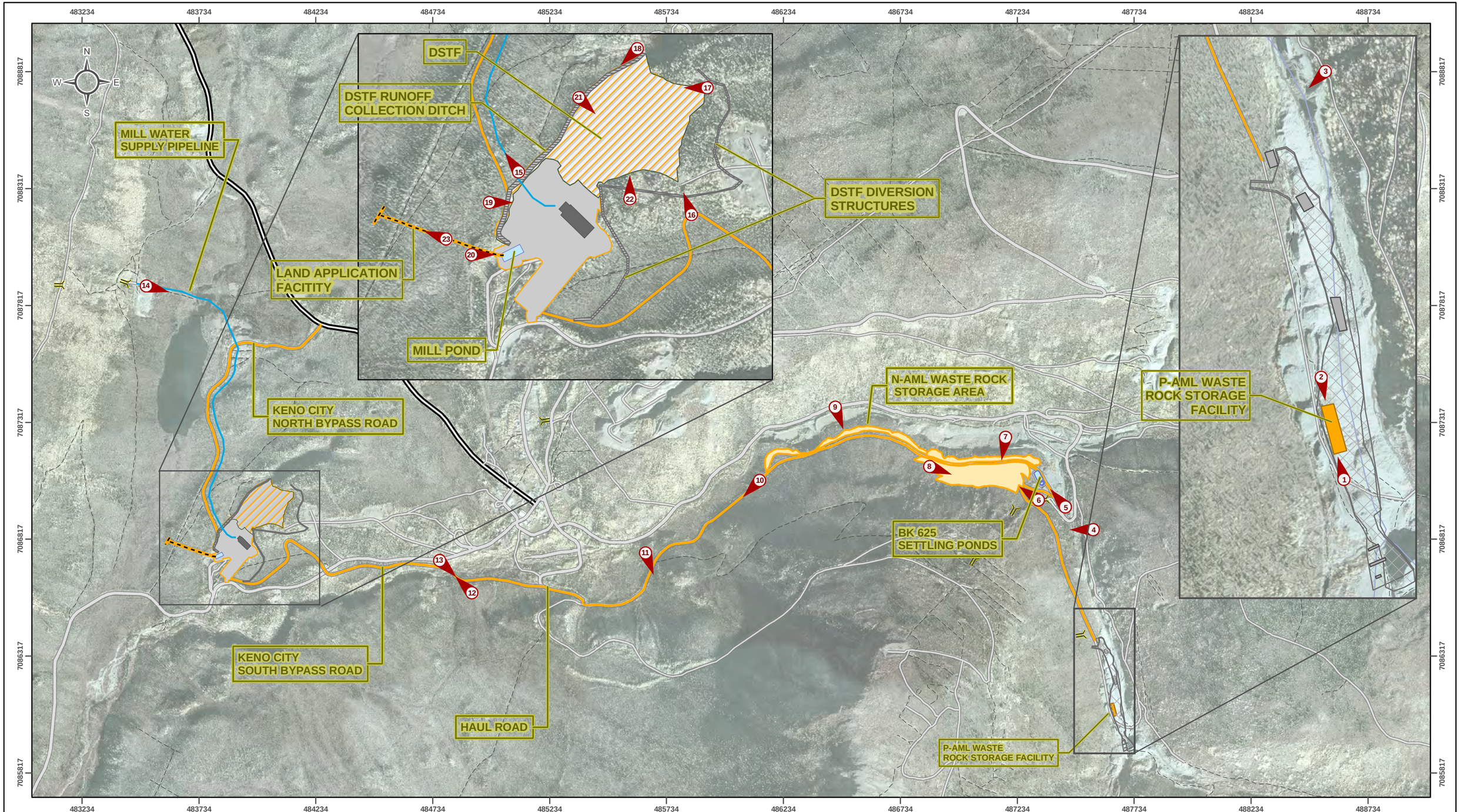
> *92. Within 60 days of the effective date of this licence, the licensee shall submit to the Board a plan titled "Physical Inspection and Reporting Plan for all water retaining structures, water conveying structures, and mine Waste structures and shall implement that plan.*
>
> *93. Inspections will be conducted on at least a weekly basis for all structures identified in the Bellekeno Physical Inspections and Reporting Plan.*

This plan outlines the Physical Inspection and Reporting methodology that will be used during mining operations at the Bellekeno Mine and Mill on Alexco's Keno Hill property.

2.0 MINE LOCATION AND DESCRIPTION

The Keno Hill Silver District is located in central Yukon Territory, 354 km (by air) due north of Whitehorse. The Bellekeno mine area is located approximately 3 km east of Keno City within the Keno Hill Silver District. The mill site and Dry Stack Tailings Facility (hereinafter referred to as the "DSTF") are located approximately 1 km west of Keno City.

The portal at Bellekeno East is located on a steep slope above Thunder Gulch, a narrow tributary of Lightning Creek, and the haul road access to the mill site is provided by an approximately 3 km access road which crosses Lightning Creek approximately 2200 meters downstream from the confluence of Thunder Gulch and Lightning Creek. Please refer to see Figure 1 for the site map.



National topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:50,000. Reproduced under license from Her Majesty the Queen , as represented by the Minister of Natural Resources Canada. All rights reserved. NTS sheets 105M13, 105M14, 106D3 and 106D4. Aerial photography flight date: July 13th 2009. Ortho-rectification produced by Challenger Geomatics Ltd. The location of the photo hubs are approximate and subject to change. Some mine and mill feature footprints are subject to change.

Datum: NAD 83; Map Projection: UTM Zone 8N

1:15,000 (when printed on 11 x17 inch paper)

0 0.25 0.5 0.75 1 Kilometers

Point Features

- Adit
- Photo Hub Location (Photo direction as shown by point)

Road Types

- Haul Road
- Highway
- Local
- Track
- Trail

Mill Site Features

- Mill Water Supply, Conceptual
- Mill Pond Discharge

Mill Site Features

- Mill
- Mill Pond
- Diversion Structure/Flume
- DSTF Footprint
- Mill Site Area

Mine Site Features

- BK East Portal Area
- Non AML Waste Rock Disposal Area
- Temporary Potential - AML Waste Rock Storage Facility
- Settling Pond
- Mine Feature Footprint

ALEXCO

ACCESS

BELLEKENO MINE

WUL- QZ09-92
PHYSICAL INSPECTION AND REPORTING PLAN
FIGURE 1 - SITE MAP

Drawn By: MD	OCTOBER 2010	Verified by: RM/EA

D:\Project\AllProjects\ALEX-05-01\Bellekeno\GIS\mxd\Physical_Inspection_Reporting_Plan\October_2010.mxd

3.0 PHYSICAL INSPECTION LOCATIONS

As per Part H, Clause 94 of Water Licence QZ09-092, the areas to be inspected include:

- Bellekeno 625 settling ponds;
- Non-AML Waste Rock Disposal Area;
- Potential-AML Waste Rock Storage Facility;
- Access and haul roads;
- Mill site & DSTF collection and sedimentation pond; and
- Dry stack tailings facility.

Additional water retaining or conveying structures associated with the project which will be included in the physical inspection schedule by Alexco include:

- Mill water supply pipeline between Galkeno 900 and mill site;
- Mill site & DSTF collection and sedimentation pond land application system
- Mill site water diversion structures; and
- Mill site and DSTF water collection structures.

4.0 PHYSICAL INSPECTION SCHEDULE

The physical inspection schedule is shown in Table 1 below.

Table 1 Physical Inspection Schedule

Physical Inspection Location	Inspection Schedule		Monthly Photo Documentation
	Weekly	Monthly	
Bellekeno 625 settling ponds	x		x
Mill site & DSTF collection and sedimentation pond	x		x
Potential-AML waste rock storage facility	x		x
Non-AML waste rock disposal area		x	x
Access and haul roads		x	x
Dry stack tailings facility*			x
Water supply pipeline between Galkeno 900 and mill		x	x
Mill site water diversion structures	x**	x	x
Mill site and DSTF water collection structures	x**	x	x
Mill site & DSTF collection and sedimentation pond land application system		x	x

*See Appendix C for DSTF inspection schedule
**Weekly during freshet and other periods of high rainfall/runoff

The physical inspection for the all water retaining structures above structures will be conducted on a weekly basis. These include the Bellekeno 625 settling ponds, the Potentially-AML Waste Rock Storage Facility at Bellekeno East, and the Mill site & DSTF collection and sedimentation pond.

All remaining water conveying and mine waste features will be subject to physical inspection on a monthly basis with photo documentation occurring monthly for all sites.

5.0 PHYSICAL INSPECTION METHOD

The purpose of the physical inspection is to observe and record sufficient information to allow for the identification of areas or issues that could potentially require modification, repair or rehabilitation as required.

Physical inspections will consist of visual inspections conducted by competent and trained field operators. The operators will document the condition of the various infrastructure at each location and record any non-standard observations (e.g. excessive icing, rilling of soils, sloughing). Maintaining clear and accurate records is as important as the physical inspection process itself, so documentation is carried out by the use of an inspection checklist. This will ensure that the inspections, even if carried out by different field personnel on different days, will record information of a similar nature.

5.1 *Photo Documentation*

Photo hubs (physical locations where photos are to be repeatedly taken) will be selected to document the features as listed in Section 3 above. Approximate locations of photo hubs are shown in the overview map (Figure 1), and a detailed list and description of these photo hubs is included in Table 2 below.

Table 2 Approximate Photo Hub Descriptions

Photo Hub #	Photo Hub Description
1	P-AML waste rock storage facility 1
2	P-AML waste rock storage facility 2
3	Bellekeno mine haul road (Non-AML Waste Rock) from opposite Thunder Gulch
4	Bellekeno East portal pad (Non-AML Waste Rock) from opposite Thunder Gulch

5	Bellekeno 625 settling pond 1
6	Non-AML Waste Rock Disposal Area 1
7	Non-AML Waste Rock Disposal Area from opposite Lightning Creek 1
8	Non-AML Waste Rock Disposal Area 2
9	Non-AML Waste Rock Disposal Area from opposite Lightning Creek 2
10	Powerline Road (Non-AML Waste Rock)
11	Powerline Road (Non-AML Waste Rock) from opposite Lightning Creek
12	Keno City South Bypass Road (Non-AML Waste Rock) 1
13	Keno City South Bypass Road (Non-AML Waste Rock) 2
14	Mill water supply pipeline 1
15	Mill water supply pipeline 2
16	Mill site water diversion structures 1
17	Mill site water diversion structures 2
18	Mill site and DSTF water collection structures 1
19	Mill site and DSTF water collection structures 2
20	Mill site & DSTF collection and sedimentation pond 1
21	Dry Stack Tailings Facility 1
22	Dry Stack Tailings Facility 2
23	Mill site & DSTF collection and sedimentation pond land application system

GPS coordinates of the photo hubs will be uploaded onto the Site Inspection Map, to accompany inspection to ensure the inspections can be conducted by different personnel. The photo hub sites will be visited for photographic documentation on a monthly basis. The photos will be circulated to appropriate internal technical staff, in case notable changes are identified.

5.2 *Inspection Checklists*

Inspection checklists will be filled out on a weekly basis to ensure structural integrity of mine components and that runoff and discharge is being appropriately managed (see Appendix I). The following rating system will be used in the field reporting to evaluate the structural integrity of the areas to be physically inspected:

Excellent “As New” Condition.

Good System or element is sound and performing its function; although it shows signs of use and may require some minor repairs, mostly routine.

Fair System or element is still performing adequately at this time, but needs "priority" and/or "routine" repair to prevent future deterioration and to restore it to good condition. A fair rating will be reported to site manager after the inspection.

Poor System or element cannot be relied upon to continue to perform its original function without "immediate" and/or "priority" repairs. A poor rating will be reported to site manager after the inspection. The site manager will then be responsible to immediately re-ascertain whether or not the system or element is safe for use for the next 24 hours.

If issues are identified during the weekly inspections of structures, works and installations (e.g. waste rock storage area, overburden stockpiles, embankments, diversion ditches, sediment ponds, and pipelines) the site manager will be informed immediately and the appropriate mitigative measures will be implemented. An inspection by a qualified geotechnical engineer would be undertaken for physical stability if necessary. Additional erosion and sediment controls may also need to be implemented as required. If fair or poor conditions are noted during an inspection, NND will be notified of the details and of any planned mitigative action.

If geotechnical inspections are required, they will be carried out during the summer months when the surface and sides of the various rock-fill structures are not obscured by snow.

5.3 *DSTF Surveillance, Inspection and Monitoring*

As a requirement of QML-0009, a dry stack tailings facility Operation Maintenance and Surveillance (OMS) manual was prepared by EBA Engineering Consultants Ltd. on behalf of Alexco. The OMS Manual forms part of the Dry Stack Tailings Facility Construction and Operation Plan under QML-0009. In addition to physical inspection and monitoring measures described in this plan, the OMS Manual describes more detailed operational physical inspection and monitoring.

Section 9 of the OMS Manual deals with surveillance and physical inspection of the DSTF, and is provided attached as Appendix C.

6.0 REPORTING

As per clause 54 of Water Licence QZ09-092:

> *Unless otherwise specified in this licence, all monitoring data, reports, plans, studies, study results, designs or manual shall be submitted to the Board in the following format:*
>
> *a) All reports required to be submitted to the Board will be unbound and reproducible by standard photocopier, accompanied by one electronic copy on a CD/DVD.*
> *b) The Licensee shall provide to the Board 5 additional copies of all reports. The additional copies may be either 5 bound paper copies or 5 electronic copies on individual CDs/DVDs.*
> *c) Electronic copies shall be IBM compatible in one of the following formats: Word 97-2003, Excel 97-2003 workbooks, or Adobe .pdf format. Water quality results must be presented in Excel 97-2003 .xls format.*

The results of the weekly physical inspections will be summarized from the weekly inspection checklists and incorporated into the annual reports (as per section 55 of the licence). Requirements of the annual reports are outlined in sections 55 and 56 of the Water Licence.

The weekly and monthly physical inspection checklists in addition to monthly photo documentation will be kept on file internally for proof of inspections and for reference as required.

Alexco Keno Hill Mining Corp.

Physical Inspection and Reporting Plan

Water Use Licence QZ09-092

Appendix A

Weekly Checklist for Water Retaining Structures

Physical Monitoring Program Water Retaining Structures Weekly Inspection Checklist

Date:

Check ☑ if correct or ☒ if not (record details in spaces below) Rating Scale: Excellent, Good, Fair or Poor

	Bellekeno 625 Settling Ponds	Mill Site & DSTF Collection/Sedimentation Pond	Bellekeno P-AML Waste Rock Storage Facility
General			
Check visually			
Photo(s) taken?			
Checked after storm event?			
Materials being disposed of in assigned areas?			
Soil/Rock Structures			
Check for movement?			
Crest checked?			
Tension Cracks?			
Toe checked?			
Seepage?			
Sinkholes?			
Depressions?			
Bulging?			
No creep?			
No failure?			
Safe for use next 24 hrs?*			
Water Structures			
No loose material or exposed liner?			
Spillway clear?			
Checked for seepage?			
Good runoff management?			
Diversion clear?			
No failure?			
Safe for use next 24 hrs?*			
Limits adhered to?			
Piping			
Leaks?			
Signs of wear?			
Inspector's Initials			

* Site Manager must countersign "safe for use next 24 hours" in any case where any "poor" rating is given

Comments (recommendations / corrective actions required)

Alexco Keno Hill Mining Corp.

Physical Inspection and Reporting Plan

Water Use Licence QZ09-092

Appendix B

Monthly Checklist

Physical Monitoring Program Monthly Inspection Checklist

Date:

Check ☑ if correct or ☒ if not (record details in spaces below) Rating Scale: Excellent, Good, Fair or Poor								
	Non-AML Waste Rock Storage Facility	Mill Water Supply Pipeline	Mill Site Water Diversion Structures	Mill Site Water Collection Structures	Access and Haul Roads			
					Upper Road	Powerline Road	Keno City Bypass South	Keno City Bypass North
General								
Check visually								
Photo(s) taken?								
Checked after storm event?								
Materials being disposed of in assigned areas?								
Soil/Rock Structures								
Check for movement?								
Crest checked?								
Tension Cracks?								
Toe checked?								
Seepage?								
Sinkholes?								
Depressions?								
Bulging?								
No creep?								
No failure?								
Safe for use next 24 hrs?*								
Water Conveyance Structures								
No loose material or exposed liner?								
Spillway clear?								
Checked for seepage?								
Good runoff management?								
Diversion clear?								
No failure?								
Safe for use next 24 hrs?*								
Limits adhered to?								
Piping								
Leaks?								
Signs of wear?								
Inspector's Initials								

* Site Manager must countersign "safe for use next 24 hours" in any case where any "poor" rating is given

Comments (recommendations / corrective actions required)

Alexco Keno Hill Mining Corp.

Physical Inspection and Reporting Plan

Water Use Licence QZ09-092

Appendix C

Dry Stack Tailings Facility Surveillance and Physical Inspection



Alexco Keno Hill Mining Corp.

REVISION 2010-1

OPERATION, MAINTENANCE, AND SURVEILLANCE MANUAL
DRY STACK TAILINGS FACILITY
KENO HILL DISTRICT MILL, YT

EBA FILE: W14101178.008

September 2010

PREPARED BY EBA ENGINEERING CONSULTANTS LTD

EBA Engineering Consultants Ltd.
p. 867.668.3068 • f. 867.668.4349
Calcite Business Centre • Unit 6, 151 Industrial Road • Whitehorse, Yukon Y1A 2V3 • CANADA

9.0 SURVEILLANCE

9.1 OBJECTIVE

Surveillance involves inspection and monitoring of the operation, structural integrity, and safety of the DSTF, and must be consistent with the life cycle and regulatory requirements of the facility. Surveillance of the DSTF consists of both routine and event-driven activities.

Key surveillance parameters and procedures must be identified for:

- Monitoring the operation, safety, and environmental performance of the DSTF;
- Promptly identifying and evaluating deviations from expected behaviour that affect operation safety, structural integrity, and environmental performance of the facility; and
- Reporting significant observations for response.

The DSTF surveillance program will continue to evolve as the facility changes in design or performance criteria, site conditions and/or the operation it is accommodating.

All personnel working at the DSTF will be involved in surveillance as a routine part of daily activities, maintaining visual awareness of the facility in the course of their regular and/or routine duties, in addition to surveillance-specific site engineering, instrument monitoring, analysis, inspection, periodic review and oversight.

It is the combination of all the regular inspections assisted by the eyes of all site personnel that ensures continued integrity and performance of the facility.

Outside consultants will also be on site periodically inspecting the facility as part of a regular program of expert review.

9.2 RESPONSIBILITY

A number of personnel conduct routine inspections of the DSTF. The Construction Monitor, or his designated replacement is assigned the responsibility of obtaining the monitoring information and preparing a monthly report for the facility designer and geotechnical consultant to review.

9.3 SURVEILLANCE PARAMETERS

Key parameters of surveillance are identified through identifying and describing potential failure modes of the DSTF.

Visual observations of the DSTF can indicate potential failure modes such as:

- Surface – cracking, bulging, depressions, sink holes;
- Seepage – new seepage areas, changes in seepage areas;
- Turbid water in the natural drainages around or downstream of the facility;
- Water or tailings flowing down the stack indicating improper grading; and

- A failure or breach of a component of the facility.

Routine monitoring for ensuring facility performance include:

- Checking for settlement or holes in embankment crest or benches;
- Checking for holes on the surface of the tailings indicating possible piping of material to outside;
- Checking for dust;
- Measuring water levels in monitoring wells located in the foundation soils during operation;
- Measuring ground temperatures using cables in the foundation soils during operation;
- Surveying DSTF components - displacements of survey monuments;
- Measuring slope inclinometers located in the foundation soils;
- Water sampling of Christal Creek; and
- Recording weather conditions.

These parameters are further described in the following sections.

9.4 SURVEILLANCE PROCEDURES

Table 13 summarizes surveillance requirements for the components of the DSTF. These surveillance requirements are the licensed monitoring requirements and conditions regarding the tailings presented in Alexco's Quartz Mining and Water Use licenses.

TABLE 13: OPERATIONAL MONITORING SCHEDULE FOR DSTF

Frequency	Provision	Source/Location	Personnel	Scope	Deliverable
Periodically During Construction	EBA Design Report and Quality Assurance Program	Entire Facility	Engineering Supervision	Follow monitoring and inspection procedures in Quality Assurance Program	Interim Reporting to Site Management with recommendations for construction process
Weekly	EBA Design Report and Quality Assurance Program	Structure of the tailings (toe, dam, tailings, etc.)	Operational personnel	Visual assessment of tailings, diversion berms, collection ditches, conveyance channel and water collection pond.	Daily Log, included in annual report.
Weekly	EBA Design Report and Quality Assurance Program	Tailings final runoff	Operational personnel	Visual inspection for suspended solids and erosion evidence.	Daily Log, included in annual report.

TABLE 13: OPERATIONAL MONITORING SCHEDULE FOR DSTF – CONT'D					
Weekly	EBA Design Report and Quality Assurance Program	Toe runoff collection ditches and conveyance channel	Operational personnel	Visual inspection for failures (possible or occurring) with more frequent checks during spring breakup period	Daily Log, included in annual report.
Weekly	EBA Design Report and Quality Assurance Program	Tailings Material	Operational personnel	Record tailings moisture content	Daily Log, included in annual report.
Weekly	Type A Water Licence Q209-092	Tailings Solids ABA Testing	Operational Personnel	Split a 200-500g sample from the daily 24-dried, metallurgical composite sample and retain in a plastic bag	Send a composite sample once per month to an accredited laboratory, as per Appendix C – evaluate results
Monthly	EBA Design Report	Groundwater Piezometer	Operational Personnel	Record readings and submit to VP Engineering for review	Results included in annual report.
Monthly	EBA Design Report	Ground Temperature Cable	Operational Personnel	Record readings and submit to VP Engineering for review	Results included in annual report.
Monthly	EBA Design Report	Settlement Monument Survey	Qualified Surveyor	Record elevations and submit to VP Engineering for review	Results included in annual report.
Monthly	Type A Water Licence Q209-092	Tailings Seepage	Operational Personnel	Sample and lab analysis of tailings supernatant, inspect for seepage, estimate flow	Representative samples shall be collected for laboratory analyses according to Set A[1] requirements outlined in the WUL.[2]
Monthly	EBA Design Report	Tailings Deposit	Operational Personnel	Confirm design moisture content density is being achieved	Results included in annual report.

TABLE 13: OPERATIONAL MONITORING SCHEDULE FOR DSTF – CONT'D					
Monthly	EBA Design Report	Tailings Disposal Basin	Qualified surveyor	A surface profile of the tailings along the centre line of the tailings disposal basin	Map and written description of profile.[2]
Annually	QML – Section 9.3.2	Tailings Disposal Basin	Professional engineer licensed to practice in the Yukon	Thorough visual assessment and physical inspection of the tailings, review of monitoring data to confirm design assumptions, preparation of inspection report	Representative samples shall be collected for laboratory analyses of grain size distribution, densities and moisture content.[2] Submission of inspection report.
Annually	Type A Water Licence Q209-092	Center Line of Tailings	Operational personnel	Full depth of tailings will be sampled at four stations along the center line.	Samples will be checked in the field for the presence of frozen tailings. Screen analyses will be done in the laboratory as a check on the homogeneity of the tailings and densities and moisture contents will be determined.[2]

Notes:

1 Set A - water quality analysis includes physical parameters, anions, nutrients, dissolved metals, total metals, and total suspended solids (Table 10.2 - WUL Application)

2 All results from the operation monitoring schedule will be included in the annual report to the Water Board

9.5 ADAPTIVE MANAGEMENT

Fundamental to successful adaptive management of the tailings production, handling and placement are triggers for management action. If the tailings handling and deposition is not meeting critical performance objectives according to specific conditions within either the WUL or the QML, the General Manager will be expected to follow Table 14 for appropriate corrective action. Close monitoring of the performance of the DSTF will be critical in determining if and when action will be required. It is expected that improvements will be made to the system on an ongoing basis once initial operating experience has been gained.

TABLE 14: TRIGGERS AND ACTIONS UNDER ADAPTIVE MANAGEMENT FOR TAILINGS MANAGEMENT			
Provision	Monitored Item	Triggers/Thresholds	Action
EBA Design Report	Groundwater Monitoring Wells	Tip @ 1.0 m or 1.7 m depth - Porewater pressure parameter (Ru) exceeds 0.15	Facility designer will review well data. Monitoring and review will be increased to semi-weekly until determined unnecessary.
		Tip @ 1.0 or 1.7 m depth - Porewater pressure parameter (Ru) exceeds 0.25	Facility designer will review existing well data Facility designer will conduct a site visit and determine if tailings placement and/or construction plan requires modification Monitoring and review will be increased to daily until determined unnecessary. Facility designer will determine if additional instrumentation is required. Facility designer will complete analysis of mitigative measures should exceedance continue.
EBA Design Report	Ground Temperature Cables	Temperature > 0°C at 1.5 m depth	Facility designer will review temperature data.
EBA Design Report	Ground Temperature Cables	Temperature > 0°C at 2.0 m depth and greater	Facility designer will review existing temperature data Facility designer will conduct a site visit and determine if tailings placement and/or construction plan requires modification Facility designer will determine if additional instrumentation or analysis is required. Facility designer will complete analysis of mitigative measures should exceedance continue. Alexco to complete survey of area of interest to monitor any future displacement, if any.

TABLE 13: TRIGGERS AND ACTIONS UNDER ADAPTIVE MANAGEMENT FOR TAILINGS MANAGEMENT – CONT.

Provision	Monitored Item	Triggers/Thresholds	Action
EBA Design Report	Survey Monuments and Slope Inclinometers	Displacements greater than 25 mm in any direction	Facility designer will review existing piezometer, temperature, and survey data. Facility designer will conduct a site visit and determine if tailings placement and/or construction plan requires modification. Monitoring and review will be increased to semi-weekly until determined unnecessary. Alexco to complete survey of area of interest to monitor any future displacement, if any. Facility designer will determine if additional instrumentation is required. Facility designer will complete analysis of mitigative measures should exceedance continue.
Water Licence Q209-092	Toe runoff collection ditches, conveyance channel and water collection pond	Presence of abnormal cracking or failure	Report to general manager, take corrective action as required
Water Licence Q209-092	Tailings Runoff	Visible turbidity in runoff and/or excessive erosion evidence	Address runoff at source; report to Water Board within 60 days Apply appropriate runoff, erosion or sediment control measures
Water Licence Q209-092	Tailings Solids	AML potential is indicated	Expand monitoring program Conduct study of options to minimize acid generation

9.6 DOCUMENTATION

Routine reporting of surveillance results is essential to provide time to make adjustments to existing systems or to initiate Emergency Response Plans. It is imperative that any unusual information (outliers) gathered from these undertakings be communicated to the facility designer, the General Manager and Chief Operating Officer.

Document control is vital to ensuring the ongoing performance of the facility. The topic was presented in Section 3.0.

Table 15 identifies the overall responsibilities for surveillance record keeping:

TABLE 15: DSTF SURVEILLANCE DOCUMENTATION		
Task	Responsible Party	Information Recipients
Daily Check Sheet	Completed by Construction Monitor	General Manager – copy; Mill Manager – copy; Bellekeno Mine Engineering Server
Monthly Placement As built	Completed by Construction Monitor	General Manager – copy; Mill Manager – copy; Bellekeno Mine Engineering Server EBA - copy
Instrumentation Data	Completed by Construction Monitor	General Manager – copy; Mill Manager – copy; Bellekeno Mine Engineering Server EBA – copy
Construction Photographs	Completed by Construction Monitor	General Manager – copy; Mill Manager – copy; Bellekeno Mine Engineering Server
ABA Testing	Completed by Geology Dept	General Manager – copy; Mill Manager – copy; Bellekeno Mine Engineering Server
Water Quality Monitoring	Completed by VP Corporate Affairs	General Manager, Mill Manager and Yukon Water Board Original reports located with General Manager

9.7 REPORTING

Observation of any unusual occurrence should be reported immediately to the General Manager, facility designer, and/or the Chief Operating Officer. Unusual occurrences include but are not limited to the following;

- Triggers/Thresholds outlined in Table 13;
- Any seismic event;
- Settlement, cracks or slumping of the tailings stack;
- Slope failure of any of the slopes;
- Abnormal seepage from any of the slopes;
- Increased or high turbidity flow from the drainage blanket; and
- Damage to any component of the DSTF.

All reports are to be maintained by the General Manager and filed in a suitable format and location for easy access by authorized mine personnel, and for review by government agencies. Annual performance reviews will be copied to the regulatory agencies.

The requirements of the consulting geotechnical engineer, other departments, or governmental agencies may dictate certain items that require inspection, monitoring, or reporting.

10.0 EMERGENCY PLANNING AND RESPONSE

10.1 BELLEKENO EMERGENCY PROCEDURES

The mine site has established procedures and response plans detailing in the following reports:

- A report by Access Consulting Group entitled "Alexco Keno Hill Mining Corp. Bellekeno Project, Monitoring and Surveillance Plan, QML-0009", dated November 2009 and submitted for the Type A Water Use License 2009.
- A report by Access Consulting Group entitled "Emergency Response Plan, QML-0009, Bellekeno Project", dated November 2009 and submitted for the Type A Water Use License 2009.
- MSDS documentation for any material used within the DSTF.

These documents provide the detailed plans on actions to be taken in case of an emergency. They also provide notification procedures.

10.2 DSTF EMERGENCY PROCEDURES

Daily visual and routine instrumentation monitoring programs outlined in Tables 12 and 13 are expected to forewarn of potential adverse conditions to the DSTF. Triggers/Thresholds presented in Table 13 must be adhered to and reported on as outlined.

The DSTF has been designed to maintain its structural integrity throughout its operational life; however, a number of conditions can affect the performance of the DSTF. Once the DSTF operations are being completed and instrumentation data is available, the requirement for additional emergency procedures will be reviewed as a part of the annual DSTF performance and OMS manual review.

10.3 ENVIRONMENTAL EMERGENCIES

Environmental emergencies of various natures and their specific response procedures are outlined in the project's Spill Contingency Plan. This document includes immediate response procedures and follow up and notification measures appropriate to the particular nature of the emergency.

10.4 KEY CONTACTS

Key contact information is detailed in Table A2, found in Appendix A.