



2017 ANNUAL REPORT

QUARTZ MINING LICENSE QML-0009

March 2018

Prepared for:

YUKON GOVERNMENT - ENERGY, MINES AND RESOURCES

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1 INTRODUCTION

Alexco Keno Hill Mining Corp. (AKHM) was issued Quartz Mining License (QML) QML-0009 on November 17, 2009. A request for amendment of this License to include mining activities at the Lucky Queen and Onek 990 Mines was submitted in 2012 and approved January 13, 2013. On February 17, 2016, an amendment to the QML was issued to include the Flame and Moth Mine. Prior to this, letters of approval for preliminary development of the Onek 990 and Lucky Queen Mines were received in November 2012.

On August 20, 2010, type A Water Licence QZ09-092 was issued to AKHM for operation of the Bellekeno Mine and Mill. Subsequently, on September 7th, 2010, the Bellekeno Mine became a “mine under development” as defined in subsection 1(1) and subsection 1(2) of the federal *Metal Mining Effluent Regulations*. On May 16, 2013, AKHM received an amendment (QZ12-053) to Water Licence QZ09-092 to similarly include the Lucky Queen and Onek 990 Mines. This report serves to fulfill the reporting requirements of the QML as defined under paragraphs 12.5 of QML-0009 and Section 14.0 of the Monitoring and Surveillance Plan. The district operations were placed in temporary closure in September 2013; therefore, no mining or milling activities occurred in 2014, 2015 or 2016. Activities in 2014 to 2017 focused on care and maintenance, water treatment, and monitoring, with the addition of collaring the Flame and Moth portal and mill maintenance in 2016 and preparation earth work for the Flame and Moth water treatment pond in 2017.

1.1 LOCATION

The Keno Hill Silver District (KHSD), owned and operated by AKHM, is located in the vicinity of Keno City (63° 55'N, 135° 29'W), in central Yukon, 354 km (by air) due north of Whitehorse. 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); a total distance of 452 km. The property lies along the broad McQuesten River valley with three prominent hills to the south of the valley. Figure 1-1 shows the general project location within Yukon while Figure 1-2 shows the location on a smaller scale. The Bellekeno Mine is located about 3 km east of Keno City, the Onek 990 Mine is about 0.5 km to the northeast of Keno City, the Keno Hill Silver District Mill site and Flame and Moth portal are about 1.2 km to the west (Figure 1-3), while the Lucky Queen Mine is about 4 km to the north of Keno City.



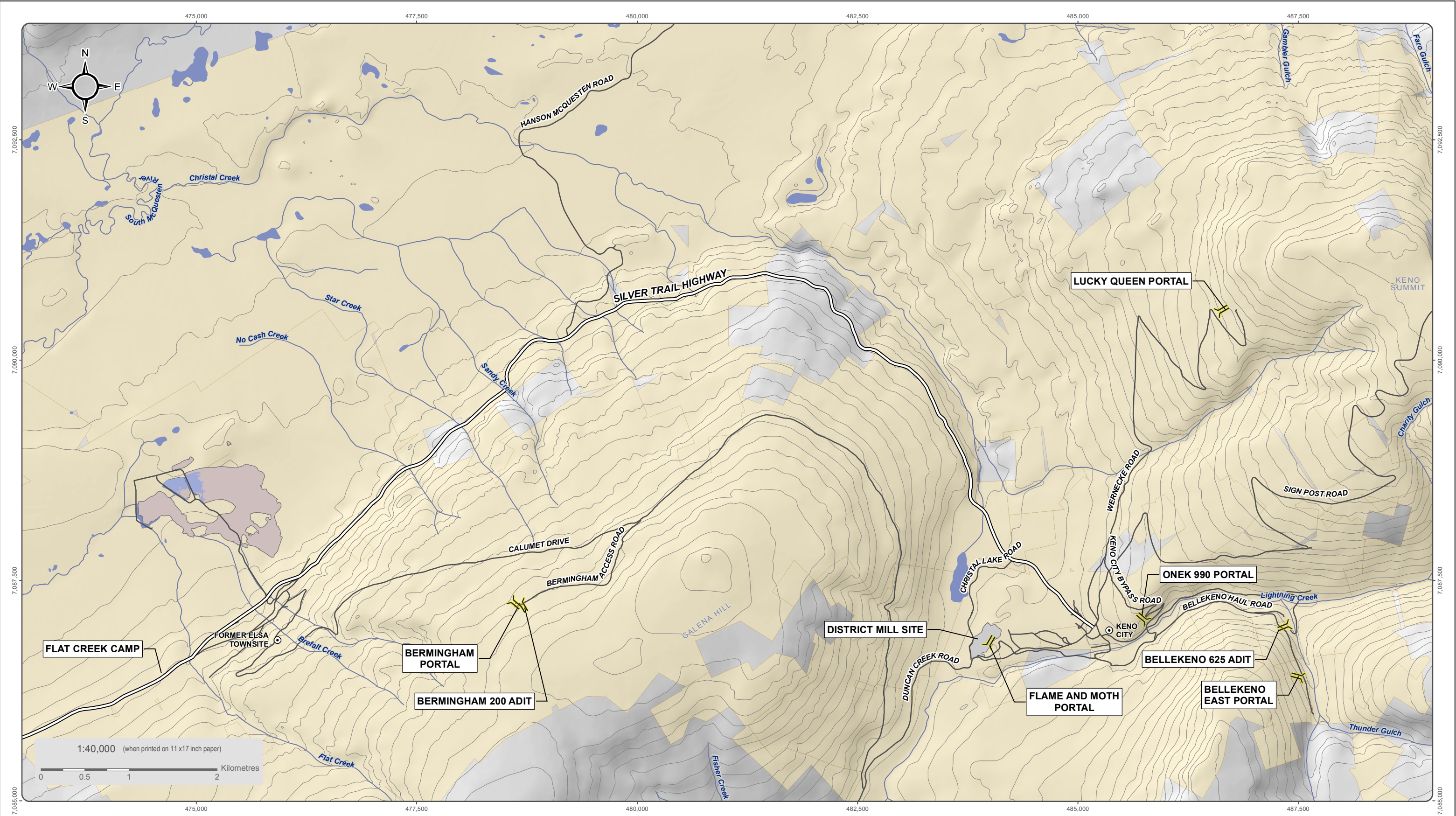
ALEXCO KENO HILL MINING CORP.
ANNUAL QUARTZ MINING LICENCE REPORT,
QML-009

FIGURE 1-1 PROJECT LOCATION

MARCH 2018

D:\Project\AllProjects\ALEX-05-01\gis\mxd\Overview_Maps\Project-Location\Project_Location_ESRI_LAYERS_20170612.mxd (Last edited by: amaliaheva; 11/01/2018/14:18 PM)





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Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on March 2018

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

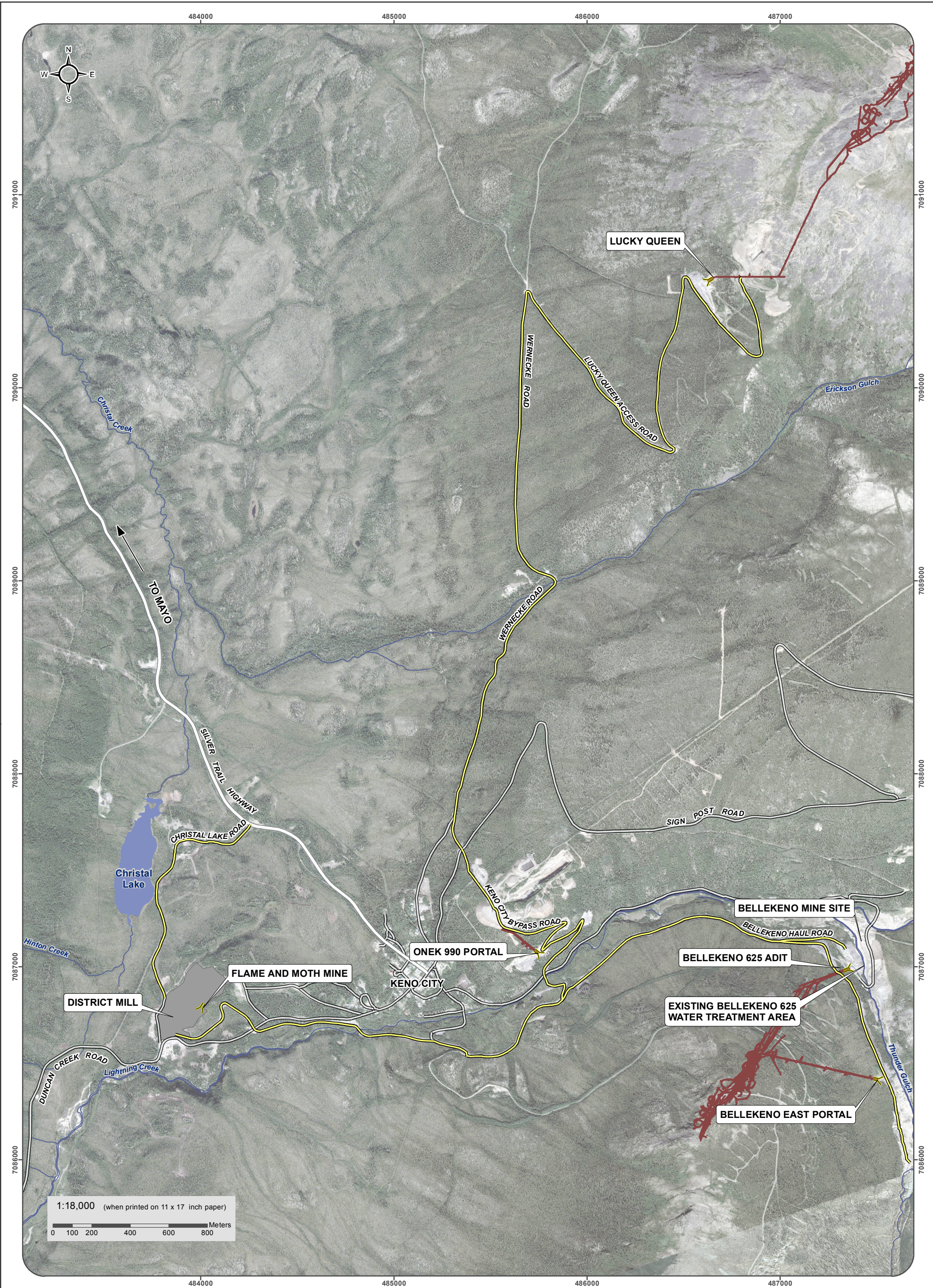
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- Place of Interest
- Adit
- Alexco/ERDC Quartz Claims

- Valley Tailings Pond
- Valley Tailings
- District Mill Footprint

- Silver Trail Highway
- Other Road





<div><div><div></div><div>Adit</div></div><div><div></div><div>District Mill Footprint</div></div><div><div></div><div>Underground Workings</div></div></div> <div><div><div></div><div>Silver Trail Highway</div></div><div><div></div><div>Other Road</div></div><div><div></div><div>Haul Road</div></div></div>	<div><div><div></div><div>AKHM</div></div><div><div></div><div>AEG</div></div></div> <div><div>ALEXCO KENO HILL MINING CORP. ANNUAL QUARTZ MINING LICENCE REPORT, QML-0009</div><div><div>FIGURE 1-3</div><div>BELLEKENO, FLAME AND MOTH, LUCKY QUEEN AND ONEK 990 LOCATION MAP</div></div><div><div>MARCH 2018</div><div><div>D:\Project\AllProjects\Keno_Area_Mines\ALL_SITES\02-Map\01_Overview\01-Property Overview\Overview_Portrait_Tab_20180305.mxd (last edited by: amullovskaya/06/03/2018/13:36 PM)</div></div></div></div>
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Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on March 2018

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2 MINING ACTIVITIES

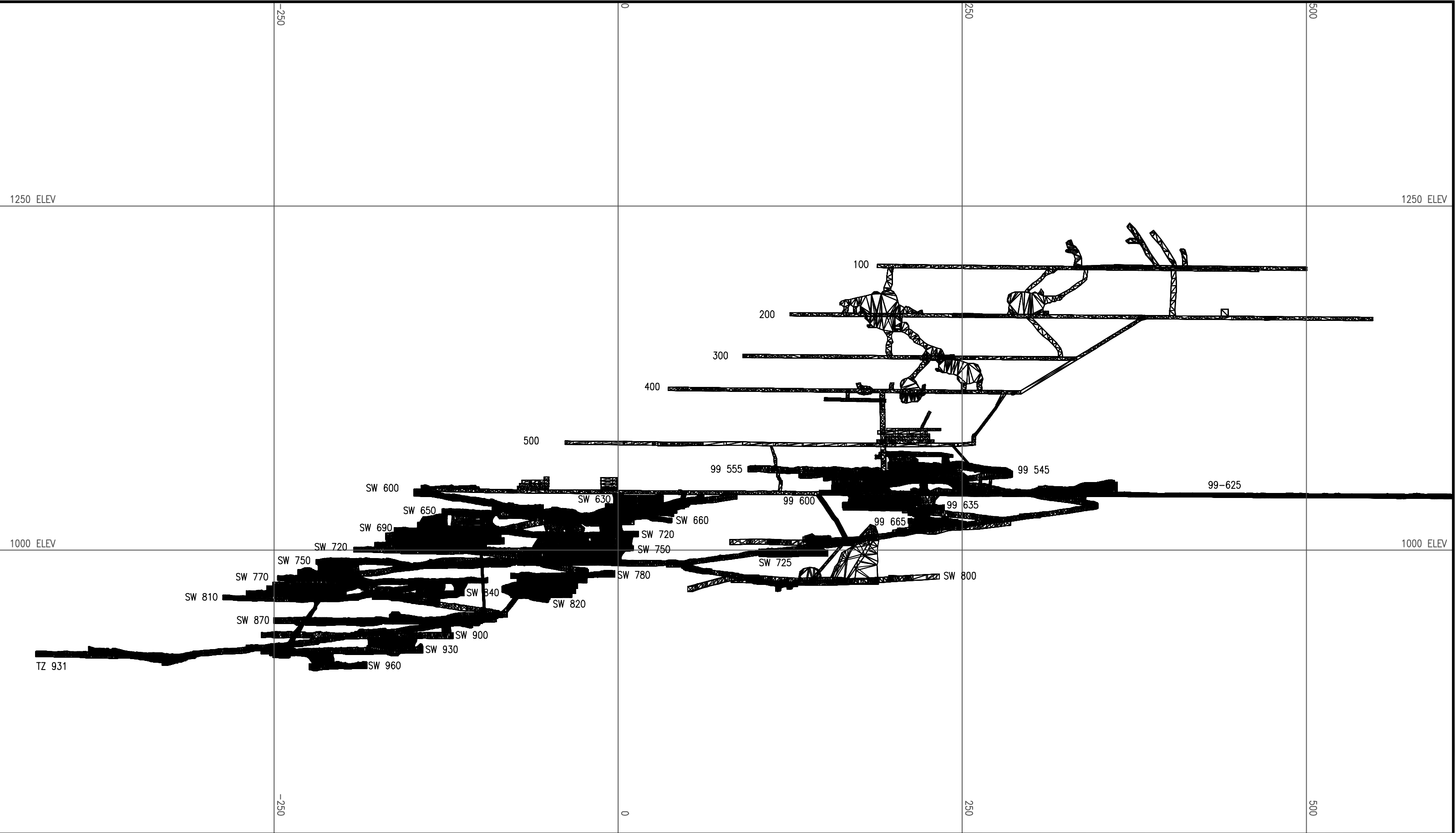
2.1 MINE SITES


2.1.1 Bellekeno

Underground development at Bellekeno was placed under temporary closure in September 2013 and no mining activities occurred in 2014 to 2017.

Production in 2013 focused mainly in the Southwest and 99 zones of the mine. The majority of development consisted of production mining of the Bellekeno ore body; specifically the SW and 99 Zone. In 2013 the CAPEX development was sustained in these zones. The waste rock development in 2013 focused on additional stope access within the Southwest and 99 zone as well as minor long term infrastructure development. The SW Main Ramp was extended down to the 930 and 960 levels for access to the lowest portion of the mine. Exploration drifting to the south of the known resources is continuing along what is termed the “Thunder Zone”. As-built drawings for the Bellekeno underground workings can be seen in Figure 2-1.

Production activities were carried out in accordance with the Operation Plans submitted as per paragraph 11.1 of QML-0009, and as described in the Project Description of Water Licence Application QZ09-092.



	ALEXCO RESOURCE CORP BELLEKENO MINE	DEPT.	APPROVED BY	DATE	COMMENTS	TITLE: BELLEKENO MINE Long Section Figure 2-1	
		SURVEY					
		ENGINEERING					
		GEOLOGY				Drawn by: DARIN BAKER	Scale: 1:2500
		ALEXCO MANAGER				Date: 07/28/2013	Approval: Date:
		PROCON SUPER				File: C:\Users\Darin Baker\Desktop\entire mine.dxf	

2.1.2 Lucky Queen

Underground rehab at Lucky Queen Mine (LQ) continued throughout the entire year in 2012 and new CAPEX development was initiated in Q4 2012 and was suspended in 2013 to allow a re-evaluation of the project. Currently the project is on hold pending re-activation of the district mining operations and no activities occurred at LQ in 2014 to 2017.

There were no issues in regards to stability or permanent closures in 2014. Preliminary activities for LQ were approved under the current QML-0009 on November 30, 2012. As-builts for underground workings can be seen in Figure 2-2.

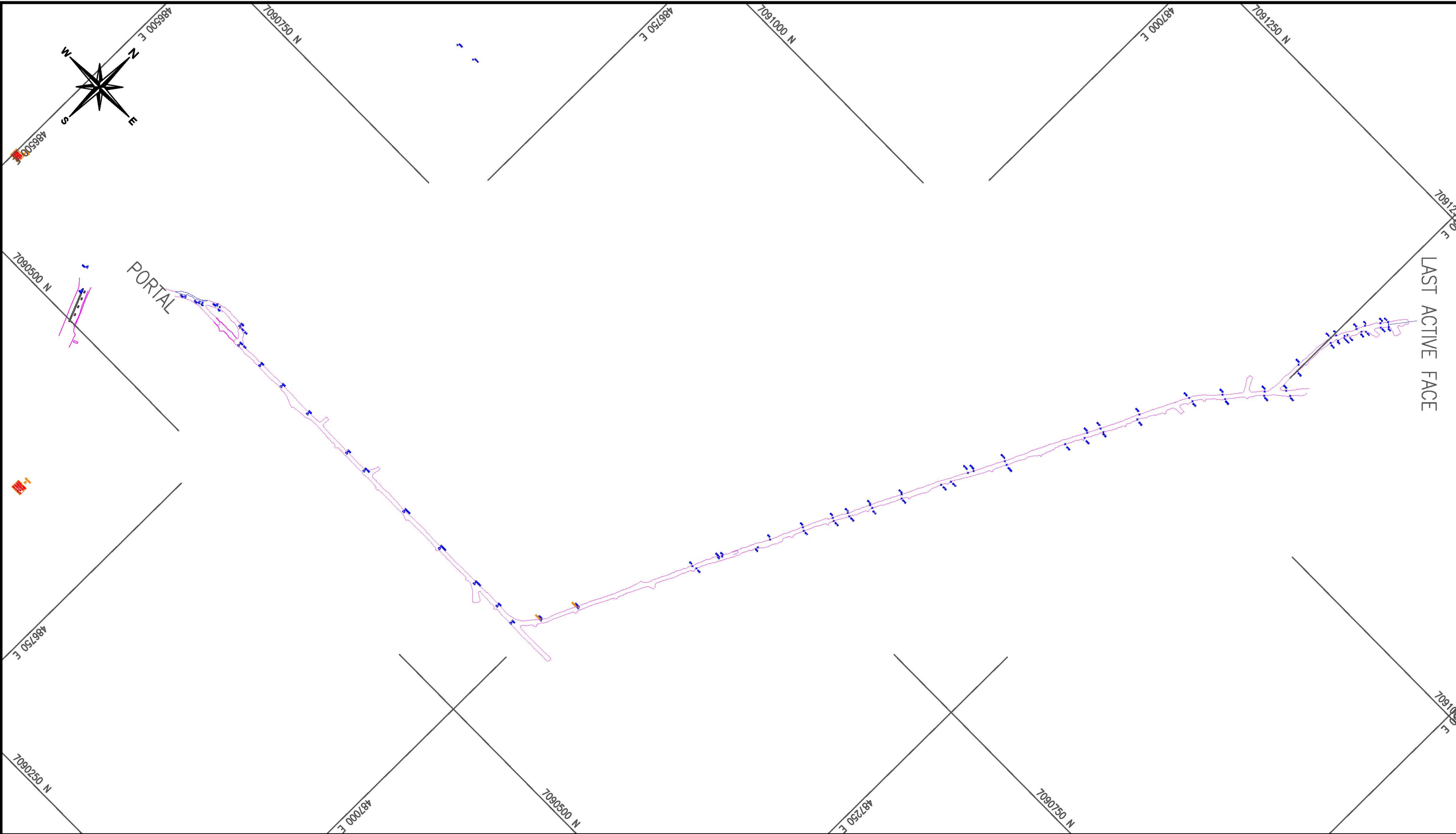
2.1.3 Onek 990


As discussed in the 2012 Pre-Season Summary Report submitted in March 2012, a new portal was to be prepared west of the historical Onek pit called Sign Post Portal. This development proceeded, however following continued community consultation, a new portal location, Onek 990, was found to be more suitable. The Onek 990 portal site is located near Lightning Creek.

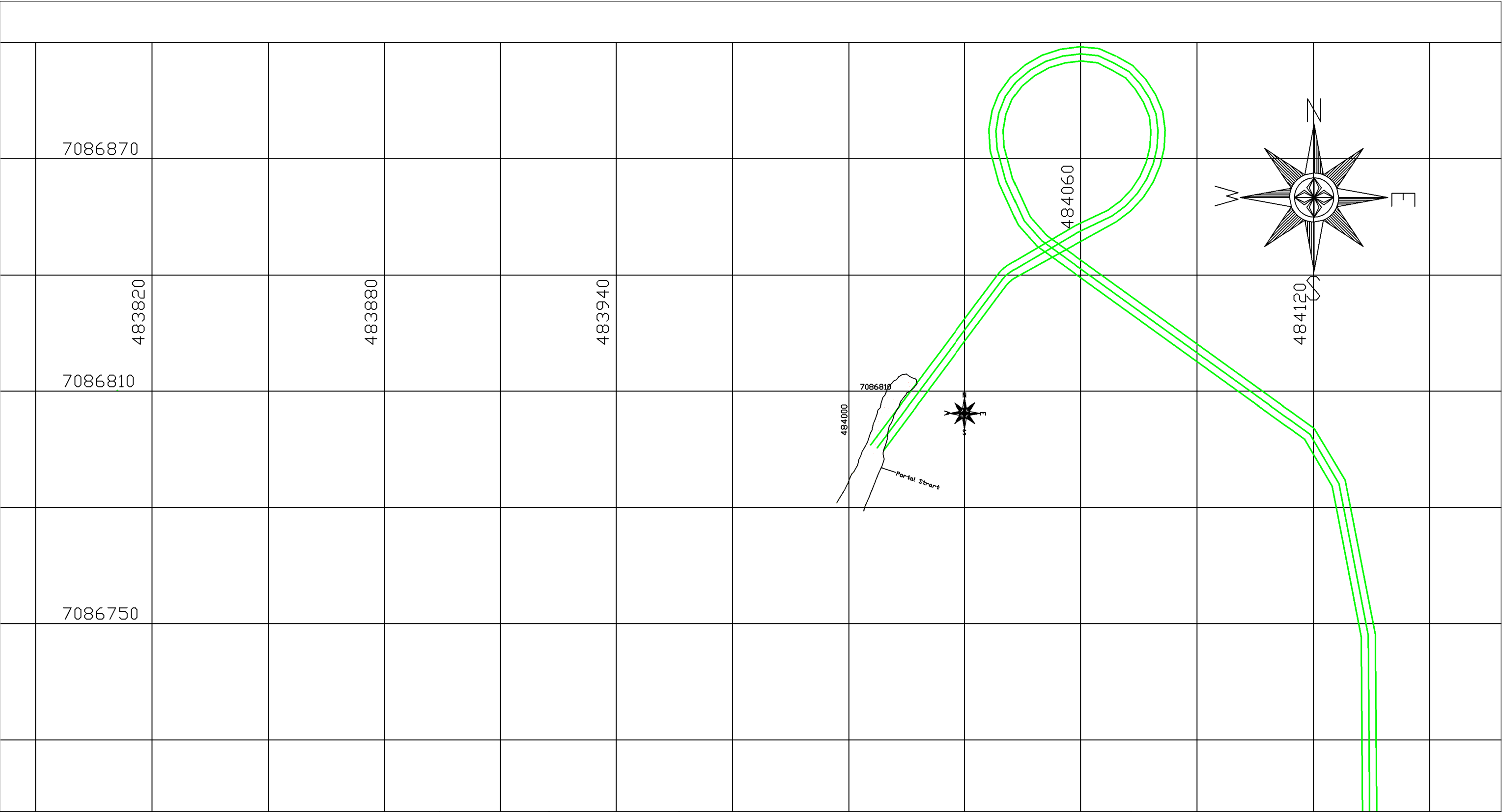
New infrastructure for the Onek 990 portal began in August 2012 and included 2 km of road building, site preparation, portal preparation, and was 80% complete by the end of 2012. CAPEX development was initiated and continued into 2013. The Onek 990 portal pad includes a temporary office/dry, shop, compressor and generator shed, several out buildings. A lay down area on the historic Onek waste rock dump is also being used. A final detailed bridge design has been submitted, permitted and construction completed in 2013 to connect the Onek connector road into the BK Haul road. Preliminary activities for the Onek 990 Mine were approved under the current QML-0009 on November 9, 2012. There were no temporary or permanent closures or stability issues that occurred in 2013, 2014, 2015, 2016 or 2017. No activities occurred at Onek 990 in 2017 to 2016. As-builts for underground workings can be seen in Figure 2-3. Remaining surface infrastructure was removed in 2017 and moved to Bermingham to support the advanced exploration program under LQ00240.

2.1.4 Flame & Moth

The Flame and Moth portal was collared in 2016 using a multi plate, which included the excavation of 22.5 m, of this length 6 m was developed with dimensions of 5 x 5 m and 16.5 m was developed with dimensions of 3.7 x 3.7 m. The development included 1,215 tonnes of N-AML waste rock that was used to create laydown areas for the project within the current District Mill site footprint. Figure 2-4 shows the as-built drawing for the Flame and Moth portal. A photo of the Flame and Moth portal is shown in Figure 2-5. No additional mine development was done in 2017.



 ALEXCO	ALEXCO RESOURCE CORP BELLEKENO MINE				DEPT.	APPROVED BY	DATE	COMMENTS	TITLE: LUCKY QUEEN MINE Asbuilt March 8, 2013 Figure 2-2	
	SURVEY								Drawn by: DARIN BAKER	
	ENGINEERING								Scale: 1:2500	
	GEOLOGY								Date: 03/08/2013	
	ALEXCO MANAGER								Approval: Date:	
	PROCON SUPER								File: C:\Users\Darin Baker\Documents\Drawing1.dwg	



ALEXCO RESOURCE CORP Flame & Moth Mine		DEPT.	APPROVED BY	DATE	COMMENTS	TITLE: <i>Flame and Moth Mine</i>	
		SURVEY				Development Plan	
		ENGINEERING				Figure 2-4	
		GEOLOGY				Drawn by: KF	Scale: As Shown
		ALEXCO MANAGER				Date: May 20, 2016	Approval: Date:
						File:	



Figure 2-5: Flame and Moth Portal

2.2 LIFE OF MINE AND RESERVES

Alexco does not report Mineral Reserves as this definition has certain economic parameters that must be established in order to report as Reserves. Alexco published the technical report “Preliminary Economic Assessment of the Keno Hill Silver District Project, Yukon, Canada” in March 2017 (https://www.alexcoresource.com/site/assets/files/3928/rpa_alexco_ni_43-101_pea_report_mar-29-2017.pdf) available here or on SEDAR. The mineral resource presented in this Updated Preliminary Economic Assessment constitutes the current mineral resource estimate for the five deposits that are part of Alexco’s Keno Hill Silver District (KHSD):

- Bellekeno deposit;
- Lucky Queen deposit;
- Flame & Moth deposit;
- Birmingham deposit; and
- Onek deposit.

This report is considered by RPA to meet the requirements of a Preliminary Economic Assessment as defined in Canadian NI 43-101 regulations. The economic analysis contained in this report is based, in part, on Inferred Mineral Resources, and is preliminary in nature. Inferred Mineral Resources are considered to be too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

A summary of the Mineral Resource at the KHSD is shown in Table 2-1.

Table 2-1: Summary Of Mineral Resource Estimates As At January 3, 2017

Alexco Resource Corp. – Keno Hill Silver District Project

Deposit	Classification	Tonnes	Ag	Pb	Zn	Au
			(g/t)	(%)	(%)	g/t
Bellekeno	Indicated	262,000	585	3.50	5.30	n/a
	Inferred	243,000	428	4.10	5.10	n/a
Lucky Queen	Indicated	132,300	1,167	2.43	1.63	0.16
	Inferred	257,900	473	1.04	0.80	0.13
Flame & moth	Indicated	1,679,000	498	1.85	5.33	0.42
	Inferred	365,200	356	0.47	4.25	0.26
Onek	Indicated	700,200	191	1.24	11.85	0.6
	Inferred	285,100	118	1.15	8.26	0.42
Birmingham	Indicated	858,000	628	2.40	1.65	0.13
	Inferred	220,000	770	2.13	2.21	0.15
Total	Indicated	3,631,500	500	2.00	5.60	0.30
	Inferred	1,371,200	408	1.63	4.26	0.21

Notes:

1. Bellekeno estimate is at September 30, 2013 and reflects the September 30, 2012 estimate less estimated depletion from mining to September 30, 2013.
2. CIM definitions were followed for Mineral Resources.
3. Mineral Resources are estimated at a net smelter return (NSR) cut-off value of \$185/tonne.
4. Bellekeno Mineral Resources are estimated using metal prices of US\$22.50/oz Ag, US\$0.85/lb Pb, US\$0.95/lb Zn, and US\$1,300/oz Au and a US\$/C\$ exchange rate of 0.96.
5. Lucky Queen, Onek, Flame & Moth and Birmingham Mineral Resources are estimated using metal prices of US\$20.00/oz Ag, US\$0.95/lb Pb, US\$1.00/lb Zn and US\$1,300/oz Au and a US\$/C\$ exchange rate of 0.80.
6. Bulk density estimated by regression analysis for Bellekeno, Lucky Queen, and Onek and from core and pulp sampling for Flame & Moth and Birmingham.
7. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
8. Numbers may not add due to rounding.

2.3 MINING METHODOLOGY

No mining occurred in 2017.

2.4 DEVELOPMENT

No development occurred in 2017.

3 CONSTRUCTION ACTIVITIES

In 2014, construction activities carried out at the KHSD site were minor, and only involved surface work near the Mill. In 2015 surface activities only included additional reclamation of the Dry Stack Tailings Facility (DSTF). In 2016, surface disturbance was limited to the area around the mill associated with the development of collaring the Flame and Mothe Portal. In 2017, surface disturbance was related to the preparation for the Flame and Moth water treatment pond. The updated surface as-built drawing for the Mill area Facility for 2017 activities is presented as Figure 3-1.

In accordance with our efforts to minimize the impact of the construction activities on the residents of Keno City, the majority of construction materials were delivered using the Christal Lake road to bypass Keno City.

3.1 ROAD CONSTRUCTION

No major upgrades occurred on the roads to Lucky Queen, Christal Lake Road, Keno City Bypass to BKR, or the BKR haul road in 2014, 2015, 2016 and 2017. Standard maintenance occurred throughout the year.

3.2 MILL SITE CONSTRUCTION

Construction of a conventional flotation mill at the historic Flame & Moth site for processing ore and producing concentrate began in February of 2010 and was completed in December 2010. As-built drawings for this construction were submitted as part of the 2011 QML Annual Report and an update mill site as-built was submitted in the 2012 annual report.

The mill yard continues to be ditched and contoured to facilitate channeling melt water in the spring to sediment basins. Organics were consolidated and contoured to allow vegetation to take over and provide a central location for organics borrow source once reclamation begins.

In 2014 the foundation for a second ball mill was poured adjacent to the district mill and a sprung structure (shop/garage) was added near the mill to centralise the KHSD mining operations in preparation for when the mining activities are resumed (Figure 3-1). No further work was done at the Mill in 2015, 2016 and 2017.

3.2.1 Dry Stack Tailings Facility

The lined area of the dry stack tailings remained at 14,148 m² in 2015. Additional area was cleared in 2013 and prepared for liner which will be laid in the future giving a total area of 10,982 m² available for additional tailings placement. The DSTF as-built was presented in the 2013 QML annual report. The extent of the cover placed on the DSTF was expanded in 2015 is shown on Figure 6-2.

Both a ground temperature cable (GTC) and a shallow monitoring well were installed in the lower bench of the DSTF as part of the ongoing monitoring of the DSTF in 2012. No water was seen during these installations, indicating no free water exists within the pile. The monitoring data collected from the GTC in the DSTF in 2017 is presented in Appendix A.

3.3 MINE SITE CONSTRUCTION

Development of the Bellekeno deposit is the first of potentially many mines in the KHSD. Because the Bellekeno Mine involved the reopening of existing historical underground mine, use of existing infrastructure such as water treatment facilities, the reuse of the previously impacted historic Flame & Moth site and the Christal Lake haul road, 'new' environmental footprint is limited in scope.

No significant changes occurred at Bellekeno Mine footprint in 2014, 2015, 2016 and 2017.

3.4 ELSA CAMP FACILITIES

A trailer camp, kitchen facility and driller's dry are currently assembled at the old Flat Creek town site (part of Elsa) on Surface Lease 105M13-001. The Camp has a total capacity of 90 permanent beds. There are four houses located on Surface Lease 105M13-009 with a total of 28 rooms. On the same lease, an additional 20 rooms are available; however, this bunkhouse is also not occupied during the winter. These bunks were upgraded to include new framing, roof, and deck.

A Commercial Dump Permit # 81-067 is currently held from Yukon Government (YG) Environment in accordance with the Environment Act, *Solid Waste Regulations* as well as the Public Health and Safety Act. This permit was renewed effective January 1, 2017 and will continue to be used in support of the District Mining operations. In compliance with this permit upgrades to the location of solid waste disposal included upgrades to the electric bear fence and addition of a cattle guard to prevent animals from entering the facility.

Alexco currently holds two sewage disposal system permits at Elsa issued by YG Environmental Health Services: an absorption bed permit for the Flat Creek Camp (Permit #3448) in replacement to a septic tank permit (Permit #3012) and an absorption permit for five houses (Permit #3449) in replacement of a septic tank permit (Permit #3246).

Water for camp consumption is being drawn from Flat Creek or the Flat Creek well and treated through a series of filters and ultra violet (UV) light before it is chlorinated and stored in holding tanks ready for consumption under the *Yukon Environmental Health Standards*.



Adit



Current Dry Stack Storage Facility Liner



Catchment



Road



Watercourse



ALEXCO KENO HILL MINING CORP.
ANNUAL QUARTZ MINING LICENCE REPORT, QML-0009

FIGURE 3-1 MILL AND DSTF LAYOUT OVERVIEW

MARCH 2018

Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on March 2018

Datum: NAD 83; Projection: UTM Zone 8N

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D:\Project\AllProjects\Keno_Area_Mines\ALL-SITES\02-Map\01_Overview\02-District Mill\Current_DSTF_20180126.mxd
(Last edited by: amatlashevsk: 05/03/2018/12:42 PM)

Power for the camp is supplied from the local grid that runs through Elsa to Keno City. Several upgrades were completed in 2012; however, no upgrades were completed in 2013, 2014, 2015, 2016 and 2017. Upgrades in 2012 included:

- a) removal of the existing overhead line running from the historical pump house to the upper house complex at Elsa and replacing line with an armored tech cable;
- b) decommissioning of old transformers in the upper house complex area at Elsa and replacing with more current transformers and switchgear;
- c) brushing out of both the Onek 990 and Elsa substations;
- d) commissioning an engineering overview of the current electrical system for the purpose of identifying areas needing upgrade in the 2013 season;
- e) installing new three phase transformer in camp to remove bunkhouse a from the kitchen complex and distribute the load more evenly;
- f) installing new three phase transformer in the warehouse to distribute the load more effectively; and
- g) commissioning an Engineering overview of the power factor at the Mill for the purpose of identifying why the power factor is low and what can be done to correct it, designed a power factor correction unit.

3.5 ANNUAL INSPECTION

In accordance with Section 12.1 to 12.3 of QML-0009, an *“annual inspection of the physical stability of all engineered structures, works and installations located at the site is conducted by an engineer by August 1st of each year”*.

Tetra Tech EBA Inc. was retained to complete the 2017 annual inspection of the surface engineered earth structures located throughout the Bellekeno Mine and District Mill site.

See Appendix A for a copy of the *2017 Annual Physical Inspection Report* which includes surface inspections.

3.6 UPCOMING MAINTENANCE AND UPGRADES

Routine maintenance of mine and mill areas continued in 2014 to 2016.

3.6.1 Mill Upgrades and Maintenance

Several projects were completed in 2014 for the mill area to improve overall efficiency. These upgrades included the addition of a mill maintenance shop, and pouring the foundation for a second ball mill. No upgrades for the mill were completed in 2015. In 2016, a maintenance program of the some of the Mill components was undertaken. No maintenance of the mill occurred in 2017.

3.6.2 Mine Upgrades and Maintenance

3.6.2.1 Bellekeno

Underground infrastructure was removed in the fall of 2015 between the 800 and 900 mine levels to allow flooding of the mine up to the 800 level to undertake insitu treatment. On July 8, 2016 water began to be

pumped up to the 625 adit and treated in the water treatment plant prior to discharge to the receiving Environment. Mine discharge and water treatment continued in 2017.

3.6.2.2 Lucky Queen

No upgrades were done during temporary closure.

3.6.2.3 Onek 990

No upgrades were done during temporary closure.

4 MILLING OPERATIONS

Mill operations did not occur in 2014 to 2017.

5 WASTE MANAGEMENT

5.1 TAILINGS MANAGEMENT

Tailings were not generated in 2014 to 2017 under temporary closure.

5.2 WASTE ROCK MANAGEMENT

Waste rock was not generated in 2014, 2015 and 2017 under temporary closure. In 2016 there were 1,215 tonnes of waste rock produced from the development of the Flame and Moth portal. The N-AML waste rock generated was used to expand the laydown areas around the District Mill Site.

6 MONITORING

6.1 MONITORING AND SURVEILLANCE PLAN

Site environmental monitoring was carried out at the site in accordance with the *Monitoring and Surveillance Plan*. A revision to the Plan was submitted in January 2018. This updated plan included monitoring and surveillance to reflect requirements of Water License QZ09-092 (amendment #2) and also to reflect updates to other terrestrial monitoring (e.g. dust monitoring) which have been developed.

Water quality and groundwater monitoring have been carried out in accordance with the Type A water license QZ09-092. Results of this monitoring were included within the Type A water license 2017 Annual Report. Details can be seen in Appendix C1 of the QZ09-092 2017 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline). Permafrost monitoring through geotechnical programs installed at the site of the future Non- acid-generating and/or metal leaching (AML) Waste Rock Disposal Area and the DSTF is monitored routinely by the engineers of record (Tetra Tech EBA Inc.) in accordance with the DSTF OMS Manual, which forms part of the DSTF Construction and Operation Plan. As discussed in Section 3.2.1 of this report, an additional GTC and monitoring well were installed on the DSTF, as well as full depth tailings analysis were completed in 2012.

6.1.1 Water Quality Surveillance Network

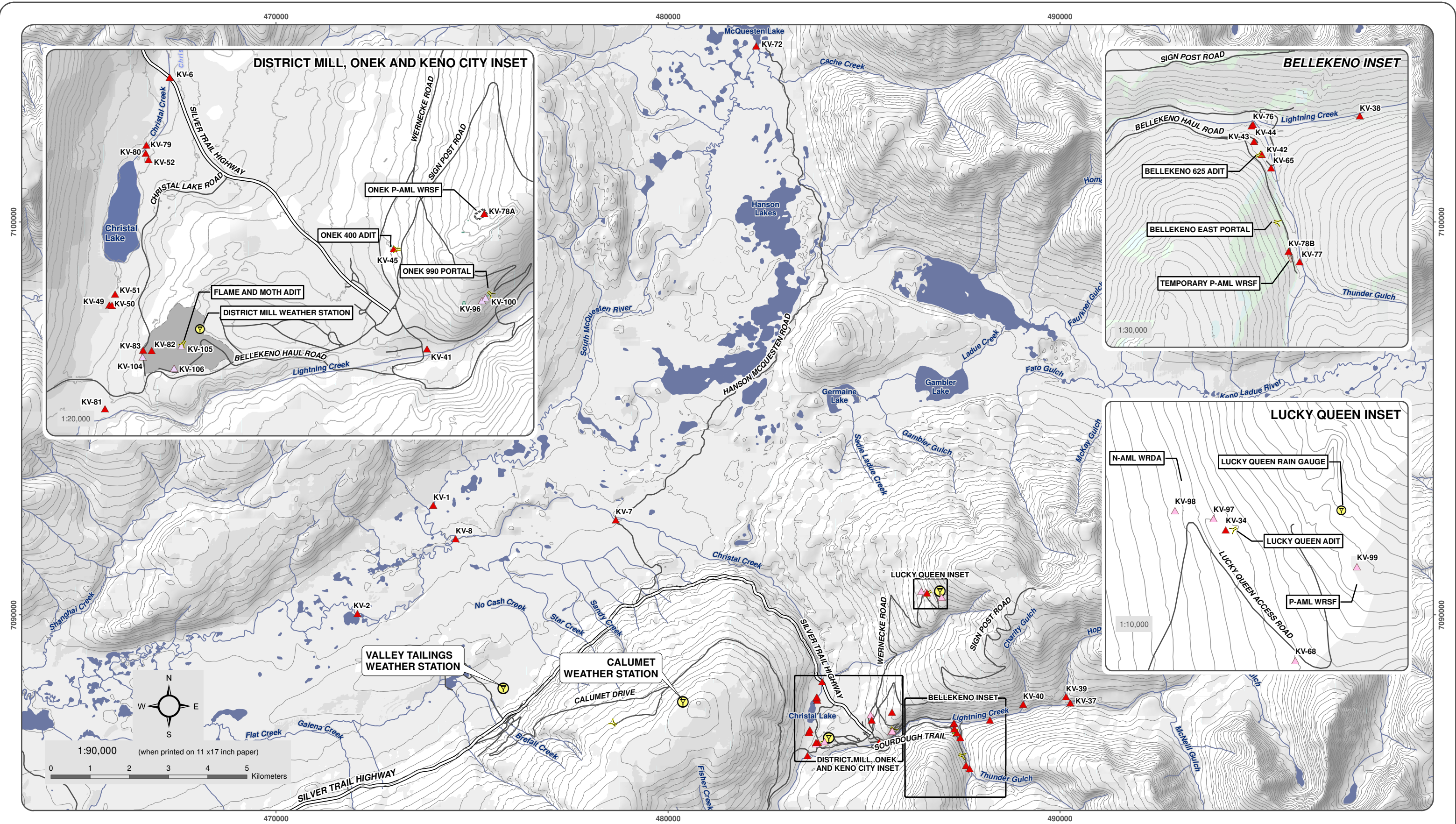
The existing water quality surveillance network for the KHSD Mining Operations includes surface receiving waters in the Lightning Creek and Christal Creek watersheds. Most of the monitoring stations have been sampled extensively in the past. Current water quality monitoring is required in these areas under Water Licence QZ17-084, and Water Licence QZ09-092. Water Licence QZ12-057 expired in January of 2018 and was renewed as QZ17-084, in 2018. Results can be seen in the QZ09-092 2017 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline). QZ09-092 surface and groundwater monitoring sites can be seen in Figure 6-1, 6-2 and 6-3.

6.1.2 Groundwater Surveillance Network

A groundwater monitoring plan for the Bellekeno mine has been developed under Water Licence QZ09-092. This program outlines monitoring locations and frequency for the Keno District Mill and Dry Stack Tailings Facility, the non-AML waste rock disposal area, and Keno City.

Groundwater wells are scheduled for monthly monitoring for both water level and quality for the first year after QZ09-092 came into effect to establish baseline conditions, followed by quarterly sampling thereafter, for the duration of the project.

Results can be seen in the QZ09-092 2017 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline). QZ09-092 groundwater monitoring locations can be seen in Figure 6-2 and Figure 6-3.



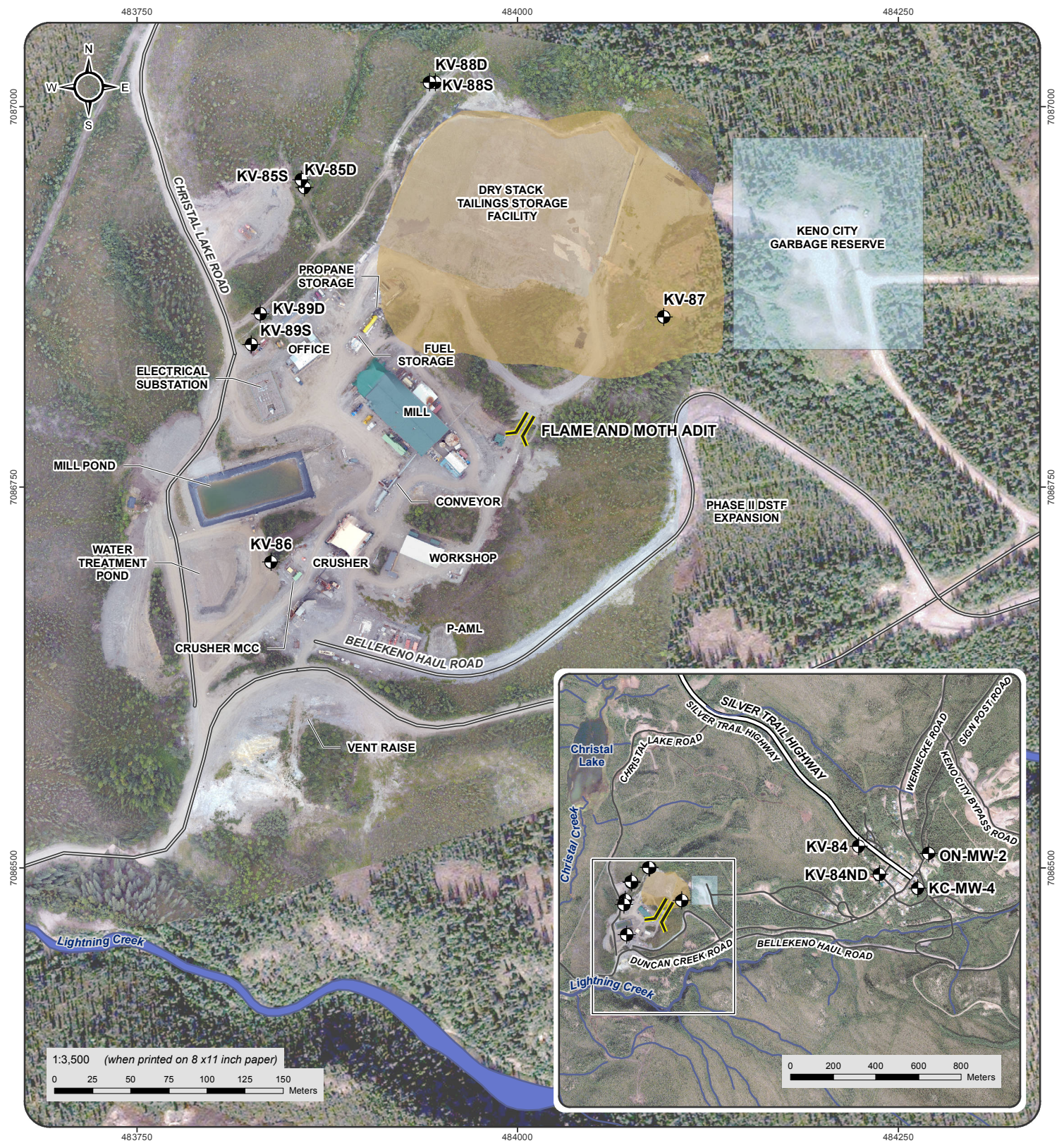
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Datum: NAD 83; Map Projection: UTM Zone 8N

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- ▲ Monitored Water Quality Station
- ▲ Pending/Proposed Water Quality Station
- ⊙ Weather Station
- Y Adit
- Valley Tailings Pond
- Valley Tailings
- Keno District Mill Site
- Silver Trail Highway
- Other Road
- Watercourse
- Waterbody







Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on March 2018

Datum: NAD 83; Projection: UTM Zone 8N

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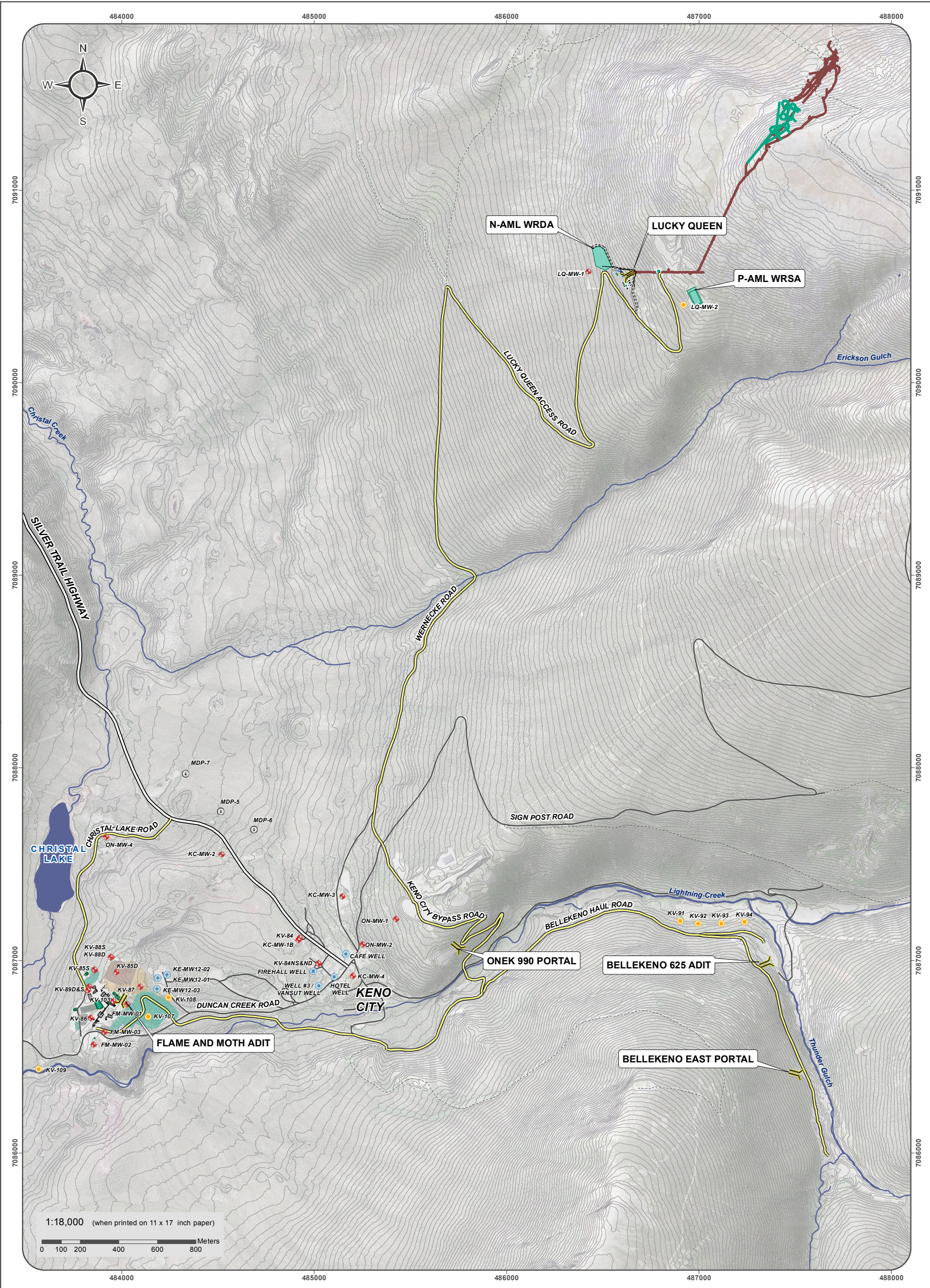



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FIGURE 6-2
GROUNDWATER MONITORING LOCATIONS

MARCH 2018

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(Last edited by: amattashevskaya, 06/03/2018/10:42 AM)



<ul style="list-style-type: none">Pending Monitoring WellMonitoring WellPrivate Drilled WellPublic Drilled WellWater Supply WellDecommissioned Manual Drive Point	<ul style="list-style-type: none">DSTF 322k Tonnes DesignCurrent DSTFTo Be Constructed FeaturesInfrastructure FootprintExisting Underground WorkingsProposed Underground Workings	<ul style="list-style-type: none">AditHaul RoadSilver Trail HighwayOther RoadLimited-Use Road	<div></div> <div></div> <div><p>ALEXCO KENO HILL MINING CORP. ANNUAL QUARTZ MINING LICENCE REPORT, QML-0009</p><p>FIGURE 6-3 KENO HILL SILVER DISTRICT GROUNDWATER MONITORING LOCATIONS</p><p>MARCH 2018</p></div>
<p>Satellite imagery obtained from Yukon Geomatics map service http://mapservices.gov.yk.ca/ArcGIS/services on March 2018</p> <p>Datum: NAD 83; Projection: UTM Zone 8N</p> <p>This drawing has been prepared for the use of Alexco Environmental Group Inc.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Alexco Environmental Group Inc. and its client, as required by law or for use of governmental reviewing agencies. Alexco Environmental Group Inc. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Alexco Environmental Group Inc.'s express written consent..</p>			<p>D:\Project\AllProjects\Keno_Ans_Mines\ALL-SITES\02-Map\01_Overview\02-Specifs_Typical\WQ Monitoring\GW_monitoring_locations_20180108.mxd (Last edited by: amafshayeva; 06/03/2018/11:11 AM)</p>

6.1.3 Permafrost Monitoring

Geotechnical programs have identified areas of permafrost within operational areas of the project. Specifically, some permafrost was encountered beneath the proposed non-AML Waste Rock Storage Area (WRSA) and in the vicinity of the proposed DSTF. Ground temperature and permafrost monitoring is currently in place at these locations. Details on monitoring for the DSTF are included in the DSTF OMS manual, which forms a part of the DSTF *Development and Operations Plan*.

Locations are monitored routinely by the engineers of record (Tetra Tech EBA Inc.). Details on permafrost monitoring for the WRSA are included in the Mine Development and operations Plan.

Results of the 2017 permafrost monitoring can be seen in the Tetra Tech EBA Inc. monitoring report in Appendix A.

6.1.4 Physical Inspections

The purpose of the physical inspection is to observe and record sufficient information related to physical and water retaining structures to permit development of a course of action, repair or rehabilitation if it is required. Physical inspections are currently inspected under the *Physical Inspections and Reporting Plan* prepared for Water Licence QZ09-092. Results of these inspections are presented in Appendix A.

6.1.5 Meteorological Monitoring

As part of closure planning studies, a meteorological station was established on Galena Hill in summer 2007 by Alexco. The station measures air temperature, relative humidity, barometric pressure, rainfall, wind speed and direction, solar radiation, and soil temperature. As a condition of Type A Water Use Licence QZ09-092, a second meteorological station and snow course was established at the Keno District Mill site. The location of the mill site weather station is shown on Figure 6-4. A YG monitored snow course station also exists in the area. An analysis of the meteorological monitoring data results can be seen in the QZ09-092 2017 Annual Report, which is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline).

6.1.6 Noise Impacts and Sound Monitoring

The objective of noise impact monitoring was to reduce and mitigate impacts to local residents and the environment resulting from noise produced during the development and operations of the Bellekeno Mine and Keno District Mill. To achieve this goal, AKHM identified potential noise sources and receivers in the *Noise Monitoring and Management Plan*, and will continue to do so during development and production as a part of monitoring. Details can be found in the *Noise Monitoring and Management Plan* submitted under QML-0009. An update to this plan was approved on March 19, 2013, and includes potential noise impact associated with the development of the Lucky Queen and Onek 990 Mines. An updated version was submitted to YG in January 2018.

As identified in the 2011 review of the data collected from 2009 to 2011 (submitted in the 2011 QML Annual Report) no significant noise impacts (defined as exceedences of daytime or nighttime noise levels as recommended in the *Decision Document*) have been observed in Keno City as a result of operations. With the approval for development of the Lucky Queen and Onek 990 Mines in November 2012 and the updated *Noise*

Abatement Plan for 2013, noise monitoring at newly identified sites commenced in 2013. The results for the Noise Monitoring Program up to 2017 are presented in Appendix B.

6.1.7 Dust Abatement and Monitoring

In accordance with Clause 69 of the Decision Document for the assessment for the Bellekeno Mine Project (Yukon Environmental and Socio-Economic Assessment Board [YESAB] File Number 2009-0030), dustfall monitoring stations were installed at four locations near the Keno District Mill site. Bergerhoff dust monitoring gauges were selected as the appropriate instrumentation to carry out this program. At the time of installation, the Yukon had not yet developed the *Ambient Air Quality Standards*.

The Bergerhoff deposit dust gauge is designed to measure dust deposition, which can be reported as a weight per unit area over unit time. These results are comparable to the *Ambient Air Control Objectives in the Pollution Control Objectives for the Mining, Smelting and Related Industries of BC* (1979), which provides an acceptable range of 1.7 to 2.9 mg/(dm²*d).

As a result of the updated Monitoring and Surveillance Plan Revision, as well as the development of the *Yukon Ambient Air Quality Standards*, two Total Suspended Particulate (TSP) monitoring devices were installed near the Keno District Mill site and one in Keno City. After a thorough investigation of both continuous duty (real-time) constant flow air monitoring systems and discrete (gravimetric) samplers, the BGI OMNI sampler was chosen as the most appropriate instrument. TSP, PM₁₀ and PM_{2.5} results have been compared to the *Yukon Ambient Air Quality Standards*. The details of the air quality monitoring is detailed in the Dust Abatement and Monitoring Plan most recently updated and submitted to YG for review in January 2018.

In addition to TSP, PM₁₀ and PM_{2.5} monitoring using the BGI OMNI samplers, samples from the TSP filters were analyzed for total metals. The metal speciation data from the TSP filters have been compared against the Ontario Ambient Air Quality Criteria and are presented in Appendix C. The complete 2017 monitoring results can be seen in Appendix C. Dust control measures including dust suppression of haul roads, mill site, and DSTF continue on an as-needed basis throughout the year. Mill site layout with locations of TSP monitoring instruments currently in place are shown on Figure 6-4.










Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on March 2018.
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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1:5,500 (when printed on 11 x17 inch paper)

0 50 100 150 200 Meters

- | | | |
|---|---|--|
|  MineFeaturePoint Weather Stns |  DSTF 322k Tonnes Design |  Silver Trail Highway |
|  Dust Monitoring Station |  Current DSTF |  Secondary Road |
| |  DSTF Phase II Expansion | |



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FIGURE 6-4
DUST MONITORING AND WEATHER STATIONS

MARCH 2018

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6.1.8 Waste Rock Monitoring

All waste rock management facilities are subject to monitoring for physical and geochemical stability (acid rock drainage or metal leaching). A complete Waste Rock Management Plan was attached to the Construction Site Plan Revision 1 and includes detailed descriptions of waste rock monitoring and mine wall testing. This plan was submitted as part of the QML-0009 2010 Annual Report submitted in June 2011. This plan was revised and approved in 2013 to include the Lucky Queen and Onek 990 Mines. The plan was updated for Flame and Moth and revision 5 of the plan was approved as part of the amended QML for Flame and Moth.

No new waste rock was generated in 2014 to 2015 and 2017, therefore no new monitoring was conducted. In 2016, 1,215 tonnes of waste rock was produced as part of the collaring of the Flame and Moth portal and was characterized as N-AML.

6.1.9 Environmental Effects Monitoring

AKHM prepared the first study design for the Environmental Effects Monitoring (EEM) program required under the federal Metal Mining Effluent Regulations (MMER) and submitted in September 2011. The first round of EEM program was completed in 2012 with the EEM interpretive report for Bellekeno completed and submitted in March 2013. Sub-lethal toxicity testing of effluent from the BK625 treatment pond decant was conducted during 2012 and no significant adverse effects were noted during these tests. The results for the first cycle of EEM were presented in the 2012 annual report. The second EEM cycle study was completed in 2015 and the results were presented as Appendix D of the 2015 annual report. Cycle 3 of the EEM will be undertaken in 2018.

6.1.10 Wildlife Monitoring Plan

The Keno Hill Silver District, including Elsa, the Silver Trail Highway, District Mill, Bellekeno, Lucky Queen, and Onek 990 Mine sites, and all associated haul roads are frequented by natural wildlife in the area. This wildlife includes fox, bear, moose, wolverine, rabbit, lynx, and a number of other species of animal and birds. Wildlife encounters are recorded in a log located in the Elsa Administration Office. The most common sightings involved moose, fox, as well as both black and grizzly bears in 2013. Other less common sightings involved lynx, and wolves.

Any encounters between vehicles and wildlife are reported to both the Safety and Environmental departments for documentation and if required, incident investigation. 2014, 2015, 2016, and 2017 saw no encounters between AKHM vehicles and wildlife.

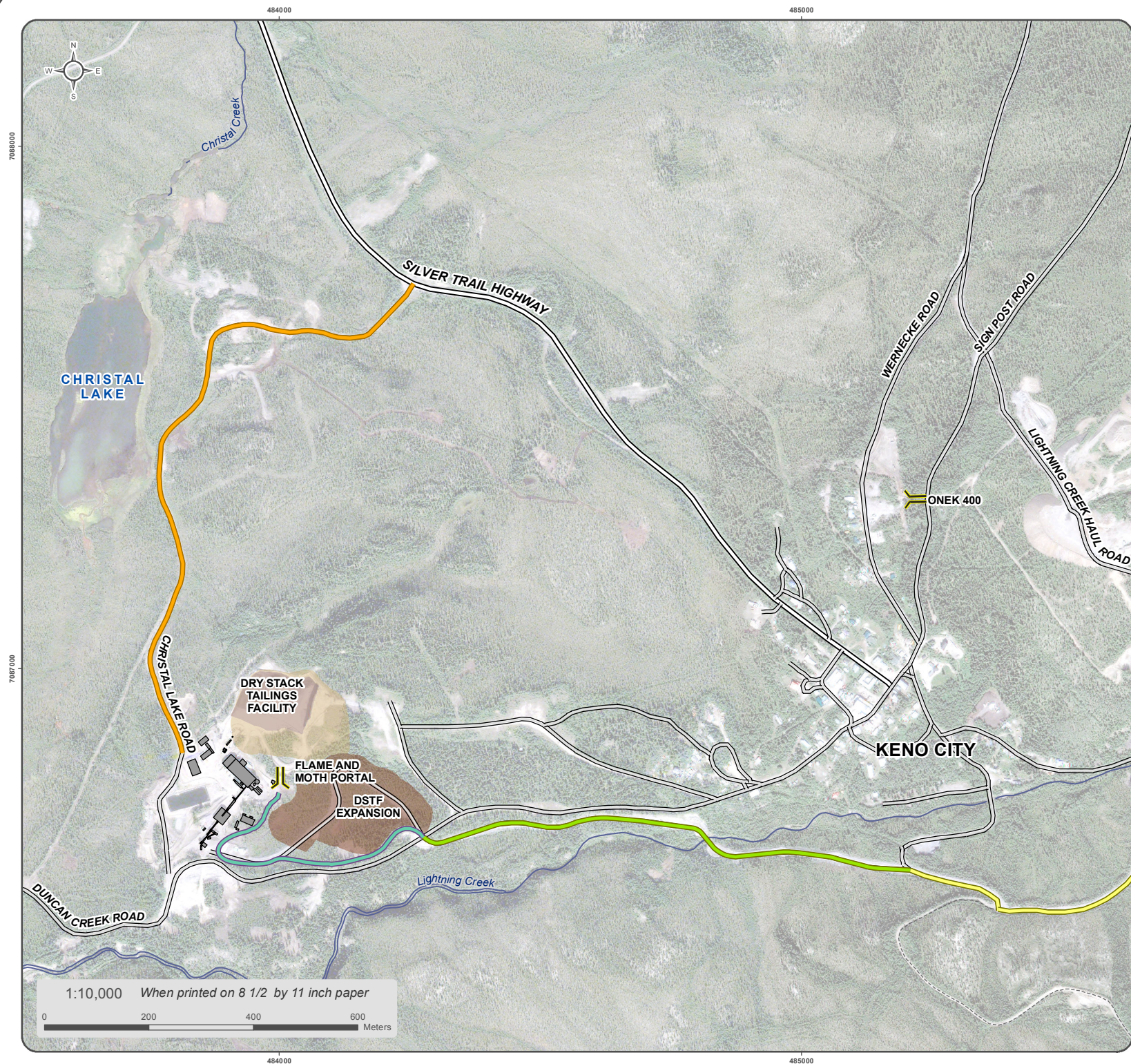
6.1.11 Traffic Management

The Bellekeno haul road crosses two public roads in the Keno City area, both Duncan Creek road and the access to the Sourdough Trail. Mine traffic has been redirected around Keno City to ensure that direct ore haulage traffic is routed around the community, effectively minimizing impact on the local community. This road consists of two portions, the Bellekeno Bypass North, which ensures all mill traffic and concentrate haul will bypass Keno City via Christal Lake Road, and the Bellekeno Bypass South which connects the Sourdough Trail on the south side of Lightning Creek to the Duncan Creek Road across Lightning Creek. Figure 6-5 shows the routing of traffic around the community along the Bellekeno Haul Road.

With the developments of the Lucky Queen and Onek 990 Mines, the Keno City Bypass Road has been developed from the Wernecke Road, crossing Sign Post Road, along the historic Onek waste rock storage area, to the Onek 990 Portal, crossing Lightning Creek Road and the new Onek Access Bridge across Lightning Creek to the Bellekeno Haul Road (Figure 6-6). The road maybe restricted to one-way travel where conditions prevent construction to 9 m wide. Until the completion of the new Onek Access Bridge in May 2013, some light vehicle traffic has been directed through Keno City. This traffic was discontinued with the construction of the new Onek Bridge. It is expected that occasional traffic will continue to flow through Keno City but the use of the bypass roads will continue to be a priority and policy.

FIGURE 6-5
BELLEKENO HAUL ROAD

MARCH 2017



- Adit/Portal
- Bellekeno Haul Road
- Bellekeno Project Bypass Road North
- Bellekeno Project Bypass Road South
- Proposed Haul Road
- Silver Trail Highway
- Road
- Limited-Use Road
- Existing Building
- DSTF 322k Tonnes Design
- Current DSTF
- DSTF Phase II Expansion

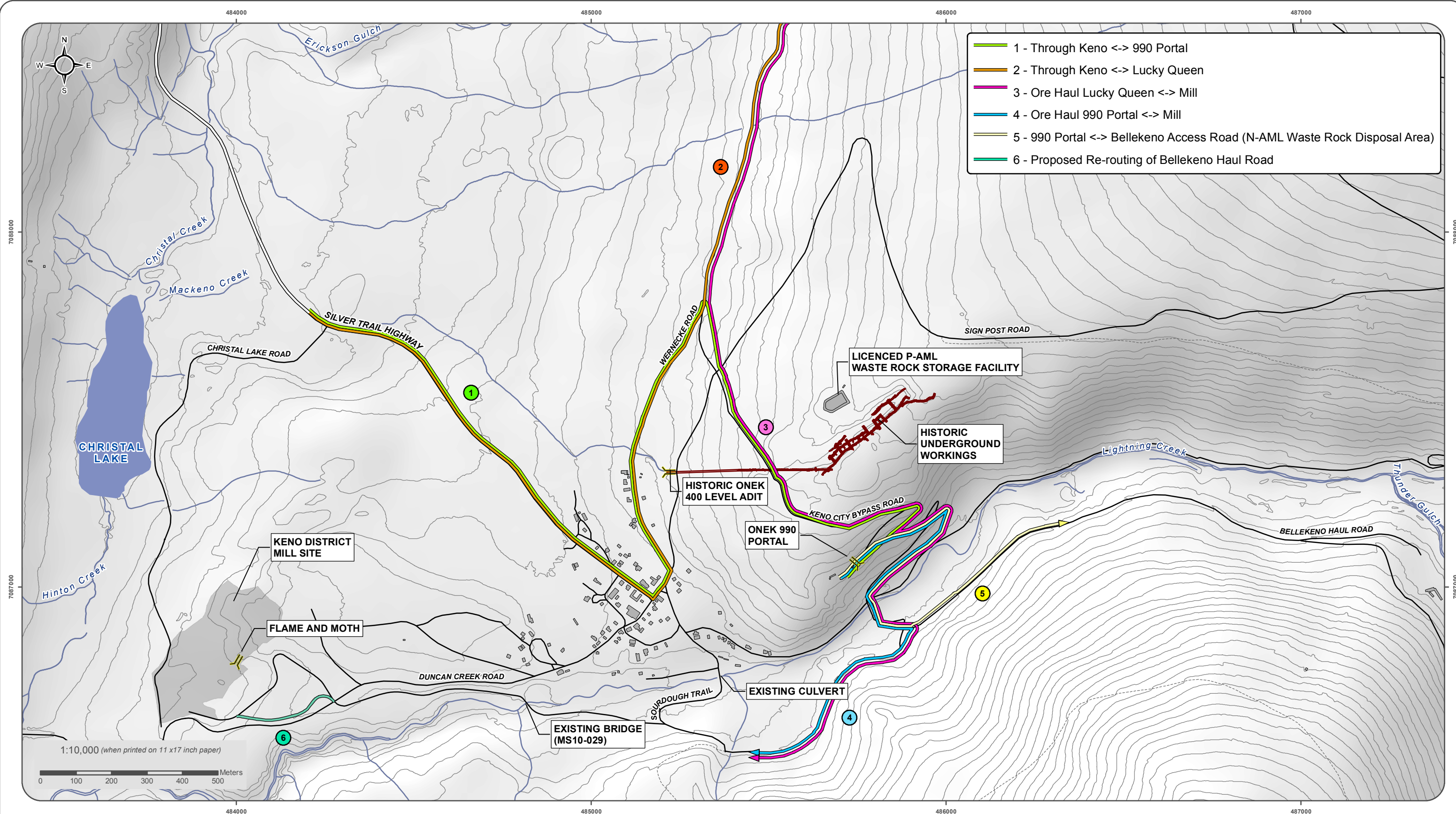
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(Last edited by: amalia.shevola:27/09/2017 11:33 AM)



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- | | | |
|-------------------------|----------------------|-----------------------------|
| Adit | Silver Trail Highway | Waterbody |
| Building/Structure | Road | Watercourse |
| District Mill Footprint | Limited-Use Road | Contours (100 ft intervals) |



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FIGURE 6-6
LUCKY QUEEN, ONEK 990 AND
BELLEKENO ACCESS ROUTES

MARCH 2018

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(Last edited by: amilavalevski/09/03/2018/12:43 PM)

6.2 ADAPTIVE MANAGEMENT PLAN

Pursuant to Clause 90 and Clause 91 of QZ09-092, Alexco developed a Bellekeno *Adaptive Management Plan*, which was submitted to Yukon Water Board in April, 2011. This plan was based on the framework established by the District Wide Adaptive Management Plan, but was customized for the specific activities and developments of the Bellekeno Undertaking. The Adaptive Management Plan was updated in 2013 to include the Onek 990 and Lucky Queen Mines. No adaptive management activities were undertaken during 2014 to 2017. An updated AMP was submitted to YG in March 2018 for review.

Reporting for the AMP including a summary of any adaptive management triggers and actions was prepared for the WUL QZ09-092 2017 Annual Report. The QZ09-092 2017 Annual Report is available on the Yukon Water Board's online registry Waterline (www.yukonwaterboard.ca/waterline).

7 UNAUTHORIZED DISCHARGE

7.1 REPORTABLE SPILLS

No reportable spill occurred in 2014 to 2017.

7.1.1 Non-Reportable Spills

There were no non-reportable spills recorded at the Site in 2014 to 2017 according to the reportable spill quantities defined in Schedule A of the *Yukon Spill Regulations*.

7.2 PERMIT EXCEEDENCES

There was one Water Licence exceedences during 2017 relating to the Bellkeno mine discharge and discussed further in the 2017 annual Water Licence Report.

8 CARE AND MAINTENANCE AND RECLAMATION

The care and maintenance activities at the Keno Hill District are the primary objective of Water Use License QZ06-074, which was renewed for five years and issued as QZ12-057 and renewed as QZ17-084.. The purpose of this license is to obtain water, divert water, store water, and to deposit waste for the purpose of care and maintenance activities for the Keno Hill Mines Property.

Alexco Resource Canada Corporation was issued Water Use Licence QZ07-078 on October 3, 2008, for the purpose to obtain water, store water, and to deposit a waste for the purpose of advanced exploration and preliminary development activities at the Bellekeno Mine on the Keno Hill Property. The Bellekeno project has since moved into production (under QZ09-092) and in 2011, Alexco applied to amend QZ07-078 to remove clauses pertinent to the mine production Licence. AKHM was issued Water Use Licence QZ10-060 on November 16, 2011 for the amended purpose: to store water and to deposit waste for the purpose of maintaining the Onek Potentially acid-generating and/or metal leaching (P-AML) Waste Rock Storage Facility on the Keno Hill Property. Licence QZ07-078 was cancelled on January 14, 2015 as all activities are now part of QZ12-053.

Information and analyses pertaining to the Bellekeno Mine, Lucky Queen Mine, Onek 990 Mine and District Mill areas have been fully developed through WUL QZ09-092 (amendment #2).

8.1 CARE AND MAINTENANCE ACTIVITIES

Prevention of environmental degradation within the Keno Hill Silver District is accomplished largely by the daily operation of lime-addition water treatment systems existing at Galkeno 900, Galkeno 300, Silver King 100, and Bellekeno 625 adits. The Valley Tailings Facility is also treated on an as-required basis during spring and early summer. Care and Maintenance activities and performance monitoring (i.e. water quality monitoring) is undertaken by Elsa Reclamation and Development Company Ltd. (ERDC), using on-site laboratory facilities for daily and weekly water quality analysis. Monitoring of surface and groundwater sites as well as physical conditions is completed as per WL monitoring schedules.

A detailed discussion of these results and other Care and Maintenance activities can be found in 2017 Annual Water License report submitted to the Yukon Water Board as per Water Use License QZ12-057 in February 2018.

8.2 RECLAMATION ACTIVITIES

Progressive reclamation of the DSTF was initiated during the summer of 2012 as presented in the *Reclamation and Closure Plan* to prevent potential dusting and erosion of exposed tailings slopes. Final slope and bench elevations were reached on the west toe of the DSTF, allowing final reclamation to begin.

The progressive reclamation included four areas (block A, B, C, & D) on the DSTF which were covered with granular/organic material and seeded to test various cover trials. The cover material was local material that had been cleared and stockpiled during the initial construction of the Keno District Mill. The seed material (Keno District Dry Land Seed Mix) was selected using a blend of suitable species seeded at the Brewery Creek and Minto Mine sites also located in the Yukon. Additional slopes were contoured in 2013 for preparation of progressive reclamation that completed in 2014 including covering portions of the DSTF and seeding the cover.

In 2015, further progressive reclamation activities were completed for the DSTF cover, which expanded the cover over the majority of the DSTF (Figure 6-2).

9 REFERENCES

- Alexco Resource Corp., *Updated Preliminary Economic Assessment for the Keno Hill Silver District Project – Phase 2*, Yukon, Canada, 2014
- Alexco Resource Corp., *Updated Preliminary Economic Assessment for the Eastern Keno Hill Silver District Project – Phase 2*, Yukon, Canada, 2013a
- Alexco Resource Corp., *Updated Technical Report on the Flame & Moth Deposit, Flame & Moth Property, Keno Hill District*, Yukon, 2013b
- Alexco Resource Corp., *Technical Report on the Onek Deposit, Onek Property, Keno Hill District*, Yukon, 2011
- Canadian Institute of Mining, *Estimation of Mineral Resource and Mineral Reserves Best Practices Guidelines*, 2003
- Roscoe Postle Associates Inc., *Technical Report Preliminary Economic Assessment of the Keno Hill Silver District Project*, Yukon Territory, Canada, 2017
- SRK Consulting, *Technical Report on the Bermingham Deposit, Bermingham Property, Keno Hill District*, Yukon, 2012
- SRK Consulting, *Technical Report on the Lucky Queen Deposit, Lucky Queen Property, Keno Hill District, Yukon. SRK Project 2CA017.001*. Prepared for Alexco Resource Corporation, September 8, 2011a.
- SRK Consulting, *Technical Report on the Onek Deposit, Onek Property, Keno Hill District, Yukon. SRK Project 2CA017.001*. Prepared for Alexco Resource Corporation, September 8, 2011b.

APPENDIX A

2017 ANNUAL PHYSICAL INSPECTION



November 7, 2017

Alexco Resource Corp.
3 – 151 Industrial Road
Whitehorse, YT Y1A 2V3

ISSUED FOR USE
FILE: 704-ENG.WARC03301-01
Via Email: kwoleshyn@alexcoresource.com

Attention: Kai Woloshyn – Environmental Manager

Subject: 2017 Annual Geotechnical Inspection – Surface Engineered Earth Structures
Bellekeno Mine, Keno City, YT

1.0 INTRODUCTION

NND-EBA Land Protection Corp. operating as NELPCo Limited Partnership (NELPCo) was retained by Alexco Resource Corp (Alexco) to complete the 2017 annual geotechnical inspection of the surface engineered earth structures at the Bellekeno Mine near Keno City, Yukon. NELPCo is a limited partnership corporation owned by the NND Development Corporation (NNDDC) and Tetra Tech Canada Inc. (Tetra Tech). The inspection was conducted by Tetra Tech, NELPCo's exclusive engineering services provider. Authorization to complete this work was received by way of an Alexco purchase order (PO #18335) on July 21, 2017.

2.0 SCOPE OF SERVICES

The following is Tetra Tech's scope of services for the 2017 annual inspection as was presented in the proposal submitted to Alexco on July 5, 2017:

- Complete a visual inspection of the surface engineered earth structure identified by Alexco, which includes:
 - Potentially acid generating (PAG) waste storage facility;
 - Bellekeno waste rock pile;
 - Bellekeno 625 water treatment ponds;
 - Lightning Creek bridge abutments (Onek Road);
 - Lightning Creek bridge abutments (Bellekeno Haul Road);
 - Mill water storage pond; and
 - Dry stacked tailings facility (DSTF).

The location of each structure is shown on Figure 1.

- Prepare an inspection report including the results of the inspection, summary of the stability, integrity, and status of all inspected structures, and any recommendations for remedial actions; and
- Prepare a DSTF instrumentation memo summarizing ground temperature and slope indicator data collected during the site inspection.

3.0 INSPECTION SUMMARY AND RECOMMENDATIONS

The 2017 annual inspection was completed by J. Richard Trimble, M.Sc.(Eng.), P.Eng., FEC, and Taylor Pasloski, P.Eng., on August 24th, 2017. The following sections summarize observations for each structure and describe recommended remedial actions, if necessary. The recommended remedial actions have been separated into critical geotechnical stability concerns and ongoing facility maintenance issues to assist in the prioritization of remedial efforts. Select photographs taken during the inspection are included in the photographs section of this report.

3.1 PAG Waste Facility

The PAG waste storage facility is located south of the Bellekeno portal, as shown on Figure 1. The facility has not been used since mining operations were suspended in winter 2013, but currently contains some volume of PAG waste rock. At the time of inspection, the perimeter berms appeared intact with no visible sign of instability.

The client also requested revisions to the “standard” design drawing for future PAG storage sites to reflect their experience in water monitoring at the present sites (Photo 1).

3.2 Bellekeno Waste Rock Pile

The Bellekeno waste rock pile forms a portion of the Bellekeno Haul Road and is located north of the Bellekeno portal, as shown on Figure 1. At the time of the inspection the sideslopes of the waste rock pile appeared to be intact and stable. No remedial action is required for the Bellekeno waste rock pile at this time.

3.3 Bellekeno 625 Ponds

The Bellekeno 625 water treatment ponds are located north of the Bellekeno portal, as shown on Figure 1. The facility consists of two water treatment ponds that were both operating at the time of inspection. The primary treatment pond was operating at the discharge invert elevation with a freeboard of 0.5 m below the perimeter berm crest at the time of inspection. The secondary pond was also operating at the discharge elevation, with a freeboard of 0.5 m in the south end. The north end was in the process of being raised to the recommended minimum 0.5 m freeboard elevation during the inspection. After the inspection was conducted, Alexco provided photos showing the north perimeter berm raised to the final grade, with the liner installed and perimeter berm compacted (Photos 2).

As recommended in the 2016 annual geotechnical inspection report, elevation surveys to monitor for settlement at the north end of the pond should be completed monthly during the snow free seasons. At the end of the discharge pipe at the 625 treatment pond, water is being discharged onto the natural soils without any protection from erosion (Photo 3). The current flow conditions of the discharge were low, but continuous monitoring should take place. If the rate of erosion increases, rip-rap armouring should be installed.

Tension cracks were observed on the access road north of 625 (Photo 4). The cracks should be filled and the ground surface re-compacted to prevent water infiltration and further erosion.

3.4 Lightning Creek Bridge Abutments (Onek Road)

The Lightning Creek Bridge on the Onek Road is located east of Keno City, as shown on Figure 1. The bridge is a single span steel structure founded on earth filled timber cribbing abutments. The abutments appeared stable at the time of the inspection and are sufficiently protected from erosion by rip-rap armouring (Photo 5). No remedial action is required for the Lightning Creek Bridge on the Onek road at this time.

3.5 Lightning Creek Bridge Abutments (Bellekeno Haul Road)

The Lightning Creek Bridge on the Bellekeno Haul Road is located southwest of Keno City, as shown on Figure 1. The bridge is a single span steel structure with a wooden deck founded on earth filled timber cribbing abutments. The abutments appeared stable at the time of the inspection and are sufficiently protected from erosion by rip-rap armouring (Photo 6). No remedial action is required for the Lightning Creek Bridge on the Bellekeno Haul Road at this time.

3.6 Mill Water Storage Pond

The mill water storage pond is located at the Keno Hill District Mill Site, west of Keno City, as shown on Figure 1. At the time of the inspection the pond was not operating but contained some water, with a freeboard of about 2 m below the perimeter berm crest (Photo 7). The perimeter berms and pond liner appeared intact with no visible signs of instability. No remedial action is required for the mill water storage pond at this time.

3.7 Dry Stacked Tailings Facility

The dry stacked tailings facility (DSTF) is located at the Keno Hill District Mill Site west of Keno City, as shown on Figure 1. No tailings have been placed in the DSTF since mining operations were suspended in winter 2013. The tailings placed to date have been regraded, covered with organic growth medium, and seeded as part of progressive reclamation activities (Photo 8). At the top of the DSTF near the south end, there was visible erosion and deposition of tailings from weathering (Photo 9). Arrangements should be made to fill the eroded area to prevent further erosion.

3.8 Instrumentation

Performance of the DSTF is monitored with compaction testing during tailings placement and regular instrumentation readings. DSTF instrumentation consists of seven ground temperature cables installed to monitor permafrost conditions (six in natural soils adjacent to the DSTF and one through tailings placed within the DSTF footprint), and three slope indicators installed to monitor lateral movement of the foundation soils. The locations of installed DSTF instrumentation are shown on Figure 2.

It should be noted that some critical instrumentation located within and adjacent to the DSTF is in need of repair and/or replacement.

3.8.1.1 Background Ground Temperature Readings

Updated ground temperature readings were collected from five of the six ground temperature cables installed in natural soils adjacent to the DSTF during the inspection. Readings were not collected from BH17 as the protective steel casing has been damaged, and the instrument connector is wedged out of inside the casing. The protective casing should be repaired or removed to allow for continued instrumentation reading.

As indicated on the updated ground temperature profiles included in Appendix B, the slight near surface warming trend observed in previous years has continued. Continued regular instrumentation readings are recommended to monitor ground temperature conditions.

The ground temperature cable installed in BH40, through the tailings and into the foundation soils below the DSTF has been damaged and requires replacement. This is a critical installation needed to confirm design assumptions and provide ongoing temperature monitoring.

3.8.1.2 Slope Indicator Readings

An updated lateral movement profile developed from readings collected from the slope indicator installed in BH36 in natural soils adjacent to the DSTF is included in Appendix C.

On August 7, 2017 the slope indicator installed in BH30 was replaced with BH38. Baseline readings were recorded after the installation and reconfirmed during the annual inspection. A profile of displacement within the slope indicator will be available once further recordings have been collected for comparison with the baseline readings. It was noted that during the inspection, approximately 4 m of water was in the casing of the slope indicator. The water should be removed, and the casing preserved using a silicone oil or suitable alternative to prevent freezing.

Readings were not possible in BH28 as the casing was blocked approximately 3.7 m down the hole. The hole was steamed out to approximately 22 m, and a subsequent attempt was made to record another measurement. The instrument was once again prevented from traveling down the casing. A downhole camera should be utilized to determine the cause of derailment of the slope indicator instrument.

4.0 CONCLUSIONS

The surface engineered earth structures inspected pose no significant risk to the environment or human health and safety in their current condition. The remedial actions recommended in the previous section are summarized in Table 1 for reference.

Table 1: Summary of Remedial Recommendations

Structure	Stability Recommendations	Maintenance Recommendations
PAG Waste Storage Facility	None	None
Bellekeno Waste Rock Pile	None	None
Bellekeno 625 Water Treatment Ponds	<ul style="list-style-type: none"> Conduct monthly elevation surveys during snow free season of perimeter berm crest of secondary pond to monitor for settlement; 	<ul style="list-style-type: none"> Monitor the erosion on the discharge pipe and install rip rap if required; and, Repair tension cracks on access road.
Lightning Creek Bridge Abutments (Onek Road)	None	None
Lightning Creek Bridge Abutments (Bellekeno Haul Road)	None	None
Mill Water Storage Pond	None	None
Dry Stacked Tailings Facility	<ul style="list-style-type: none"> Install new ground temperature cable to replace damaged cable at BH40; Purge and clean BH38 and preserve using liquid suitable for use in permafrost conditions; and Investigate cause of derailment in BH28 with downhole camera. Rehabilitate or replace as required 	<ul style="list-style-type: none"> Continue regular instrumentation readings to monitor DSTF foundation conditions

5.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Alexco Resource Corp. and their agents. Tetra Tech Canada Inc. (Tetra Tech) 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. NELPCo's Limitations are provided in Appendix A of this report.

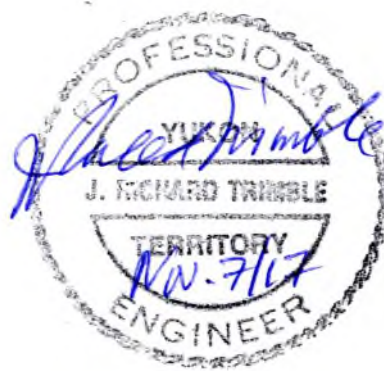
6.0 CLOSURE

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

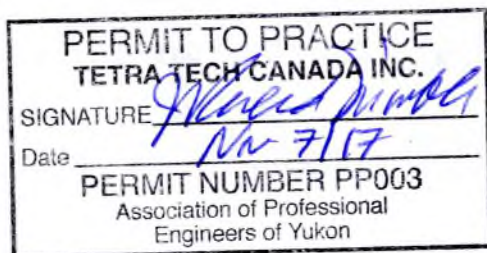
Respectfully submitted,
NELPCo Limited Partnership



Prepared by:
Taylor Pasloski, P.Eng
Intermediate Geotechnical Engineer, Arctic Region
Direct Line: 867.668.9213
Taylor.Pasloski@tetrattech.com



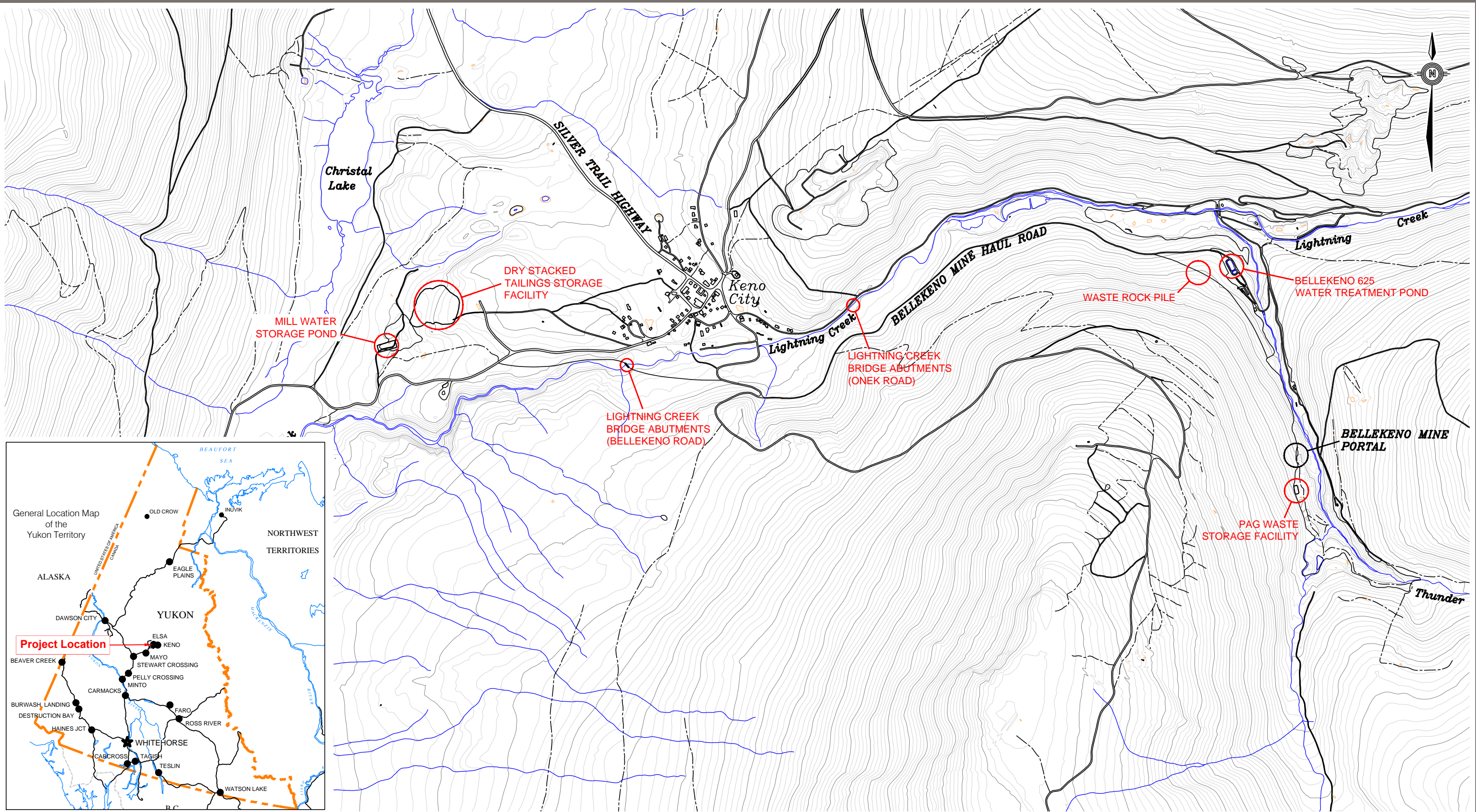
Reviewed by:
J Richard Trimble, M.Sc.(Eng.), P.Eng., FEC
Principal Consultant, Arctic Region
Direct Line: 867.668.9216
Richard.Trimble@tetrattech.com



FIGURES

-
- | | |
|----------|--|
| Figure 1 | Site Plan Showing Structure Locations |
| Figure 2 | DSTF Site Plan Showing Instrumentation Locations |

Q:\WhitehorseData\0201 drawings\Keno\ENG.WARC03301-01 2017 Annual Inspection\ENG.WARC03301-01 Fig.1 RD.dwg [FIGURE 1] August 30, 2017 - 8:06:04 pm (BY: BUCHAN, CAMERON)



0 500m
Scale: 1:15,000 @ 11"x17"

NOTES
CONTOUR INFORMATION IS BASED ON DRAWING
PROVIDED BY ALEXCO RESOURCE INC.

CLIENT

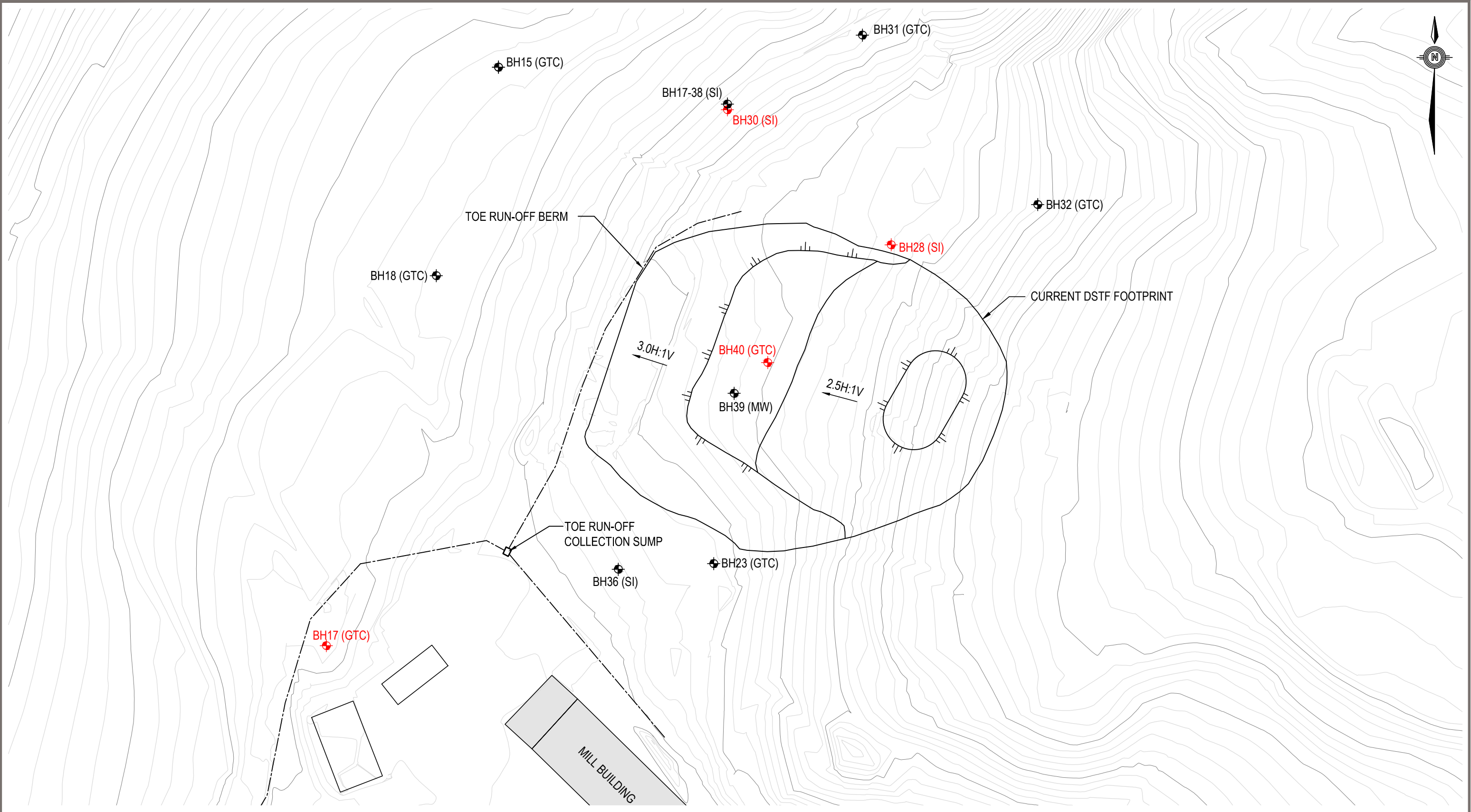


2017 ANNUAL INSPECTION
BELLEKENO MINE SITE - KENO CITY, YUKON

SITE PLAN SHOWING
STRUCTURE LOCATIONS

PROJECT NO. ENG.WARC03301-01	DWN CB	CKD TP	REV 0	Figure 1
OFFICE EBA-WHSE	DATE August 31, 2017			

Q:\Whitehorse\Data\0201 drawings\Keno\ENG.WARC03301-01 2017 Annual Inspection\ENG.WARC03301-01 Fig.2_R0.dwg [FIGURE 2] August 30, 2017 - 8:05:45 pm (BY: BUCHAN, CAMERON)



LEGEND

- GTC - GROUND TEMPERATURE CABLE
SI - SLOPE INDICATOR
MW - MONITORING WELL

NOTE
INSTRUMENTATION SHOWN IN RED HAS BEEN DAMAGED.

CLIENT

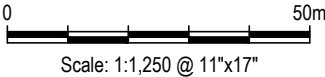


2017 ANNUAL INSPECTION
BELLEKENO MINE SITE - KENO CITY, YUKON

SITE PLAN SHOWING
BOREHOLE AND INSTRUMENTATION LOCATIONS

PROJECT NO. ENG.WARC03301-01	DWN CB	CKD TP	REV 0
OFFICE EBA-WHSE	DATE August 31, 2017		

Figure 2



PHOTOGRAPHS



Photo 1: PAG Waste Storage Facility
Facing North – August 24, 2017



Photo 2: Bellekeno 625 Water Treatment Ponds
North Perimeter Berm
Facing South – August 24, 2017



Photo 3: Bellekeno 625 Water Treatment Ponds
Water Discharge
August 24, 2017



Photo 4: Bellekeno 625 Water Treatment Ponds
Access Road Tension Cracks
August 24, 2017



Photo 5: Lightning Creek Abutments
Onek Road
August 24, 2017



Photo 6: Lightning Creek Abutments
Bellekeno Haul Road
August 24, 2017



Photo 7: Mill Water Storage Pond
August 24, 2017



Photo 8: DSTF Progressive Reclamation
August 24, 2017



Photo 9: DSTF
Visible Erosion and Deposition
August 24, 2017

APPENDIX A

NELPCO'S LIMITATIONS

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of NELPCO Limited Partnership's (NELPCo) Client (the "Client") as specifically identified in the NELPCO Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). NELPCO does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by NELPCO.

Any unauthorized use of the Professional Document is at the sole risk of the user. NELPCO accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, in fact, caused by the unauthorized use of the Professional Document.

Where NELPCO has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by NELPCO during the performance of the work are NELPCO's professional work product and shall remain the copyright property of NELPCO.

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

1.2 ALTERNATIVE DOCUMENT FORMAT

Where NELPCO submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed NELPCO's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by NELPCO shall be deemed to be the original. NELPCO will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of NELPCO's Instruments of Professional Service shall not, under any circumstances, be altered by any party except NELPCO. NELPCO's Instruments of Professional Service will be used only and exactly as submitted by NELPCO.

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

1.3 STANDARD OF CARE

Services performed by NELPCO for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of NELPCO.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with NELPCO with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for NELPCO to properly provide the services contracted for in the Contract, NELPCO has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO NELPCO BY OTHERS

During the performance of the work and the preparation of this Professional Document, NELPCO may have relied on information provided by third parties other than the Client.

While NELPCO endeavours to verify the accuracy of such information, NELPCO accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to NELPCO at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document 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 conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

NELPCO is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, NELPCO has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. NELPCO does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. NELPCO does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

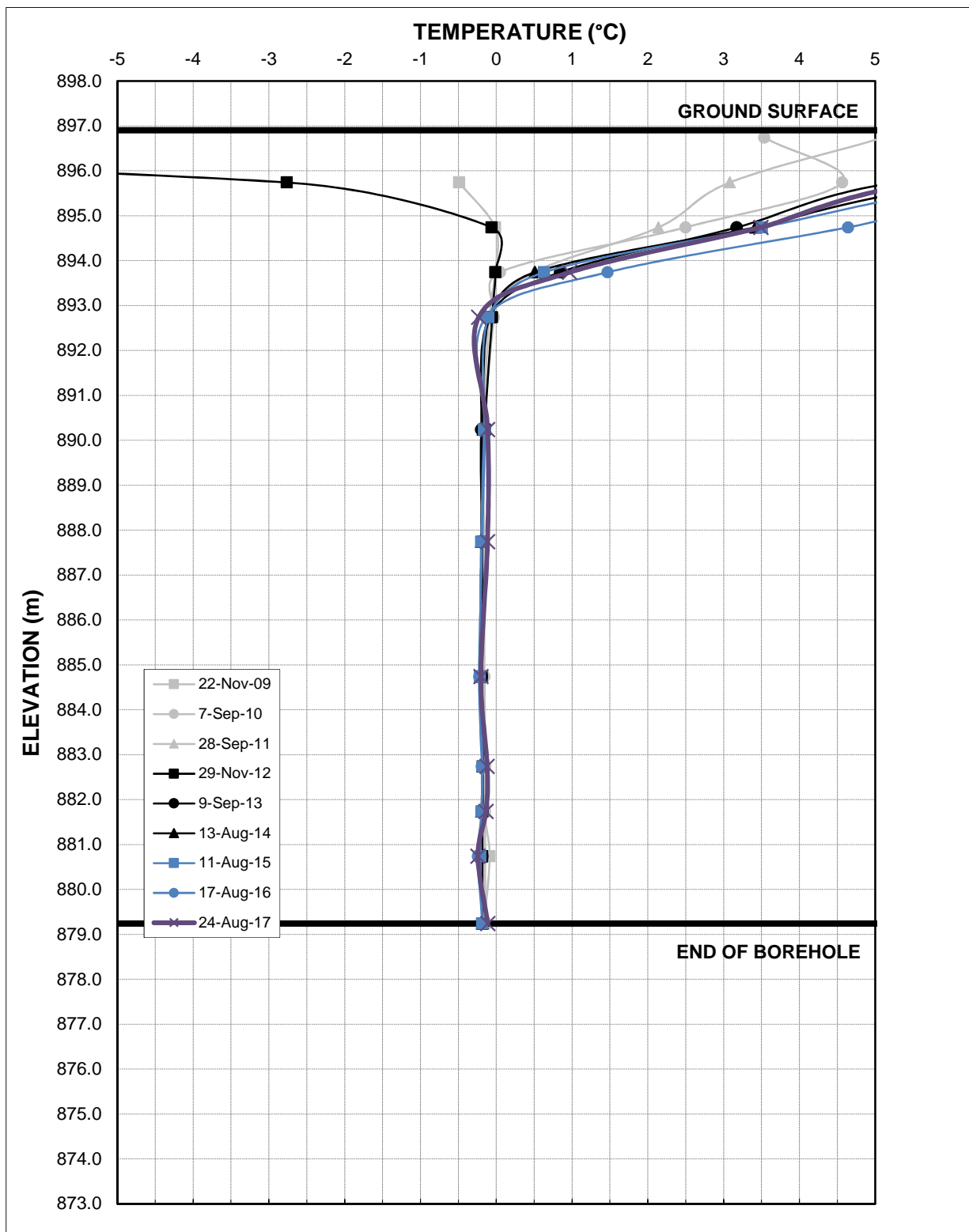
NELPCO will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. NELPCO cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

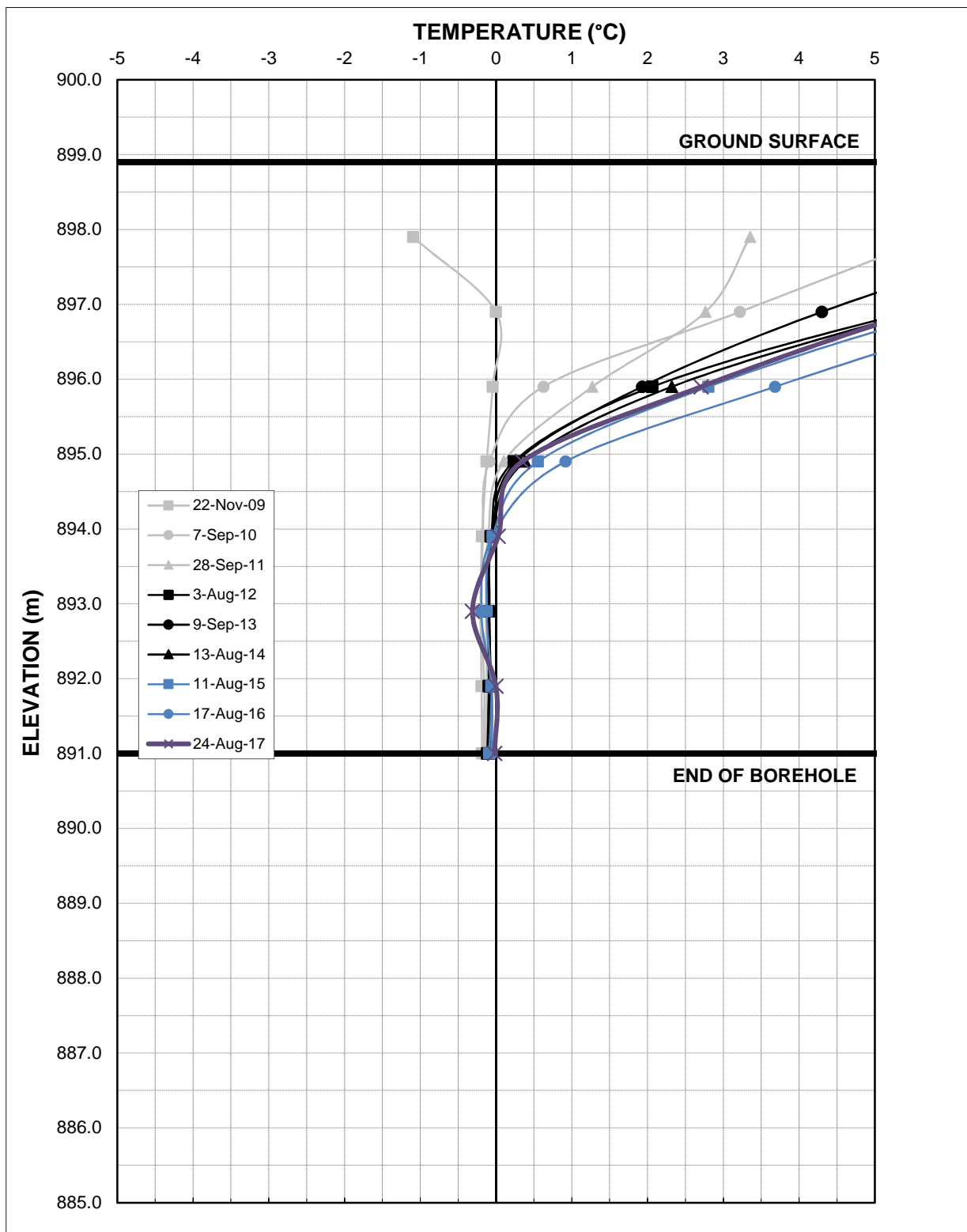
APPENDIX B

DSTF GROUND TEMPERATURE PROFILES



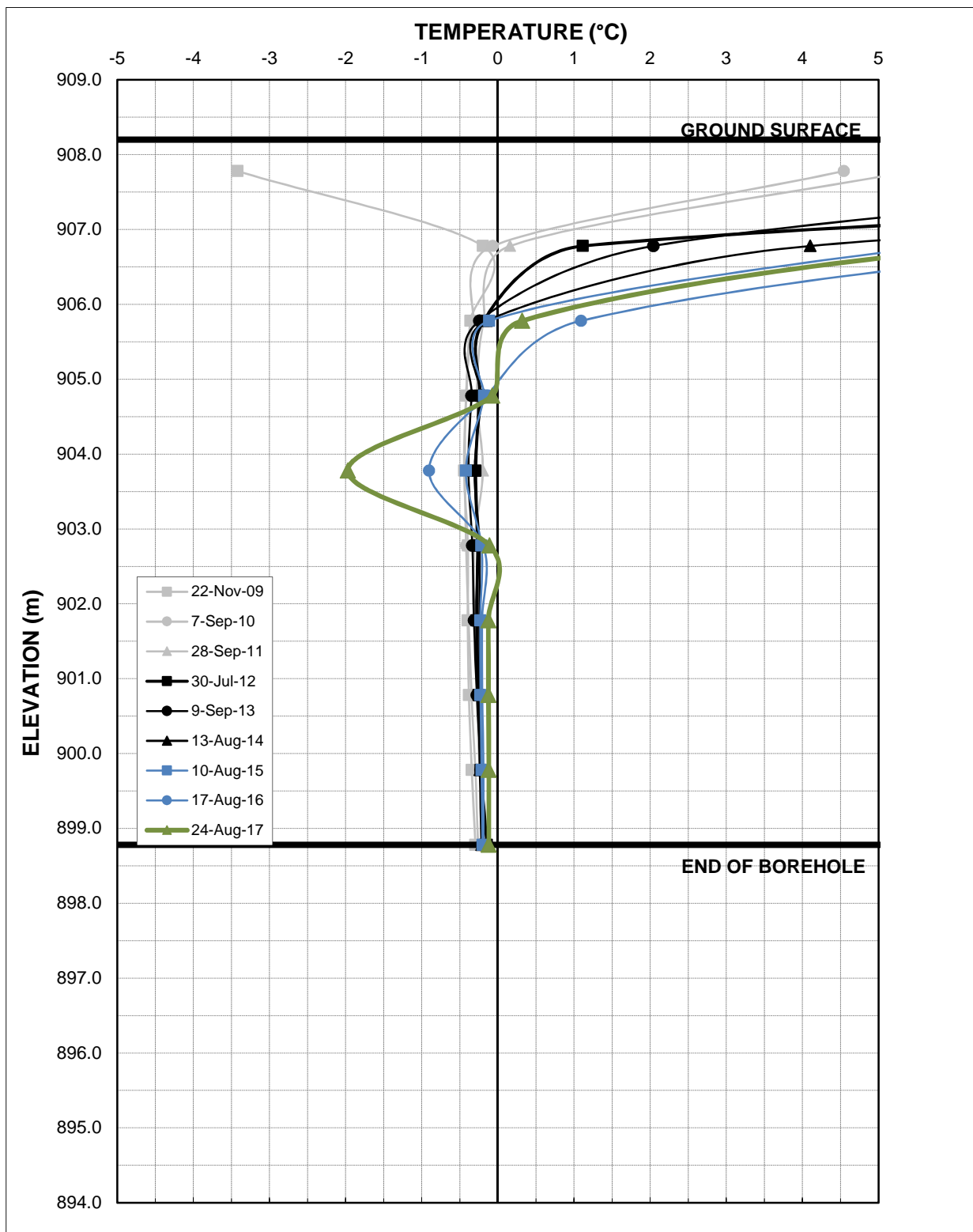
Install Date August 30, 2009
 Last Updated August 24, 2017
 Cable No: 2207

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH15
Figure T1



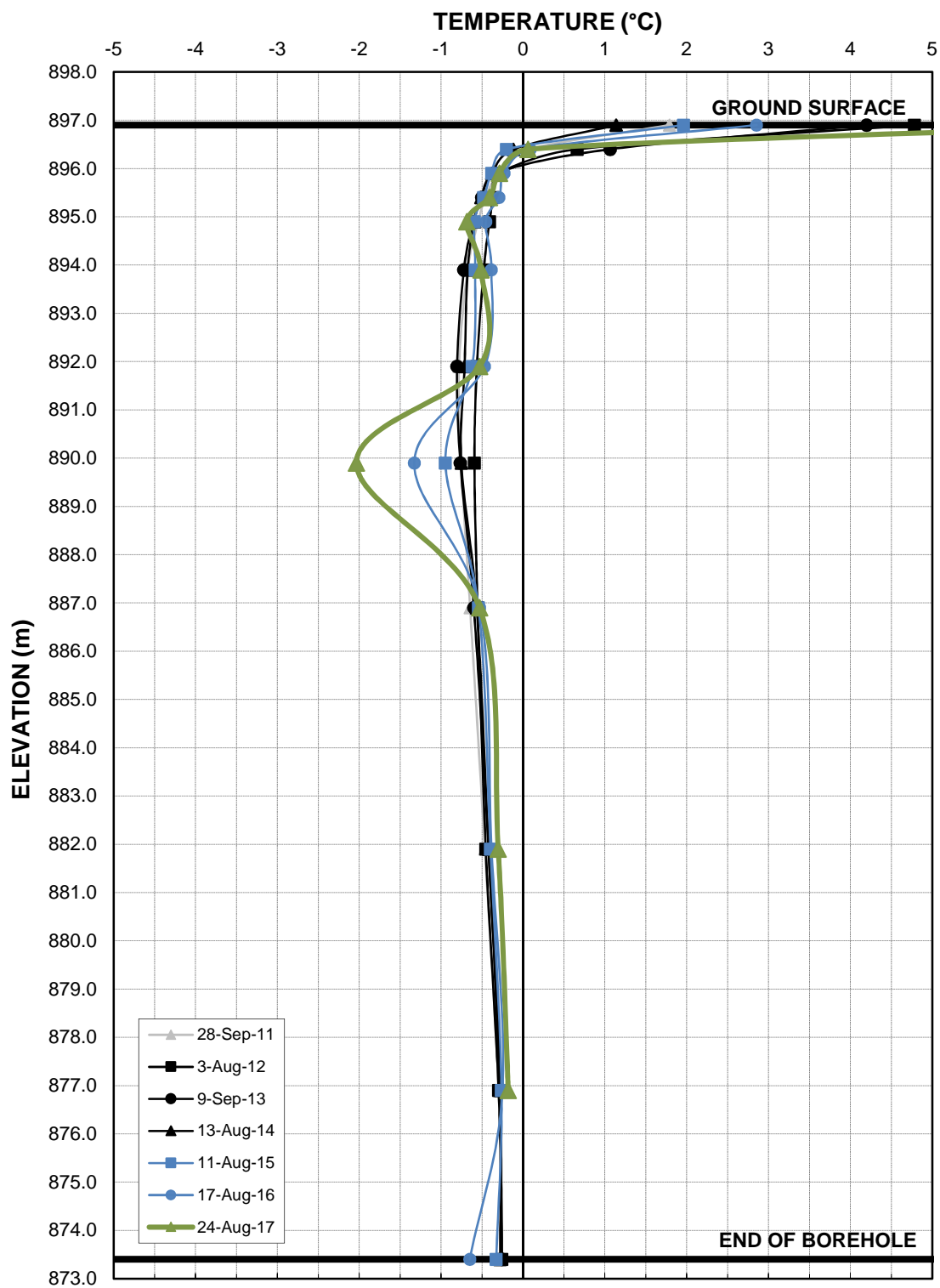
Install Date September 2, 2009
 Last Updated August 24, 2017
 Cable No: 2209

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH18
Figure T3



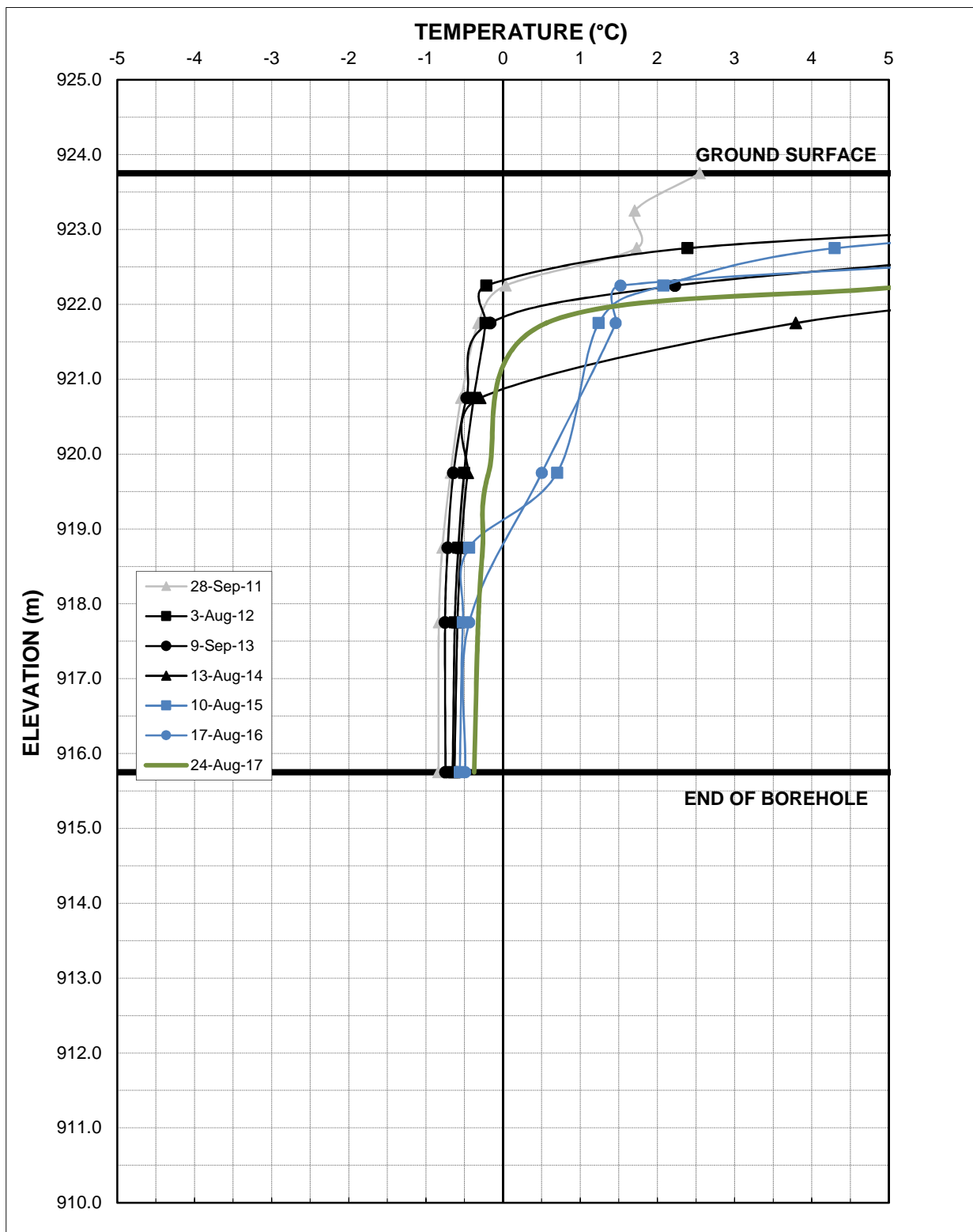
Install Date September 29, 2009
 Last Updated August 24, 2017
 Cable No: 2210

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH23
Figure T4



Install Date February 22, 2011
 Last Updated August 24, 2017
 Cable No: 2263

Ground Temperature Profile
Keno Hill District Mill Site Borehole BH31
Figure T5



Install Date February 22, 2011
Last Updated August 24, 2017
Cable No: 2264

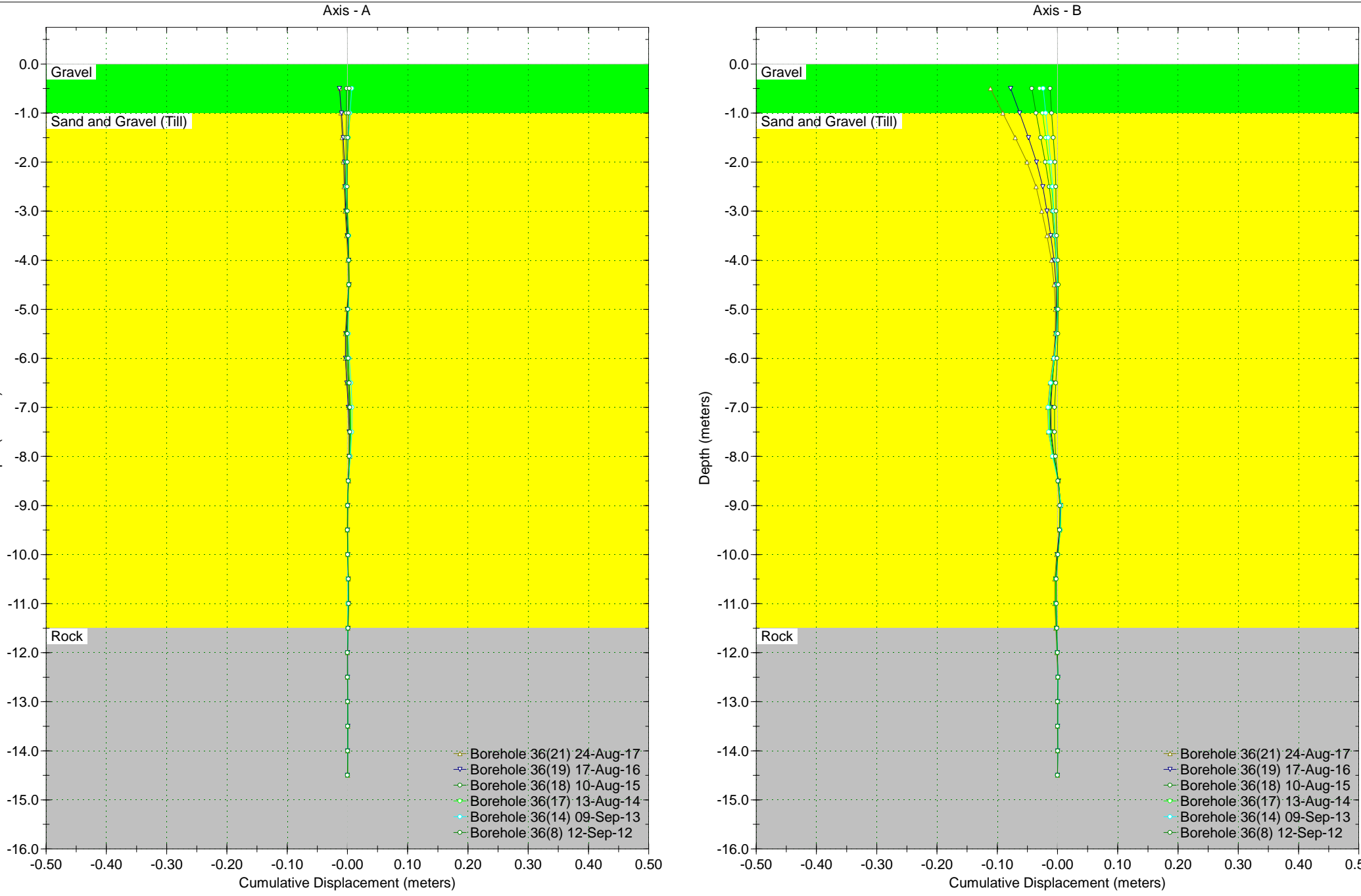
Ground Temperature Profile
Keno Hill District Mill Site Borehole BH32
Figure T6

APPENDIX C

DSTF LATERAL MOVEMENT PROFILES

Borehole : Borehole 36
Project : Keno Hill District Mill
Location : DSTF
Northing : 7086872
Easting : 483931
Collar :

Spiral Correction : N/A
Collar Elevation : 0.0 meters
Borehole Total Depth : 14.5 meters
North Groove Azimuth :
Base Reading : 2011 Dec 14 16:52
Axis A Azimuth : 0.0 degrees



APPENDIX B

2017 NOISE MONITORING RESULTS

Memorandum

To: Alexco Keno Hill Mining Corp.

From: Alexco Environmental Group Inc.

CC: Kai Woloshyn, Alexco Resource Corp.

Date: March 28, 2018

Re: 2017 Noise Monitoring Data Summary, Keno, YT

INTRODUCTION

As part of the Keno Hill Silver District Mining Operations Noise Monitoring and Management Plan (the Plan) (AKHM, 2018), Alexco Keno Hill Mining Corp. (AKHM) monitors noise levels in Keno City. The Plan was initially developed to address any potential noise effects that might occur with the addition of the two new mines, Lucky Queen and Onek 990. In addition to noise mitigation measures and the creation of a Noise Disturbance Notification Form and Noise Disturbance Register to track noise disturbance claims, AKHM committed to monitor noise levels within the community at various locations to assess the actual versus predicted noise levels and to determine if the noise abatement measures are effective. These noise data collected between September 2013 to 2017 can be used in the context of the no active mining period for the District, but exploration and care and maintenance of the District was ongoing.

The predicted noise levels were presented in the Noise Impact Assessment (NIA) completed by Patching Associates Acoustical Engineering Ltd. (PAAE) conducted during the Yukon Environmental and Socio-Economic Assessment Act (YESAA) process (Project 2011-0315). The NIA identifies the noise sources from the current mining-related activities, noise receptors, and predicts the anticipated noise level from all existing sources and those associated with the addition of Lucky Queen and Onek 990 mining operations.

This memo presents noise monitoring results from 2017 with reference to the data collected since 2013.

NOISE RECEPTORS

AKHM has monitored noise at the five locations selected in the NIA as being potential noise receptors within a 2 km radius study area around Keno City. Since November 2013, noise has also been monitored at a sixth location, the Keno City Campground. These monitoring locations are listed in Table 1 and shown in Figure 1.

Table 1 Representative Locations Assessed in Keno City

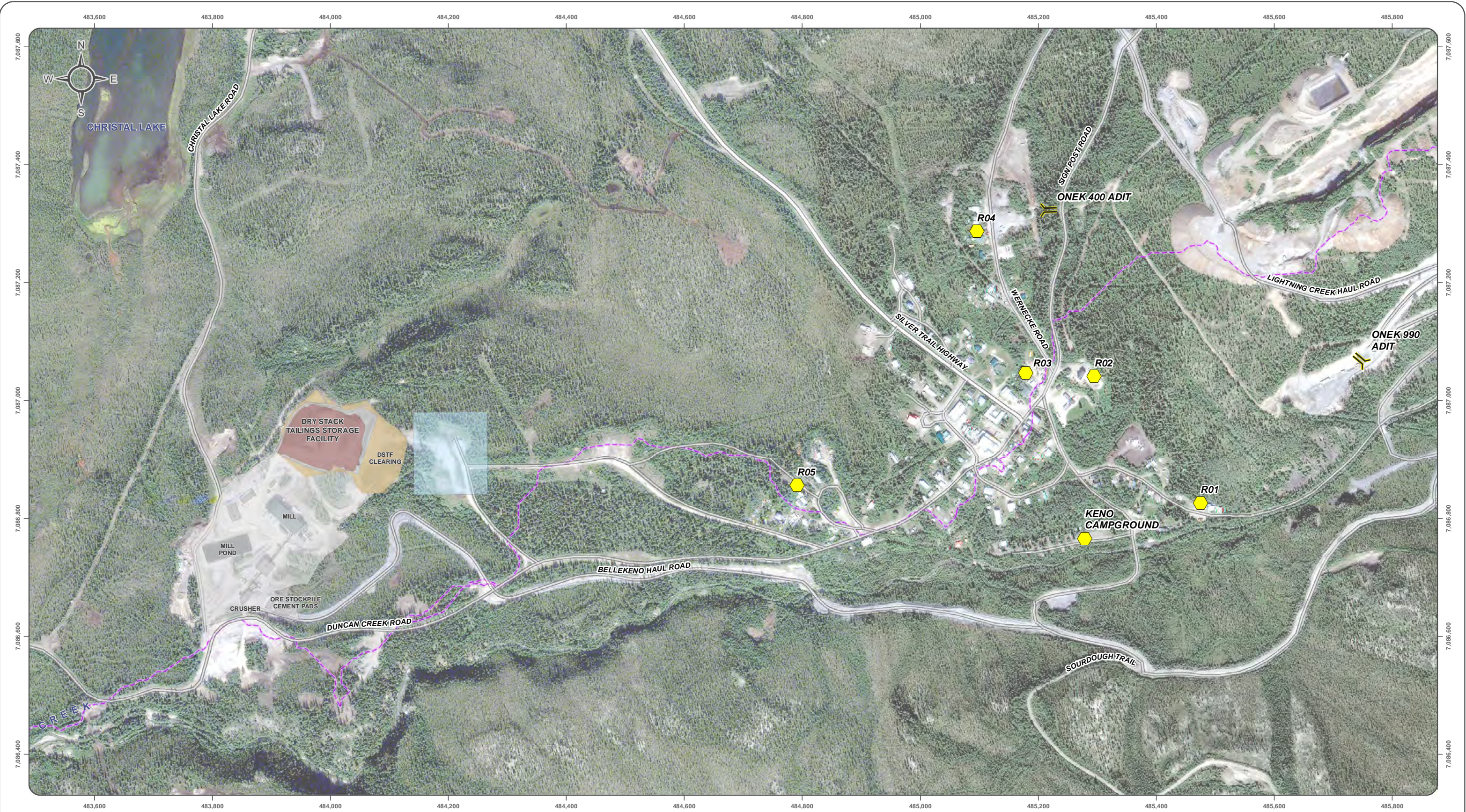
Monitoring Location	GPS Location	Description
R01	N63.90827 W135.29599	East end Residence, north side of Lightning Creek Road
R02	N63.91019 W135.29968	Residence, east side of Sign Post Road
R03	N63.91023 W135.30205	Town Center, north from the Snack Bar
R04	N63.91239 W135.30376	Residence, west side of Wernecke Road
R05	N63.90851 W135.30993	Residence, about 850 m east from the Mill
Campground	N63.90772 W135.29998	Keno City campground

The background noise levels experienced by these locations vary considerably, depending on location and local activities. Climate parameters, such as relative humidity, temperature, and temperature inversions impact the sound level and propagation experienced by each of these receptors.

MINING ACTIVITIES TIMELINE

Mining took place at Bellekeno, and milling at the Keno District Mill throughout 2013, until these were suspended on September 3rd, 2013. Operations at Onek 990 ceased at the end of May 2013. Exploration activities at Flame & Moth took place from late March to early November 2014. The remaining months: September 2013 through March 2014, and December 2014 to December 2017, can be considered baseline conditions as no mining or exploration activities were taking place near Keno City at that time. Only Care and Maintenance and preparation of the Flame and Moth water treatment pond occurred in 2017.

Care and Maintenance activities associated with the closed mines are minor but ongoing from September 2013 to present, which includes activities such as maintaining roads, and other small construction activities at the mill site.



Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on March 2016
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

This drawing has been prepared for the use of Alexco Environmental Group Inc.'s client and may not be used, reproduced or relied upon by third parties, except as agreed by Alexco Environmental Group Inc. and its client, as required by law or for use of governmental reviewing agencies. Alexco Environmental Group Inc. accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without Alexco Environmental Group Inc.'s express written consent.

1:6,000 (when printed on 11 x17 inch paper)

0 50 100 150 200 Meters



Adit



Noise Monitoring Station



Building/Structures



DSTF 322k Tonnes Design



Current DSTF



Mill Site Footprint



Land Disposition Garbage Dump



Watershed Boundaries



Silver Trail Highway



Secondary Road



KENO HILL SILVER DISTRICT MINING OPERATIONS

FIGURE 1 NOISE MONITORING STATIONS

MARCH 2016

D:\Project\AllProjects\Keno_Area_Mines\Bellekeno\GIS\mxd\Overview_Maps\Specific_Topics\Noise_Monitoring_Strs_20160330.mxd
(Last edited by: amalashevskia, 3/30/2016 11:19 AM)

MONITORING EQUIPMENT

The noise monitoring profiles collected between April 2013 and November 2014 were measured using an Extech Integrating Sound Level Datalogger (Model 407780) to capture average dBA over a single ten minute period. The wind speed, wind direction, temperature and precipitation data from the Flame and Moth Meteorological Station, on top of the dry stack tailings facility, associated with each noise monitoring event have been reported as these can have a significant effect on measured noise levels. Any notable noise sources associated with the monitoring event were also documented where possible. The results from 31 monitoring events from April 2013 to November 2014 are presented in Appendix A.

Starting in December 2014, noise monitoring readings were collected with a Casella CEL-63X Sound Level Meter and a Casella CEL-495 Microphone. The microphone was mounted on a tri-pod at approximately 1.5 meters above ground and surrounded by a windscreen provided by Casella for use with this microphone to reduce wind impacts as required for outdoor sound measurements. The sound level meter and battery power source were housed inside a weather-proof case which was held in a locked metal box for extra security.

In 2015, 24 hr period data were able to be collected in January and August through November; equipment issues preventing the collection of 24 hr period data for the remainder of the year. In 2016, 24 hr period data were collected every month, however not all stations could be monitored every month due to battery or other equipment issues, or the temperature being below operating conditions for the equipment. In 2017, a combination of equipment malfunction, equipment vandalism and very cold temperatures only allowed for 24 hr period noise data collection in June, July and November.

RESULTS

In 2017, a total of seven 24 hr period sampling events took place over 12 months. The LA_{eq} values for all of these measurements ranged from 36.4 to 46.5 dB, with a median of 42.0 dB. The LA_{eq} is an equivalent continuous sound level which would contain the same sound energy as the varying sound record. The LA_{eq} value exceeds the LAF_{10} value for four out of five measurements (two measurements didn't report the LAF_{10}), indicating that these 24 hr noise monitoring events are characterized by short-term events and not general background levels, similar to what was observed in previous years.

The difference between the LA_{eq} and the LAF_{90} provides an indication if the LA_{eq} has been heavily influenced by short term noise events (difference greater than 10dB) or if the LA_{eq} indicates a very steady noise background level (difference less than 5dB). Four out of five LA_{eq} values are heavily influenced by short term events, and one shows a very steady noise environment. As 2017 represents baseline conditions, much of the short term noise events was presumably road traffic, such as the water truck or local vehicle traffic plus some heavy equipment

Approximately 71% of the LA_{eq} measurements in 2017 exceeded the predicted levels from the NIA range (from 32 to 39 dB) and of those that exceeded, only one measurement (14%) represents steady to very steady baseline conditions. Baseline noise levels were greater than those predicted in the NIA on several occasions between 2014 and 2016 as well, indicating that many of the notable noise sources are not linked to Keno mining or milling operations.

The Casella sound meter is calibrated in the field before and after each set of measurements. This calibration data is recorded with the noise monitoring records. The drift can be affected by temperature or too long a period from factory calibration. If the drift is greater than ± 3.0 dB not all data is recorded. Since drift increases as temperature decreases, it is important to keep the sound level meter and microphone as warm as possible. During periods of extended low temperatures, the data validity may need to be assessed. In 2017, calibration drift remained smaller than ± 3 dB for six out of seven 24 hr sampling events.

Table 2 presents all 24 hr period noise data available to date (all data runs with <24 hours have been excluded), and associated meteorological parameters obtained from the district mill weather station (averaged from hourly data for the corresponding 24 hr period). The existing 2013 and 2014 10 minute noise data measurements are provided in Appendix A.

Table 2 2014-2017 24 hr Noise Data and Corresponding Meteorological Data

Station	Start Date & Time	LAeq (dB)	LAF 10% (dB)	LAF 90% (dB)	LAeq > LAF10	LAeq - LAF90 (dB)	LZeq	LAleq	LAE	LCeq	LCeq-LAeq	Calibration Drift	Temp. (°C)	R.H. (%)	Avg. WS (m/s)
R01	14/12/2014 10:30	43.1	N/A	N/A			72.7	45.3	92.4	59.4	16.4	-4.8	-4.4	92.6	n/a
R02	15/12/2014 16:20	44.3	N/A	N/A			77.1	49.6	93.7	64.3	20	-4.8	-1.9	76.4	1.35
R03	17/12/2014 10:00	58.6	N/A	N/A			59.4	62	108	59.2	0.6	-4.8	-8.4	94.4	0.70
R05	18/12/2014 10:30	42.0	N/A	N/A			50.6	45.2	91.3	48.5	6.6	-4.8	-13.6	90.7	0.60
Cmpgr.	22/12/2014 12:30	25.4	N/A	N/A			43.5	27.4	74.8	38	12.6	-4.8	-9.6	93.8	n/a
R01	10/01/2015 10:15	28.8	N/A	N/A			38.2	33.4	78.2	35.6	6.8	-4.8	-10.2	93.7	n/a
R02	11/01/2015 15:50	33.8	N/A	N/A			43.8	36	83.2	40.3	6.5	-4.8	-10.1	93.3	n/a
R03	13/01/2015 8:40	28.6	N/A	N/A			40.7	31.6	78	37.9	9.3	---	-7.3	95.3	n/a
R04	14/01/2015 9:45	36.5	N/A	N/A			51.4	41.8	85.9	47.6	11.1	-4.8	-9.4	93.9	n/a
R05	15/01/2015 12:30	37.5	N/A	N/A			47.8	42.1	86.9	41.1	3.6	-4.8	-1.8	99.0	0.52
Cmpgr.	22/01/2015 8:30	23.2	N/A	N/A			28	23.4	72.6	22.5	-0.7	---	-9.8	93.6	0.47
N/A	13/08/2015 11:00	34.2	35.5	22.5	No	11.70	56.1	36.6	83.6	51.4	17.2	0.3	8.6	63.3	1.57
N/A	14/08/2015 13:30	111.8	116.0	45.5	No	66.30	123.9	119.1	161.2	118	6.2	0.3	9.7	68.4	1.68
N/A	16/08/2015 14:00	49.2	48.0	46.5	Yes	2.70	62.6	52.6	98.6	61.3	12.1	0.3	11.3	67.5	1.56
N/A	23/08/2015 11:00	60.6	61.0	60.0	No	0.60	62.7	61.2	110	62	1.4	0.3	8.3	84.0	1.38
N/A	24/08/2015 13:00	41.9	38.5	20.5	Yes	21.40	54.1	47.2	91.3	52	10.1	0.3	7.7	87.2	0.95
N/A	12/09/2015 10:00	---	8.5	8.0			---	---	57.7	---	-1.1	0.3	4.6	79.4	1.73
N/A	14/09/2015 10:15	---	8.5	8.0			---	---	57.7	---	-1.1	0.3	3.3	87.8	1.00
N/A	15/09/2015 10:30	---	8.5	8.0			---	---	57.7	---	-1.1	0.3	1.4	93.6	1.09
N/A	17/09/2015 6:00	---	8.5	8.0			---	---	57.7	---	-1.1	0.3	5.2	84.6	1.58
N/A	18/09/2015 13:15	---	8.5	8.0			---	---	57.6	---	-1.1	0.3	2.5	81.2	1.65
N/A	17/10/2015 12:40	30.4	31.5	20.0	No	10.40	44.8	35.8	79.8	40.5	10.1	0.3	3.3	94.8	0.76
N/A	18/10/2015 16:33	58.9	59.5	58.5	No	0.40	61	59.4	108.3	59.8	0.9	0.3	4.1	85.3	0.84
R05	14/11/2015 11:30	32.8	17.0	15.0	Yes	17.80	42.4	33.6	82.2	39.2	6.4	0.3	-18.4	86.5	n/a
R01	16/11/2015 8:30	34.7	19.5	16.0	Yes	18.70	51.2	37	84	49.2	14.5	0.3	-17.4	87.3	n/a
R04	17/11/2015 10:00	21.3	18.0	15.5	Yes	5.80	46.4	27.3	70.6	36.3	15	0.3	-21.0	83.9	n/a
R02	19/11/2015 9:00	33.1	16.0	15.5	Yes	17.60	46.9	40.3	82.4	44.2	11.1	0.3	-28.4	76.7	n/a
R03	21/11/2015 9:40	39.7	17.5	16.0	Yes	23.70	47.8	46	89	46.3	6.6	0.3	-9.0	94.0	n/a
Cmpgr.	07/01/2016 11:30	23.2	20	15.5	Yes	7.70	38.1	30.2	72.5	75.8	7.8	0.1	-16.1	81.8	0.63
R03	08/01/2016 18:45	28.3	19.5	16.5	Yes	11.80	40	35.9	77.7	74.6	4.5	-0.2	-11.5	90.4	0.44
R01	09/01/2016 19:30	39.0	20.0	15.5	Yes	23.50	48.9	41.7	88.4	79.3	6.4	-0.2	-14.6	89.7	0.51
R05	10/01/2016 20:30	30.6	20.5	15.5	Yes	15.10	44.1	35.5	80	71.6	5.7	-0.2	-18.2	86.5	0.33
N/A	14/01/2016 17:00	25.4	17.0	15.5	Yes	9.90	36.5	33.6	74.7	68.1	6.6	0.1	-8.1	94.5	n/a
R04	15/02/2016 17:00	25.5	19.0	15.5	Yes	10.00	48.5	33.9	74.9	68.1	6.3	0.3	-7.8	89.0	1.12
R03	17/02/2016 10:00	23.9	19.0	15.0	Yes	8.90	40.3	30.2	73.3	66.8	11.6	-2.1	-22.9	77.9	0.45
Ball diamond	25/02/2016 9:00	---	18.5	15.5	Yes	n/a	43.7	24.4	69.3	56.2	9.2	-0.2	-5.5	81.4	1.27

Station	Start Date & Time	LAeq (dB)	LAF 10% (dB)	LAF 90% (dB)	LAeq > LAF10	LAeq - LAF90 (dB)	LZeq	LAeq	LAE	LCeq	LCeq-LAeq	Calibration Drift	Temp. (°C)	R.H. (%)	Avg. WS (m/s)
R01	28/02/2016 10:40	22.4	20.5	16.5	Yes	5.90	55.1	26.1	71.8	65	15.6	-0.5	-2.8	85.0	0.92
R04	12/03/2016 17:30	37.5	25.0	15.5	Yes	22.00	56.9	44.4	86.8	82	3.8	0.4	-5.3	62.8	1.03
N/A	14/03/2016 10:32	44.9	24.0	21.0	Yes	23.90	49	48.2	94.2	91.6	2.9	0.1	-7.6	88.2	0.87
R05	15/03/2016 11:32	26.1	22.0	17.0	Yes	9.10	56.1	32.5	75.5	65.4	13.8	-0.1	-6.2	91.4	0.86
R03	17/03/2016 10:00	111.8	115.5	45.5	No	66.30	127.7	120.4	161.2	136.7	7.8	-0.1	-4.9	70.9	1.09
Cmpgr.	18/03/2016 11:00	27.7	30.5	18.5	No	9.20	57.5	31.3	77.1	63.7	12.9	-0.1	-7.8	72.8	1.89
N/A	01/04/2016 15:00	54.4	46.0	30.5	Yes	23.90	61.6	64.7	103.7	108.5	4.9	0.2	3.5	67.2	1.25
R05	15/04/2016 11:46	31.9	30.0	18.0	Yes	13.90	54.3	34.4	81.2	67.1	9.1	-0.1	3.2	63.6	1.51
R03	16/04/2016 13:00	41.0	34.5	17.0	Yes	24.00	60.8	43.7	90.4	75.3	12.1	----	3.7	57.2	1.56
R04	18/04/2016 15:30	28.0	27.0	17.0	Yes	11.00	56.3	36.1	77.4	72	11.9	-0.1	0.5	64.2	1.73
R02	23/04/2016 8:30	29.1	28.5	16.5	Yes	12.60	65.9	38	78.5	66.9	20.1	0.1	7.3	59.3	1.44
Cmpgr.	24/04/2016 9:05	35.2	34.5	27.5	Yes	7.70	52.4	36.9	84.5	67.9	14.3	-0.1	7.6	59.9	1.28
R01	25/04/2016 12:00	39.1	39.5	36.5	No	2.60	55.1	39.5	88.4	73.4	13.5	-0.1	5.7	57.5	1.78
R01	15/05/2016 8:40	49.3	50.5	48.0	No	1.30	57.5	49.7	98.7	66.3	3.3	-0.1	12.2	47.4	2.30
R02	16/05/2016 11:10	44.4	42.5	24.5	Yes	19.90	64.9	56.9	93.8	84.1	10.7	----	5.9	71.5	3.12
R03	18/05/2016 13:00	38.7	38.5	24.5	Yes	14.20	60.2	40.4	88.1	76.9	13.6	0.1	7.5	66.6	1.88
R04	19/05/2016 14:15	39.2	34.0	21.5	Yes	17.70	59.5	46.8	88.6	81	6.3	-0.2	10.3	56.7	1.57
Cmpgr.	21/05/2016 8:30	47.1	48.5	44.5	No	2.60	56.8	47.8	96.4	79.2	7.7	----	16.6	39.4	1.47
R05	22/05/2016 11:30	41.0	44.0	30.5	No	10.50	52.8	42.8	90.4	69.9	10.3	-0.2	9.9	66.2	1.72
R01	13/06/2016 8:40	50.9	51.0	50.0	No	0.90	53.8	54.5	100.2	85.4	2.5	----	11.1	78.0	1.63
R05	19/06/2016 8:40	39.7	42.5	31.5	No	8.20	53	41.6	89.1	70.4	7.5	0.1	19.6	26.9	2.28
R04	20/06/2016 13:40	38.5	34.0	21.0	Yes	17.50	55.6	48.8	87.9	82.7	10	0.1	10.3	79.6	1.47
R03	29/06/2016 13:00	48.0	44.0	22.5	Yes	25.50	61	53.6	97.3	91.1	10.8	-0.2	15.5	67.8	1.35
Cmpgr.	30/06/2016 18:00	51.1	51.0	15.5	Yes	35.60	57	60.1	100.5	95.4	5	0.1	12.7	83.3	0.69
R05	17/07/2016 8:30	40.5	42.0	30.5	No	10.00	52.9	43.3	89.9	75.8	8.9	----	14.8	64.6	2.50
Cmpgr.	18/07/2016 14:30	48.3	46.5	44.5	Yes	3.80	54.1	56.6	97.6	90.1	4.7	-0.1	11.2	82.5	1.61
R03	30/07/2016 19:30	40.3	38.5	27.0	Yes	13.30	61.1	46.4	89.7	84.8	14	----	13.7	69.0	2.00
R01	31/07/2016 20:00	91.0	92.5	61.5	No	29.50	105.5	97.9	140.3	128.2	5.4	0.2	12.5	65.7	1.93
N/A	18/08/2016 16:35	94.1	71.0	35.0	Yes	59.10	109.9	101.7	143.5	132.6	7.9	-0.2	9.6	87.0	0.84
N/A	20/08/2016 13:00	38.1	40.0	29.0	No	9.10	52.3	40.5	87.4	75.3	10.4	0.1	10.6	72.3	1.55
Cmpgr.	21/09/2016 17:05	44.3	46.0	40.5	No	3.80	59.3	47.9	93.7	77.5	5.1	----	10.1	36.8	2.63
R01	22/09/2016 17:51	46.5	47.0	45.0	No	1.50	64.8	46.9	95.8	72.8	5.2	0.1	7.2	56.4	2.47
R04	23/09/2016 20:15	33.9	33.5	23.5	Yes	10.40	57.2	38.1	83.3	72	13.8	-0.1	4.1	59.1	1.85
R05	24/09/2016 20:40	77.2	73.5	39.5	Yes	37.70	89.3	89.8	126.6	122.1	4.5	0.2	0.9	94.4	0.88
N/A	28/09/2016 15:30	37.0	31.0	22.5	Yes	14.50	58.5	39.8	86.3	77.2	13.7	----	1.0	66.7	1.90
N/A	25/10/2016 10:00	36.0	35.5	26.0	Yes	10.00	63.4	40.8	85.3	81	22.3	-0.1	-15.2	89.0	0.54
N/A	26/10/2016 11:00	33.2	34.5	25.0	No	8.20	59.3	35.6	82.6	70.6	22.2	-0.1	-10.7	92.1	0.66
R01	11/11/2016 7:15	40.4	40.5	37.5	No	2.90	53.6	42.4	89.8	83.4	7.1	----	1.3	69.8	1.90
N/A	22/06/2017 13:15	42	31.5	21.5	Yes	20.50	55.6	49.9	91.4	52.7	10.7	-0.2	13.3	61.6	1.41

Station	Start Date & Time	LAeq (dB)	LAF 10% (dB)	LAF 90% (dB)	LAeq > LAF10	LAeq - LAF90 (dB)	LZeq	LAleq	LAE	LCeq	LCeq-LAeq	Calibration Drift	Temp. (°C)	R.H. (%)	Avg. WS (m/s)
N/A	27/06/2017 9:05	42.2	41	28.5	Yes	13.70	50.8	50.6	91.6	49	6.8	-0.1	12.6	65.2	1.89
N/A	28/06/2017 13:50	46.5	44.5	42	Yes	4.50	52.6	54.7	95.9	51.6	5.1	0.1	13.2	67.1	1.60
N/A	23/07/2017 11:30	43.7	41	25	Yes	18.70	61.7	47.5	93.1	56.2	12.5	-0.1	17.0	56.1	2.12
N/A	24/07/2017 12:30	36.4	36.5	22	No	14.40	64	40.3	85.8	50.7	14.3	-3.3	17.0	57.0	2.00
R03	17/11/2017 9:00	41.5					53	43	90.9	46.9	5.3	----	-21.5	82.8	0.34
R04	22/11/2017 9:00	37					46.8	38.6	86.3	37.9	0.9	----	-28.8	75.8	0.14

Legend:

Yes	When LAeq > LAF10
<5	LAeq - LAF90 (dB) less than 5
>10	LAeq - LAF90 (dB) greater than 10
Red	Calibration Drift greater than 3.0 dB

NOISE COMPLAINTS

No formal noise complaints were received by AKHM in 2017.

CONCLUSION

Noise levels measured at all noise receptors were well within or below the 50-90 dBA range deemed to be socially acceptable for daytime noise limits, with the exception of three anomalous data points. Five out of seven LA_{eq} measurements in 2017 exceeded the predicted levels from the NIA range and of those that exceeded, one represents steady to very steady baseline conditions, despite the absence of mining and milling operations in the Keno Hill Silver District in 2017. Continued monthly monitoring over a 24-hour interval provides further data which can better inform noise monitoring thresholds.

REFERENCES

Alexco Keno Hill Mining Corp., Noise Monitoring and Management Plan, Keno Hill Silver District Mining Operations, January 2018

APPENDIX A

Keno Noise Monitoring Data September 2013 to December 2014

Keno Noise Monitoring Data

Date	Location	Time	Temp (°C)	Wind	Precipitation	DBA	Observations
08/04/2013	R01	12:26	2	Windy SSE	None	52.0	
08/04/2013	R02	12:05	2	Windy SSE	None	58.6	
08/04/2013	R03	11:45	2	Windy SSE	None	52.4	
08/04/2013	R04	11:25	2	Windy SSE	None	67.2	A dog barked 2 times.
08/04/2013	R05	11:04	2	Windy SSE	None	48.5	
10/04/2013	R01	11:33	-6	Light SSW	None	42.1	
10/04/2013	R02	13:00	-6	Light SSW	None	42.5	
10/04/2013	R03	12:40	-6	Light SSW	None	49.0	Doors slamming. People talking.
10/04/2013	R04	12:20	-6	Light SSW	None	39.4	
10/04/2013	R05	12:00	-6	Light SSW	None	39.1	
06/05/2013	R01	15:30	2	Wind West	None	35.1	Backup alarm at Onek. Tarps flapping in wind.
06/05/2013	R02	15:30	2	Slight breeze	None	34.4	
06/05/2013	R03	15:30	2	Windy	None	44.8	Dog barking. Boart truck.
06/05/2013	R04	15:30	2	Slight breeze	None	32.8	
06/05/2013	R05	15:30	2	Slight breeze	None	37.5	Dog barking.
19/05/2013	R01	10:25	-2	Light (<10km/h) N	Light snow	69.6	Creek flowing loud. Squirrels making noise. Tarp flapping. Volvo going by on the BKR.
19/05/2013	R02	10:10	-2	Light (<10km/h) E	Light snow	43.2	Creek flowing below. A few birds chirping. Boart pickup went by.
19/05/2013	R03	9:55	-2	Light (<10km/h) E	Light snow	56.3	A few birds. Talking and trucks in town in the distance. Water truck went by.
19/05/2013	R04	9:30	-2	Light (<10km/h) E	Light snow	46.6	Lots of birds calling and a woodpecker pecking close by.
19/05/2013	R05	8:55	-2	Light (<10km/h) E	Light snow	36.4	A few birds and a squirrel chirping.
18/06/2013	R01	16:25	22	Light (<10km/h) S	None	48.6	Creek flowing. Leaves rustling.
18/06/2013	R02	16:10	22	Light (<10km/h) S	None	46.8	Volvo on BKR. 2 vehicles drove past. Gusts of wind rustling trees. Chainsaw nearby in town.
18/06/2013	R03	15:55	22	Light (<10km/h) S	None	44.8	People talking and walking close by. 2 Vehicles driving through town and 1 driving by.
18/06/2013	R04	15:40	21	Light (<10km/h) S	None	34.9	Wind rustling leaves. Birds calling.
18/06/2013	R05	14:55	21	Light (<15km/h) S	None	37.6	Wind rustling leaves. Volvo on the BKR.
24/07/2013	R01	11:07	23	light (<20km/h) S	None	48.7	Leaves rustling. Creek nearby. Birds chirping.
24/07/2013	R02	10:55	23	light (<10km/h) S	None	40.4	Three vehicles driving nearby. Leaves rustling.
24/07/2013	R03	10:43	23	light (<10km/h) S	None	47.7	Backup alarm at Mill. Leaves rustling. Someone in town hammering. Two vehicles drove by.
24/07/2013	R04	10:30	23	light (<10km/h) SE	None	38.0	Backup alarm at Mill. Mill crusher. Leaves rustling. Car drove by twice. Car on Silver Trail.
24/07/2013	R05	10:14	23	Calm	None	38.0	Backup alarm at Mill. Volvo down BKR. Mill crusher.
16/11/2013	R01	14:11	-20	Calm	None	27.8	Birds.
16/11/2013	R02	13:51	-20	Calm	None	31.9	Squirrel, ravens, birds noise.
16/11/2013	R03	13:35	-20	Calm	None	34.9	Squirrel, ravens, birds noise+ truck.
16/11/2013	R04	13:20	-20	Calm	None	40.6	Lots of ravens activity, birds.
16/11/2013	R05	14:27	-20	Calm	None	38.1	Birds, truck plus door slamming + humain voive + dog barking. All at about 200 meters from sound meter.
17/11/2013	R01	12:46	-30	Calm	None	25.4	Birds.
17/11/2013	R02	12:25	-30	Calm	None	27.6	Birds, squirrel and vehicle.
17/11/2013	R03	12:07	-30	Calm	None	31.1	Ravens, squirrel and vehicle.
17/11/2013	R04	11:48	-30	Calm	None	35.9	Ravens.
17/11/2013	R05	13:01	-30	Calm	None	23.8	Quiet.
29/11/2013	Cmpgrnd	15:08	-23	Calm	None	26.4	Chainsaw in town, birds chirping.
29/11/2013	R01	14:52	-23	Calm	None	27.4	Birds chirping, snowmobile in distance.
29/11/2013	R03	14:36	-23	Calm	None	46.7	Ravens, chainsaw and dog barking in the distance, water truck drove by and backed up (alarm) nearby.
29/11/2013	R04	14:20	-23	Calm	None	29.0	squirrels and little birds in distance, ravens flying by, someone coughing, doors closing nearby, dog barking.
29/11/2013	R05	13:59	-24	Calm	None	30.7	Raven calling, snowmobile in distance, squirrel nearby.
13/12/2013	Cmpgrnd	10:55	-20	N-W Calm	None	25.2	Quiet, birds signing once.
13/12/2013	R01	10:35	-20	N-W Calm	None	24.4	Quiet.
13/12/2013	R02	10:17	-20	N-W Calm	None	32.1	Raven, birds, squirrel.
13/12/2013	R03	10:02	-20	N-W Calm	None	27.3	Raven, birds, squirrel.
13/12/2013	R04	9:44	-20	N-W Calm	None	31.2	Raven flying and walking around. Birds signing.
13/12/2013	R05	11:13	-20	N-W Calm	None	27.1	Quiet, squirrel.

Keno Noise Monitoring Data

Date	Location	Time	Temp (°C)	Wind	Precipitation	DBA	Observations
31/12/2013	R05	13:52	-18	calm	None	30.7	A few little birds chirping.
31/12/2013	R04	14:06	-18	Calm	None	44.0	lots of ravens flying, calling. Dog chewing on bone nearby. Person walking by, closing door.
31/12/2013	R03	14:20	-17	Light (<10km/h)S	None	35.8	Two vehicles drove through town. Flagpole dinging in the wind. People talking, walking in town.
31/12/2013	R01	14:34	-17	Calm	None	26.4	Little birds chirping. Raven flew by.
31/12/2013	Cmpgrnd	14:49	-17	Calm	None	25.2	Ravens calling in distance. Someone coughing. Little birds chirping.
20/01/2014	R04	14:04	-14	Calm	None	49.8	Distant grader. Birds. Vehicle.
20/01/2014	R03	14:24	-13	Calm	None	45.6	Distant grader. Birds.
20/01/2014	Cmpgrnd	14:39	-13	Calm	None	30.7	Distant grader.
20/01/2014	R01	15:13	-14	Calm	None	38.8	Distant grader. Vehicle.
20/01/2014	R05	14:56	-14	Calm	None	68.1	Grader went by.
29/01/2014	R05	15:07	-12	Calm	None	26.6	Squirrels, whiskeyjack calling nearby.
29/01/2014	R04	15:23	-12	Calm	None	33.5	Small bird chirping, ravens calling and flying by.
29/01/2014	R03	15:36	-12	Calm	None	41.1	Ravens calling, truck driving by, squirrel chatting, small bird chirping.
29/01/2014	R01	15:50	-12	Calm	None	26.1	Squirrel chatting, door closing in distance, birds calling, neighbour getting firewood.
29/01/2014	Cmpgrnd	16:06	-12	Calm	None	23.5	Squirrel chatting, bird chirping, ravens flying over and calling.
05/02/2014	R05	12:55	-20	light (5km/h)	None	28.4	Raven calling, squirrel chattering.
05/02/2014	R04	13:12	-20	light(<5km/h)	None	31.2	Small bird chirping, ravens calling and flying, door closing in distance X3, neighbour getting firewood.
05/02/2014	R03	13:27	-20	light(<5km/h)	None	26.5	Ravens calling in distance. Squirrel chattering, small birds, truck creaking.
05/02/2014	R01	13:40	-18	light(<5km/h)	None	43.0	Squirrel chattering, ice inside old dump truck (beside sample site) cracked loudly, birds chirping.
05/02/2014	Cmpgrnd	13:59	-19	light(<5km/h)	None	26.0	Small birds chirping, ravens in distance.
26/02/2014	R05	14:14	-9	Calm	None	32.5	Water truck running nearby, driving. Squirrel chattering, little birds calling.
26/02/2014	R04	14:31	-8	Calm	None	35.4	Ravens calling, person walking by and into house.
26/02/2014	R03	14:56	-8	Calm	None	30.9	Lots of squirrels chattering, dog barking in distance, small birds chirping, radio from neighbours house, raven calling.
26/02/2014	R01	15:10	-8	Calm	None	27.7	Little birds chirping. Squirrels.
26/02/2014	Cmpgrnd	15:26	-8	Calm	None	31.2	Someone chainsawing in town. Birds chirping.
05/03/2014	R05	14:19	-14	Calm	None	28.0	Raven calling in distance. Lots of little birds chirping nearby.
05/03/2014	R04	14:37	-14	Slight breeze	None	30.1	Ravens calling nearby. Squirrels chattering. Helicopter in distance. Little birds chirping. Ravens flying by.
05/03/2014	R03	14:50	-13	light (<10km/h)	None	40.1	Vehicle in town idling. Lots of little birds chirping. Raven calling. Flags tinging on flagpoles. Helicopter in distance.
05/03/2014	R01	15:04	-13	calm	None	26.9	lots of little birds chorping. Rvens in distance. Helicopter faintly in distance.
05/03/2014	Cmpgrnd	15:19	-14	very slight breeze	None	28.5	little birds chirping. Ravens in distance. Helicopter in distance. Backup alarm in town.
29/03/2014	R05	14:31	-3	Slight breeze	None	28.7	Lots of small birds calling nearby. Squirrel chattering.
29/03/2014	R04	14:48	0	light (10 km/h)	None	34.8	Ravens calling closeby. Small birds calling. Diamond drill and equipment working in distance. Wind chimes. Someone scraping snow.
29/03/2014	R03	15:00	0	light (10 km/h)	None	29.8	Flags hitting flagpoles. Lots of small birds calling nearby. Raven calling. Squirrel chattering. Squirrel climbing on sign nearby.
29/03/2014	R01	15:13	0	Slight breeze	None	31.3	Small birds. Squirrel chattering. Steel pipe made sound as it expanded.
29/03/2014	Cmpgrnd	15:34	0	Slight breeze	None	27.6	Small birds calling. Bulldozer (drillers) going down Duncan creek road in distance. Someone working on something in town. Raven calling.
09/04/2014	R01	10:04	-10	Calm	None	45.9	Pickup , backup alarm. Birds.
09/04/2014	R02	9:55	-10	Calm	None	44.7	Water truck x 2, delivering.
09/04/2014	R03	9:24	-10	Calm	None	29.8	Water truck x 2, delivering.
09/04/2014	R04	9:00	-10	Calm	None	33.8	Ravens.
09/04/2014	R05	10:47	-10	Calm	None	28.0	Ravens.
09/04/2014	Cmpgrnd	10:32	-10	Calm	None	25.2	Squirrel.
18/04/2014	R01	15:43	2	Calm	None	32.0	Birds, loader, backup alarm far away.
18/04/2014	R02	16:22	2	Calm	Snow/rain	30.0	Car, birds.
18/04/2014	R03	15:20	2	Calm	Snow	61.4	Loader, backup alarm. Car +horn. People talking, dog barking.
18/04/2014	R04	15:04	2	Calm	Snow	36.2	Ravens, birds.
18/04/2014	R05	16:37	2	Calm	None	31.6	Birds.

Keno Noise Monitoring Data

Date	Location	Time	Temp (°C)	Wind	Precipitation	DBA	Observations
18/04/2014	Cmpgrnd	15:04	2	Calm	Rain/snow	34.2	Birds.
11/05/2014	R01	9:14		strong N wind	None	45.7	Birds, creek.
11/05/2014	R02	8:58		Light N wind	None	40.7	Birds, car, house doors slamming.
11/05/2014	R03	8:42		Light N wind	None	40.3	Birds.
11/05/2014	R04	8:27		calme	None	34.4	Birds.
11/05/2014	R05	10:21		Light N wind	None	38.8	Wind in trees, bear or moose cracking branches.
11/05/2014	Cmpgrnd	9:30		Light N wind	None	52.4	Creek.
29/05/2014	R01	10:50		Light SW wind	None	43.4	Creek.
29/05/2014	R02	10:30		Light SW wind	None	31.5	Raven, truck.
29/05/2014	R03	9:50		Light SW wind	None	44.3	Raven, car, truck running idle, starting.
29/05/2014	R04	9:40		Light SW wind	None	33.6	Ravens.
29/05/2014	R05	11:40		Light SW wind	None	32.7	Birds.
29/05/2014	Cmpgrnd	11:20		Light SW wind	None	47.9	Creek.
01/06/2014	R01	15:49		strong wind all directions	None	46.1	Creek, wind, dog barking.
01/06/2014	R02	15:33		strong wind all directions	None	36.8	Doors slamming x 2.
01/06/2014	R03	15:20		strong wind all directions	None	40.8	Truck, trailer, horn.
01/06/2014	R04	15:03		light wind all directions	None	31.8	ATV far away.
01/06/2014	R05	16:18		strong wind all directions	None	35.7	Silent.
01/06/2014	Cmpgrnd	16:03		strong wind all directions	None	50.0	Creek.
26/06/2014	R01	12:52		strong N wind	None	47.0	Wind in trees,creek, birds.
26/06/2014	R02	12:38		strong N wind	None	57.3	Wind in trees, car, chainsaw, ravens, people talking.
26/06/2014	R03	12:25		N wind	None	49.0	Wind in trees, ATV, music, car, ravens.
26/06/2014	R04	12:09		N wind	None	33.5	Wind in trees, birds.
26/06/2014	R05	13:30		N wind	None	42.3	Wind in trees, birds.
26/06/2014	Cmpgrnd	13:11		N wind	None	50.5	Wind in trees, creek.
05/08/2014	R01	10:14		N wind	None	42.8	Wind in trees, creek, birds.
05/08/2014	R02	9:51		N wind	None	34.6	Truck running, people talking, door slamming, wind.
05/08/2014	R03	9:33		N wind	None	39.6	Truck running, people talking, wind.
05/08/2014	R04	9:19		N wind	None	38.7	Car starting, door slamming,, car passing by, wind.
05/08/2014	R05	11:47		N wind	None	36.9	Wind in willows.
05/08/2014	Cmpgrnd	11:17		N wind	None	46.1	Creek, wind, people talking.
23/08/2014	R01	13:36		N wind	None	45.1	Creek, house building.
23/08/2014	R02	13:19		N wind	None	67	Pickup truck, motor running.
23/08/2014	R03	13:07		N wind	None	32	Dog barking x 2, vehicles.
23/08/2014	R04	12:43		N wind	None	36.3	Ravens.
23/08/2014	R05	15:44		N wind	None	38.6	Dump truck, vehicles, drill far away.
23/08/2014	Cmpgrnd	13:54		N wind	None	48.9	Creek, vehicles.
03/09/2014	R01	16:01		W wind, strong	None	49.9	Wind + creek.
03/09/2014	R02	15:47		W wind, strong	None	47.8	Dogs barking, ATV's, wind, door slamming.
03/09/2014	R03	15:35		W wind, strong	None	52.7	2 trucks drove by, dogs barking, wind.
03/09/2014	R04	15:22		W wind, strong	None	37.9	Wind, ravens.
03/09/2014	R05	16:29		W wind, strong	None	41.6	Drill, wind.
03/09/2014	Cmpgrnd	16:15		W wind, strong	None	51.1	Wind, creek, vehicles.
18/09/2014	R01	16:02		NW little wind	None	45.3	Strong wind, creek.
18/09/2014	R02	15:48		NW little wind	None	53.9	ATVs, birds.
18/09/2014	R03	15:35		NW little wind	None	39.2	ATVs, birds.
18/09/2014	R04	15:22		NW little wind	None	32.5	Birds.
18/09/2014	R05	16:30		NW little wind	None	43.1	Little wind, leaves in wind.
18/09/2014	Cmpgrnd	16:15		NW little wind	None	48.9	Strong wind, creek.
15/10/2014	R01	14:28		No Wind	None	42.5	Creek, ravens, birds.
15/10/2014	R02	14:14		No Wind	None	46.7	Car, ravens, birds, squirrels.

Keno Noise Monitoring Data

Date	Location	Time	Temp (°C)	Wind	Precipitation	DBA	Observations
15/10/2014	R03	14:00		No Wind	None	40.2	Car, ravens.
15/10/2014	R04	13:40		No Wind	None	29.6	Squirrel, birds, door slamming.
15/10/2014	R05	15:31		No Wind	None	28.8	Ravens, birds.
15/10/2014	Cmpgrnd	14:46		No Wind	None	45.7	Creek, ravens, birds.
25/10/2014	R01	9:33		No Wind	None	38.0	Calm, creek, ravens, birds.
25/10/2014	R02	9:08		No Wind	None	30.2	Calm, ravens, birds.
25/10/2014	R03	8:53		No Wind	None	27.8	Calm, ravens, birds.
25/10/2014	R04	8:37		No Wind	None	31.0	Calm, ravens, birds.
25/10/2014	R05	10:36		No Wind	None	39.2	Calm, ravens.
25/10/2014	Cmpgrnd	10:22		No Wind	None	38.3	Calm, creek, ravens.
14/11/2014	R01	10:57		No Wind	None	67.4	Water truck, squirrel, creek.
14/11/2014	R02	10:37		No Wind	None	33.8	Calm.
14/11/2014	R03	10:10		No Wind	None	37.8	Car x 2.
14/11/2014	R04	9:56		No Wind	None	31.6	Ravens, calm.
14/11/2014	R05	11:30		No Wind	None	33.3	Calm.
14/11/2014	Cmpgrnd	11:12		No Wind	None	38.2	Creek, truck.
23/11/2014	R01	9:45		No Wind	None	26.5	Squirrel.
23/11/2014	R02	9:22		No Wind	None	27.9	Ravens.
23/11/2014	R03	9:01		No Wind	None	53.9	Ravens, truck x2.
23/11/2014	R04	8:46		No Wind	None	40.7	Ravens, truck idling.
23/11/2014	R05	10:12		No Wind	None	33.3	Ravens.
23/11/2014	Cmpgrnd	9:58		No Wind	None	22.7	Ravens.
01/12/2014							Noise Monitoring converted to 24 hours from 10 min measurements in December 2014

*All readings are taken using an Extech integrating sound level datalogger model 407780 to measure DBA for 10 min. Reading from 16/11/13 taken with an Casella CEL-63X model.(Laeq, Db.)

APPENDIX C

2017 DUST MONITORING RESULTS



Memorandum

To: Alexco Keno Hill Mining Corp.

From: Catherine Henry, Alexco Environmental Group Inc.

CC: Kai Woloshyn, Alexco Resource Corp.

Date: March 28, 2018

Re: Air Quality Data Summary, Keno, YT

1. INTRODUCTION

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 were initially selected as the appropriate instrumentation to carry out this program. In accordance with clauses 36 and 37 of the Decision Document for the assessment of the Onek and Lucky Queen Deposit production (YESAB File Number 2011-0315), total suspended particulates (TSP) monitoring was subsequently initiated in August 2012 and dustfall monitoring was discontinued in January 2013. Additional sampling for coarse and fine fractions of particulate matter (PM₁₀ and PM_{2.5} respectively) was instigated in August 2015, in accordance with the revised Dust Abatement and Monitoring Plan required in the Decision Document (clause 19) for the assessment of the Flame & Moth Development and Production Program (YESAB file Number 2013-0161). This memorandum presents the results of the ambient air quality monitoring to date.

2. INSTRUMENTATION AND METHODOLOGY

Two BGI Omni Ambient Air Quality Samplers (see Figure 1) were commissioned in August 2012, one to the East of the mill and crusher (TSP-1) and one at the toe of the dry stack tailings facility (TSP-2). A third sampler (TSP-3), located in Keno City, was commissioned in December 2014, in accordance with the revised Dust Abatement and Monitoring Plan required in the Decision Document for the assessment of the Flame & Moth Development and Production Program (YESAB file Number 2013-0161). The sampling locations are shown on Figure 2. The BGI Omni samplers are set up with TSP, PM₁₀ or PM_{2.5} inlets, and use the filter reference method. Samples are collected over 24-hour periods and sent to Maxxam Analytics laboratory for gravimetric analysis and ICP

metals mass spectrometry (from TSP samples only). The sampling program aims to collect three samples per location every month, in order to capture the different weather conditions that may affect dust sources and transport. The BGI Omni Ambient Air Quality Samplers cannot collect samples below -20°C and therefore some winter months will have reduced data.



Figure 1 BGI Omni Ambient Air Quality Sampler



Satellite imagery obtained from Yukon Geomatics map service <http://mapservices.gov.yk.ca/ArcGIS/services> on March 2017
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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1:5,500 (when printed on 11 x17 inch paper)

0 50 100 150 200 Meters

- | | | | | | |
|--|-------------------------------|--|-------------------------|--|----------------------|
| | MineFeaturePoint Weather Stns | | DSTF Extent | | Silver Trail Highway |
| | Dust Monitoring Station | | DSTF Clearing | | Secondary Road |
| | | | Building/Infrastructure | | |



ALEXCO KENO HILL MINING CORP.
ANNUAL QUARTZ MINING LICENCE REPORT, QML-0009

FIGURE 2
DUST MONITORING AND WEATHER STATIONS

MARCH 2017

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3. RESULTS

3.1. AMBIENT TSP, PM₁₀ AND PM_{2.5} CONCENTRATIONS

Results of the gravimetric analyses can be converted into 24-hour average ambient concentrations based on the flow rate of the instruments. These can then be compared with the Yukon Ambient Air Quality Standard (YAAQS) of 120 µg/m³ for TSP, 50 µg/m³ for PM₁₀ and 28 µg/m³ for PM_{2.5} (24-hour average). Table 1 below presents summary statistics for the three sampling locations (TSP-1, TSP-2 and TSP-3), while the complete result tables are presented in Appendix A. When results were below the detection limit a value of half the detection limit was used to calculate the summary statistics. Table 1 shows that all results are well below the Yukon ambient standards, most results being between 5 and 20 times inferior, with the exception of one PM_{2.5} exceedance at TSP-3 on July 14, 2017, which this sample is considered an outlier as it was an order of magnitude higher than historic TSP-3 results and results for TSP-1 and TSP-2 from samples collected on the same day. As an example, the air quality monitoring results on the same day for TSP-1 for PM_{2.5} was 7.9 µg/m³ and TSP-2 PM₁₀ was 9.2 µg/m³ both closer to the Mill and dry stack tailings area. The TSP-3 PM_{2.5} outlier result from July 14, 2017 may be due to laboratory error or filter contamination between being provided by the lab and being analysed in the lab. No trends in the TSP, PM₁₀ and PM_{2.5} data before on or after this date validate this outlier result, but this result has been included in the report for completeness. Note that over half of the results for each of the three parameters are below the detection limit at all three stations.

The air quality monitors located on site are 160 (TSP-1) and 46 (TSP-2) meters away from the dry stack tailings facility (DSTF) and 163 (TSP-1) and 240 (TSP-2) meters away from the crusher, two of the main potential dust sources. The nearest residence is at a distance of 710 meters from the DSTF and 860 meters from the crusher. TSP levels experienced at the nearest residence are better approximated by levels observed at air quality monitor TSP-3, located in Keno City (950 m from the DSTF and 1240 m from the crusher). Note that the mine announced a temporary closure as of September 4th, 2013 and operation continues to be suspended at this time. Therefore, the crusher would not have contributed to fugitive dust emissions during that period.

Table 1 24-hour TSP, PM₁₀ and PM_{2.5} Summary Statistics, August 2012 – December 2017

	TSP (µg/m ³)			PM ₁₀ (µg/m ³)			PM _{2.5} (µg/m ³)		
Yukon Ambient Air Quality Standards	120			50			28		
Sampling Location	TSP-1*	TSP-2	TSP-3	TSP-1	TSP-2	TSP-3	TSP-1	TSP-2	TSP-3
Average	5.7	6.5	5.6	4.1	4.1	4.1	3.9	4.3	5.3
Count	205	191	103	75	69	70	76	71	66
Minimum	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6
Maximum	53.2	62.2	68.1	15.1	16.2	11.8	17.4	23.1	65.0
Geometric Mean	4.3	4.7	4.0	3.5	3.5	3.6	3.5	3.6	3.9
Count <DL	133	115	72	61	55	53	59	57	47
Standard Deviation	6.1	7.2	8.0	3.0	2.8	2.5	2.6	3.9	8.0
1st Quartile	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6
Median	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6



3rd Quartile	6.9	7.7	6.0	<5.6	<5.6	<5.6	<5.6	<5.6	6.2
Count Over Standard	0	0	0	0	0	0	0	0	1
% Over Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5

* One outlier result was removed (976.4 $\mu\text{g}/\text{m}^3$ on July 1, 2015)

3.2. METAL SPECIATION

There are no ambient air quality standards for metals in Yukon, however the Ontario Ministry of Environment has developed a comprehensive list of Ambient Air Quality Criteria (AAQC) that includes 24-hour average concentrations for a number of metals. Table 2 below presents the summary statistics for metal concentrations from TSP samples at TSP-1, TSP-2 and TSP-3, while the complete result tables are presented in Appendix A. For reference, the Ontario AAQCs are indicated in the first row where available. When results were below the detection limit a value of half the detection limit was used to calculate the statistics.

Very few exceedances of the Ontario AAQCs are observed overall, and only one was observed in 2017 (manganese at TSP-2 on August 9, 2017); samples are generally below the detection limit for most parameters. Parameters for which exceedances have occurred include lead (1.0 % of samples) at TSP-1 and cadmium (1.1 % of samples), lead (0.5 % of samples) and manganese (2.1 % of samples) at TSP-2. No exceedances were observed at TSP-3 to date. Note that the chromium and manganese criteria did not come into effect until July 1, 2016, but were still used as reference for the entire sampling period.



Table 2 24-hour Metal Concentrations Summary Statistics (µg/m³) August 2012 – December 2017

	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	P	K	Se	Si	Ag	Na	Sr	S	Sn	Ti	V	Zn	Zr	
Ontario Air Quality Criteria		25	0.3	10	0.01	120	0.025		0.5	0.1	50	4	0.5		0.4	120	2			10		1		120		10	120	2	120		
TSP-1*																															
Average	0.210	0.137	0.055	0.003	0.006	0.024	0.014	0.325	0.079	0.034	0.035	0.231	0.066	0.037	0.012	0.034	0.035	0.206	0.684	0.034	0.446	0.021	0.261	0.003	0.165	0.056	0.014	0.021	0.025	0.035	
Count	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	140	204	204	204	201	204	204	204	204	204	
Minimum	0.029	0.000	0.000	0.001	0.000	<0.042	0.000	<0.278	<0.042	0.000	0.001	<0.042	0.001	<0.042	0.001	0.000	0.001	<0.112	<0.070	0.000	<0.278	0.000	<0.138	<0.004	<0.278	0.000	<0.028	<0.028	<0.006	<0.006	
Maximum	5.292	0.139	0.056	0.022	0.006	0.264	0.014	8.722	0.146	0.035	0.035	2.528	1.083	0.429	0.301	0.035	0.035	0.208	0.694	0.035	3.875	0.021	2.444	0.041	0.708	0.193	0.042	0.021	0.558	0.035	
Geometric Mean	0.152	0.139	0.056	0.002	0.006	0.022	0.014	0.185	0.073	0.035	0.034	0.139	0.055	0.027	0.008	0.035	0.033	0.204	0.664	0.035	0.290	0.021	0.231	0.003	0.154	0.057	0.014	0.021	0.017	0.034	
Count <DL	188	204	204	182	204	200	204	169	15	204	201	27	196	162	170	204	201	204	204	204	110	204	182	163	181	202	203	204	168	204	
Standard Deviation	0.515	0.017	0.007	0.003	0.001	0.024	0.002	0.889	0.027	0.004	0.004	0.278	0.090	0.049	0.029	0.004	0.004	0.018	0.080	0.004	0.660	0.003	0.217	0.004	0.089	0.014	0.002	0.001	0.050	0.004	
1st Quartile	<0.278	<0.278	<0.112	<0.004	<0.012	<0.042	<0.028	<0.278	0.064	<0.070	<0.070	0.057	<0.112	<0.042	<0.012	<0.070	<0.070	<0.416	<1.388	<0.070	<0.416	<0.042	<0.416	<0.004	<0.278	<0.112	<0.028	<0.042	<0.028	<0.070	
Median	<0.278	<0.278	<0.112	<0.004	<0.012	<0.042	<0.028	<0.278	0.081	<0.070	<0.070	0.194	<0.112	<0.042	<0.012	<0.070	<0.070	<0.416	<1.388	<0.070	<0.416	<0.042	<0.416	<0.004	<0.278	<0.112	<0.028	<0.042	<0.028	<0.070	
3rd Quartile	<0.278	<0.278	<0.112	<0.004	<0.012	<0.042	<0.028	<0.278	0.099	<0.070	<0.070	0.334	<0.112	<0.042	<0.012	<0.070	<0.070	<0.416	<1.388	<0.070	<0.416	<0.042	<0.416	<0.004	<0.278	<0.112	<0.028	<0.042	<0.028	<0.070	
Count Over Standard	n/a	0	0	0	0	0	0	n/a	0	0	0	0	2	n/a	0	0	0	n/a	n/a	0	n/a	0	n/a	0	n/a	0	0	0	0	n/a	
% Over Standard	n/a	0.0	0.0	0.0	0.0	0.0	0.0	n/a	0.0	0.0	0.0	0.0	1.0	n/a	0.0	0.0	0.0	n/a	n/a	0.0	n/a	0.0	n/a	0.0	n/a	0.0	0.0	0.0	0.0	n/a	
TSP-2																															
Average	0.160	0.137	0.055	0.003	0.006	0.022	0.014	0.244	0.082	0.034	0.034	0.296	0.070	0.040	0.029	0.034	0.034	0.206	0.684	0.034	0.491	0.021	0.231	0.003	0.170	0.055	0.014	0.021	0.031	0.034	
Count	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	130	190	190	190	187	190	190	190	190	190	
Minimum	<0.028	0.000	0.000	0.001	0.000	<0.042	0.000	<0.278	<0.042	0.000	0.001	<0.042	0.001	<0.042	0.001	0.000	0.001	<0.112	<0.070	0.000	<0.278	0.000	<0.138	<0.004	0.139	0.000	<0.028	<0.028	<0.006	<0.006	
Maximum	1.625	0.139	0.056	0.048	0.006	0.099	0.040	3.472	0.146	0.035	0.035	2.778	0.736	0.468	0.651	0.035	0.035	0.208	0.694	0.035	5.028	0.021	1.125	0.032	0.736	0.056	0.032	0.021	0.294	0.035	
Geometric Mean	0.143	0.139	0.055	0.002	0.006	0.021	0.014	0.185	0.076	0.035	0.033	0.182	0.058	0.030	0.010	0.035	0.033	0.204	0.662	0.035	0.314	0.021	0.218	0.002	0.157	0.056	0.014	0.021	0.020	0.034	
Count <DL	181	190	189	172	190	187	187	148	14	190	187	19	176	136	134	190	187	190	190	190	97	190	178	154	164	190	189	190	140	190	
Standard Deviation	0.158	0.017	0.007	0.004	0.001	0.008	0.003	0.339	0.028	0.004	0.004	0.312	0.072	0.046	0.081	0.004	0.004	0.019	0.082	0.004	0.695	0.003	0.119	0.003	0.092	0.007	0.001	0.001	0.047	0.004	
1st Quartile	<0.278	<0.278	<0.112	<0.004	<0.012	<0.042	<0.028	<0.278	0.064	<0.070	<0.070	0.080	<0.112	<0.042	<0.012	<0.070	<0.070	<0.416	<1.388	<0.070	<0.416	<0.042	<0.416	<0.004	<0.278	<0.112	<0.028	<0.042	<0.028	<0.070	
Median	<0.278	<0.278	<0.112	<0.004	<0.012	<0.042	<0.028	<0.278	0.084	<0.070	<0.070	0.268	<0.112	<0.042	<0.012	<0.070	<0.070	<0.416	<1.388	<0.070	<0.416	<0.042	<0.416	<0.004	<0.278	<0.112	<0.028	<0.042	<0.028	<0.070	
3rd Quartile	<0.278	<0.278	<0.112	<0.004	<0.012	<0.042	<0.028	<0.278	0.101	<0.070	<0.070	0.372	<0.112	0.046	<0.028	<0.070	<0.070	<0.416	<1.388	<0.070	0.385	<0.042	<0.416	<0.004	<0.278	<0.112	<0.028	<0.042	0.029	<0.070	
Count Over Standard	n/a	0	0	0	0	0	2	n/a	0	0	0	0	1	n/a	4	0	0	n/a	n/a	0	n/a	0	n/a	0	n/a	0	0	0	0	n/a	
% Over Standard	n/a	0.0	0.0	0.0	0.0	0.0	1.1	n/a	0.0	0.0	0.0	0.0	0.5	n/a	2.1	0.0	0.0	n/a	n/a	0.0	n/a	0.0	n/a	0.0	n/a	0.0	0.0	0.0	0.0	n/a	
TSP-3																															
Average	0.219	0.135	0.054	0.003	0.006	0.027	0.014	0.399	0.081	0.034	0.034	0.119	0.054	0.045	0.007	0.034	0.034	0.204	0.677	0.034	0.284	0.020	0.221	0.008	0.147	0.054	0.014	0.021	0.018	0.034	
Count	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	94	106	106	106	103	106	106	106	106	106	
Minimum	<0.028	0.000	0.000	0.001	0.000	<0.042	0.000	<0.278	<0.042	0.000	0.001	<0.042	0.001	<0.042	0.001	0.000	0.001	<0.112	<0.070	0.000	<0.278	0.000	<0.138	<0.004	<0.278	0.000	<0.028	<0.028	<0.006	<0.006	
Maximum	2.778	0.139	0.056	0.024	0.006	0.218	0.014	6.417	0.158	0.035	0.035	0.514	0.056	0.553	0.070	0.035	0.035	0.208	0.694	0.035	1.569	0.021	0.694	0.175	0.431	0.056	0.014	0.021	0.144	0.035	
Geometric Mean	0.147	0.139	0.056	0.002	0.006	0.023	0.014	0.199	0.076	0.035	0.033	0.077	0.051	0.028	0.006	0.034	0.032	0.200	0.648	0.035	0.240	0.021	0.213	0.003	0.144	0.054	0.014	0.021	0.016	0.033	
Count <DL	101	106	106	98	106	101	103	80	3	106	103	25	103	84	95	105	103	106	105	106	83	106	100	79	99	105	106	106	93	106	



	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	P	K	Se	Si	Ag	Na	Sr	S	Sn	Ti	V	Zn	Zr
Ontario Air Quality Criteria		25	0.3	10	0.01	120	0.025		0.5	0.1	50	4	0.5		0.4	120	2			10		1		120		10	120	2	120	
Standard Deviation	0.425	0.023	0.009	0.003	0.001	0.030	0.002	1.036	0.026	0.006	0.005	0.113	0.009	0.086	0.007	0.006	0.006	0.025	0.102	0.006	0.251	0.003	0.074	0.027	0.041	0.009	4E-10	0.001	0.015	0.005
1st Quartile	<0.278	<0.278	<0.112	<0.004	<0.012	<0.042	<0.028	<0.278	0.061	<0.070	<0.070	0.043	<0.112	<0.042	<0.012	<0.070	<0.070	<0.416	<1.388	<0.070	<0.416	<0.042	<0.416	<0.004	<0.278	<0.112	<0.028	<0.042	<0.028	<0.070
Median	<0.278	<0.278	<0.112	<0.004	<0.012	<0.042	<0.028	<0.278	0.079	<0.070	<0.070	0.069	<0.112	<0.042	<0.012	<0.070	<0.070	<0.416	<1.388	<0.070	<0.416	<0.042	<0.416	<0.004	<0.278	<0.112	<0.028	<0.042	<0.028	<0.070
3rd Quartile	<0.278	<0.278	<0.112	<0.004	<0.012	<0.042	<0.028	<0.278	0.097	<0.070	<0.070	0.167	<0.112	<0.042	<0.012	<0.070	<0.070	<0.416	<1.388	<0.070	<0.416	<0.042	<0.416	<0.004	<0.278	<0.112	<0.028	<0.042	<0.028	<0.070
Count Over Standard	n/a	0	0	0	0	0	0	n/a	0	0	0	0	0	n/a	0	0	0	n/a	n/a	0	n/a	0	n/a	0	n/a	0	0	0	0	n/a
% Over Standard	n/a	0.0	0.0	0.0	0.0	0.0	0.0	n/a	0.0	0.0	0.0	0.0	0.0	n/a	0.0	0.0	0.0	n/a	n/a	0.0	n/a	0.0	n/a	0.0	n/a	0.0	0.0	0.0	0.0	n/a

* One outlier result was removed (976.4 µg/m³ on July 1, 2015)

3.3. WIND ANALYSIS

An analysis of the hourly wind speed and direction collected between June 2011 and December 2017 at the Keno District Mill weather station (shown on Figure 2), at a height of 10 meters, indicates that dominant winds are blowing from the North and from the Southeast. The wind rose in Figure 3, which has data availability of 92.0% for that period, depicts this information based on 16 wind direction categories. The average wind speed is 1.30 m/s and winds are calm 16.18% of the time. Note that the wind sensor experienced occasional icing during the winter months and extended periods of zero wind speed were excluded from this analysis. Also, winter wind speeds may occasionally be underestimated due to the presence of ice on the sensor, but these occurrences cannot be detected in the data record.

Table 3 below compiles the wind speed and direction frequency distribution based on 8 wind direction categories, and 6 wind speed categories.

Table 3 Wind Frequency Distribution (%), Keno District Mill, June 2011 - December 2017

Directions / Wind Classes (m/s)	0.5 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	>= 5.0	Total (%)
N	5.01	8.19	3.33	0.60	0.09	0.03	15.87
NE	5.57	5.11	1.40	0.16	0.01	0.00	11.26
E	3.60	7.79	2.46	0.45	0.07	0.02	13.23
SE	3.76	5.98	3.26	1.43	0.55	0.34	14.08
S	3.33	5.81	2.44	0.46	0.09	0.04	11.19
SW	0.76	1.77	1.50	0.35	0.05	0.02	4.09
W	0.37	0.55	0.44	0.28	0.14	0.09	1.72
NW	0.87	1.45	1.29	0.68	0.33	0.10	4.33
Sub-Total	21.39	33.72	14.82	4.05	1.24	0.57	75.79
Calms							16.18
Missing/Incomplete							8.03
Total							100

The dominant wind direction is from the north (15.87% of the time), followed by southeast (14.08%) and east (13.23%). As can be seen on the wind rose, the strongest winds tend to originate from the southeast. Referring to Figure 2, we can see that air quality station TSP-1 is located downwind from the DSTF when the wind blows from the north, but generally upwind from the DSTF and crusher when the wind blows from the SE. Station TSP-2 is generally downwind from the DSTF and may capture the influence of the crusher when the wind is from the SE but not when it is from the north. TSP-3, located in Keno City and further away from the DSTF and crusher, is generally east (ENE) of these potential dust sources. Based on Table 3 above, westerly winds only occur 1.72% of the time (or 10.14% of the time when combining NW, W and SW), so the DSTF and crusher are expected to have very limited influence on air quality in Keno City (TSP-3).

WIND ROSE PLOT:

Figure 3 - Keno District Mill Wind Rose
June 2011 - December 2017

DISPLAY:

Wind Speed
Direction (blowing from)

COMMENTS:

Excludes periods of ice-affected
or missing data.
Anemometer height: 10m

DATA PERIOD:

Start Date: 02/06/2011 - 00:00
End Date: 15/12/2017 - 03:00

TOTAL COUNT:

53077 hrs.

CALM WINDS:

16.18%

AVG. WIND SPEED:

1.30 m/s

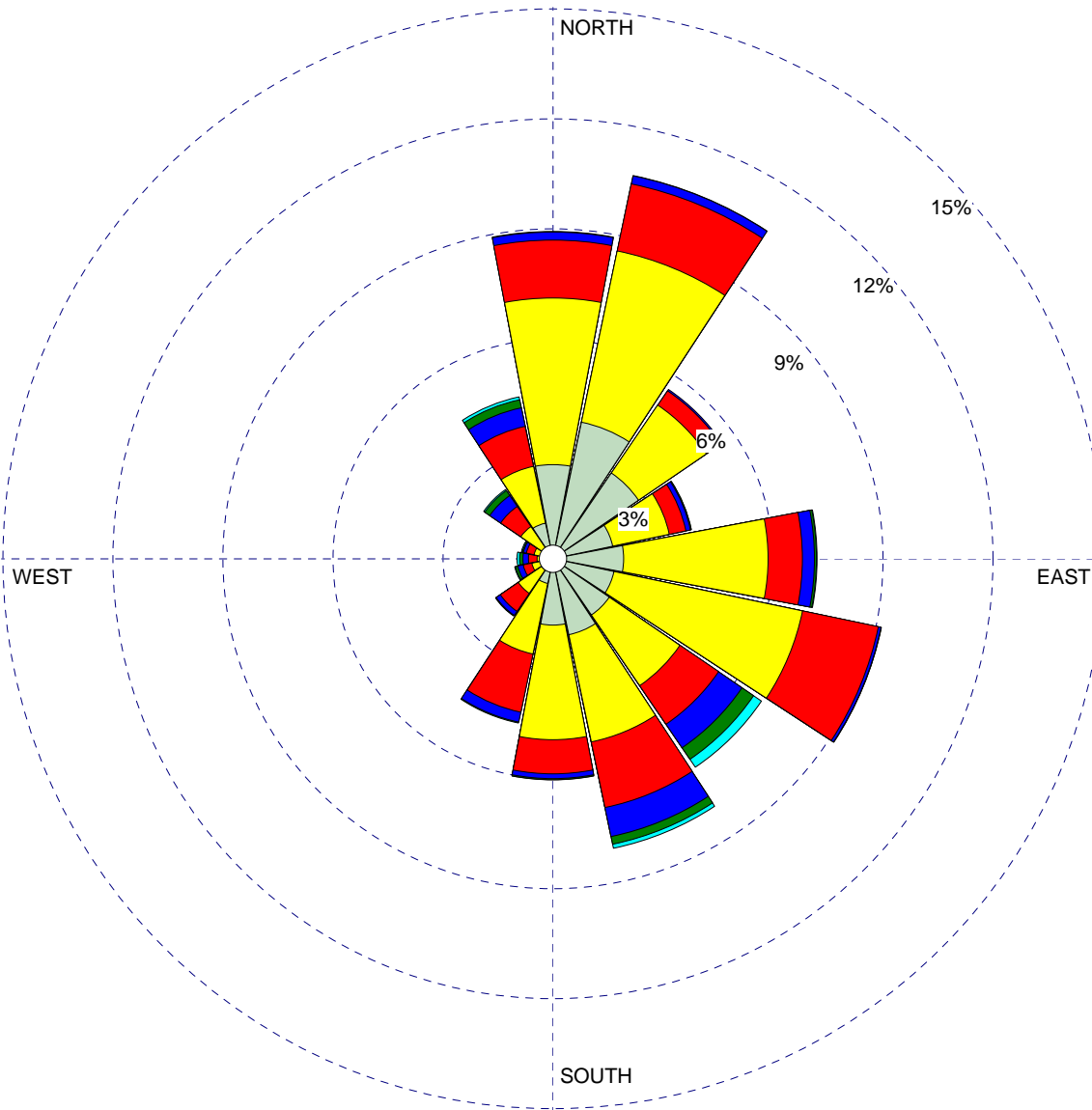
COMPANY NAME:

MODELER:

DATE:

26/01/2018

PROJECT NO.:



The average TSP concentration is slightly higher at TSP-2 than at TSP-1 and TSP-3 ($6.5 \mu\text{g}/\text{m}^3$ versus $5.7 \mu\text{g}/\text{m}^3$ and $5.6 \mu\text{g}/\text{m}^3$ respectively), however the differences are not statistically significant and all results are well below the YAAQS. For PM_{10} , the average concentration is the same at all stations and for $\text{PM}_{2.5}$, the average concentration is slightly higher at TSP-3 than at the other two stations (see Table 1), but no statistically significant differences exist and all results are well below the YAAQS (except for one $\text{PM}_{2.5}$ result).

Figure 4 presents comparisons of average metals concentrations between the three sampling stations for all parameters that were above detection limit for at least one sample. Half the detection limit (RDL) was used to calculate averages for samples that were below RDL. Although some differences in average concentrations of certain metals can be observed between the three stations, results of statistical tests indicate that only iron is significantly lower at TSP-3 than at TSP-1 and TSP-2 and manganese is significantly lower at TSP-3 than at TSP-2. Because the samples are not normally distributed and variances are not equal, non-parametric test were used for statistical comparisons of the sample medians at a significance level of 0.05. Detailed results can be found in Appendix B.

Dust originating from the DSTF would be expected to contain high concentrations of iron, manganese, calcium, zinc, lead, magnesium, arsenic and aluminum, based on metal characterization analyses of the tailings conducted monthly in 2012 and 2013. From the wind direction distribution, TSP-2 is more frequently located downwind of the DSTF than TSP-1, and would therefore be expected to record higher concentrations of the above metals. However, no significant differences were found between TSP-1 and TSP-2, suggesting that the DSTF is likely not the predominant source of ambient dust.

On days where TSP levels were higher than average and where exceedances of the Ontario AAQCs were observed for lead at TSP-1, winds were generally blowing from the northeast and from the east (on October 23, 2012 and June 18, 2013 respectively). Site activities occurring in October 2012 and June 2013 included mining at Bellekeno, development at Lucky Queen (LQ) and Onek and milling at the Keno District Mill. Explorations activities at Flame & Moth also took place in June 2013. A source of ambient dust on these two occasions could have been the unpaved roads. Roads within the vicinity of the TSP stations include mine access roads as well as public roads including Duncan Creek Road.

On days where TSP levels were higher than average and/or where exceedances of the Ontario AAQCs were observed for lead at TSP-2, winds were generally blowing from the NNE (on August 23, 2012). A source of ambient dust in this case could have been the unpaved roads. On days where TSP levels were higher than average and/or where exceedances of the Ontario AAQCs were observed for manganese at TSP-2, winds were generally blowing from the NE (March 23-24, 2013; August 9, 2017) and from the east (April 7, 2013). On these three occasions, the DSTF could have been a source of TSP at TSP-2. Similarly, on days where exceedances of the Ontario AAQCs were observed for cadmium at TSP-2, winds were generally from the NE or NNE (on September 28, 2013 and October 21, 2015 respectively) suggesting a possible influence of the DSTF but also eventually of the unpaved roads. Site activities occurring in August 2012, March 2013 and April 2013 included mining at Bellekeno, development at LQ and Onek, and milling at the Keno District Mill. Between September 2013 and December 2017, only care and maintenance activities were taking place as the mine and mill were under a temporary suspension of operations with exception of collaring Flame and Moth Portal in 2016 and the preparation of the Flame and moth Pond. Detailed meteorological conditions and site activities associated with each ambient air quality sampling event are provided with the complete tabular data in Appendix A-1.

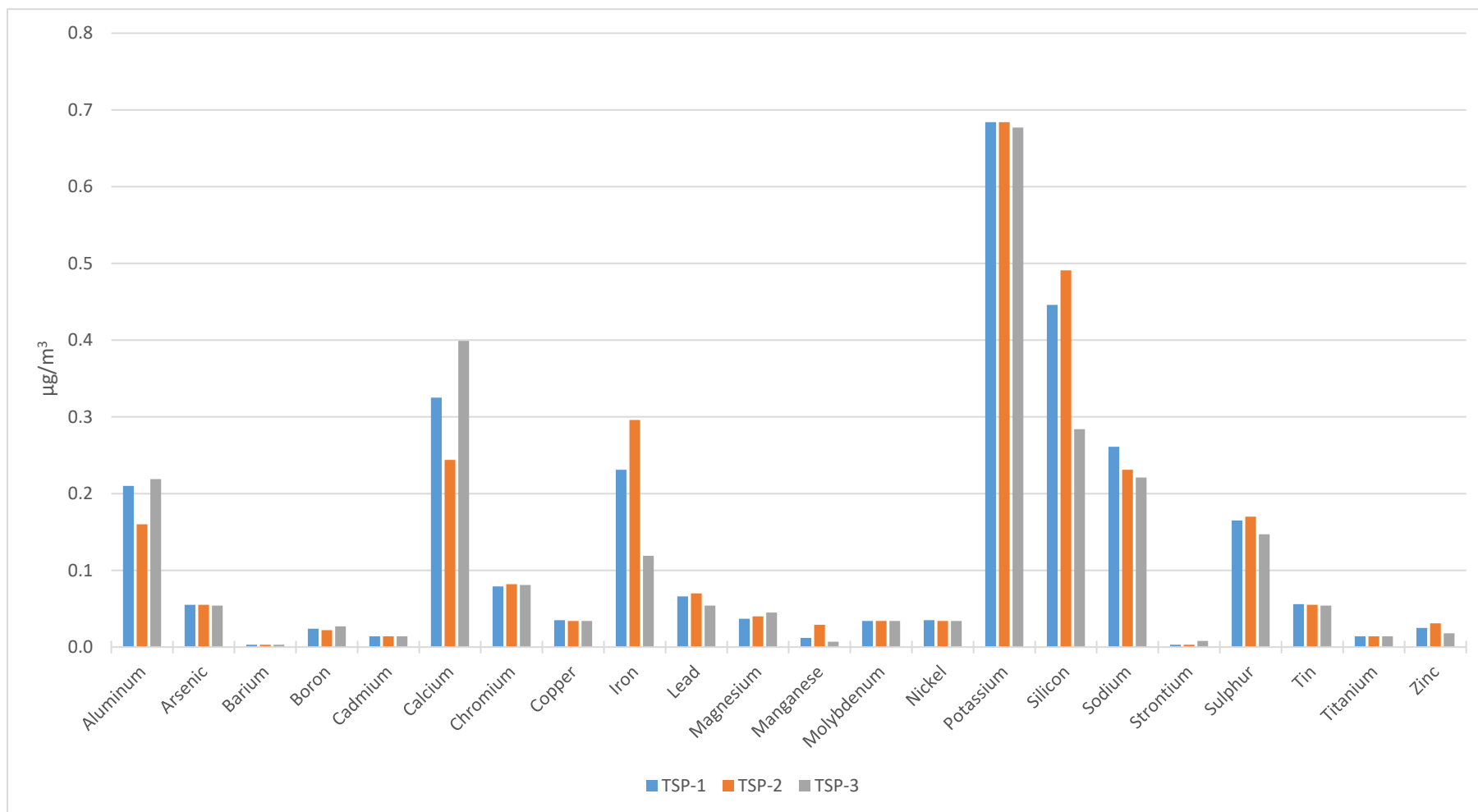


Figure 4 24-hour Average Ambient Metal Concentrations

4. QA/QC

As a quality assurance and quality control measure, blanks were collected along with regular samples starting in December 2015 and analyzed for either TSP and metals, PM₁₀ or PM_{2.5}. A total of 29 blanks were collected during that period and most results were found to be below the detection limit, with the exception of one TSP, one PM_{2.5}, four calcium, nine chromium, five iron, four strontium, one sulfur and one zinc results. Of those, the ones that had results greater than two times the detection limit are shown in Table 4 below. Note that blank results from September 29, 2017 were removed from the database as many unusually elevated values indicated potential contamination of the filter.

Table 4 Blanks with results great than two times the RDL

Date	Parameters
29-Sep-2016	Cr, Sr
29-Dec-2016	Cr
29-Jan-2017	Cr
25-Mar-2017	Cr
25-May-2017	Cr, Fe, Zn
27-Jun-2017	Cr
24-Aug-2017	PM _{2.5}

5. PM₁₀ SAMPLING BY YUKON GOVERNMENT

Independent PM₁₀ sampling was conducted by Yukon Government in 2013 at the locations shown in Figure 5. The station labelled BG represents background (8 km outside of Keno), stations labelled KC are located in Keno City, stations labelled HR are along the Bellekeno Haul Road and stations labelled FL are fence line stations and correspond to TSP-1 and TSP-2 locations. 5-minute data averaged over the different sampling periods are presented in Table 5 below. The sampling period varies between sites (ranges from about 14 to 53 hours) but for comparison purposes, the average results are all below the 24-hour YAAQS of 50 µg/m³. Note that in some cases the measured background PM₁₀ concentration is higher than that measured at some of the receptors, suggesting that there is some variability in the data and that the difference between background and receptors sites may not be significant. Results are generally comparable to the PM₁₀ concentrations measured by AKHM at stations TSP-1, TSP-2 and TSP-3 between August 2015 and December 2017.

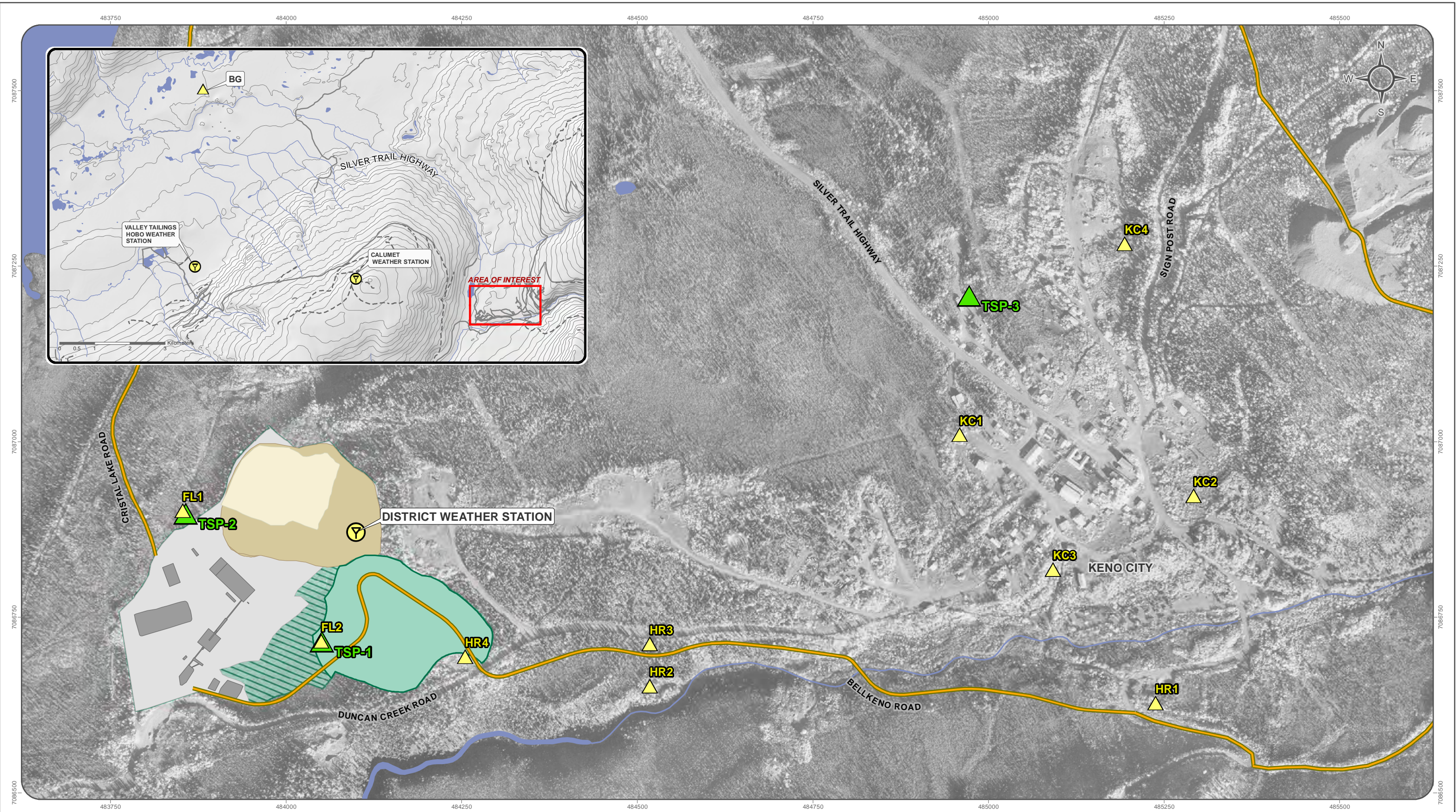


Table 5 Average PM₁₀ concentrations (µg/m³)

	June 11-13, 2013	July 15-17, 2013	August 21-22, 2013
BG	2.8	10.2	3.8
KC1	6.2		
KC2	3.8		
KC3	8.3		
KC4	2.1		
HR1		5.2	
HR2		2.1	
HR3		13.8	
HR4		16.4	
FL1			0.8
FL2			39.3

Source: Yukon Government, 2014

Data presented in Table 5 were obtained from Yukon Government and not collected by Alexco, therefore details of the collection have not been presented within this report. The data is assumed to be accurate and valid, but potentially not representative of all conditions observed over a year due to the limited dataset.







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 under license from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved.

Quartz claim boundaries current as of Octoberth, 2013. Data source: <http://geomatics.yukon.ca>.

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

1:5,000 (when printed on 11 x17 inch paper)

0 50 100 200 300 400 Meters

-  Weather Stations
-  Alexco TSP Monitoring Stations
-  YG PM10 Monitoring Sites 2013
-  Haul Road

-  Building/Infrastructure
-  Current DSTF
-  DSTF 322k Tonnes Design
-  Proposed DSTF Expansion
-  Proposed Mill Site Footprint Expansion



KENO HILL SILVER DISTRICT MINING OPERATIONS

FIGURE 5

**METEOROLOGICAL AND
AIR QUALITY MONITORING STATIONS LOCATION**

MARCH 2017

D:\Project\AIP\Keno_Area_Mines\FMMap\01-Overview\SpecificTopics\Air_Dispersal_Model\03_01_Meteorological_and_air_quality_monitoring_stations_20170328.mxd
(Last edited by: mduchovic 3/29/2017 10:16 AM)



6. CONCLUSION

- All TSP samples collected to date near the District Mill, DSTF and Keno City are on average at least an order of magnitude below the Yukon air quality standard for TSP;
- PM₁₀ and PM_{2.5} samples collected at the same three locations are all well below their respective YAAQS, with the exception of one PM_{2.5} outlier sample collected at TSP-3 on July 14, 2017, which has been determined to be an outlier. Most results were in fact found to be below the lab detection limit;
- Two metal concentrations (lead) exceeded the Ontario ambient air quality criteria at TSP-1 out of 204 samples collected to date and 7 exceedances (4 manganese, 1 lead and 2 cadmium) were measured at TSP-2 from 190 samples collected to date. No exceedances of the Ontario AAQCs for metals were observed at TSP-3 in 106 samples. Air quality samples will continue to be collected 3 times per month to identify if these infrequent events are associated with any trends or patterns;
- Blanks will continue to be collected along with regular samples to ensure that no sample contamination is occurring during handling, transport or lab analysis; and
- A few samples were damaged during transport to the lab and could not be analyzed. Precautions have been taken to prevent this from happening again in the future.

7. REFERENCES

Ontario Ministry of Environment. 2012. Ontario's Ambient Air Quality Criteria. Standards Development Branch. PIBS#6570e01. April 2012.

Yukon Environment. 2014. Yukon Ambient Air Quality Standards. April 2010, updated September 2014.

APPENDIX A

TABULAR DATA

Table A-1 24-Hour Average Total Suspended Particulate Results and Associated Meteorological Condition and Site Activities, August 2012 – December 2017

Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Average Solar Radiation (W/m²)	Total Evapo-transpiration (mm)	Activities at site
23/08/2012	10.1	12.8		13.11	10.25	6.84	75.31	0	0.68	29.5	3.42	6.6	n/a	n/a	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
27/09/2012	<5.6	<5.6		8.18	5.23	2.42	62.53	4.5	4.28	124.7	14.27	145.1	n/a	n/a	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
29/09/2012	<5.6	<5.6		5.69	4.28	2.27	60.46	0	2.33	129.7	8.48	155.9	n/a	n/a	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
16/10/2012	5.8	-		1.65	0.24	-2.12	89.17	0.8	0.9	32.6	6.26	75.9	n/a	n/a	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
17/10/2012	<5.6	-		-0.04	-2.84	-8.45	76.89	0.1	1.26	58.8	7.19	159.2	n/a	n/a	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
23/10/2012	53.2	-		-9.97	-14.04	-17.54	78.41	0	0.66	43.2	3.28	17.0	n/a	n/a	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
15/12/2012	<5.6	13.6		-13.59	-15.89	-19.29	88.8	0	0.2	357.4	1.85	5.7	1.71	0.01	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
14/01/2013	<5.6	-		-3.02	-8.34	-11.78	95.04	0	0.28	284.8	1.43	189.9	0.29	0	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
16/01/2013	<5.6	<5.6		-15.96	-18.61	-20.79	84.83	0	1.26	70.2	4.52	36.1	1.08	0.039	Mining at Bellekeno and development at LQ and Onek, Milling at the Keno District Mill
23/03/2013	<5.6	18.2		-3.01	-10.79	-18.99	51.87	0	1.65	28.3	7.48	148.5	117.58	0.359	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
24/03/2013	<5.6	23.2		0.17	-4.17	-9.93	57.7	0.2	2.61	78.3	11.11	131.7	113.46	0.521	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
25/03/2013	<5.6	13.5		3.26	-0.18	-1.98	60.02	0.2	3.57	83.1	12.47	135.8	89.92	0.692	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
26/03/2013	9.6	11.1		-1.96	-7.27	-17.97	64.66	0.1	3.53	29	10.49	152.2	107.38	0.518	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
07/04/2013	-	17.1		3.46	-3.18	-12.29	65.38	2.2	2.96	94.8	10.32	145.0	113.25	0.71	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
10/04/2013	5.7	7.2		-2.04	-6.54	-11.32	67.42	2.6	2.51	256.1	8.09	199.2	59.54	0.374	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
13/04/2013	<5.6	6.9		-5.93	-12.43	-19.03	45.43	0	1.96	10.6	6.29	26.6	219	0.395	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
15/04/2013	6.5	6.5		-1.9	-7.18	-13.58	53.95	0	2.18	42.3	7.95	103.5	141.21	0.401	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
16/04/2013	7.2	6.4		0.44	-3.52	-8.62	69.65	0.1	2.14	64.3	7.03	73.8	197.88	0.38	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill
28/05/2013	6.8	-		19.47	14.39	9.06	49.38	1.6	1.74	23.9	6.95	353.5	221.13	1.048	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
16/06/2013	8.2	-		23.38	17.3	11.35	47.8	3.4	1.94	7.2	12.71	357.9	187.21	1.3	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
17/06/2013	-	<5.6		14.07	10.7	7.39	50.03	0	3.05	16.8	10.87	344.0	234.08	1.435	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth



Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Average Solar Radiation (W/m²)	Total Evapo- transpiration (mm)	Activities at site
18/06/2013	47.2	6.3		21.94	15.07	7.66	47.63	0	1.65	97.3	6.13	136.7	277.13	1.082	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
21/06/2013	7.2	<5.6		17.66	13.9	10.38	79.66	6.6	1.42	344.9	6.83	177.0	124.17	0.363	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
23/06/2013	-	<5.6		18.44	12.68	7.82	76.09	9.4	1.65	23.7	9.54	306.5	149.04	0.509	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
24/06/2013	<5.6	-		23.85	15.91	6.54	59.11	0	1.72	15.1	5.33	336.8	337.54	1.183	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
28/06/2013	-	62.2		23.98	18.36	12.73	65.86	10.5	1.67	51.2	10.37	140.4	182.54	0.783	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
19/07/2013	5.6	<5.6		20.14	14.74	9.64	65.78	0.1	1.42	2.3	6.15	196.5	184.71	0.647	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
20/07/2013	12.2	<5.6		17.94	12.89	7.1	72.14	0.8	1.66	27.6	6.36	304.1	179.46	0.652	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
21/07/2013	<5.6	<5.6		15.94	13.17	11.18	70.77	0.6	1.57	41.9	5.25	11.6	117.25	0.557	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
22/07/2013	<5.6	10.1		20.87	15.55	11.04	56.74	0	1.57	18.9	5.79	209.9	240.08	0.877	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
22/08/2013	<5.6	<5.6		14.14	7.63	1.62	69.1	0	1.76	7.6	6.41	245.3	150.75	0.66	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
23/08/2013	<5.6	-		8.68	6.55	4.21	91.68	6.6	0.85	17.8	3.18	108.3	56.21	0.074	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
24/08/2013	<5.6	-		8.03	5.92	3.43	75.82	0.3	2.61	60.9	8.73	87.5	134.21	0.571	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
25/08/2013	<5.6	<5.6		8.4	5.09	1.8	75.02	0	1.29	16.8	4.03	17.2	96.25	0.274	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
26/08/2013	-	<5.6		10.85	6.73	3.85	82.06	1	1.36	41.4	5.22	324.4	125.54	0.321	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
28/08/2013	-	7.2		17.01	8.66	1.14	61.42	0	1.38	73.5	6.5	145.7	181.92	0.639	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
31/08/2013	-	<5.6		9.51	7.68	5.12	91.35	4.7	1.01	22.5	4.9	191.4	53.42	0.094	Mining at Bellekeno and development at Onek, Milling at the Keno District Mill, Exploration activities at Flame & Moth
21/09/2013	-	<5.6		2.64	0.6	-0.96	96.45	6.6	0.92	356.8	3.41	27.7	48.71	0.036	No mining operations, Exploration activities at Flame & Moth
24/09/2013	<5.6	<5.6		1.7	0.38	-2.3	89.58	0	1.68	17.2	6.2	220.9	55.67	0.138	No mining operations, Care and Maintenance
27/09/2013	<5.6	<5.6		6.66	3.26	1.15	84.55	2.8	1.25	50.8	7.66	137.4	49.38	0.183	No mining operations, Care and Maintenance
28/09/2013	<5.6	<5.6		7.32	3.73	0.07	69.19	0	1.14	55.2	5.51	78.8	78.04	0.346	No mining operations, Care and Maintenance
29/09/2013	<5.6	-		6.77	3.58	1.28	60.97	0	2.18	63.6	7.7	92.1	81.08	0.636	No mining operations, Care and Maintenance
30/09/2013	-	6		6.19	3.22	1	63.34	0	1.64	49.8	5.32	84.6	49.79	0.447	No mining operations, Care and Maintenance
24/10/2013	-	<5.6		-4.58	-6.99	-10.1	95.67	0	0.77	48.1	3.78	238.2	22.92	0.022	No mining operations, Care and Maintenance
25/10/2013	7.6	<5.6		-3.58	-5.09	-7.52	96.9	0	0.47	43.3	2.99	31.6	8.96	0.015	No mining operations, Care and Maintenance
26/10/2013	<5.6	<5.6		-0.68	-4.9	-8.64	95.13	1.2	1.19	79.3	4.02	152.5	41.21	0.036	No mining operations, Care and Maintenance



Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Average Solar Radiation (W/m²)	Total Evapo- transpiration (mm)	Activities at site
27/10/2013	6.8	<5.6		-5.73	-7.6	-9.98	95.57	0	0.71	44.1	2.77	15.1	7.17	0.024	No mining operations, Care and Maintenance
28/10/2013	<5.6	-		0.21	-3.79	-5.96	97.83	0	0.97	19.7	5.27	25.8	4.92	0.016	No mining operations, Care and Maintenance
28/11/2013	7.8	8.8		-5.9	-10.14	-15.55	91.67	2.3	1.53	22.8	8.22	202.6	1.04	0.051	No mining operations, Care and Maintenance
29/11/2013	7.6	7.5		-16.84	-22.52	-27.23	81.85	0.1	1.04	111.6	3.7	159.4	1.13	0.031	No mining operations, Care and Maintenance
30/11/2013	8.9	8.5		-25.99	-27.76	-29.67	77.52	0	0.37	75.8	1.95	97.3	1.08	0.012	No mining operations, Care and Maintenance
01/12/2013	6.7	7.2		-29.46	-30.57	-32.06	74.69	0	0.54	103.8	3.58	114.7	0.79	0.016	No mining operations, Care and Maintenance
03/01/2014	13.2	11.8		-20.82	-24.67	-28.26	80.16	0	n/a	n/a	n/a	n/a	0.5	n/a	No mining operations, Care and Maintenance
04/01/2014	12.6	9.3		-23.86	-27.58	-29.03	77.62	0	n/a	n/a	n/a	n/a	0.38	n/a	No mining operations, Care and Maintenance
05/01/2014	18.6	11.4		-11.47	-15.47	-22.96	88.97	0	n/a	n/a	n/a	n/a	0.25	n/a	No mining operations, Care and Maintenance
06/01/2014	11.9	11		-10.08	-10.91	-11.81	92.77	2.3	0	239.5	0.17	239.5	0.63	0	No mining operations, Care and Maintenance
01/02/2014	9.7	11.9		-13.87	-15.42	-16.72	89.15	0	0.17	68.5	1.26	41.1	16.67	0.006	No mining operations, Care and Maintenance
02/02/2014	<5.6	<5.6		-10.84	-13.88	-16.51	90.43	0	0.7	54.6	2.99	45.8	18.17	0.028	No mining operations, Care and Maintenance
03/02/2014	<5.6	<5.6		-13.05	-16.23	-18.55	88.38	0	0.71	8.2	4.06	12.8	20.17	0.027	No mining operations, Care and Maintenance
04/02/2014	<5.6	6.4		-16.81	-19.32	-20.81	85.64	0	0.31	66.7	2.22	19.1	20.38	0.013	No mining operations, Care and Maintenance
05/03/2014	<5.6	<5.6		-13.83	-18.81	-21.99	54.48	0	1.1	59.6	3.62	124.0	82.79	0.12	No mining operations, Care and Maintenance
06/03/2014	<5.6	<5.6		-14.55	-20.5	-26.02	61.57	0	1.24	36.8	4.91	117.7	89.46	0.119	No mining operations, Care and Maintenance
07/03/2014	<5.6	<5.6		-15.31	-21.47	-26.79	62.8	0	0.84	38.6	3.17	5.5	92.17	0.084	No mining operations, Care and Maintenance
25/03/2014	<5.6	<5.6		-1.15	-9.04	-16.37	41.09	0	2.09	39.8	5.68	79.2	151.67	0.533	No mining operations, Care and Maintenance
12/04/2014	<5.6	<5.6		1.63	-6.67	-14.67	40.6	0	1.38	23.9	4.11	241.4	189.08	0.444	Exploration activities at Flame & Moth
13/04/2014	6.8	8.1		5.29	-0.4	-6.75	39.56	0.4	1.16	34.5	4.06	355.5	176.96	0.585	Exploration activities at Flame & Moth
14/04/2014	18.8	20.3		8.44	3.51	-0.45	45.57	0.1	1.43	56.6	5.66	15.6	167.38	0.69	Exploration activities at Flame & Moth
15/04/2014	15.7	14.4		8.6	3.21	-1.58	56.03	0	1.46	31.1	6.69	133.6	164.21	0.606	Exploration activities at Flame & Moth
11/05/2014	21.9	23.2		13.32	7.67	2.564	40.33	0.4	1.81	3.5	6.44	302.1	0.3	1.048	Exploration activities at Flame & Moth
12/05/2014	14.4	10		15.92	9.23	1.645	40.14	0.2	1.55	10.5	6.13	209.7	0.28	0.985	Exploration activities at Flame & Moth
13/05/2014	<5.6	18.6		17.93	11.47	4.408	47.25	0.2	2.2	335.7	8.58	194.2	0.27	1.367	Exploration activities at Flame & Moth
29/05/2014	17.1	<5.6		17.05	10.5	2.236	58.36	1.2	1.64	3.6	7.38	314.9	0.29	0.877	Exploration activities at Flame & Moth
26/06/2014	<5.6			15.56	11.04	5.062	48.68	0.4	2.02	79.7	7.96	150.5	0.26	1.047	Exploration activities at Flame & Moth
27/06/2014	<5.6	5.6		18.11	12.96	8.05	48.56	0	1.42	34.9	5.67	322.6	0.18	0.916	Exploration activities at Flame & Moth
28/06/2014		<5.6		23.06	16.15	6.332	38.97	0.4	2.11	328.2	7.94	285.6	0.35	1.641	Exploration activities at Flame & Moth
29/06/2014	<5.6	<5.6		24.93	17.07	7.576	40.23	0.2	1.9	35	6.44	336.1	0.29	1.48	Exploration activities at Flame & Moth
30/06/2014	<5.6	<5.6		17.12	14.37	12.5	67.69	0	1.12	47.7	6.95	92.8	0.09	0.454	Exploration activities at Flame & Moth
08/07/2014	<5.6	<5.6		16.39	12.98	8.98	63.26	0	1.57	326.4	6.45	223.7	0.16	0.65	Exploration activities at Flame & Moth
27/07/2014	<5.6	<5.6		16.61	11.39	8.41	83.5	2.8	1.11	228.9	5.3	334.3	0.14	0.266	Exploration activities at Flame & Moth
28/07/2014	<5.6	<5.6		18.93	12.56	7.43	68.18	0.6	1.36	220.2	6.31	151.2	0.19	0.599	Exploration activities at Flame & Moth



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29/07/2014	<5.6	<5.6		15.18	12.05	9.11	79.4	3.4	1.69	211.1	6.9	320.3	0.13	0.354	Exploration activities at Flame & Moth
22/08/2014	<5.6	<5.6		14.95	10.31	6.149	76.43	0	1.35	44.2	5.99	16.6	0.13	0.337	Exploration activities at Flame & Moth
23/08/2014	6.9	16.7		16.65	10.05	4.659	78.54	1.5	1.37	59.5	4.99	143.5	0.18	0.354	Exploration activities at Flame & Moth
24/08/2014	<5.6	5.6		14.83	9.69	5.429	74.6	0	1.6	55.6	5.76	354.8	0.12	0.447	Exploration activities at Flame & Moth
25/08/2014	<5.6			12.09	9.4	7.071	86.62	1.1	0.73	18.6	3.96	354	0.09	0.156	Exploration activities at Flame & Moth
26/08/2014		<5.6		11.48	8.22	5.645	91.57	16	0.65	51.2	4.1	193.2	0.07	0.059	Exploration activities at Flame & Moth
20/09/2014	<5.6	<5.6		8.42	6.1	4.174	77.89	0	1	58.8	5.53	94.3	0.05	0.223	Exploration activities at Flame & Moth
23/09/2014	5.6	6.9		4.986	0.95	-1.977	88.36	0.7	1.51	271.1	7.22	194.9	0.06	0.134	Exploration activities at Flame & Moth
24/09/2014	5.6	6.9		4.955	-0.44	-3.427	76.34	0.4	1.28	22.7	4.81	221.0	0.1	0.221	Exploration activities at Flame & Moth
27/09/2014	5.6	<5.6		4.42	0.96	-1.406	89.84	3.5	1.42	32.8	8.05	166.0	0.02	0.109	Exploration activities at Flame & Moth
15/10/2014	9.7	18.1		-0.86	-3.51	-5.65	87.21	0.1	0.88	25.4	3.51	30.7	0.03	0.063	Exploration activities at Flame & Moth
16/10/2014	<5.6	<5.6		-0.581	-1.62	-3.093	89.96	0	1.1	28.4	4.97	25.6	0.01	0.068	Exploration activities at Flame & Moth
23/10/2014	<5.6	<5.6		-3.667	-4.97	-5.752	89.54	0	0.93	30.2	4.95	34.6	0.02	0.063	Exploration activities at Flame & Moth
24/10/2014	<5.6	<5.6		-2.715	-4.57	-5.456	95.21	0	0.79	39.2	3.81	171.6	0.01	0.031	Exploration activities at Flame & Moth
19/11/2014	10			-2.206	-3.73	-5.562	97.74	0	0.45	50.3	2.98	187.5	0	0.012	No mining operations, Care and Maintenance
20/11/2014	<5.6			-4.7	-10	-15.01	93.46	0	0.49	124.5	2.75	117.0	0	0.016	No mining operations, Care and Maintenance
22/11/2014		<5.6		-18.86	-19.79	-21.6	85.38	0.2	0.22	12.2	1.61	29.1	0	0.008	No mining operations, Care and Maintenance
23/11/2014		5.8		-17.53	-19.71	-22.09	85.39	0.1	0.15	14.1	2.55	17.0	0	0.003	No mining operations, Care and Maintenance
24/11/2014	<5.6			-14.55	-16.44	-18.21	88.27	0.1	0.18	45	1.58	28.1	0	0.007	No mining operations, Care and Maintenance
25/11/2014	10.4	8.1		-11.02	-12.48	-13.85	91.5	0	0.18	30.3	1.31	40.8	0	0.002	No mining operations, Care and Maintenance
12/12/2014	10.3	7.8		-11.81	-14.01	-16.65	90.33	0	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance
13/12/2014	5.8	11.7	16	-11.22	-14.47	-17.02	89.88	0	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance
14/12/2014		5.6	<5.6	-2.637	-10.17	-15.75	93.13	0.1	n/a	n/a	0.04	46.8	0	0	No mining operations, Care and Maintenance
15/12/2014	<5.6	<5.6	<5.6	-0.904	-1.88	-4.157	85.83	0	0.78	48.5	8.87	155.1	0	0.081	No mining operations, Care and Maintenance
17/12/2014	<5.6			-5.392	-6.76	-8.51	94.93	0	0.55	69.5	3.02	38.6	0	0.024	No mining operations, Care and Maintenance
10/01/2015	5.6	<5.6		-9.46	-10.34	-10.97	93.47	0	0.09	251.9	1.42	10.3	0	0.003	No mining operations, Care and Maintenance
11/01/2015	<5.6	<5.6		-9.37	-10.03	-10.63	93.32	0	0.11	65.4	1.26	33.4	0	0.001	No mining operations, Care and Maintenance
12/01/2015			<5.6	-9.68	-10.29	-11.46	93.2	0	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance
13/01/2015	<5.6	<5.6		-6.068	-8.44	-11.23	94.59	0	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance
15/01/2015	6.1	<5.6	<5.6	-0.888	-5.06	-9.68	96.82	0	0.22	356.6	3.7	38.4	0	0.005	No mining operations, Care and Maintenance
16/01/2015			<5.6	-0.335	-2.85	-7.954	98.1	0	1.14	346.9	4.48	188.0	0	0.018	No mining operations, Care and Maintenance
18/01/2015			<5.6	-3.823	-6.18	-8.51	96	0.2	0.69	60.2	4.21	170.8	0	0.023	No mining operations, Care and Maintenance
12/02/2015		6.3	8.6	-11.62	-13.95	-15.81	89.23	0	0.37	19.4	3.26	272.0	0.01	0.023	No mining operations, Care and Maintenance
13/02/2015	<5.6	<5.6		-6.289	-8.23	-11.42	93.9	0	0.52	24.5	4.93	37.9	0	0.024	No mining operations, Care and Maintenance



Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Average Solar Radiation (W/m²)	Total Evapo- transpiration (mm)	Activities at site
15/02/2015	7.1	<5.6	8.8	-3.145	-6.33	-9.71	92.52	7.3	0.73	98.5	3.04	97.7	0.01	0.038	No mining operations, Care and Maintenance
16/02/2015	<5.6	<5.6	7.9	-2.157	-7.74	-11.49	93.95	0.7	0.85	15.9	4.61	30.5	0	0.029	No mining operations, Care and Maintenance
18/02/2015	<5.6		11.5	-0.889	-2.64	-4.515	96.48	0	0.42	29.1	3.69	7.9	0	0.016	No mining operations, Care and Maintenance
06/03/2015	7.1	7.8	<5.6	-0.298	-3.66	-5.577	86.59	0.1	1.37	322.7	6.53	188.2	0.03	0.148	No mining operations, Care and Maintenance
07/03/2015	<5.6	<5.6	<5.6	0.932	-2.44	-4.272	78.47	0.2	1.42	30.5	6.22	180.2	0.02	0.2	No mining operations, Care and Maintenance
16/03/2015	6.7	<5.6	9	-12.89	-19.53	-26.15	73.31	0	0.89	14.5	3.84	17.0	0.06	0.07	No mining operations, Care and Maintenance
17/03/2015	<5.6	<5.6	16.5	-1.807	-9.23	-13.81	72.37	0.3	0.93	28.9	4.24	24.0	0.07	0.158	No mining operations, Care and Maintenance
02/04/2015	<5.6	<5.6	<5.6	4.032	-1.57	-5.899	66.26	0	1.7	27.7	4.94	71.0	0.17	0.415	No mining operations, Care and Maintenance
03/04/2015	<5.6	<5.6	<5.6	2.002	-2.72	-7.184	58.66	0	2.35	16.5	7.17	88.7	0.17	0.575	No mining operations, Care and Maintenance
04/04/2015	<5.6	<5.6	5.7	3.513	-3.7	-10.48	61.55	0	1.53	71	6.57	152.2	0.16	0.414	No mining operations, Care and Maintenance
05/04/2015	<5.6	<5.6	5.8	3.213	-2.1	-5.496	84.15	0	1.2	345.9	7.63	247.7	0.13	0.174	No mining operations, Care and Maintenance
21/05/2015			<5.6	23.83	16.28	7.585	34.05	0	1.73	13	5.17	238.3	0.31	1.389	No mining operations, Care and Maintenance
22/05/2015			<5.6	25.09	17.82	10.28	29.16	0	1.71	25.5	6.02	300.9	0.29	1.554	No mining operations, Care and Maintenance
23/05/2015			8.8	26.43	19.79	12.86	26.79	0	1.36	18.1	9.86	184.2	0.25	1.466	No mining operations, Care and Maintenance
24/05/2015			9.9	26.51	19.2	11.59	32.85	0	1.79	91.6	7.59	167.6	0.27	1.648	No mining operations, Care and Maintenance
25/05/2015	15.8	18.9		25.12	17.97	10.28	38.93	0	2.05	1.8	8.18	180.7	0.28	1.556	No mining operations, Care and Maintenance
26/05/2015	22.2	26.4		21.73	15.55	9.78	53.49	0	1.79	32.8	9.22	90.9	0.16	0.986	No mining operations, Care and Maintenance
27/05/2015	15.8	15		22.99	16.43	11.38	52.67	0	2.18	351.8	8.63	24.0	0.29	1.243	No mining operations, Care and Maintenance
28/05/2015	6.3	5.8		20.98	14.38	8.42	62.4	0	1.94	333.9	10.63	269.0	0.25	0.924	No mining operations, Care and Maintenance
16/06/2015	<5.6	<5.6	<5.6	19.74	13.76	6.668	51.79	0.9	1.75	21.2	10.14	354.4	0.27	1.096	No mining operations, Care and Maintenance
17/06/2015	<5.6	9.3	<5.6	15.41	11.36	6.976	63.5	0	2.66	357.7	9.73	337.9	0.22	1.071	No mining operations, Care and Maintenance
18/06/2015	<5.6	<5.6	<5.6	18.34	11.65	4.589	42.59	0	2.27	349.6	7.18	316.9	0.35	1.479	No mining operations, Care and Maintenance
01/07/2015		<5.6	68.1	15.59	11.07	7.143	76.46	1.4	1.58	304.9	7.87	205.5	0.18	0.466	No mining operations, Care and Maintenance
08/07/2015	15.4	32.1	43.8	17.01	12.85	10.73	80.11	3.2	1.68	276.1	11.49	257.1	0.08	0.453	No mining operations, Care and Maintenance
11/07/2015	<5.6	7.6	<5.6	14.04	12.35	10.35	75.27	9.5	1.01	39	5.52	152.4	0.11	0.281	No mining operations, Care and Maintenance
20/07/2015	9.6	5.7	13.1	17.42	11.86	4.725	62.55	0	2.03	2	9.09	318.7	0.26	1.007	No mining operations, Care and Maintenance
13/08/2015	6.8	10.4		14.48	7.56	0.308	64.18	0	1.56	4.2	6.06	322.4	0.21	0.644	No mining operations, Care and Maintenance
14/08/2015	11.4	<5.6	9.7	16.49	9.14	3.399	70.07	0	1.67	34.3	6.71	224.5	0.17	0.55	No mining operations, Care and Maintenance
15/08/2015	7.4	9	6.4	18.97	11.31	4.551	63.45	0	1.67	1.3	5.93	215.3	0.21	0.728	No mining operations, Care and Maintenance
16/08/2015	11	8.6	6.5	16.31	11.81	8.21	64.84	0	1.52	298.6	6.48	207.9	0.14	0.687	No mining operations, Care and Maintenance
17/09/2015	5.7	<5.6		8.56	5.26	3.57	83.42	4.4	1.69	121.4	6.94	142.7	0.08	0.26	No mining operations, Care and Maintenance
20/10/2015	6	<5.6	5.6	3.167	1.32	-1.097	89.12	0	0.99	90.8	5.45	120.4	0.04	0.11	No mining operations, Care and Maintenance
21/10/2015	<5.6	8.2	<5.6	2.824	0.27	-1.349	89.93	0	0.7	23.8	5.71	140.6	0.01	0.065	No mining operations, Care and Maintenance
13/11/2015	21.4	14	16	-11.46	-12.67	-14.95	91.27	2.4	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance



Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Average Solar Radiation (W/m²)	Total Evapo- transpiration (mm)	Activities at site
15/11/2015	10.3	10	8.5	-14.97	-16.71	-19.11	88	1	n/a	n/a	0.09	205.8	0	0	No mining operations, Care and Maintenance
16/11/2015	10.8	12.2	6.9	-14.95	-16.51	-18.04	88.14	0.2	0.36	19.4	2.93	26.0	0	0.005	No mining operations, Care and Maintenance
17/11/2015	17.8	20.8		-17.84	-18.96	-22.21	85.9	0.3	0.69	20.9	2.99	20.7	0	0.02	No mining operations, Care and Maintenance
18/11/2015	9.7	17.4		-22.09	-25.52	-29.1	79.53	0	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance
16/12/2015	<5.6		<5.6	-15.9	-17.77	-21.21	87.08	0	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance
17/12/2015	<5.6		<5.6	-12.54	-17.25	-19.91	87.61	0	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance
18/12/2015	<5.6		<5.6	-10.93	-11.8	-12.91	91.85	0.1	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance
19/12/2015	<5.6		<5.6	-11.73	-12.75	-14.99	90.93	0	n/a	n/a	n/a	n/a	0	n/a	No mining operations, Care and Maintenance
05/01/2016	<5.6		<5.6	-12.1	-14.93	-16.42	89.23	0	0.41	49.4	2.10	76.3	0.00	0.023	No mining operations, Care and Maintenance
06/01/2016	<5.6		<5.6	-14.12	-15.06	-15.93	85.37	0	0.21	47.1	1.59	30.3	0.00	0.014	No mining operations, Care and Maintenance
07/01/2016			<5.6	-14.34	-15.65	-16.56	79.81	4	0.33	64.8	2.20	36.4	0.00	0.028	No mining operations, Care and Maintenance
08/01/2016	<5.6			-15.34	-16.32	-17.01	79.46	0	0.51	88.9	2.41	140.3	0.00	0.036	No mining operations, Care and Maintenance
26/02/2016	<5.6		<5.6	-2.88	-6.39	-9.04	89.98	0	0.83	44.7	3.82	14.3	0.01	0.045	No mining operations, Care and Maintenance
27/02/2016	<5.6		<5.6	-0.499	-3.86	-5.51	89.43	0.2	0.90	18.1	5.08	341.7	0.09	0.105	No mining operations, Care and Maintenance
28/02/2016	<5.6		<5.6	-0.842	-2.71	-5.93	76.81	0	1.14	30.8	6.79	139.1	0.03	0.173	No mining operations, Care and Maintenance
12/03/2016	<5.6	<5.6	<5.6	3.148	-2.98	-7.60	62.41	0.2	1.07	68.3	4.02	90.3	0.10	0.286	No mining operations, Care and Maintenance
14/03/2016	<5.6	<5.6	<5.6	-4.622	-6.39	-9.43	83.42	0	1.14	17.3	3.71	21.7	0.06	0.101	No mining operations, Care and Maintenance
15/03/2016	<5.6	<5.6	<5.6	-3.963	-6.65	-9.78	91.08	0.1	0.77	25.8	3.96	45.1	0.04	0.052	No mining operations, Care and Maintenance
19/04/2016	<5.6	<5.6	<5.6	4.494	0.18	-5.34	60.59	0	1.58	13.4	6.15	318.7	0.22	0.48	No mining operations, Care and Maintenance
23/04/2016	<5.6	<5.6	<5.6	12.14	5.94	0.67	67.36	0.5	1.25	74.3	5.66	111.3	0.23	0.538	No mining operations, Care and Maintenance
24/04/2016	<5.6	<5.6	<5.6	13.5	7.50	2.87	59.67	0	1.27	32.3	5.58	64.8	0.18	0.538	No mining operations, Care and Maintenance
23/05/2016	<5.6	<5.6	<5.6	15.41	10.35	2.50	55.84	0	1.95	10.5	6.47	319.6	0.22	1.007	No mining operations, Care and Maintenance
25/05/2016	10.6	<5.6	<5.6	9.99	7.54	5.79	64.33	0.2	2.36	359.9	8.15	339.7	0.15	0.723	No mining operations, Care and Maintenance
13/06/2016	<5.6	<5.6	<5.6	14.65	10.54	6.45	73.67	1.1	1.33	26.6	4.77	339.0	0.11	0.353	No mining operations, Care and Maintenance
17/06/2016	<5.6	<5.6	<5.6	21.96	15.16	8.18	37.44	0	1.90	8.8	7.63	317.6	0.35	1.509	No mining operations, Care and Maintenance
19/06/2016	9.7	22.6	6.1	25.98	18.97	9.57	35.04	0	2.41	292.5	9.21	198.7	0.35	2.176	No mining operations, Care and Maintenance
28/07/2016	<5.6	<5.6	<5.6	18.66	14.78	10.16	67.43	1.7	1.57	61.8	7.73	236.2	0.14	0.675	No mining operations, Care and Maintenance
29/07/2016	<5.6	<5.6	<5.6	15.55	11.73	7.72	88.27	2.7	0.95	61.3	4.20	238.4	0.12	0.141	No mining operations, Care and Maintenance
30/07/2016	<5.6	<5.6	<5.6	15.5	12.59	9.46	78.82	0.6	1.44	285.4	6.19	233.8	0.13	0.364	No mining operations, Care and Maintenance
09/08/2016	<5.6	<5.6	<5.6	12.96	11.51	9.52	93.48	8.5	1.17	302.7	5.50	194.6	0.08	0.096	No mining operations, Care and Maintenance
10/08/2016	<5.6	<5.6	<5.6	11.59	9.94	8.94	91.50	2.9	1.31	355.7	7.75	255.8	0.06	0.147	No mining operations, Care and Maintenance
11/08/2016	<5.6	<5.6	<5.6	16.77	11.59	7.05	75.82	0.1	0.87	337.9	5.60	228.3	0.16	0.321	No mining operations, Care and Maintenance
28/09/2016	<5.6	<5.6	<5.6	5.192	0.46	-2.50	67.44	0	1.38	79.8	5.88	178.1	0.09	0.373	No mining operations, Care and Maintenance
29/09/2016	<5.6	<5.6	<5.6	3.332	0.51	-3.57	67.16	0.2	2.12	349.2	8.03	309.6	0.05	0.544	No mining operations, Care and Maintenance



Sample Date	TSP-1 (µg/m³)	TSP-2 (µg/m³)	TSP-3 (µg/m³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Average Solar Radiation (W/m²)	Total Evapo- transpiration (mm)	Activities at site
30/09/2016	<5.6	<5.6	<5.6	3.833	-1.67	-6.18	65.93	0	1.35	48.9	4.13	209.7	0.09	0.295	No mining operations, Care and Maintenance
05/10/2016	8.8	6.7	5.7	1.857	-4.62	-8.16	70.26	0	1.36	59.1	3.94	111.7	0.09	0.252	No mining operations, Care and Maintenance
07/10/2016	<5.6		<5.6	1.909	-4.42	-8.66	67.82	0	1.41	74.1	3.65	126.2	0.09	0.253	No mining operations, Care and Maintenance
10/10/2016	<5.6		13.5	0.07	-5.24	-9.03	75.16	0	1.27	74.9	3.26	102.4	0.07	0.168	No mining operations, Care and Maintenance
27/10/2016		<5.6		-5.793	-8.05	-10.39	89.97	0.3	0.96	39.1	3.35	16.5	0.04	0.048	No mining operations, Care and Maintenance
26/11/2016	<5.6	<5.6	<5.6	-8.12	-13.62	-17.72	89.97	0	0.45	20.1	3.97	23.1	0.00	0.014	No mining operations, Care and Maintenance
27/11/2016	<5.6	6.1	7.6	-6.422	-6.91	-8.06	95.25	0	0.45	39.6	3.59	37.4	0.00	0.017	No mining operations, Care and Maintenance
28/11/2016	<5.6	<5.6	<5.6	-6.707	-8.32	-13.37	94.16	1.3	0.34	119.1	4.63	179.3	0.00	0.013	No mining operations, Care and Maintenance
27/12/2016	<5.6	<5.6	<5.6	-11.02	-11.92	-14.10	91.65	0	0.05	51.0	1.20	63.8	0.00	0.002	No mining operations, Care and Maintenance
29/12/2016	<5.6	<5.6	<5.6	-14.61	-16.92	-19.94	87.48	0	0.12	147.9	1.53	184.4	0.00	0.002	No mining operations, Care and Maintenance
30/12/2016	<5.6	<5.6	<5.6	-14.31	-16.67	-18.52	87.67	0	n/a	n/a	n/a	n/a	0.00	n/a	No mining operations, Care and Maintenance
28/01/2017	<5.6	<5.6	<5.6	-2.812	-4.68	-6.23	77.47	0	1.36	19.2	5.45	23.8	0.01	0.148	No mining operations, Care and Maintenance
29/01/2017	<5.6	<5.6	<5.6	-3.933	-7.42	-12.29	93.13	0	1.41	335.4	5.89	193.2	0.00	0.047	No mining operations, Care and Maintenance
30/01/2017	<5.6	<5.6	<5.6	-12.36	-16.09	-19.73	84.55	0	1.06	96.9	3.83	112.3	0.01	0.044	No mining operations, Care and Maintenance
02/02/2017		<5.6		-20.22	-21.79	-23.16	83.14	0	0.35	7.5	2.25	90.9	0.01	0.013	No mining operations, Care and Maintenance
14/02/2017	<5.6	<5.6		4.767	3.12	0.27	62.56	18.1	3.42	108.6	11.61	138.2	0.02	0.757	No mining operations, Care and Maintenance
18/02/2017	8.8	6.5	<5.6	-9.24	-14.62	-16.86	79.32	0	0.73	53.2	3.41	96.2	0.05	0.057	No mining operations, Care and Maintenance
19/02/2017	<5.6	<5.6	<5.6	-10.69	-15.61	-17.89	78.99	0	0.68	59.2	3.70	108.8	0.05	0.05	No mining operations, Care and Maintenance
20/02/2017			<5.6	-11.48	-15.99	-18.31	80.63	0	0.69	49.4	2.89	98.1	0.06	0.049	No mining operations, Care and Maintenance
23/03/2017		<5.6		-5.982	-12.30	-16.98	74.85	0	1.23	21.8	3.92	350.1	0.12	0.15	No mining operations, Care and Maintenance
25/03/2017	<5.6			-9.14	-13.94	-17.87	73.19	0	2.52	14.7	5.84	336.3	0.11	0.202	No mining operations, Care and Maintenance
27/03/2017	<5.6	<5.6		-1.321	-8.92	-16.19	68.59	0.1	1.43	55.2	7.70	92.0	0.12	0.272	No mining operations, Care and Maintenance
28/03/2017	<5.6	<5.6		2.596	-2.91	-7.28	78.33	0.7	1.72	57.2	6.25	169.5	0.10	0.253	No mining operations, Care and Maintenance
14/04/2017	5.7	<5.6		5.503	-1.28	-8.49	58.58	0	1.52	8.3	7.33	262.9	0.21	0.539	No mining operations, Care and Maintenance
18/04/2017	<5.6	6.5		-1.935	-8.36	-15.36	40.66	0	2.07	39.7	10.23	343.8	0.24	0.562	No mining operations, Care and Maintenance
20/04/2017	<5.6	5.7		-3.151	-8.49	-14.59	42.05	0	2.66	1.5	6.63	321.3	0.25	0.642	No mining operations, Care and Maintenance
25/05/2017	<5.6	<5.6		13.56	8.74	4.31	59.86	0	1.61	31.2	7.19	254.5	0.14	0.753	No mining operations, Care and Maintenance
26/05/2017	<5.6	<5.6		7.391	3.62	0.76	80.44	5.6	2.19	281.0	10.29	249.3	0.17	0.472	No mining operations, Care and Maintenance
30/05/2017	<5.6	11.1		17.42	12.48	8.60	46.99	0	2.40	347.7	8.74	206.5	0.25	1.347	No mining operations, Care and Maintenance
01/06/2017	<5.6	<5.6		12.23	9.09	5.07	60.89	0	2.38	63.3	6.83	94.3	0.16	0.827	No mining operations, Care and Maintenance
08/06/2017	<5.6	6.1		25.34	20.56	14.96	29.44	0.5	2.07	76.2	7.33	85.1	0.30	1.92	No mining operations, Care and Maintenance
09/06/2017	<5.6	<5.6		24.13	19.01	12.95	45.12	0	1.78	11.4	9.34	287.6	0.22	1.354	No mining operations, Care and Maintenance
13/06/2017	<5.6	<5.6		10.14	4.91	-0.90	38.16	0	2.18	42.5	13.32	335.6	0.31	1.057	No mining operations, Care and Maintenance
15/06/2017			<5.6	14.9	10.39	2.94	38.74	0	1.27	70.2	5.50	79.5	0.21	0.856	No mining operations, Care and Maintenance



Sample Date	TSP-1 (µg/m ³)	TSP-2 (µg/m ³)	TSP-3 (µg/m ³)	Maximum Air Temperature (°C)	Mean Air Temperature (°C)	Minimum Air Temperature (°C)	Average Relative Humidity (%)	Total Rain* (mm)	Average Wind Speed (m/s)	Average Wind Direction (°)	Maximum Wind Speed (m/s)	Direction of Maximum Wind Speed (°)	Average Solar Radiation (W/m ²)	Total Evapo-transpiration (mm)	Activities at site
16/06/2017			<5.6	16.56	11.43	4.81	50.45	0	1.59	15.8	8.91	311.5	0.18	0.923	No mining operations, Care and Maintenance
20/06/2017			9.9	20.64	14.23	8.78	51.80	0	1.68	321.7	9.28	206.9	0.22	1.055	No mining operations, Care and Maintenance
04/07/2017		8.5		20.37	15.89	9.55	42.58	0	2.00	16.7	7.96	338.3	0.26	1.523	No mining operations, Care and Maintenance
05/07/2017		7.6		24.54	17.32	8.12	39.77	0.8	1.52	31.5	5.25	331.7	0.33	1.234	No mining operations, Care and Maintenance
07/07/2017		10.6		27.18	20.31	11.61	38.51	0.1	1.62	53.7	6.76	178.4	0.30	1.359	No mining operations, Care and Maintenance
18/07/2017	8.5		9.7	20.81	13.10	8.32	82.36	1.9	1.37	46.2	13.65	349.3	0.18	0.389	No mining operations, Care and Maintenance
20/07/2017			6	20.7	15.78	9.53	63.30	0.2	1.79	11.1	9.43	284.1	0.22	0.852	No mining operations, Care and Maintenance
21/07/2017			<5.6	17.26	13.20	10.80	79.06	1	1.43	29.5	10.42	253.4	0.15	0.39	No mining operations, Care and Maintenance
25/07/2017	12.5			20.81	16.42	11.24	60.04	0	1.71	35.7	8.58	335.3	0.23	0.937	No mining operations, Care and Maintenance
27/07/2017	<5.6			14.94	11.75	8.44	77.83	0	1.71	47.7	5.46	96.9	0.10	0.462	No mining operations, Care and Maintenance
02/08/2017	8.8		6.1	21.73	15.44	9.30	60.75	0	1.80	354.7	7.21	193.4	0.18	0.966	No mining operations, Care and Maintenance
04/08/2017	<5.6		<5.6	19.12	15.31	10.51	60.32	0	1.72	1.9	6.17	203.7	0.14	0.889	No mining operations, Care and Maintenance
06/08/2017	11.7		6.1	24.03	16.57	9.37	49.23	0	1.48	25.7	6.35	222.8	0.21	0.935	No mining operations, Care and Maintenance
09/08/2017		41.1		28.31	19.30	11.34	45.48	0	1.75	39.7	5.73	219.6	0.25	1.224	No mining operations, Care and Maintenance
11/08/2017		17.8		22.04	16.94	12.90	50.64	0	1.76	99.7	8.07	163.6	0.15	1.18	No mining operations, Care and Maintenance
15/08/2017		<5.6		12.01	7.92	4.54	81.39	0.3	1.27	341.0	5.75	199.9	0.10	0.288	No mining operations, Care and Maintenance
20/09/2017	7.6	7.2	7.1	10.76	7.23	4.57	75.59	0	0.88	23.8	4.29	345.6	0.07	0.235	No mining operations, Care and Maintenance
26/09/2017		<5.6	<5.6	6.973	3.16	-0.17	81.17	0.1	1.37	46.7	4.24	12.2	0.08	0.204	No mining operations, Care and Maintenance
27/09/2017	7.1			9.4	4.85	2.43	85.17	1.4	1.72	55.6	9.86	143.6	0.02	0.159	No mining operations, Care and Maintenance
29/09/2017	6.7	<5.6	<5.6	8.55	3.54	-0.46	84.70	0.4	1.14	71.0	3.71	352.7	0.11	0.181	No mining operations, Care and Maintenance
03/10/2017	<5.6	<5.6	<5.6	6.991	4.19	1.17	66.06	0	0.90	63.5	3.47	6.4	0.05	0.282	No mining operations, Care and Maintenance
05/10/2017	<5.6	<5.6	<5.6	9	4.97	2.37	80.66	4.7	1.56	112.6	6.03	154.4	0.06	0.288	No mining operations, Care and Maintenance
06/10/2017	<5.6	<5.6	<5.6	6.152	3.33	-0.21	86.92	0.3	1.19	353.3	6.01	347.3	0.05	0.156	No mining operations, Care and Maintenance
02/11/2017	<5.6			-10.4	-11.79	-14.32	90.97	0	n/a	n/a	n/a	n/a	0.00	n/a	No mining operations, Care and Maintenance
16/11/2017	<5.6			-19.45	-20.55	-21.31	83.80	0	0.22	26.7	2.28	120.7	0.00	0.008	No mining operations, Care and Maintenance
17/11/2017	<5.6			-19.7	-21.00	-23.24	83.29	0	0.30	29.3	2.08	36.9	0.00	0.011	No mining operations, Care and Maintenance
30/11/2017		<5.6	<5.6	-9.73	-11.89	-13.80	91.40	0	n/a	n/a	n/a	n/a	0.00	n/a	No mining operations, Care and Maintenance
05/12/2017		<5.6	<5.6	-5.088	-6.78	-8.39	94.24	0.8	n/a	n/a	n/a	n/a	0.00	n/a	No mining operations, Care and Maintenance
07/12/2017		<5.6	<5.6	3.777	0.39	-1.82	90.97	3.7	1.94	113.9	11.65	142.3	0.00	0.144	No mining operations, Care and Maintenance
12/12/2017		<5.6	<5.6	-3.688	-6.40	-8.45	86.70	0	1.15	100.2	4.75	168.2	0.00	0.082	No mining operations, Care and Maintenance
13/12/2017	<5.6			-5.324	-8.94	-12.34	94.10	0.4	0.89	43.8	4.35	43.4	0.00	0.025	No mining operations, Care and Maintenance
15/12/2017	<5.6			-0.017	-2.54	-6.63	98.31	2.7	0.65	n/a	2.40	166.2	0.00	0	No mining operations, Care and Maintenance
19/12/2017	<5.6			-10.78	-13.18	-15.23	90.91	0	n/a	n/a	n/a	n/a	0.00	n/a	No mining operations, Care and Maintenance

* Starting October 15, 2013, total precipitation is reported rather than total rain



Table A-2 24-Hour Average PM₁₀ and PM_{2.5} Results, August 2015 – December 2017

Sample Date	TSP-1		TSP-2		TSP-3		Sample Date	TSP-1		TSP-2		TSP-3		Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
17/08/2015		<5.6		<5.6		<5.6	18/03/2016	<5.6		<5.6		<5.6		15/08/2016	<5.6		<5.6		<5.6	
18/08/2015		6.5		<5.6		<5.6	19/03/2016	<5.6		<5.6		<5.6		30/08/2016		<5.6		<5.6		9
20/08/2015		6.5		<5.6		<5.6	21/03/2016		<5.6		<5.6		<5.6	31/08/2016		<5.6		<5.6		<5.6
22/08/2015	<5.6		8.6		<5.6		23/03/2016		<5.6		<5.6		<5.6	12/09/2016		<5.6		<5.6		<5.6
23/08/2015	7.8		8.6		<5.6		28/03/2016		<5.6		<5.6		<5.6	14/09/2016		<5.6		<5.6		<5.6
24/08/2015	14.6		8.5		5.8		15/04/2016		<5.6		<5.6		<5.6	21/09/2016		<5.6		<5.6		<5.6
05/09/2015	<5.6		<5.6		<5.6		16/04/2016		<5.6		<5.6		<5.6	23/09/2016	<5.6				<5.6	
06/09/2015	<5.6		<5.6		<5.6		18/04/2016		<5.6		<5.6		<5.6	24/09/2016	<5.6		<5.6		<5.6	
09/09/2015	<5.6		<5.6		<5.6		25/04/2016	<5.6		<5.6		<5.6		25/09/2016	<5.6		<5.6		<5.6	
11/09/2015		<5.6		<5.6		<5.6	26/04/2016	<5.6		<5.6		<5.6		03/10/2016					<5.6	
12/09/2015				<5.6		<5.6	29/04/2016	<5.6		<5.6		8.2		23/10/2016		<5.6				<5.6
14/09/2015				<5.6		<5.6	15/05/2016	<5.6		<5.6		<5.6		27/10/2016		<5.6				<5.6
20/11/2015		<5.6		<5.6			16/05/2016	<5.6		<5.6		<5.6		28/10/2016		<5.6		<5.6		<5.6
21/11/2015		<5.6		<5.6			18/05/2016	<5.6		<5.6		<5.6		29/10/2016	<5.6			<5.6	<5.6	
24/11/2015		<5.6	<5.6				19/05/2016		<5.6		<5.6		<5.6	30/10/2016	<5.6		<5.6			
25/11/2015	<5.6				<5.6		21/05/2016		<5.6		<5.6		<5.6	31/10/2016	<5.6		<5.6		<5.6	
09/01/2016		<5.6				<5.6	22/05/2016		<5.6		<5.6		<5.6	04/11/2016	<5.6		<5.6		<5.6	
10/01/2016		<5.6				6.3	20/06/2016	<5.6		<5.6		<5.6		05/11/2016	<5.6		<5.6		<5.6	
16/01/2016		<5.6				<5.6	22/06/2016	<5.6		<5.6		<5.6		25/11/2016	<5.6		<5.6		<5.6	
17/01/2016	<5.6				<5.6		26/06/2016	<5.6		<5.6		<5.6		30/11/2016		6		<5.6		<5.6
18/01/2016	<5.6				<5.6		27/06/2016		5.6		7.4		<5.6	01/12/2016		<5.6		<5.6		<5.6
19/01/2016	<5.6				<5.6		29/06/2016		13.8		20.8		13.6	02/12/2016		<5.6		<5.6		<5.6
13/02/2016	<5.6				6.4		15/07/2016		17.4		8.9		12.1	18/12/2016		<5.6		<5.6		10
14/02/2016	<5.6				<5.6		17/07/2016		10.1		23.1		12.2	20/12/2016		8.3		<5.6		6.3
15/02/2016	<5.6				<5.6		18/07/2016		<5.6		<5.6		<5.6	21/12/2016		<5.6		<5.6		<5.6
22/02/2016		<5.6				<5.6	25/07/2016	<5.6		<5.6		<5.6		31/12/2016	<5.6		<5.6		<5.6	
23/02/2016		<5.6				<5.6	26/07/2016	<5.6		<5.6		<5.6		01/01/2017	<5.6		<5.6		<5.6	
25/02/2016		<5.6				<5.6	27/07/2016	<5.6		<5.6		<5.6		02/01/2017	<5.6		<5.6		<5.6	
12/03/2016							13/08/2016	<5.6		<5.6		<5.6		15/01/2017	11		8.9		11.4	
17/03/2016	<5.6		<5.6		<5.6		14/08/2016	<5.6		<5.6		<5.6		19/01/2017	6.1		8.1		11	



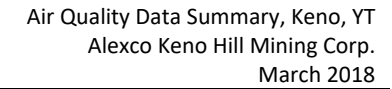
Table A-2 24-Hour Average PM₁₀ and PM_{2.5} Results, August 2015 – December 2017 (continued)

Sample Date	TSP-1		TSP-2		TSP-3		Sample Date	TSP-1		TSP-2		TSP-3		Sample Date	TSP-1		TSP-2		TSP-3	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
23/01/2017	5.8		7.6		11.8		07/06/2017		<5.6		<5.6			08/09/2017	9.2			8.9	6.9	
25/01/2017		6.4		<5.6		5.7	09/06/2017						<5.6	15/09/2017					<5.6	
26/01/2017		<5.6		6.2		6.2	13/06/2017						<5.6	16/09/2017	7.8			<5.6		
27/01/2017		8.2		6.4		7.2	14/06/2017	<5.6		16.2			<5.6	19/09/2017	9.2			8.3	5.8	
20/02/2017	<5.6						15/06/2017	6.2		<5.6				10/10/2017	<5.6		<5.6		<5.6	
22/02/2017	<5.6		<5.6		<5.6		16/06/2017	14.2		5.7				12/10/2017	<5.6		<5.6		<5.6	
23/02/2017	<5.6		<5.6		<5.6		23/06/2017					7.9		13/10/2017	<5.6		<5.6		<5.6	
24/02/2017		<5.6		<5.6	<5.6		27/06/2017					6.2		18/10/2017				<5.6		<5.6
25/02/2017		<5.6		<5.6		<5.6	28/06/2017					<5.6		19/10/2017		<5.6				
26/02/2017		<5.6		<5.6		<5.6	04/07/2017	<5.6				6		24/10/2017		<5.6		<5.6		<5.6
17/03/2017		6.2		<5.6			05/07/2017	6.1				5.6		26/10/2017				<5.6		<5.6
18/03/2017		<5.6		<5.6			07/07/2017	<5.6				<5.6		02/11/2017				<5.6	7.2	
19/03/2017		<5.6		<5.6			11/07/2017		<5.6	<5.6			<5.6	14/11/2017				<5.6	<5.6	
21/03/2017	<5.6		<5.6				12/07/2017		<5.6	7.5			7.9	16/11/2017				<5.6	<5.6	
22/03/2017	<5.6		<5.6				14/07/2017		7.9	9.2			65	17/11/2017		<5.6				<5.6
23/03/2017	<5.6		<5.6				18/07/2017				<5.6			23/11/2017		5.6	<5.6			
21/04/2017	<5.6		<5.6				25/07/2017				12.1			24/11/2017						8.3
23/04/2017	<5.6		<5.6				27/07/2017				<5.6			28/11/2017		7.5	<5.6			7.1
24/04/2017	<5.6		<5.6				02/08/2017				8.1			30/11/2017		<5.6				
25/04/2017		<5.6		6.4			04/08/2017				<5.6			05/12/2017		<5.6				
28/04/2017		6		<5.6			06/08/2017				13.8			07/12/2017		6.5				
29/04/2017		<5.6		<5.6			09/08/2017	13.9				11.1		13/12/2017				<5.6		<5.6
12/05/2017		<5.6		<5.6			11/08/2017	15.1				9.6		15/12/2017				10.4		7.1
17/05/2017		<5.6		6			15/08/2017	6.7				<5.6		19/12/2017	<5.6			<5.6		6.5
18/05/2017		<5.6		<5.6			16/08/2017		<5.6	<5.6			<5.6	20/12/2017	<5.6				<5.6	
19/05/2017	<5.6		9.6				22/08/2017		<5.6	8.7			<5.6	21/12/2017			<5.6			
23/05/2017	<5.6		<5.6				23/08/2017		<5.6	6.7			<5.6	24/12/2017			<5.6		8.9	
24/05/2017	<5.6		<5.6				01/09/2017		<5.6	<5.6			8.5	26/12/2017			<5.6			
02/06/2017		<5.6		<5.6			05/09/2017		5.7	<5.6			8.3	28/12/2017					6.5	
06/06/2017		<5.6		<5.6			06/09/2017		<5.6	12.5			8.7							

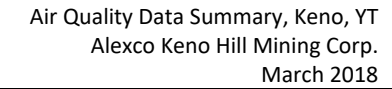


Table A-3 24-Hour Average Metal Concentrations, TSP-1, August 2012 – December 2017

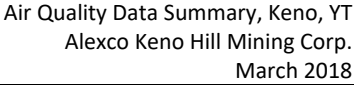
Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³ *	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³ *	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
Ontario AAQC (24-hr avg)		25	0.3	10	0.01	120	0.025		0.5	0.1	50	4	0.5		0.4	120	2			10		1		120		10	120	2	120	
23/08/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.486	<0.042	<0.069	<0.069	0.554	0.174	0.061	0.045	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.708	<0.111	<0.028	<0.042	0.118	<0.069
27/09/12	0.667	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	1.722	<0.042	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
23/10/12	0.653	<0.278	<0.111	0.022	<0.011	<0.042	<0.028	1.153	<0.042	<0.069	<0.069	2.528	1.083	0.308	0.301	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.569	<0.111	<0.028	<0.042	0.558	<0.069
15/12/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.194	0.139	<0.042	0.053	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.094	<0.069
14/01/13	0.403	<0.278	<0.111	0.010	<0.011	<0.042	<0.028	2.069	<0.042	<0.069	<0.069	0.815	<0.111	0.217	0.026	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	0.875	0.007	0.556	0.174	<0.028	<0.042	0.196	<0.069
16/01/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.444	<0.042	<0.069	<0.069	0.126	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
23/03/13	0.292	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	1.347	<0.042	<0.069	<0.069	0.318	<0.111	0.072	0.034	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.347	<0.111	<0.028	<0.042	0.043	<0.069
24/03/13	<0.278	<0.278	<0.111	0.019	<0.011	<0.042	<0.028	0.597	<0.042	<0.069	<0.069	0.293	<0.111	0.094	0.066	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.067	<0.069
25/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.057	<0.069	<0.069	0.181	<0.111	0.058	0.021	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
26/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.168	<0.111	0.057	0.019	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.050	<0.069
10/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.043	<0.069	<0.069	0.272	<0.111	0.082	0.017	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.292	<0.111	<0.028	<0.042	0.035	<0.069
13/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.306	0.053	<0.069	<0.069	0.465	<0.111	0.106	0.022	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.375	<0.111	<0.028	<0.042	0.038	<0.069
15/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.047	<0.069	<0.069	0.169	<0.111	0.061	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.333	<0.111	<0.028	<0.042	<0.028	<0.069
16/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.107	<0.111	0.046	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/05/13	5.292	<0.278	<0.111	0.009	<0.011	0.264	<0.028	8.722	0.049	<0.069	<0.069	0.313	<0.111	0.222	0.013	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	0.583	0.017	0.306	<0.111	<0.028	<0.042	0.079	<0.069
16/06/13	5.236	<0.278	<0.111	0.012	<0.011	0.264	<0.028	8.597	0.076	<0.069	<0.069	0.879	0.224	0.211	0.083	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	0.722	0.016	0.292	<0.111	<0.028	<0.042	0.164	<0.069
18/06/13	0.861	<0.278	<0.111	0.019	<0.011	<0.042	<0.028	1.417	0.075	<0.069	<0.069	2.153	0.794	0.318	0.218	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	0.569	0.005	0.681	<0.111	0.042	<0.042	0.382	<0.069
21/06/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.319	0.068	<0.069	<0.069	0.372	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	0.431	<0.004	<0.278	<0.111	<0.028	<0.042	0.058	<0.069
24/06/13	<0.278	<0.278	<0.111	0.018	<0.011	<0.042	<0.028	<0.278	0.103	<0.069	<0.069	0.450	<0.111	<0.042	0.018	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	0.444	<0.004	<0.278	<0.111	<0.028	<0.042	0.032	<0.069
19/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.128	<0.069	<0.069	0.419	<0.111	<0.042	0.017	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.032	<0.069
20/07/13	<0.278	<0.278	<0.111	0.005	<0.011	<0.042	<0.028	0.444	0.100	<0.069	<0.069	1.367	<0.111	0.096	0.175	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.096	<0.069
21/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.106	<0.069	<0.069	0.322	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
22/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.119	<0.069	<0.069	0.493	<0.111	<0.042	0.032	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.051	<0.069
22/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.078	<0.069	<0.069	0.383	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.029	<0.069
23/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.053	<0.069	<0.069	0.194	<0.111	0.054	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
24/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.088	<0.069	<0.069	0.388	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
25/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.046	<0.069	<0.069	0.208	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
24/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.096	<0.069	<0.069	0.319	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.086	<0.069	<0.069	0.435	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.083	<0.069	<0.069	0.351	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.088	<0.069	<0.069	0.672	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
25/10/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.096	<0.069	<0.069	0.360	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
26/10/1																														



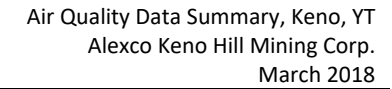
AIR QUALITY DATA SUMMARY MEMO MARCH 2018



AIR QUALITY DATA SUMMARY MEMO MARCH 2018



AIR QUALITY DATA SUMMARY MEMO MARCH 2018



AIR QUALITY DATA SUMMARY MEMO MARCH 2018



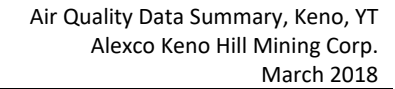
Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³ *	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³ *	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
08/06/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.085	<0.069	<0.069	0.101	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
09/06/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.110	<0.069	<0.069	0.111	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
13/06/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.100	<0.069	<0.069	0.131	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
18/07/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.101	<0.069	<0.069	0.069	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
25/07/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.100	<0.069	<0.069	0.222	<0.111	0.043	0.027	<0.069	<0.069	<0.417	<1.389	<0.069	0.486	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/07/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.146	<0.069	<0.069	0.071	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	0.431	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
02/08/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.118	<0.069	<0.069	0.164	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
04/08/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.089	<0.069	<0.069	0.064	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
06/08/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.103	<0.069	<0.069	0.232	<0.111	<0.042	0.024	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
20/09/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.514	0.113	<0.069	<0.069	0.057	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/09/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.417	0.087	<0.069	<0.069	0.078	<0.111	0.049	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/09/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.417	0.094	<0.069	<0.069	<0.111	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
03/10/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.093	<0.069	<0.069	0.188	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.071	<0.069
05/10/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.089	<0.069	<0.069	0.078	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
06/10/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.103	<0.069	<0.069	0.151	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
02/11/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.082	<0.069	<0.069	0.047	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
16/11/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.075	<0.069	<0.069	0.049	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
17/11/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.082	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
13/12/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.111	<0.069	<0.069	0.047	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
15/12/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.444	0.064	<0.069	<0.069	0.054	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	0.764	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
19/12/17	<0.278	<0.278	<0.111	0.010	<0.011	<0.042	<0.028	0.528	0.110	<0.069	<0.069	0.081	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	0.903	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/01/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.075	<0.069	<0.069	0.133	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069

* Criteria effective on July 1, 2016

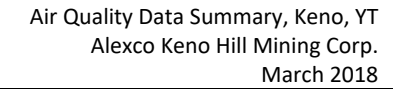


Table A-4 24-Hour Average Metal Concentrations, TSP-2, August 2012 – December 2017

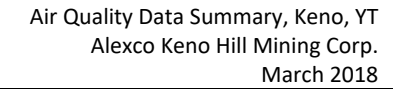
Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³ *	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³ *	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
Ontario AAQC (24-hr avg)		25	0.3	10	0.01	120	0.025		0.5	0.1	50	4	0.5		0.4	120	0.2			10		1		120		10	120	2	120	
23/08/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.439	0.736	0.047	0.033	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.736	<0.111	<0.028	<0.042	0.108	<0.069
27/09/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.375	<0.042	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
15/12/12	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.533	0.181	0.076	0.066	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.122	<0.069
16/01/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	0.143	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
23/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.375	<0.042	<0.069	<0.069	1.431	0.321	0.089	0.407	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.389	<0.111	<0.028	<0.042	0.244	<0.069
24/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.486	<0.042	<0.069	<0.069	1.174	0.361	0.124	0.651	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.389	<0.111	<0.028	<0.042	0.278	<0.069
25/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.417	0.056	<0.069	<0.069	1.163	0.367	0.108	0.390	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.403	<0.111	<0.028	<0.042	0.264	<0.069
26/03/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.375	0.046	<0.069	<0.069	0.921	0.153	0.117	0.290	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.319	<0.111	<0.028	<0.042	0.142	<0.069
07/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.486	<0.042	<0.069	<0.069	1.161	0.417	0.119	0.471	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.333	<0.111	<0.028	<0.042	0.294	<0.069
10/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.043	<0.069	<0.069	0.439	<0.111	0.081	0.049	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.069	<0.069
13/04/13	0.306	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.044	<0.069	<0.069	0.199	<0.111	0.081	0.017	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.375	<0.111	<0.028	<0.042	<0.028	<0.069
15/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.047	<0.069	<0.069	0.268	<0.111	0.079	0.025	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.333	<0.111	<0.028	<0.042	<0.028	<0.069
16/04/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.043	<0.069	<0.069	0.165	<0.111	0.065	0.013	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.319	<0.111	<0.028	<0.042	<0.028	<0.069
17/06/13	0.361	<0.278	<0.111	0.009	<0.011	<0.042	<0.028	0.708	<0.042	<0.069	<0.069	0.232	<0.111	0.053	0.016	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
18/06/13	1.583	<0.278	<0.111	0.005	<0.011	0.071	<0.028	2.569	0.122	<0.069	<0.069	0.825	0.133	0.094	0.078	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	0.542	0.005	<0.278	<0.111	<0.028	<0.042	0.096	<0.069
21/06/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.089	<0.069	<0.069	0.432	<0.111	<0.042	0.014	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	0.472	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
23/06/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.361	0.054	<0.069	<0.069	0.282	<0.111	0.072	0.017	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.031	<0.069
28/06/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.500	0.054	<0.069	<0.069	0.414	<0.111	0.082	0.046	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	0.319	<0.111	<0.028	<0.042	0.071	<0.069
19/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.117	<0.069	<0.069	0.526	<0.111	<0.042	0.027	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
20/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.065	<0.069	<0.069	0.381	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
21/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.096	<0.069	<0.069	0.500	<0.111	<0.042	0.052	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.029	<0.069
22/07/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.292	0.094	<0.069	<0.069	1.122	<0.111	0.071	0.134	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.092	<0.069
22/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.094	<0.069	<0.069	0.314	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
25/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.050	<0.069	<0.069	0.185	<0.111	0.047	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
26/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.074	<0.069	<0.069	0.496	<0.111	<0.042	0.012	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.046	<0.069
28/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.071	<0.069	<0.069	0.496	<0.111	<0.042	0.046	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.122	<0.069
31/08/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.057	<0.069	<0.069	0.200	<0.111	0.047	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
21/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.097	<0.069	<0.069	0.347	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
24/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.114	<0.069	<0.069	0.424	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.126	<0.069	<0.069	0.479	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	0.036	<0.278	0.086	<0.069	<0.069	0.338	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.047	<0.069
30/09/13	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.069	<0.069	<0.069	0.450	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	



AIR QUALITY DATA SUMMARY MEMO MARCH 2018



AIR QUALITY DATA SUMMARY MEMO MARCH 2018

AIR QUALITY DATA SUMMARY MEMO MARCH 2018



Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³ *	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³ *	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
09/08/16	0.031	<0.001	<0.001	0.001	<0.001	<0.042	0.000	0.500	0.131	<0.001	0.002	<0.042	0.002	<0.042	0.004	0.000	0.001	<0.111	<0.069	<0.001	<0.278	0.000	<0.139	0.003	-	<0.001	<0.028	<0.028	<0.006	<0.006
10/08/16	0.014	<0.001	<0.001	0.001	<0.001	<0.042	0.000	0.444	0.122	<0.001	0.001	<0.042	0.001	<0.042	0.001	0.000	0.001	<0.111	<0.069	<0.001	<0.278	0.000	<0.139	0.002	-	<0.001	<0.028	<0.028	<0.006	<0.006
11/08/16	0.032	<0.001	0.001	0.001	<0.001	<0.042	0.000	0.528	0.117	<0.001	0.002	0.078	0.003	<0.042	0.002	0.000	0.001	<0.111	<0.069	<0.001	<0.278	0.000	<0.139	0.009	-	<0.001	<0.028	<0.028	<0.006	<0.006
28/09/16	<0.278	<0.278	<0.111	0.006	<0.011	<0.042	<0.028	<0.278	0.099	<0.069	<0.069	0.108	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.007	<0.278	<0.111	<0.028	<0.042	0.029	<0.069
29/09/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.093	<0.069	<0.069	0.114	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
30/09/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.333	0.099	<0.069	<0.069	0.097	<0.111	0.051	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
05/10/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.099	<0.069	<0.069	0.386	<0.111	0.065	0.058	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.040	<0.069
27/10/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.114	<0.069	<0.069	0.044	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
26/11/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.486	0.128	<0.069	<0.069	0.061	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/11/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.278	0.090	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/11/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.072	<0.069	<0.069	0.050	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/12/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.093	<0.069	<0.069	0.047	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/12/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.108	<0.069	<0.069	0.062	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.006	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
30/12/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.096	<0.069	<0.069	0.082	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/01/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.086	<0.069	<0.069	0.044	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/01/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.069	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.011	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
30/01/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.119	<0.069	<0.069	0.185	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.007	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
02/02/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.092	<0.069	<0.069	0.060	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	1.125	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
14/02/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.090	<0.069	<0.069	0.124	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
18/02/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.082	<0.069	<0.069	0.072	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.011	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
19/02/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.079	<0.069	<0.069	0.068	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
23/03/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.103	<0.069	<0.069	0.185	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/03/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.069	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/03/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.292	0.092	<0.069	<0.069	0.260	<0.111	<0.042	0.025	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.024	<0.278	<0.111	<0.028	<0.042	0.149	<0.069
14/04/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.611	0.101	<0.069	<0.069	0.089	<0.111	0.046	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.008	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
18/04/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.375	0.125	<0.069	<0.069	0.458	<0.111	0.086	0.030	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.009	0.333	<0.111	<0.028	<0.042	0.042	<0.069
20/04/17	<0.278	<0.278	<0.111	0.004	<0.011	<0.042	<0.028	0.347	0.111	<0.069	<0.069	0.349	<0.111	0.081	0.029	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	0.417	0.010	<0.278	<0.111	<0.028	<0.042	0.032	<0.069
25/05/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.458	0.074	<0.069	<0.069	0.107	<0.111	0.064	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	0.431	0.007	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
26/05/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.121	<0.069	<0.069	0.071	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
30/05/17	<0.278	<0.278	<0.111	0.004	<0.011	<0.042	<0.028	0.403	0.086	<0.069	<0.069	0.643	<0.111	0.129	0.078	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.011	<0.278	<0.111	<0.028	<0.042	0.060	<0.069
01/06/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.097	<0.069	<0.069	0.124	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
08/06/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.099	<0.069	<0.069	0.133	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.036	<0.069
09/06/17	<0.278	<0.278	<0.1																											



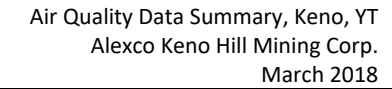
Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³ *	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³ *	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
07/07/17	<0.278	<0.278	<0.111	0.004	<0.011	<0.042	<0.028	0.431	0.082	<0.069	<0.069	0.608	<0.111	0.144	0.088	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.054	<0.069
09/08/17	0.653	<0.278	<0.111	0.020	<0.011	<0.042	<0.028	1.278	0.076	<0.069	<0.069	2.778	0.369	0.468	0.404	<0.069	<0.069	<0.417	<1.389	<0.069	1.097	<0.042	<0.417	0.005	0.569	<0.111	0.032	<0.042	0.276	<0.069
11/08/17	<0.278	<0.278	<0.111	0.009	<0.011	<0.042	<0.028	0.514	0.060	<0.069	<0.069	1.046	0.162	0.167	0.164	<0.069	<0.069	<0.417	<1.389	<0.069	0.556	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.115	<0.069
15/08/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.100	<0.069	<0.069	0.150	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
20/09/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.472	0.101	<0.069	<0.069	0.050	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
26/09/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.444	0.106	<0.069	<0.069	0.054	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/09/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.444	0.146	<0.069	<0.069	0.086	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
03/10/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.115	<0.069	<0.069	0.082	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
05/10/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.417	0.118	<0.069	<0.069	0.076	<0.111	0.175	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
06/10/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.117	<0.069	<0.069	0.092	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
30/11/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.089	<0.069	<0.069	0.058	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
05/12/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.444	0.099	<0.069	<0.069	0.074	<0.111	0.043	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
07/12/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.528	0.085	<0.069	<0.069	0.068	<0.111	0.043	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	0.431	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
12/12/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.486	0.062	<0.069	<0.069	0.062	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.060	<0.069

* Criteria effective on July 1, 2016



Table A-5 24-Hour Average Metal Concentrations, TSP-3, December 2014 – December 2017

Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³ *	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³ *	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
Ontario AAQC (24-hr avg)		25	0.3	10	0.01	120	0.025		0.5	0.1	50	4	0.5		0.4	120	0.2			10		1		120		10	120	2	120	
12/12/14	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.306	0.096	<0.069	<0.069	0.367	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	0.694	<0.069	1.472	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
13/12/14	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.319	0.097	<0.069	<0.069	0.315	<0.111	<0.042	0.021	<0.069	<0.069	<0.417	0.694	<0.069	1.097	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
14/12/14	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.103	<0.069	<0.069	0.272	<0.111	<0.042	0.014	<0.069	<0.069	<0.417	<1.389	<0.069	0.611	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
15/12/14	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.099	<0.069	<0.069	0.339	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	1.569	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
12/01/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.081	<0.069	<0.069	0.351	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
15/01/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.053	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
16/01/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.076	<0.069	<0.069	0.065	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	0.569	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
18/01/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.061	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
12/02/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.06	<0.069	<0.069	0.043	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
15/02/15	<0.278	<0.278	<0.111	<0.004	<0.011	0.064	<0.028	0.431	0.09	<0.069	<0.069	0.325	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	0.542	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
16/02/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.306	0.068	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
18/02/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.292	0.131	<0.069	<0.069	0.046	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	0.972	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
06/03/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.057	<0.069	<0.069	0.054	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
07/03/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.057	<0.069	<0.069	0.147	<0.111	0.05	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
16/03/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.054	<0.069	<0.069	0.054	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	0.472	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
17/03/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.056	<0.069	<0.069	0.062	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	0.833	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
02/04/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.097	<0.069	<0.069	0.317	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
03/04/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.101	<0.069	<0.069	0.289	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
04/04/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.094	<0.069	<0.069	0.332	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
05/04/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.118	<0.069	<0.069	0.433	<0.111	<0.042	0.024	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
21/05/15	2.583	<0.278	<0.111	<0.042	<0.011	0.218	<0.028	6.417	<0.042	<0.069	<0.069	0.247	<0.111	0.51	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.151	<0.278	<0.111	<0.028	<0.042	0.051	<0.069
22/05/15	2.097	<0.278	<0.111	0.018	<0.011	0.165	<0.028	5.083	<0.042	<0.069	<0.069	0.238	<0.111	0.421	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.12	<0.278	<0.111	<0.028	<0.042	0.04	<0.069
23/05/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.05	<0.069	<0.069	0.274	<0.111	0.071	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	0.306	<0.111	<0.028	<0.042	<0.028	<0.069
24/05/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.417	0.05	<0.069	<0.069	0.332	<0.111	0.106	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	0.431	<0.111	<0.028	<0.042	<0.028	<0.069
16/06/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.047	<0.069	<0.069	0.214	<0.111	0.075	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
17/06/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.333	0.049	<0.069	<0.069	0.228	<0.111	0.082	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	0.333	<0.111	<0.028	<0.042	<0.028	<0.069
18/06/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.306	0.057	<0.069	<0.069	0.157	<0.111	0.049	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
01/07/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.06	<0.069	<0.069	0.128	<0.111	0.057	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	0.306	<0.111	<0.028	<0.042	<0.028	<0.069
08/07/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.053	<0.069	<0.069	0.082	<0.111	0.05	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
11/07/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	<0.042	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	-	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
20/07/15	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.042	<0.069	<0.069	0.254	<0.111	0.071	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
14/08/15	<0.278	<0.278	<0.111	<0.00																										



AIR QUALITY DATA SUMMARY MEMO MARCH 2018



Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³ *	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³ *	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
28/09/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.078	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/09/16	1.833	<0.278	<0.111	0.015	<0.011	0.124	<0.028	4.333	0.086	<0.069	<0.069	0.071	<0.111	0.353	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.116	<0.278	<0.111	<0.028	<0.042	0.039	<0.069
30/09/16	2.778	<0.278	<0.111	0.024	<0.011	0.189	<0.028	6.181	0.096	<0.069	<0.069	0.249	<0.111	0.553	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.175	<0.278	<0.111	<0.028	<0.042	0.054	<0.069
05/10/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.111	<0.069	<0.069	0.272	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	0.040	<0.069
07/10/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.108	<0.069	<0.069	0.167	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.007	<0.278	<0.111	<0.028	<0.042	0.031	<0.069
10/10/16	<0.278	<0.278	<0.111	0.006	<0.011	<0.042	<0.028	0.319	0.107	<0.069	<0.069	0.514	<0.111	0.115	0.026	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	0.144	<0.069
26/11/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.117	<0.069	<0.069	0.044	<0.111	<0.042	0.024	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
27/11/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.087	<0.069	<0.069	0.051	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.006	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/11/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.078	<0.069	<0.069	0.104	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.010	<0.278	<0.111	<0.028	<0.042	0.050	<0.069
27/12/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.093	<0.069	<0.069	0.071	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/12/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.111	<0.069	<0.069	0.068	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
30/12/16	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.118	<0.069	<0.069	0.089	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
28/01/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.086	<0.069	<0.069	0.072	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/01/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.076	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.011	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
30/01/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.089	<0.069	<0.069	<0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
18/02/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.078	<0.069	<0.069	0.085	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.005	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
19/02/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.075	<0.069	<0.069	0.153	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.008	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
20/02/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.097	<0.069	<0.069	0.129	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	0.008	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
15/06/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.089	<0.069	<0.069	0.075	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
16/06/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.085	<0.069	<0.069	0.082	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
20/06/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.132	<0.069	<0.069	0.247	<0.111	0.047	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
18/07/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.082	<0.069	<0.069	0.068	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	0.431	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
20/07/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.090	<0.069	<0.069	0.068	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
21/07/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.092	<0.069	<0.069	0.057	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	0.458	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
02/08/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.071	<0.069	<0.069	<0.278	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
04/08/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.158	<0.069	<0.069	0.192	<0.111	<0.042	0.012	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
06/08/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.117	<0.069	<0.069	0.232	<0.111	0.046	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
20/09/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.444	0.107	<0.069	<0.069	0.069	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
26/09/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.361	0.076	<0.069	<0.069	0.042	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
29/09/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.472	0.146	<0.069	<0.069	0.074	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
03/10/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.143	<0.069	<0.069	0.125	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069
05/10/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	<0.278	0.131	<0.069	<0.069	0.072	<0.111	<0.042	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	<0.417	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069



Sample Date	Aluminum (Al), total µg/m³	Antimony (Sb), total µg/m³	Arsenic (As), total µg/m³	Barium (Ba), total µg/m³	Beryllium (Be), total µg/m³	Boron (B), total µg/m³	Cadmium (Cd), total µg/m³	Calcium (Ca), total µg/m³	Chromium (Cr), total µg/m³ *	Cobalt (Co), total µg/m³	Copper (Cu), total µg/m³	Iron (Fe), total µg/m³	Lead (Pb), total µg/m³	Magnesium (Mg), total µg/m³	Manganese (Mn), total µg/m³ *	Molybdenum (Mo), total µg/m³	Nickel (Ni), total µg/m³	Phosphorus (P), total µg/m³	Potassium (K), total µg/m³	Selenium (Se), total µg/m³	Silicon (Si), total µg/m³	Silver (Ag), total µg/m³	Sodium (Na), total µg/m³	Strontium (Sr), total µg/m³	Sulphur (S), total µg/m³	Tin (Sn), total µg/m³	Titanium (Ti), total µg/m³	Vanadium (V), total µg/m³	Zinc (Zn), total µg/m³	Zirconium (Zr), total µg/m³
12/12/17	<0.278	<0.278	<0.111	<0.004	<0.011	<0.042	<0.028	0.472	0.097	<0.069	<0.069	0.082	<0.111	0.046	<0.011	<0.069	<0.069	<0.417	<1.389	<0.069	<0.417	<0.042	0.569	<0.004	<0.278	<0.111	<0.028	<0.042	<0.028	<0.069

* Criteria effective on July 1, 2016

APPENDIX B

STATISTICAL TESTS RESULTS



Parameter	Non-parametric	Pairwise comparisons (Wilcoxon test) p-values**		
	Kruskal-Wallis p-value*	TSP-1/TSP-2	TSP-1/TSP-3	TSP-2/TSP-3
TSP	0.1675	-	-	-
PM ₁₀	0.8481	-	-	-
PM _{2.5}	0.4096	-	-	-
Al	0.3689	-	-	-
As	0.6575	-	-	-
Ba	0.4083	-	-	-
B	0.1982	-	-	-
Cd	0.434	-	-	-
Ca	0.3903	-	-	-
Cr	0.4083	-	-	-
Cu	0.6672	-	-	-
Fe	1.38E-10	0.03264	0.008802	4.24E-06
Pb	0.03198	0.4889	0.08632	0.07282
Mg	0.1278	-	-	-
Mn	7.36E-05	0.03253	0.6001	0.01041
Mo	0.6661	-	-	-
Ni	0.6698	-	-	-
K	0.6661	-	-	-
Si	0.0321	0.4537	0.3285	0.05494
Na	0.08038	-	-	-
Sr	0.4853	-	-	-
S	0.06296	-	-	-
Sn	0.4123	-	-	-
Ti	0.7642	-	-	-
Zn	0.00301	0.4035	0.1476	0.02553

* Compared to $\alpha=0.05$

** Compared to $\alpha=0.017$ (using Bonferroni adjustment α/x where α is the overall significance level and $x=3$ for 3 pairwise comparisons)