TETRA TECH EBA

February 25, 2016

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Via Email: josee.perron@gov.yk.ca

Assessment and Abandoned Mines
Energy Mines and Resources
Room 2C – Royal Centre
PO Box 2703, Whitehorse, YT Y1A 2C6

Attention: Ms. Josée Perron
Senior Project Manager

Subject: Existing Geotechnical Subsurface and Monitoring Data Summary Report
Abandoned Clinton Creek Asbestos Mine Site, Yukon

1.0 INTRODUCTION

Government of Yukon, Assessment and Abandoned Mines (AAM) have retained Tetra Tech EBA Inc. (Tetra Tech EBA) to assist with the summary and evaluation of geotechnical information related to closure of the Clinton Creek asbestos mine near Dawson City, Yukon. This report presents a summary of the existing geotechnical subsurface, movement monitoring, and meteorological data available for the subject site.

1.1 Scope

Tetra Tech EBA has been retained to review existing geotechnical information, make assumptions to fill data gaps, conduct stability analyses, provide recommendations for improvements to monitoring, prepare a geotechnical investigation plan to confirm assumptions, and provide engineering recommendations and costs for design modifications improving site access for the five short listed closure options.

This work is being conducted to guide project parties in making decisions regarding future design and implementation of short listed closure options.

1.2 Background

The former Clinton Creek asbestos mine site is located approximately 100 km northwest of Dawson City, Yukon. When operational the site included three open pits (Porcupine, Creek, and Snowshoe), two waste rock piles (Clinton Creek and Porcupine Creek), and a tailings pile. Between 1968 and the depletion of economic reserves in 1978, the Cassiar Mining Corporation extracted about 12 million tonnes of serpentine ore from the three pits. 60 million tonnes of waste rock from pit development and mining activities were deposited on the south slope of the Clinton Creek valley and between 10 and 12 million tonnes of tailings were deposited on the west slope of the Wolverine Creek valley (AECOM 2009).

Since closure, concerns have been raised with respect to the physical condition of the site, specifically stability of the Clinton Creek waste rock pile and Wolverine tailings pile.

Sudden failure of a portion of the waste rock pile in 1974 blocked Clinton Creek, leading to the creation of Hudgeon Lake (AECOM 2009). As a result of the failure, the toe of the waste rock pile moved approximately 300 m, covering the bottom of Clinton Creek valley (see Figure 1). Continued instability and ongoing erosion of the Clinton Creek waste rock pile could result in an uncontrolled release of the water in Hudgeon Lake. Ongoing movement of the Clinton Creek waste rock pile results in erosion, particularly with freshet water each spring.

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Tailings were placed in what is now referred to as the south lobe of the Wolverine tailings pile until that area failed suddenly in early 1974 covering the valley base and blocking flow in Wolverine Creek (see Figure 1). The blockage was subsequently breached and some remedial work including the immediate removal of tailings was conducted (AECOM 2009). In 1978 a rock lined channel and series of rock weirs were constructed downstream of the south lobe to prevent downcutting of the Wolverine Creek channel. After the 1974 failure of the south lobe, tailings were placed in what is now referred to as the north lobe of the Wolverine tailings pile. Movement of the north lobe was observed almost immediately and subsequent tailings were placed on flatter ground to the northwest until operations ceased in 1978. The north lobe never experienced a sudden failure but ongoing movement resulted in tailings crossing the valley base by 1986. Continued movement of both north and south lobes has resulted in the formation of two small upstream ponds and ongoing erosion of the leading edge of tailings by Wolverine Creek, particularly with freshet water each spring (AECOM 2009).

2.0 REFERENCES

Tetra Tech EBA has reviewed the package of Clinton Creek geotechnical documentation made available by AAM to prepare the summary of existing information reported herein. A complete list of the documents from which this summary was generated is included in the reference section at the end of this report.

3.0 EXISTING GEOTECHNICAL SUBSURFACE INFORMATION

Previously completed geotechnical subsurface investigation of the Clinton Creek waste rock pile and Wolverine tailings pile is limited to 19 boreholes advanced by Golder Associates in 1978 (Golder 1978). The locations of the boreholes are shown on Figure 1. (The locations of BH03 and BH05 within the Clinton Creek waste rock pile are unknown and are not shown on Figure 1). Moisture content, particle size, and direct shear testing was conducted on samples of gravel (overburden), waste rock, tailings, and weathered bedrock collected during the Golder investigation.

Testing of the physical properties (moisture content, particle size, Atterberg Limits, and direct shear) of the waste rock and tailings were completed by R.M. Hardy & Associates in 1977 (Hardy 1977). The sampling locations for this laboratory testing are not known.

Royal Roads University collected 23 soil samples of waste rock and tailings for chemical testing (RRU 1999). Moisture content testing was completed on the collected soil samples. The sampling locations were distributed across the Wolverine tailings pile (13 samples), Clinton Creek waste rock pile (7 samples), and background locations (3 samples). All 23 sampling locations are shown in the original report figures but have not been included in the figures of this report.

Worley Parsons completed particle size testing and modified proctor testing on two samples of waste rock and a sample of rock from a pit near the entrance to the Clinton Creek Site in 2015 (Worley 2015). The sample locations are shown on Figure 1.

Chilkoot Engineering completed laboratory testing including an assortment of particle size, LA abrasion, and specific gravity testing on samples collected from six locations across the Clinton Creek mine site (Chilkoot 2015). The sample locations are shown on Figure 1.

The above reference borehole logs and laboratory test results are included in Appendix B of this report.

3.1 Clinton Creek Waste Rock Pile

Geotechnical subsurface conditions in the Clinton Creek waste rock pile area consist primarily of silty sand and gravel sized argillite waste rock underlain by weathered argillite bedrock that becomes more competent with depth on the south valley wall. On the valley floor the argillite waste rock is likely underlain by colluvium and/or alluvium deposits over argillite bedrock but previous subsurface investigations did not extend below the waste rock in this area. Section locations for the Waste Rock Pile shown on Figure 1 are presented on Figure 2. It should be noted that the stratigraphy beneath the waste rock is not known with any certainty; however, this is an estimation based on a review of existing information.

No subsurface investigation has been completed on the north valley wall opposite the Clinton Creek waste rock pile.

From the laboratory testing referenced above in Section 3.0, the waste rock has a peak internal friction angle of 40 degrees (0 to 170 kPa effective stress) and 33.5 degrees (1,380 kPa effective stress), and a residual friction angle of 23 degrees. The waste rock has a standard proctor maximum dry density of 2,070 – 2,195 kg/m^3, a natural moisture content of 3 to 16%, a liquid limit of 27.3, and a plastic limit of 18.7. Tetra Tech EBA did not locate any existing laboratory test results defining the physical properties of the foundation soils for the Clinton Creek waste rock pile. A summary of physical properties of the waste rock derived from previously completed laboratory testing is presented in the following Table 3.1.

Table 3.1: Physical Properties from Existing Laboratory Testing

Soil Type	Internal Friction Angle (degrees)		Standard Proctor Maximum Dry Density (kg/ m^3)	Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)
	Peak	Residual				
Waste Rock	33.5 – 40	23	2,070 – 2,195	3 – 16	27.3	18.7

3.1.1 Permafrost

Golder Associates installed four ground temperature cables in the Clinton Creek waste rock pile to depths of between 17 and 27 m in April of 1978. The locations of the ground temperature cables are shown on Figure 1. Ground temperature readings were obtained until readings ceased in July 1978. Cables T1, T2, and T4 indicated permafrost was immediately below the interface between the waste rock and underlying weathered argillite. Cable T3 indicated unfrozen conditions to at least 9 m below the interface between the waste rock and underlying weathered argillite. The ground temperature readings obtained in 1978 are included in Appendix C of this report.

Worley Parsons encountered permafrost in 2015 during excavation of an access road used to complete repairs to Clinton Creek gabion drop structure four (DS4), near the toe of the Clinton Creek waste rock pile. The top of permafrost was observed to be at an elevation of between 402 and 406 m in the waste rock on the south side of the valley in the vicinity of DS4. No ground temperature, ice content, or permafrost description was included in the report.

3.1.2 Piezometric Elevations

Golder Associates installed five piezometers in the Clinton waste rock pile in April of 1978. The locations of the piezometers are shown on Figure 1. None of the piezometers functioned properly and as a result no piezometric elevation data is available for the Clinton Creek waste rock pile.

3.2 Wolverine Tailings Pile

Geotechnical subsurface conditions in the Wolverine tailings pile area consist of a silty sand and gravel sized serpentine tailings material underlain by fluvial silty, sand and gravel deposits underlain by weathered argillite bedrock that becomes more competent with depth. Section locations for the Tailings Pile shown on Figure 1 are presented on Figure 3. It should be noted that due to the limited drilling performed to date, these sections present our best estimation of the general subsurface conditions.

From the laboratory testing referenced above in Section 3.0, the tailings has a peak internal friction angle of between 35 and 45 degrees and a residual friction angle of 30 degrees. The tailings has a natural moisture content of 2 to 15%.

The overburden fluvial silty, sand and gravel deposits below the tailings have a peak internal friction angle of between 27.5 and 29 degrees and a natural moisture content of 4 to 41%.

The weathered argillite (sand and gravel sized particles with trace to some silt) has a peak internal friction angle of 26 to 27 degrees and a natural moisture content of 5 to 12%.

A summary of physical properties of the materials in the Wolverine tailings pile area derived from previously completed laboratory testing is presented in the following Table 3.2.

Table 3.2: Physical Properties from Existing Laboratory Testing

Soil Type	Internal Friction Angle (degrees)		Natural Moisture Content (%)
	Peak	Residual	
Tailings	35 – 45	30	2 – 15
Overburden	27.5 – 29	-	4 – 41
Weathered Argillite	26 – 27	-	5 – 12

3.2.1 Permafrost

Golder Associates installed three ground temperature cables in the Wolverine tailings pile to depths of between 12 and 21 m and one ground temperature cable in undisturbed ground northwest of the Wolverine tailings pile to a depth of 25 m. The locations of the ground temperature cables are shown on Figure 1. Ground temperatures were obtained until readings ceased in July 1978.

Cables on the southern half of the Wolverine tailings pile (T5 and T8) indicate unfrozen conditions below the depth of investigation, and permafrost at 1.5 to 3 m below the interface between tailings and underlying foundation soils in T5 and T8, respectively.

The cable on the northern half of the Wolverine tailings pile (T7) and the cable in undisturbed ground north of the Wolverine tailings pile (T6) indicates permafrost at or near the original ground surface.

The ground temperature readings obtained in 1978 are included in Appendix C of this report.

3.2.2 Piezometric Elevations

No piezometric elevation data is available for the Wolverine tailings pile.

4.0 EXISTING MOVEMENT MONITORING INFORMATION

Monitoring programs conducted for the Clinton Creek mine site were first initiated in 1976 and over the years have grown to include data collection for the following site components:

- Access Road;
- Gabion Drop Structures;
- Clinton Creek channel from outlet to confluence with Wolverine Creek – centreline;
- Wolverine Creek channel – centreline;
- Clinton Creek and Wolverine Creek cross sections – various;
- Open Pit Area;
- Clinton Creek waste rock pile; and
- Wolverine Creek tailings pile (north and south lobes).

This report summarizes only the movement monitoring for the Clinton Creek Waste Rock Pile and Wolverine Creek Tailings Pile.

Movements in all survey monitoring programs were determined by calculating the distance between surveyed coordinates recorded for each monitoring point over the various monitoring periods. Figures 4 and 5 present locations of survey monitoring points which were surveyed in 2014 (the most recent site-wide survey conducted) for the Waste Rock Pile and the Tailings Pile, respectively. The annual movements (average, maximum, and minimum) previously reported are summarized in this section. Documents referenced to collect the data are listed in the reference section of this report and digital versions (Excel) of the summarized movement data are submitted with this report.

Movement rates reported in the summary tables in Appendix D, and as plotted in the figures in the following subsections, are values as-reported in previous reports and were not calculated based on raw data, unless otherwise noted in the summary tables in Appendix D.

No movement monitoring was conducted on the site from 1986 to 1999 or in 2013.

4.1 Clinton Creek Waste Rock Pile

Existing survey data for the Clinton Creek waste rock pile were available from 1976 to 2015. Over the years, some monitoring points were either destroyed or needed to be re-established, and new monitoring points were installed as required. As a result, the horizontal rates of movement in Figure 4.1 and the attached summary table present an overall summary; however, it should be noted that different reporting periods for each section of the slope do not necessarily summarize the same monitoring points.

The waste rock area monitoring points were grouped according to their location on the slope and were divided into three segments for reporting purposes. The segments used in the summary table are as follows:

- Upper slope – above 450 masl;
- Mid slope – between 450 masl and 420 masl; and

- Lower slope – below 420 masl.

The Porcupine Pit slope monitoring points were not included in these categories since they provide data on pit wall movements and not waste rock movements.

Figure 4.1 presents the summarized movement data from 1976 to 2015 and clearly indicates attenuating movements of the Waste Rock Pile, with the exception of increased movement in Summer 2010. Figure 4.2 presents the summarized movement from 2003 to 2015. Note that the vertical scale Figures 4.1 and 4.2 differ. Supporting data for the movement plots is presented in Appendix D1.

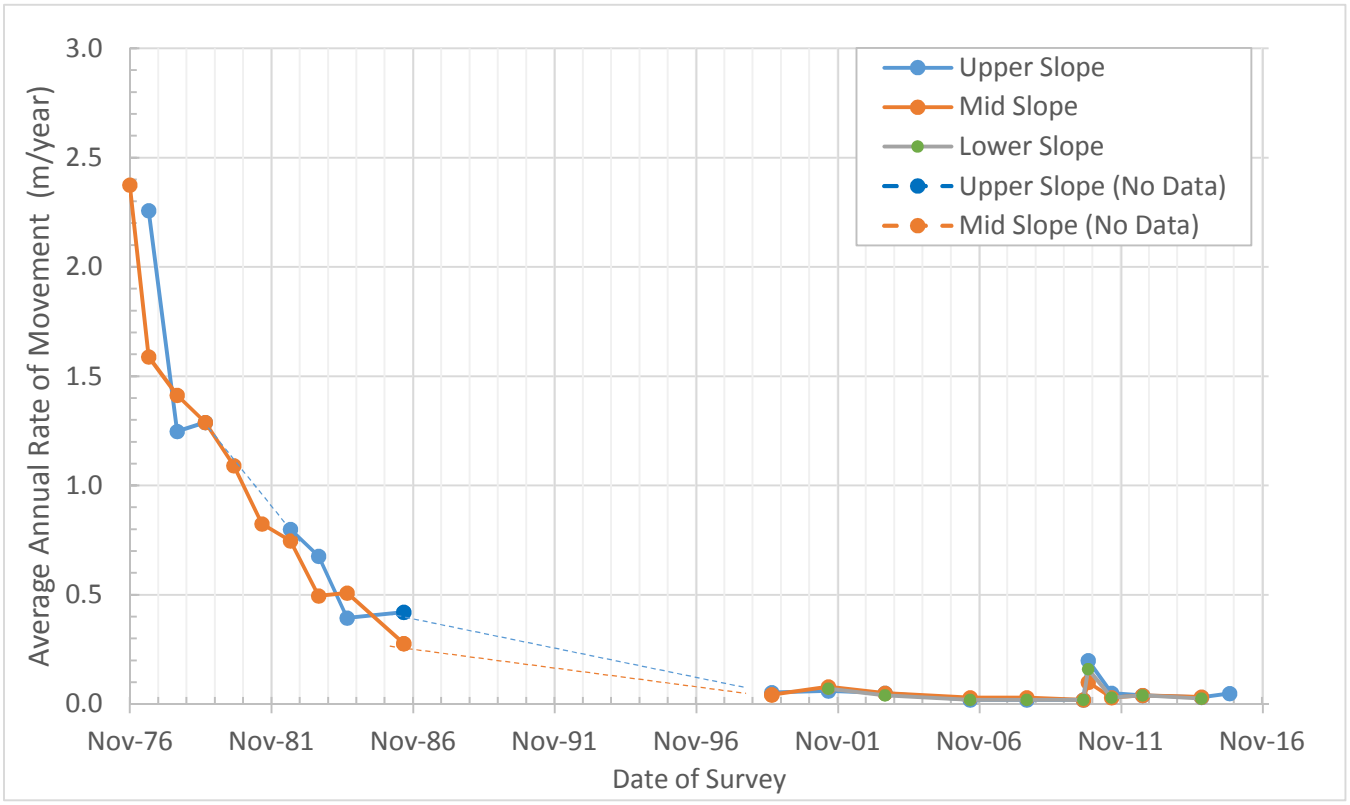

Figure 4.1: Clinton Creek Waste Rock Pile – Summary of Historical Movement Data 1976 - 2015

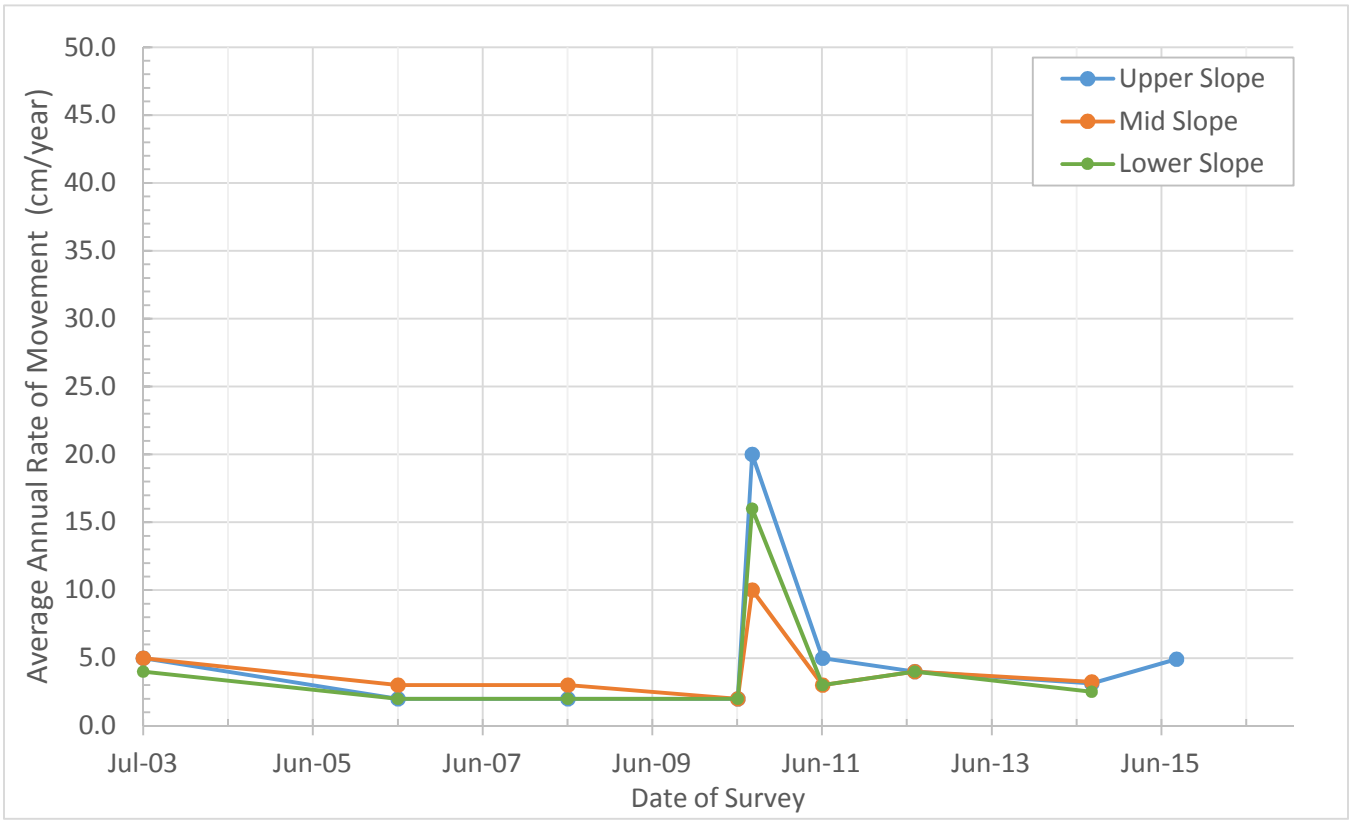

Figure 4.2: Clinton Creek Waste Rock Pile – Summary of Historical Movement Data 2003 – 2015

4.2 Wolverine Tailings Pile

Existing survey data for the Wolverine tailings pile were available to some degree from 1978 to 2015. Over the years, some monitoring points were either destroyed or needed to be re-established, and new monitoring points were installed as required. As a result, the horizontal rates of movement presented in Figures 4.3 through 4.6 and the attached summary tables present an overall summary of the North Lobe and South Lobe; however, it should be noted that different reporting periods for each section of the slope do not necessarily summarize the same monitoring points.

The monitoring points on the north and south lobes were grouped according to their location on the slope and were divided into three segments for reporting purposes. The segments are used in the summary tables and are as follows:

- Upper slope – above 529 masl;
- Mid slope – between 529 masl and 425 masl; and
- Lower slope – below 425 masl.

There seems to be data gaps for the monitoring of Wolverine tailings pile from 1986 to 2003. The background information provided to Tetra Tech EBA has been reviewed and neither summaries of movement, nor supporting survey documents, have been located for that period of time.

In general, the summarized data indicates attenuating movements for the Tailings Pile, with the exception of increased movement in Summer 2010. Figures 4.3 and 4.4 present the summarized movement data for the North Lobe and Figures 4.5 and 4.6 present the summarized movement data for the South Lobe. Supporting data for the movement plots is presented in Appendix D2.

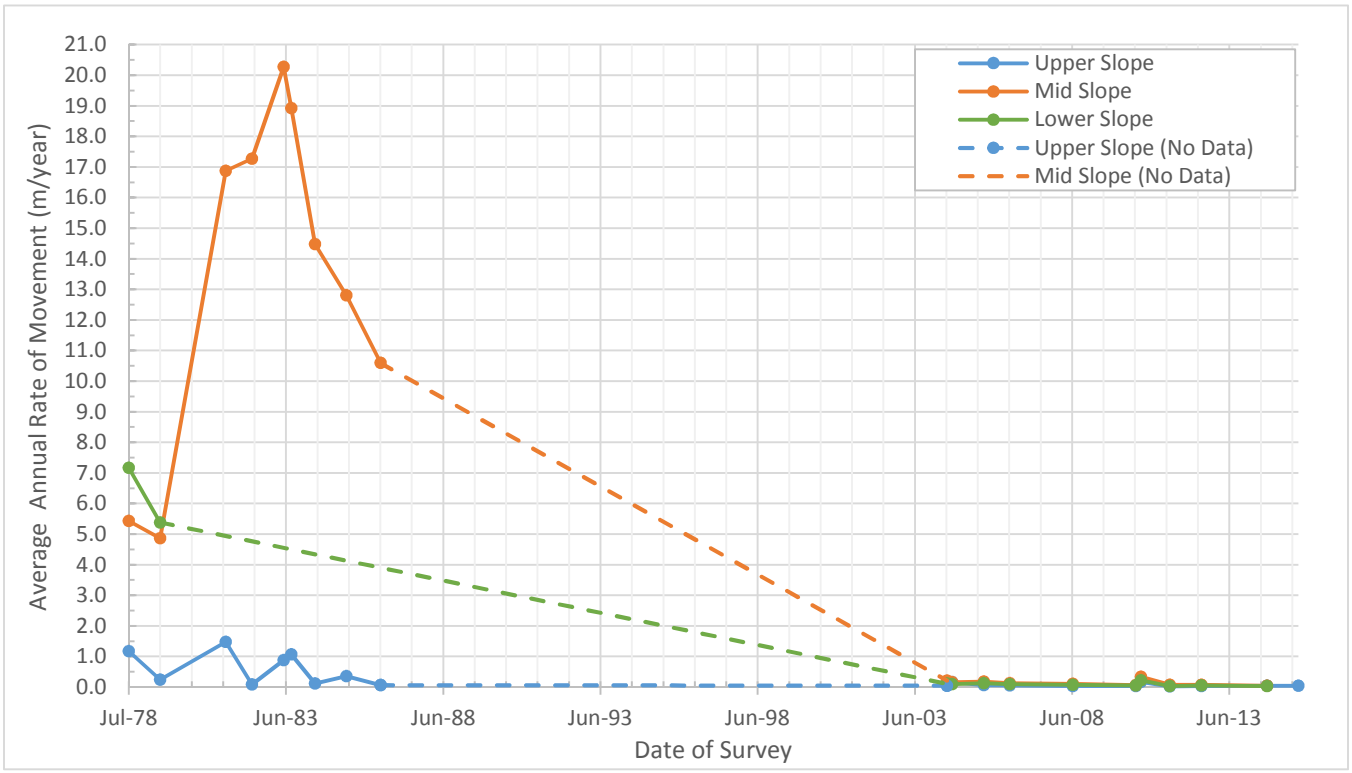

Figure 4.3: Wolverine Tailings Pile North Lobe – Summary of Historical Movement Data 1978 – 2015

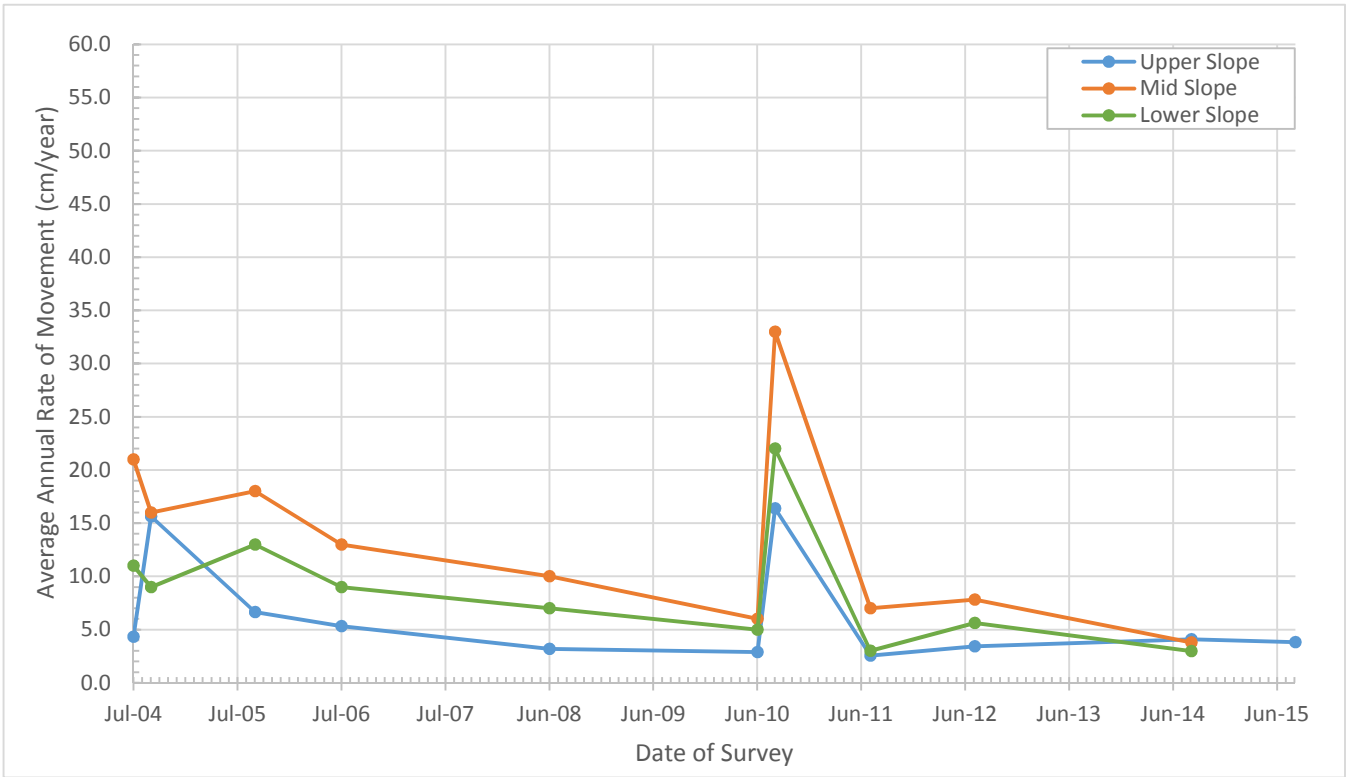

Figure 4.4: Wolverine Tailings Pile North Lobe – Summary of Historical Movement Data 2004 – 2015

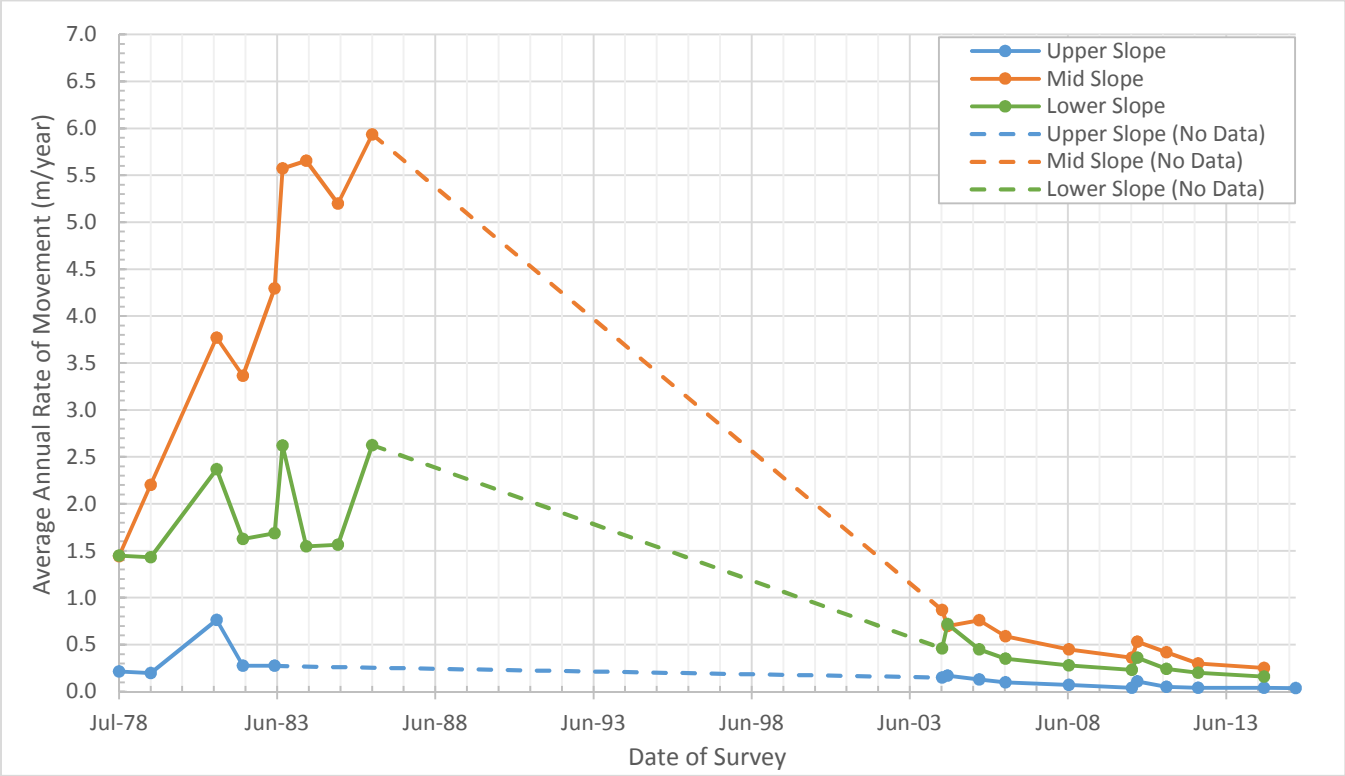

Figure 4.5: Wolverine Tailings Pile South Lobe – Summary of Historical Movement Data 1978 – 2015

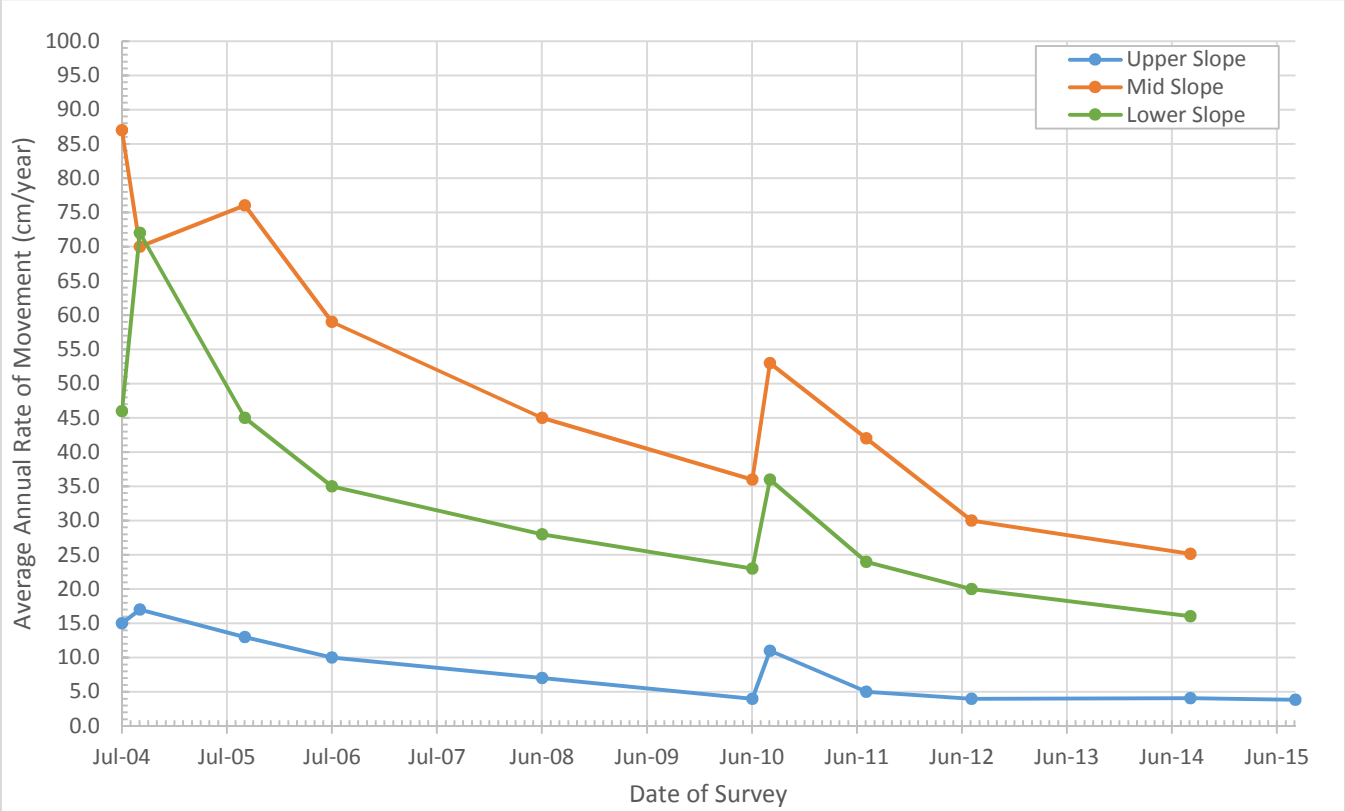

Figure 4.6: Wolverine Tailings Pile South Lobe – Summary of Historical Movement Data 2004 – 2015

5.0 EXISTING METEOROLOGICAL INFORMATION

5.1 Regional Meteorological Information

Existing regional meteorological data were available from several weather stations in the vicinity of Clinton Creek, operated by Government of Canada. Generally, the regional weather data consists of the following daily measurements:

- Temperature; and
- Rainfall.

A summary of the weather stations near Clinton Creek with available climate data date ranges is presented below in Table 5.1. A plot of temperature and rainfall data from the four nearest stations (within 50 km of the site) has been presented in Appendix E and the supporting digital versions (Excel) are submitted along with this report. Digital versions of the publically available regional meteorological data from the remaining weather stations are not included with this report.

Table 5.1: Regional Meteorological Data

Weather Station Name	Distance from Clinton Creek (km)	Elevation (m)	Data Date Range
Clinton Creek	0	576	1966 – 1978
Forty Mile	16	335	1978 – 1984
Boundary	47	1,036	1967 – 1978
Little Gold	50	1,257	1974 – 1999
Dawson City	139	320	1897 – 1979
Dawson City Airport	168	370	1976 – 2015

5.2 Site Specific Meteorological Information

Existing site specific meteorological data were available sporadically from July 19, 2004 to December 7, 2015. The data is summarized below and complete digital versions (Excel) are submitted along with this report. There are some significant time periods for which no data are available. Data gaps are summarized as follows:

- September 17, 2004 to June 22, 2006 – No data found;
- February 4 to October 5, 2007 – No data found;
- September 30 ,2009 to April 28, 2010 – No data found;
- October 5, 2011 to December 13, 2013 – No data found;
- January 20, 2014 to June 21, 2015 – No data found;
- June 21 to June 30, 2015 – Reported data incorrect;
- December 7, 2015 – End of collected data.

Generally, the site specific weather data consists of the following measurements:

- Temperature;
- Rainfall;
- Relative humidity;
- Wind speed;
- Wind gust speed; and
- Wind direction.

There are no indications if these data are instantaneous or averages over the reading increment. We have assumed that the temperature is the average and the rainfall is the total over the increments.

In September 2013, when a new weather station was installed, the recordings are labeled as averages over the reading increment, except for precipitation which is labeled as total and average barometric pressure recordings began. In June 2015 snow depth measurements began, however they appear erroneous. For example, there are snow depth readings reported in July 2015 but no hourly temperatures below freezing. These snow depth data should not be relied upon until manual measurements verifying their accuracy can be completed.

The existing site specific temperature and rainfall data are presented graphically in the following Figure 5.1.

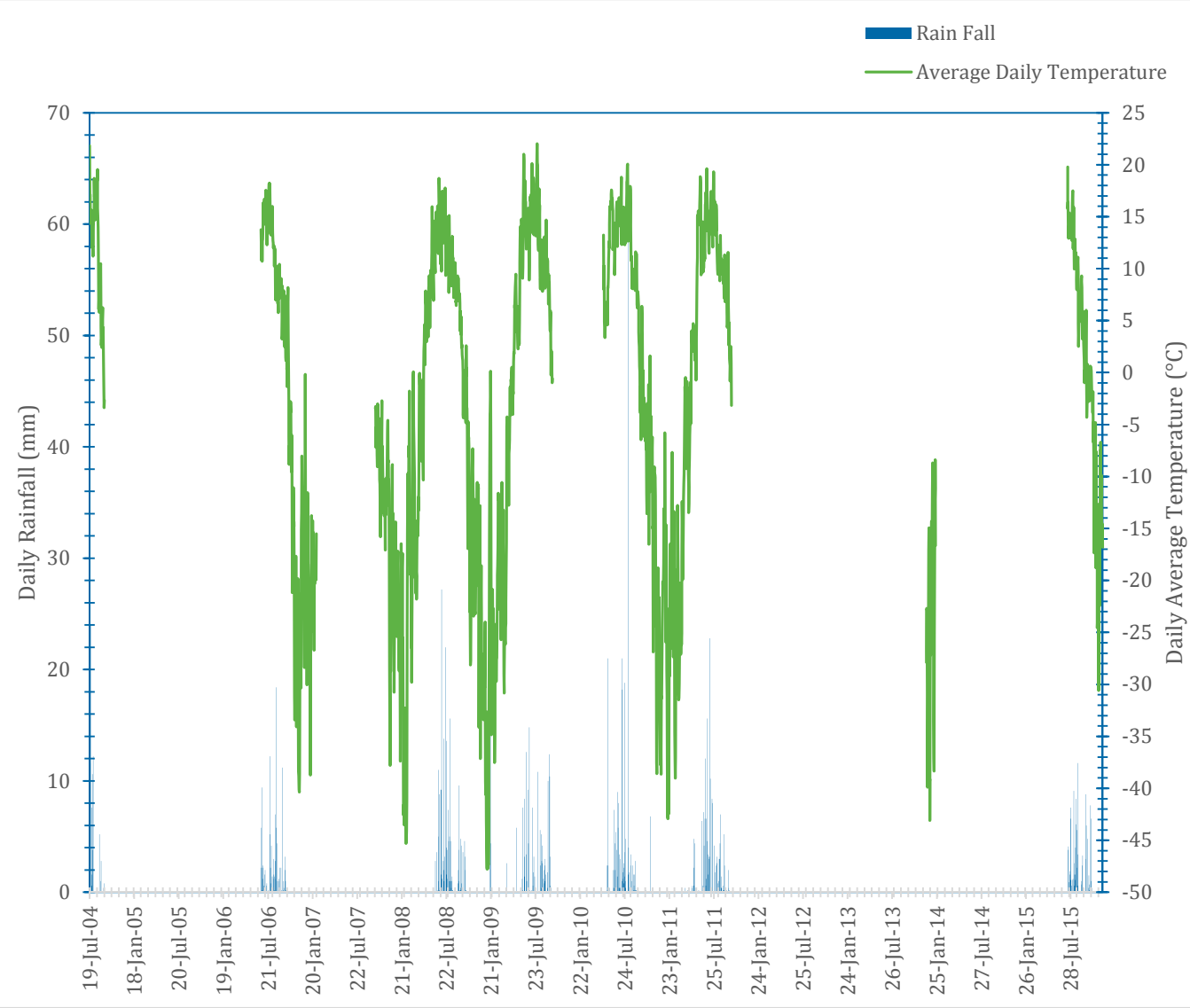

Figure 5.1: Average Daily Temperature and Total Daily Rainfall Jul 2004 to Dec 2015

6.0 EXISTING SURFACE WATER FLOW INFORMATION

Existing surface water flow data were available from various hydrometric stations along Clinton Creek (operated by DIAND, and now the Yukon Government) and surface water monitoring stations located along Clinton Creek and its tributaries, and also along Forty Mile River.

Based on available information, the following three hydrometric stations exist along Clinton Creek, downstream of the mine site:

- Station 29EC001A – located approximately 3.5 km downstream of the site, at the confluence with Eagle Creek;
- Station 29EC001B – located approximately 5 km downstream of the site; and
- Station 29EC001 – located approximately 8 km downstream of the site, above Forty Mile River.

Generally, flow monitoring data recorded at these stations is collected each year between the months of May and September, likely when ice coverage on the creek is not present. Daily discharge readings available indicate that data from these stations are recorded by a real-time monitoring system at each site. Combined flow monitoring data from these three stations makes up a creek monitoring period that generally extends from 1978 to 2014; however, data from some years is not available forming gaps in information. Summarized flow monitoring data for these three hydrometric stations are presented in Appendix F.

Several surface water monitoring stations were established in 2009 as a means to measure surface water flow and monitor water quality. Additional monitoring stations were established in subsequent years. Based on available information, flows at these stations were first measured in 2012 in the field by calculating flow based on creek dimensions. It appears that flow may have only been measured, or possibly recorded, once per year. The infrequency of such recordings, coupled with the relatively short monitoring period to date has limited the amount of useful information that can be used to establish seasonal trends in surface water flow or draw any associated conclusions from this data.

7.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Government of Yukon Assessment and Abandoned Mines and their agents. Tetra Tech EBA Inc. (Tetra Tech EBA) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Government of Yukon Assessment and Abandoned Mines, 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. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

8.0 CLOSURE

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

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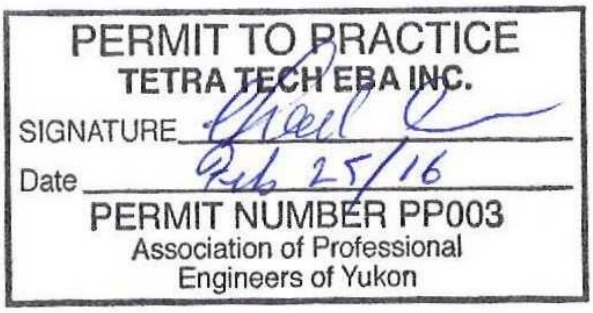


REFERENCES

AECOM (2009). “Former Clinton Creek Asbestos Mine Overview Report”.

Associated Engineering (2013). “Long Term Performance Monitoring 2012”.

Chilkoot Geological Engineers Ltd. (2015). “Geotechnical Evaluation Borrow Source Assessment – Clinton Creek Area, Dawson, Yukon”.

Golder Associates (1978). “Report to Cassiar Asbestos Mining Corporation Ltd. Re: Mine Waste Dump and Tailing Pile, Clinton Creek Operations”.

Golder Associates (1979). “Clinton Creek Mine – Movement to Monitor Data to April 1979, Clinton Creek, Yukon Territory”.

Golder Associates (1980). “Clinton Creek Mine – Movement to Monitor Data to July 1980, Clinton Creek, Yukon Territory”.

Government of Canada (2015). “Historical Climate Data” www.climate.weather.gc.ca

Hardy & Associates Ltd. (1977). “Requirements for Development of a Rehabilitation Plan, Clinton Creek Mine, Cassiar Asbestos Corporation”.

Hardy & Associates Ltd. (1981). “Cassiar Asbestos Mine, Waste Dump and Tailings Pile Stability”.

Klohn Leonoff (1983). “Clinton Creek Waste Dump”.

Klohn Leonoff (1984). “Clinton Creek Asbestos Mine – Wolverine Creek Tailings Piles”.

Klohn Leonoff (1986). “Clinton Creek Asbestos Mine – Abandonment Plan”.

Royal Roads University (1999). “An Environmental Review of the Clinton Creek Abandoned Asbestos Mine, Yukon, Canada”.

UMA Engineering (2002). “Abandoned Clinton Creek Asbestos Mine – Conceptual Design Report”.

UMA Engineering (2007). “Long Term Performance Monitoring”.

Yukon Government (2005). “Yukon Water Resources Hydrometric Program – Historical Summary 1975 – 2004”.

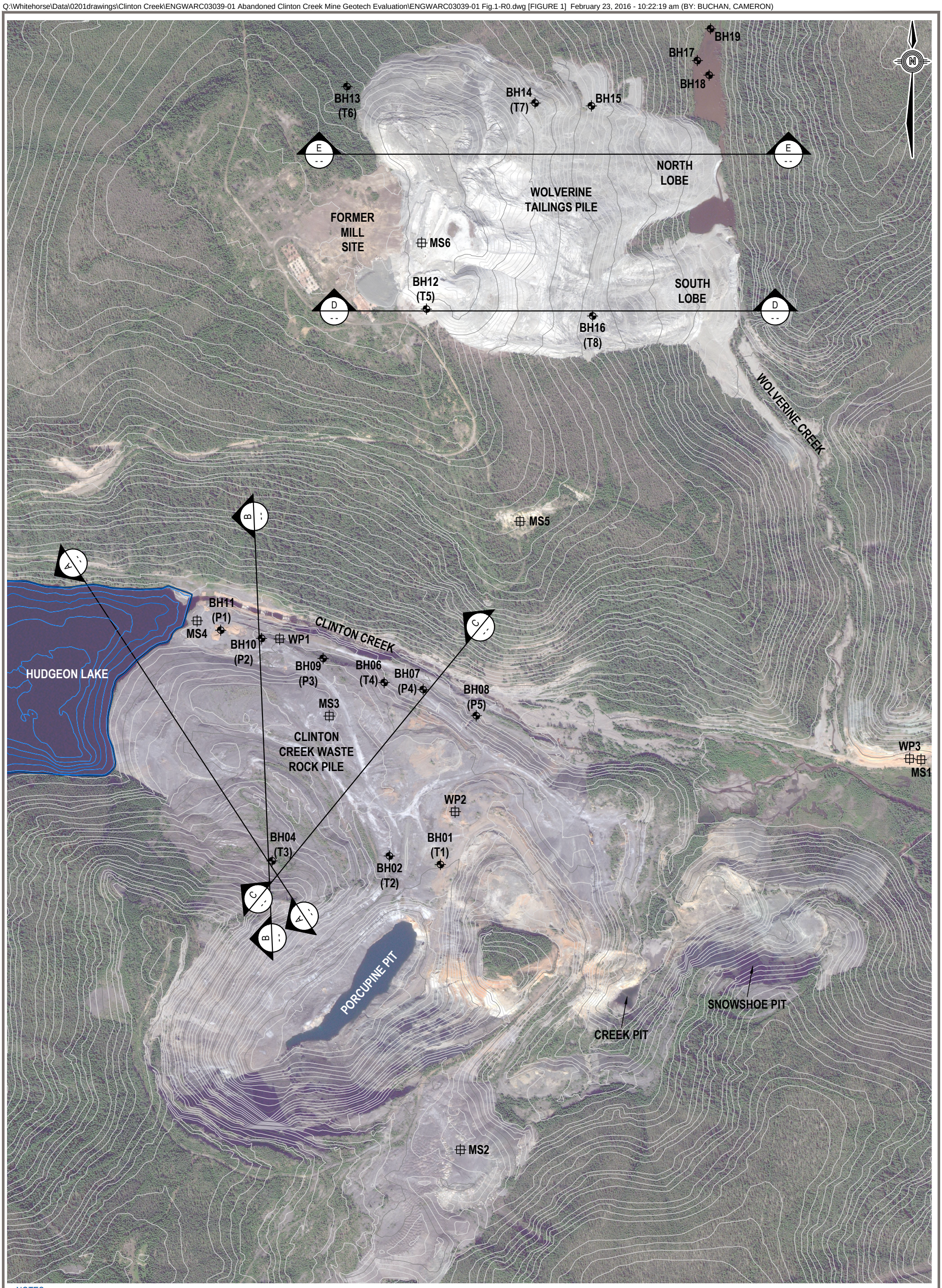
WorleyParsons Group (2015). “Clinton Creek Lab Test Results, Rev.0”.

WorleyParsons Group (2015). “Clinton Creek Long Term Monitoring Program”.

FIGURES

Figure 1 Site Plan
Figure 2 Sections A - C
Figure 3 Sections D - E
Figure 4 Clinton Creek Waste Rock Pile Monitoring Point Locations
Figure 5 Wolverine Creek Tailings Pile Monitoring Point Locations

Q:\Whitehorse\Data\0201drawings\Clinton Creek\ENGWARC03039-01 Abandoned Clinton Creek Mine Geotech Evaluation\ENGWARC03039-01 Fig.1-R0.dwg [FIGURE 1] February 23, 2016 - 10:22:19 am (BY: BUCHAN, CAMERON)



NOTES :
- IMAGERY WAS EXTRACTED FROM GOOGLE EARTH PRO EDITION (DATED 2012)
- ONSITE TOPOGRAPHY CONTOURS PROVIDED BY CLIENT (DATED 2012), AND ARE SET TO INTERVALS OF 10 m

0 250m

Scale: 1:7,500 @ 11"x17"

LEGEND

- BOREHOLE LOCATION
- TESTPIT LOCATION
P - INDICATES HISTORIC PIEZOMETER
T - INDICATES HISTORIC THERMISTOR

MS1 - CHILKOOT (2015) - 6 LOCATIONS
BH01 - GOLDER (1978) - 19 LOCATIONS
CLMS - RRU (1999) - 13 LOCATIONS (NOT SHOWN)
CLWS - RRU (1999) - 7 LOCATIONS (NOT SHOWN)
WP1 - WORLEY (2015) - 3 LOCATIONS

CLIENT

Yukon Government
Energy, Mines & Resources
Assessment & Abandoned Mines Branch

TETRA TECH EBA

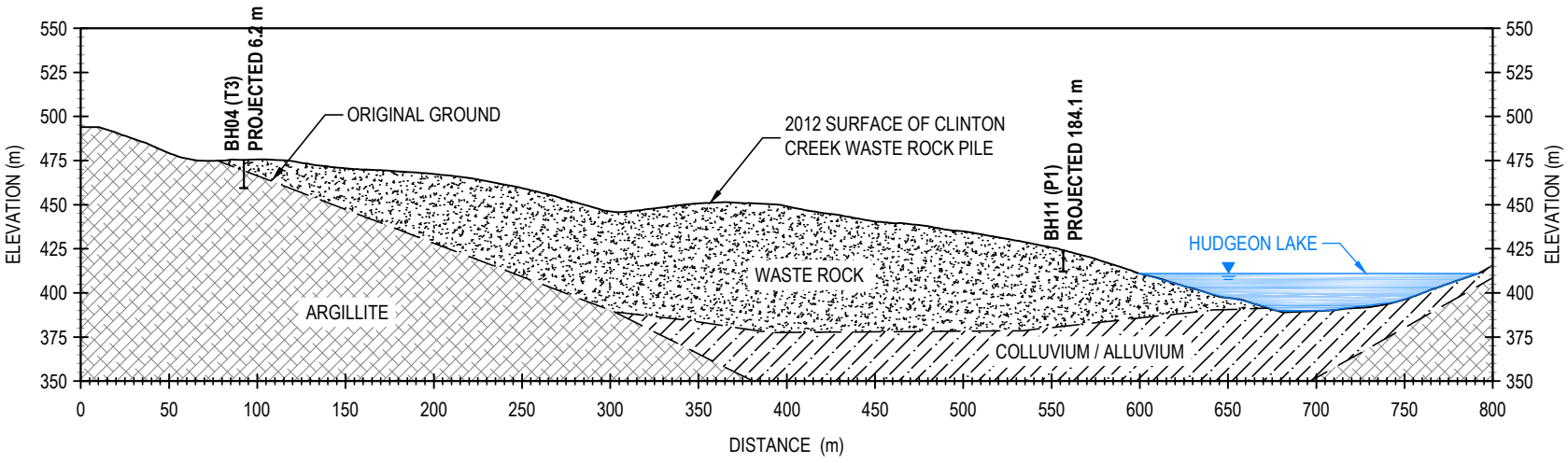
EXISTING GEOTECHNICAL SUMMARY REPORT ABANDONED CLINTON CREEK MINE, YUKON

SITE PLAN

PROJECT NO.	DWN	CKD	REV
ENGWARC03039-01	CB	JTP	0

OFFICE	DATE
EBA-WHSE	February 2, 2016

Figure 1



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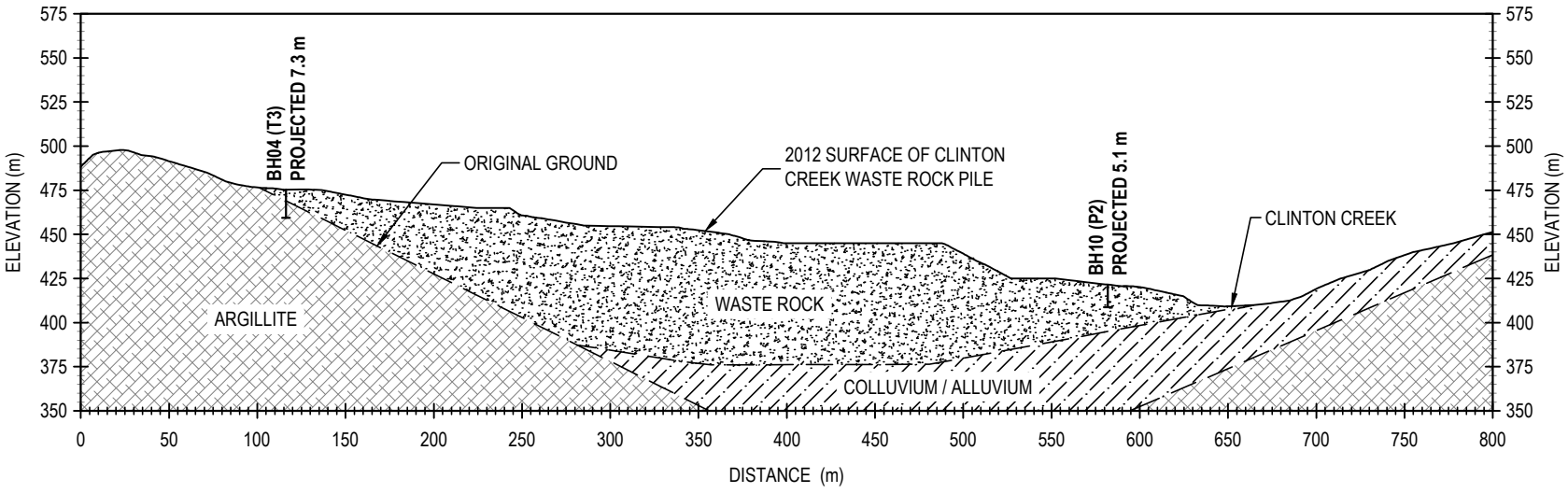
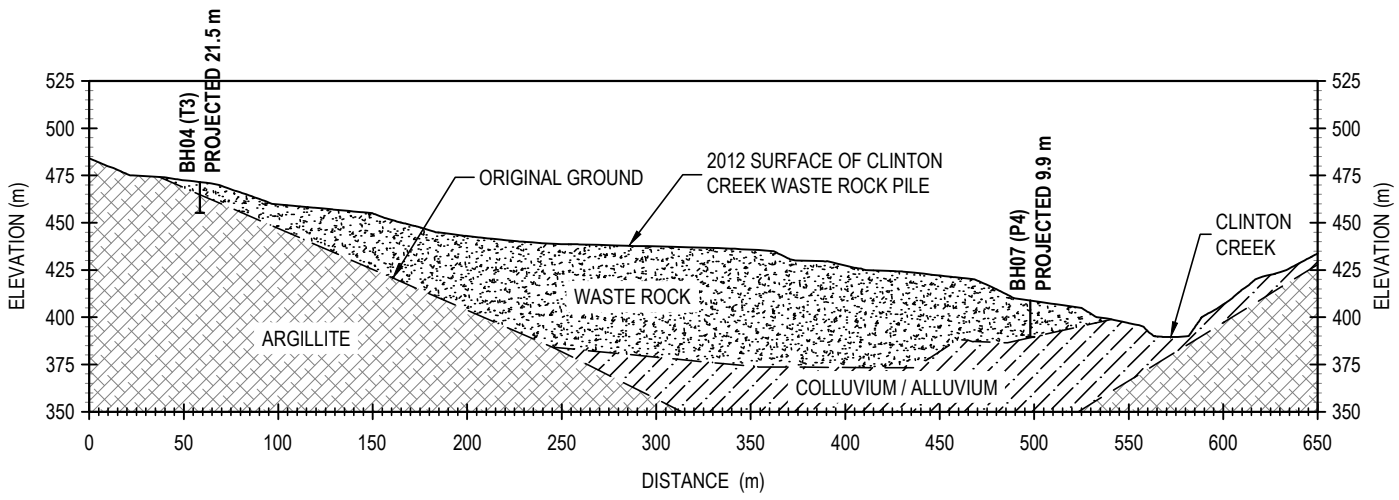


SECTION B - B'



SECTION C - C'

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Scale: 1:4,000 @ 11"x17"

LEGEND

- TAILINGS
- WASTE ROCK
- GRAVEL
- ARGILLITE
- COLLUVIUM / ALLUVIUM
- ASSUMED
- SURVEYED

CLIENT

Yukon Government
Energy, Mines & Resources
Assessment & Abandoned Mines Branch

TETRA TECH EBA

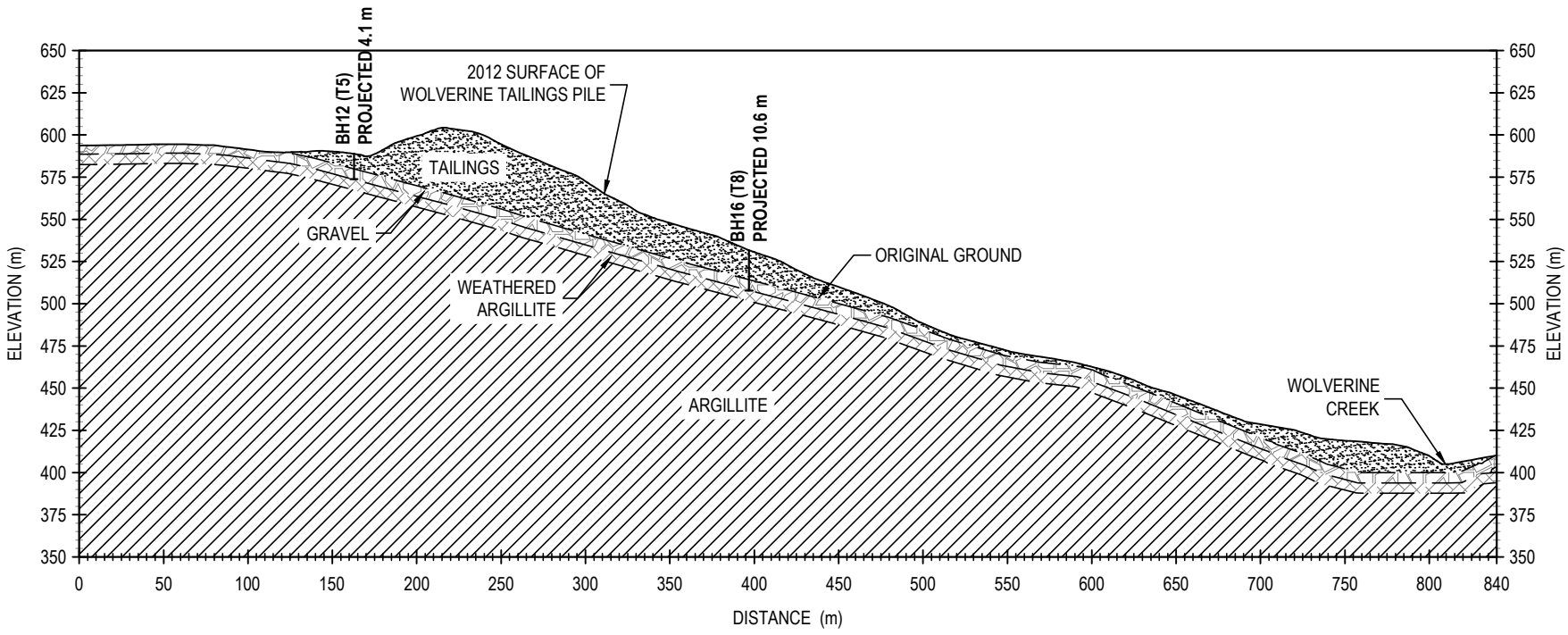
EXISTING GEOTECHNICAL SUMMARY REPORT ABANDONED CLINTON CREEK MINE, YUKON

SECTIONS A - C

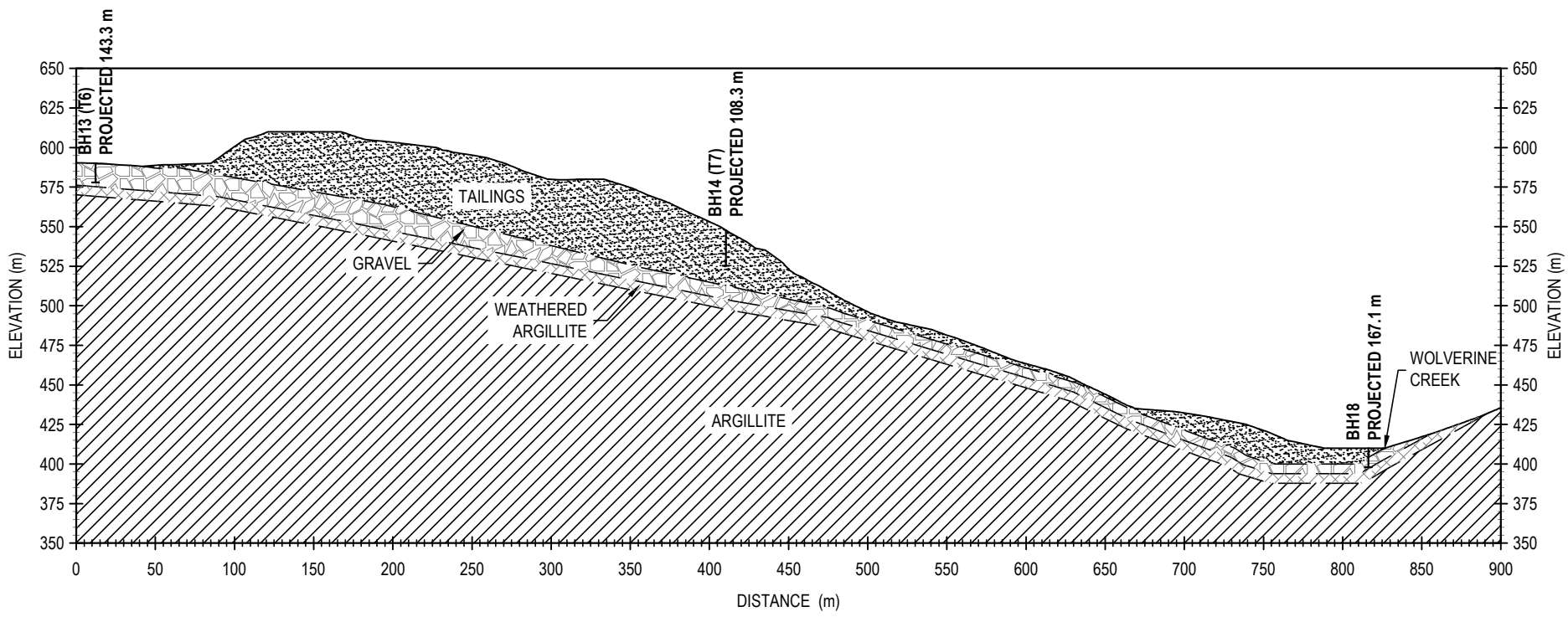
PROJECT NO.	DWN	CKD	REV
ENGWARC03039-01	CB	JTP	0

OFFICE	DATE
EBA-WHSE	February 2, 2016

Figure 2



SECTION D - D'



SECTION E - E'

0 200m

Scale: 1:4,000 @ 11"x17"

LEGEND

- TAILINGS
- WASTE ROCK
- GRAVEL
- WEATHERED ARGILLITE
- ARGILLITE
- — — —- ASSUMED
- ————- SURVEYED

CLIENT

Yukon Government
Energy, Mines & Resources
Assessment & Abandoned Mines Branch

TETRA TECH EBA

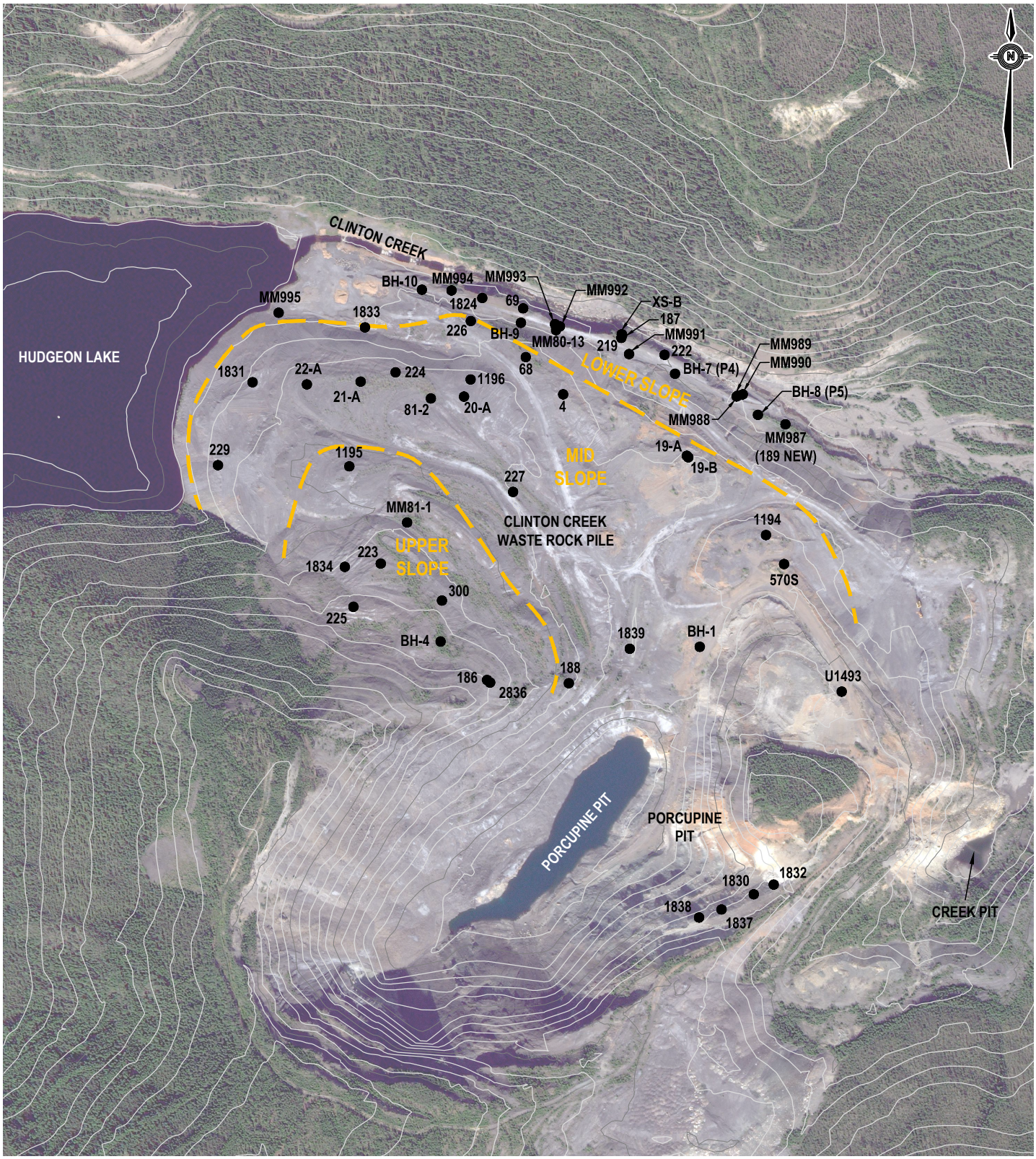
EXISTING GEOTECHNICAL SUMMARY REPORT
ABANDONED CLINTON CREEK MINE, YUKON

SECTIONS D - E

PROJECT NO.	DWN	CKD	REV
ENGWARC03039-01	CB	JTP	0

OFFICE	DATE
EBA-WHSE	February 2, 2016

Figure 3



NOTES :
- IMAGERY WAS EXTRACTED FROM GOOGLE EARTH PRO EDITION (DATED 2012)
- ONSITE TOPOGRAPHY CONTOURS PROVIDED BY CLIENT (DATED 2012), AND ARE SET TO INTERVALS OF 10 m

LEGEND

● - SURVEY POINT LOCATION

0 250m

Scale: 1:7,500 @ 8.5"x11"

CLIENT

Yukon Government
Energy, Mines & Resources
Assessment & Abandoned Mines Branch

TETRA TECH EBA

EXISTING GEOTECHNICAL SUMMARY REPORT ABANDONED CLINTON CREEK MINE, YUKON

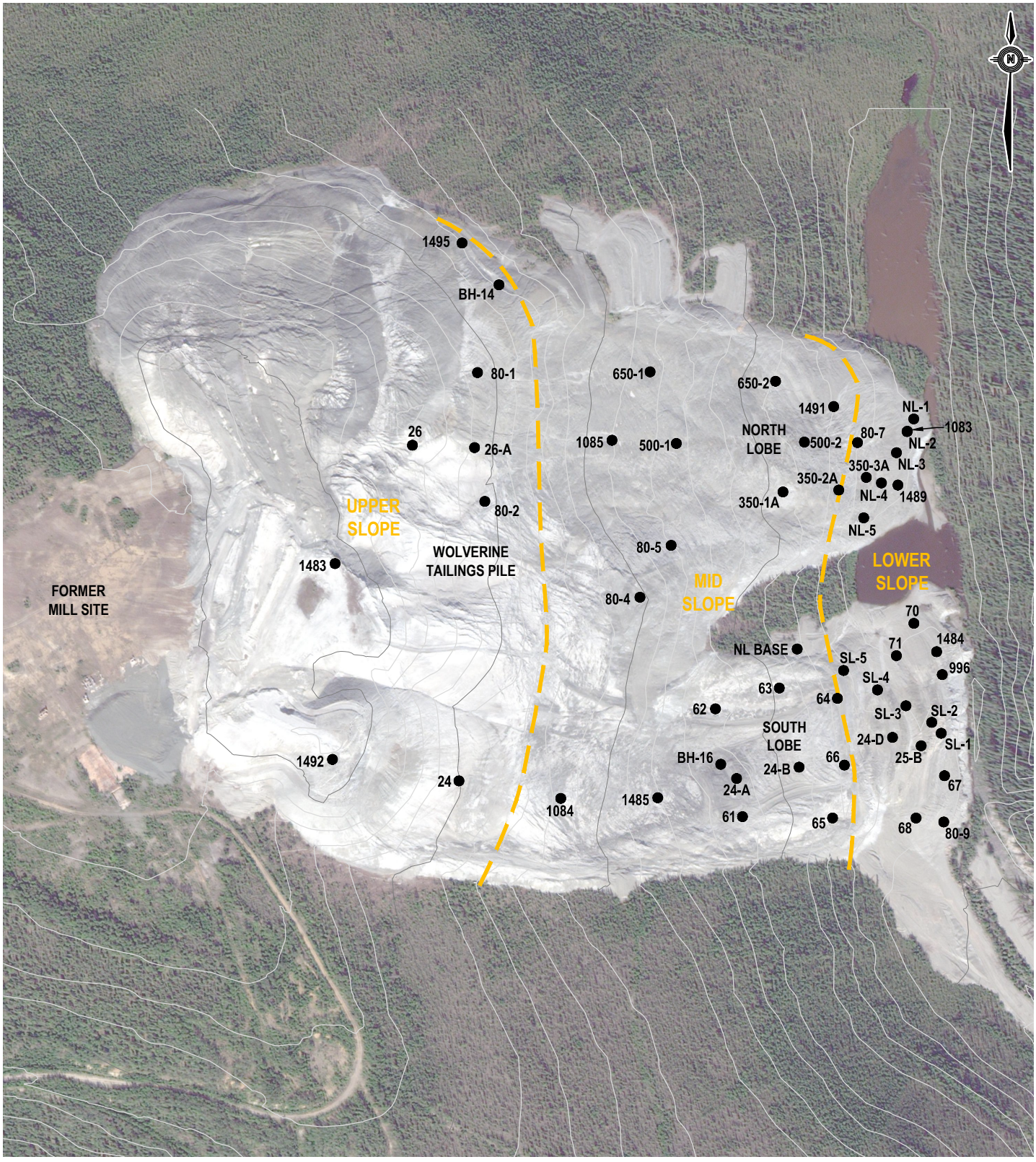
CLINTON CREEK WASTE ROCK PILE MONITORING POINT LOCATIONS

PROJECT NO.	DWN	CKD	REV
ENGWARC03039-01	CB	SB	0

OFFICE	DATE
EBA-WHSE	February 11, 2016

Figure 4

Q:\Whitehorse\Data\0201drawings\Clinton Creek\ENGWARC03039-01 Abandoned Clinton Creek Mine Geotech Evaluation\ENGWARC03039-01 Fig.4 & 5-R0.dwg [FIGURE 4] February 23, 2016 - 10:24:50 am (BY: BUCHAN, CAMERON)



NOTES :

- IMAGERY WAS EXTRACTED FROM GOOGLE EARTH PRO EDITION (DATED 2012)
- ONSITE TOPOGRAPHY CONTOURS PROVIDED BY CLIENT (DATED 2012), AND ARE SET TO INTERVALS OF 10 m

LEGEND

● - SURVEY POINT LOCATION

0 250m

Scale: 1:5,000 @ 8.5"x11"

CLIENT

Yukon Government
Energy, Mines & Resources
Assessment & Abandoned Mines Branch

TETRA TECH EBA

EXISTING GEOTECHNICAL SUMMARY REPORT ABANDONED CLINTON CREEK MINE, YUKON

WOLVERINE CREEK TAILINGS PILE MONITORING POINT LOCATIONS

PROJECT NO.	DWN	CKD	REV
ENGWARC03039-01	CB	SB	0

OFFICE	DATE
EBA-WHSE	February 11, 2016

Figure 5

Q:\Whitehorse\Data\0201drawings\Clinton Creek\ENGWARC03039-01 Abandoned Clinton Creek Mine Geotech Evaluation\ENGWARC03039-01 Fig.4 & 5-R0.dwg [FIGURE 5] February 23, 2016 - 10:24:19 am (BY: BUCHAN, CAMERON)

APPENDIX A
TETRA TECH EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOTECHNICAL REPORT – YUKON GOVERNMENT

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

1.0 USE OF REPORT AND OWNERSHIP

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

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

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of the Yukon Government, the Client, or Tetra Tech EBA. It is acknowledged that the Yukon Government, the Client, may reproduce the report freely for internal usage.

2.0 ALTERNATE REPORT FORMAT

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

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

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

3.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, Tetra Tech EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

4.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods 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. Tetra Tech EBA 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.

5.0 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.

6.0 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 historic environment. Tetra Tech EBA 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 investigation and review may be necessary.

7.0 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.

8.0 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.

9.0 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and 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 are known.

10.0 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as 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.

11.0 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 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.

12.0 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses 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 assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

13.0 SAMPLES

Tetra Tech EBA 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.

14.0 INFORMATION PROVIDED TO TETRA TECH EBA BY OTHERS

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

APPENDIX B

HISTORIC BOREHOLE LOGS AND LABORATORY TEST RESULTS

Project No. V72016--

RECORD OF BOREHOLE 1 (T-1)

LOCATION (See Figure 2)
BOREHOLE TYPE
SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN.

BORING DATE April 4, 1978
BOREHOLE DIAMETER 6 in.
DATUM

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P — W — W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
1386.6'								
0.0'	WASTE ROCK -argillite - dry - grey - some asbestos fibres							
1370.6'								
16.0'	WASTE ROCK -argillite - dry - brownish grey - very fibrous.							
1364.6'								
22.0'	WASTE ROCK -argillite with some serpentine - dry to damp -grey to brown to green - some asbestos fibres							
	Original Ground Surface							
1323.6'	ORGANICS - dark brown - moss, leaves etc. - ice chips							
63.0'								
65.0'	ARGILLITE - weathered - moist - grey brown - ice chips							
1306.6'								
82.0'	ARGILLITE - weathered - grey (brownish) - wet - ice chips							
1296.6'								
90.0'	End of Hole							Thermistor cable installed to 90' (9 units at 5' intervals)

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EDF

Project No. 77016

RECORD OF BOREHOLE 2 (T-2)

LOCATION (See Figure 2) BORING DATE April 5, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6 in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
1398.1'								
0.0'	WASTE Rock - argillite - dark grey - damp							
1386.1'								
12.0'			1	DO				
			2	"				
	WASTE ROCK - argillite - dark grey - damp							
			3	"				
1333.1'	Original Ground Surface							
65.0'	ORGANICS - dark brown							
66.0'			4	"				
	ARGILLITE - dark grey - weathered - ice chips							
1308.1'								
90.0'	End of Hole							Thermistor cable installed to 90 ft. (9 units at 5 ft. interval)

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EBF

RECORD OF BOREHOLE 3

Project No. V77016

LOCATION (See Figure 2)
BOREHOLE TYPE
SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN.

BORING DATE April 6, 1978
BOREHOLE DIAMETER 6 in.
DATUM

SOIL PROFILE								PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	
0.0'	WASTE ROCK -argillite -dry -dark grey							
8.0'	WASTE ROCK -argillite -damp		1	D.O.				
			2	"				
52.0'	End of Hole							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D
CHECKED EBE

Project No. V77016

RECORD OF BOREHOLE 4 (T-3)

LOCATION (See Figure 2) BORING DATE April 7, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6 in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE								PIEZOMETER OR STANDPIPE INSTALLATION
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	ADDITIONAL LAB. TESTING
1559.9' 0.0'	WASTE ROCK - orgillite - dry - grey							
1541.9' 18.0'	Original Ground Surface) ARGILLITE - damp - dark grey - original rock		1	0.0.				Thermistor cable installed to 55ft. (9 units at 5' intervals)
1504.9' 55.0'	End of Hole							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EBF

Project No. V77016

RECORD OF BOREHOLE 5

LOCATION (See Figure 2)

BOREHOLE TYPE

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN.

BORING DATE April 8, 1978

BOREHOLE DIAMETER 6 in.

DATUM

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
0.0'	WASTE ROCK - argillite - dry to damp - grey							
80.0'	End of Hole (hole collapsed at 80ft.)							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EBF

Project No. 77016

RECORD OF BOREHOLE 6 (T-4)

LOCATION (See Figure 2)

BOREHOLE TYPE

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN.

BORING DATE April 10, 1978

BOREHOLE DIAMETER 6 in.

DATUM

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
0.0'	WASTE ROCK - argillite - dark grey - dry - some asbestos fibre							
25.0'	WASTE ROCK - argillite - dark grey - damp							
50.0'	WASTE ROCK - argillite - wet - free water running into hole at 50.0' - some asbestos fibres - possible original ground surface at approx. 80'.							Thermistor cable installed to 60' (9 units at 5' intervals) Borehole collapsed during installation preventing cable from reaching full depth in bore hole
82.0'	End of Hole							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EDF

Project No. 177016

RECORD OF BOREHOLE 7 (P-4)

LOCATION (See Figure 2) BORING DATE April 10, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6 in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE								PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	
1304.6'	WASTE ROCK - orgillite - dry - dark grey - damp at 40'							
1241.6' / 63.0'	End of Hole							Piezometer el. 1245.17'

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EDF

Project No. V77016--

RECORD OF BOREHOLE 8 (P-5)

LOCATION (See Figure 2)
BORING DATE April 10, 1978
BOREHOLE TYPE
BOREHOLE DIAMETER 6 in.
SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN.
DATUM

SOIL PROFILE									
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
1271.5' 0.0'	WASTE ROCK - argillite - dry - dark grey							
1241.5' 30.0'	ARGILLITE - dark grey - damp. ARGILLITE bedrock-weathered							
1202.5' 69.0'	End of Hole							Piezometer el. 1202.76'

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EBE

Project No. 177016--

RECORD OF BOREHOLE 9 (P-3)

LOCATION (See Figure 2) BORING DATE April 11, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6 in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE		STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
ELEV. / DEPTH	DESCRIPTION							
1364.3'	WASTE ROCK - orgillite - dry to damp - dark grey - moist at 45.0'							Piezometer el. 1314.19'
1301.3' / 66.0'	End of Hole							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EBF

Project No. 117016

RECORD OF BOREHOLE 10 (P-2)

LOCATION (See Figure 2)
BOREHOLE TYPE
SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN.

BORING DATE April 11, 1978
BOREHOLE DIAMETER 6 in.
DATUM

SOIL PROFILE									
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P — W — W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
1368.0' / 0.0'	WASTE ROCK - argillite - dry to damp - dark grey							
1330.0' / 42.0'	End of Hole							Piezometer, el. 1329.43'

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D
CHECKED EDF

Project No. 77016

RECORD OF BOREHOLE 11 (P-1)

LOCATION (See Figure 2) BORING DATE April 11, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE									
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
1363.0' / 0.0'	WASTE ROCK - argillite - dry to damp - dark grey							Piezometer el. 1321.95'
1345.0' / 38.0'	End of Hole							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED

Project No. V77016

RECORD OF BOREHOLE 12 (T-5)

LOCATION (See Figure 6)
BORING DATE May 9, 1978
BOREHOLE TYPE
BOREHOLE DIAMETER 6 in.
SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN.
DATUM

SOIL PROFILE									
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L (10 20 30 40)	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
19452' / 0.0'	Surface of Tailing Pile							
1911.7' / 33.5'	Tails						⊙	
1891.2' / 54.0'	Compact, light brown, sub-rounded, fine to med. GRAVEL with clay, silt and sand - fluvial lacustrine traces of organics at bottom of tails		1 2					Thermistor cable installed to 54 ft. (9 units at 5' intervals)
	End of Hole							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.O.
CHECKED EBF

Project No. 77016-

RECORD OF BOREHOLE 13 (T-6)

LOCATION (See Figure 6)
BOREHOLE TYPE
SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN.

BORING DATE May 9, 1978
BOREHOLE DIAMETER 6 in.
DATUM

SOIL PROFILE									
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L 10 20 30 40	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
1880.6' 0.0'	Ground Surface in Roadway Cut							
	Frozen, light brown sub-rounded fine to med. GRAVEL with clay, silt & sand fluvial lacustrines		1, 2, 3, 4				⊙ ⊙ ⊙	Thermistor cable installed to 40 ft. (9 units at 5' intervals)
1840.6' 40.0'	End of Hole							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D
CHECKED E.B.F

Project No. 177016

RECORD OF BOREHOLE 14 (T-7)

LOCATION (See Figure 6)
BOREHOLE TYPE
SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN.

BORING DATE May 10, 1978
BOREHOLE DIAMETER 6 in.
DATUM

SOIL PROFILE									
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L		PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
1741.0	Surface of Tailing Pile								
0.0'	Tails								
1696.0'									
45.0'	-Frozen - ice crystals - light brown - sub-rounded - fine to med. GRAVEL with clay, silt & sand. - fluvial - lacustrine		1 2				o		Thermistor cable installed to 74ft. (9 units at 5' intervals)
1667.0'									
74.0'	End of Hole								

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN RD
CHECKED EBE

Project No. 77016

RECORD OF BOREHOLE 15 (ST-8)

LOCATION (See Figure 6) BORING DATE May 11, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6 in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE									PIEZOMETER OR STANDPIPE INSTALLATION
ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L (10 20 30 40)		ADDITIONAL LAB. TESTING
1607.2'	Ground Surface in Road Cut								
0.0' 1607	- Frozen - light brown - sub rounded - fine to med. GRAVEL with clay silt & sand - fluvial lacustrines		1				⊙		
	- Frozen - black - ARGILLITE weathered bedrock		2				⊙		
1567.2									
40.0'	End of Hole								

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EBF

Project No. 177016

RECORD OF BOREHOLE 16 (T-8)

LOCATION (See Figure 6) BORING DATE May 12, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6 in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L (10 20 30 40)	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
1623.8 0.0'	Surface of Tailing Pile							
	Tails							
1560.8 63.0'	- light brown - sub-rounded - fine to med. GRAVEL with clay silt & sand. fluvial lacustrine		1				⊙	
1540.8 83.0'	End of Hole							Thermistor cable installed to 83.0 ft. (9 units at 5' intervals)

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EBF

Project No. 127016

RECORD OF BOREHOLE 17 (D.S.-2)

LOCATION (See Figure 6) BORING DATE May 16, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6 in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
0.0'	Frozen dark brown organic silty SAND							
3.0'	Frozen dark brown PEAT							
5.0'	Frozen, light brown, sub-rounded, fine to med. GRAVEL with clay, silt & Sand (fluvial Lacustrine)							
7.0'	ARGILLITE - hard, dry unweathered							
19.0'	SERPENTINE, weathered frozen							
21.0'	ARGILLITE BEDROCK soft, weathered, frozen		1					
46.0'	ARGILLITE BEDROCK unweathered, frozen		2					
57.0'	End of Hole							

VERTICAL SCALE 1 inch to 20 feet

Golder Associates

DRAWN

RECORD OF BOREHOLE 18 (D.S-5)

Project No. V77016

LOCATION (See Figure 6) BORING DATE May 17, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6 in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE		STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
ELEV. / DEPTH	DESCRIPTION							
0.0'	Frozen, dark brown, organic silty, SAND.							
8.0'	Frozen, light brown, sub-rounded, fine to med. GRAVEL with clay, silt & sand (fluvial lacustrian)		1					
19.0'	ARGILLITE frozen, weathered (ice lens approx. 3in. thick recovered with sample)		2					
37.0'	ARGILLITE - frozen, becoming harder with depth, unweathered		3 4					
60.0'	End of Hole							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EBF

Project No. 77216

RECORD OF BOREHOLE 19(D-S-6)

LOCATION (See Figure 6) BORING DATE May 18, 1978

BOREHOLE TYPE BOREHOLE DIAMETER 6 in.

SAMPLER HAMMER WEIGHT 140 LB. DROP 30 IN. DATUM

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE NUMBER	SAMPLE TYPE	BLOWS / FOOT	ELEVATION SCALE	WATER CONTENT PERCENT W_P W W_L	PIEZOMETER OR STANDPIPE INSTALLATION / ADDITIONAL LAB. TESTING
0.0'	Frozen, light brown sub-rounded, fine to medium GRAVEL with clay, silt & sand (alluvial)							
7.0'	Frozen silt with layers of fibrous peat							
	Frozen, light brown sub-rounded, fine to medium GRAVEL with clay, silt and sand (fluvial lacustrine		-1-					
17.0'								
20.0'	ARGILLITE frozen, weathered		-2-					
32.0'	ARGILLITE - frozen becoming harder with depth, unweathered		-3-					
60.0'	End of Hole							

VERTICAL SCALE
1 inch to 20 feet

Golder Associates

DRAWN R.D.
CHECKED EBF

TABLE 5.4.1

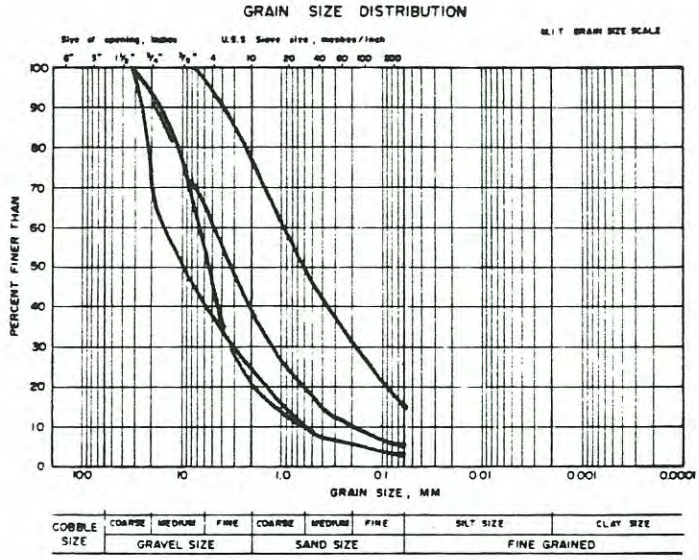
Shear Summary of Laboratory Direct Shear Tests

LOCATION	DEPTH	SOIL TYPE	NATURAL MOISTURE CONTENT W (%)	MOISTURE CONTENT BEFORE TEST	MOISTURE CONTENT AFTER TEST	EFFECTIVE ANGLE OF INTERNAL FRICTION Ø'
		Mill Tailings	1.9	1.9	1.9	35° - 45°
BH 13 (T-6)	15' - 20'	Fluvial Lacustrine Gravel	40.6	21.8	18.2	29°
BH 13 (T-6)	32' - 34'	Fluvial Lacustrine Gravel	32.9			27.5°
BH 14 (T-7)	46' - 48'	Fluvial Lacustrine Gravel	19.5	16.3	11.8	32°
BH 16 (T-8)	66' - 68'	Fluvial Lacustrine Gravel	13.5	13.4	13.0	27.5° - 32.5°
BH 15 (ST-8)	6' - 9'	Weatherd Argillite	5.2	15.8	12.9	26°
BH 15 (ST-8)	20' - 21'	Weathered Argillite	11.4	13.6	13.0	27°

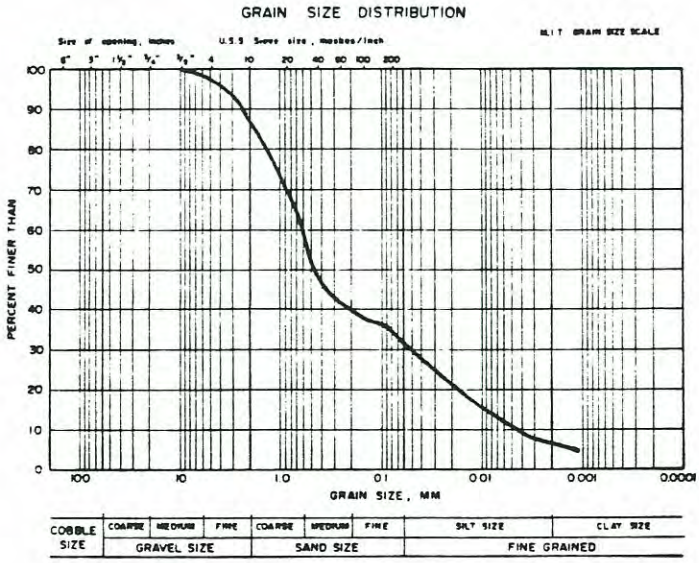
Golder Associates

GRAIN SIZE DISTRIBUTION

Figure B - 1



Borehole No. _____
Location CLINTON WASTE DUMP
Sample No. _____
Depth _____
Soil Type WASTE ROCK FROM CLINTON DUMP

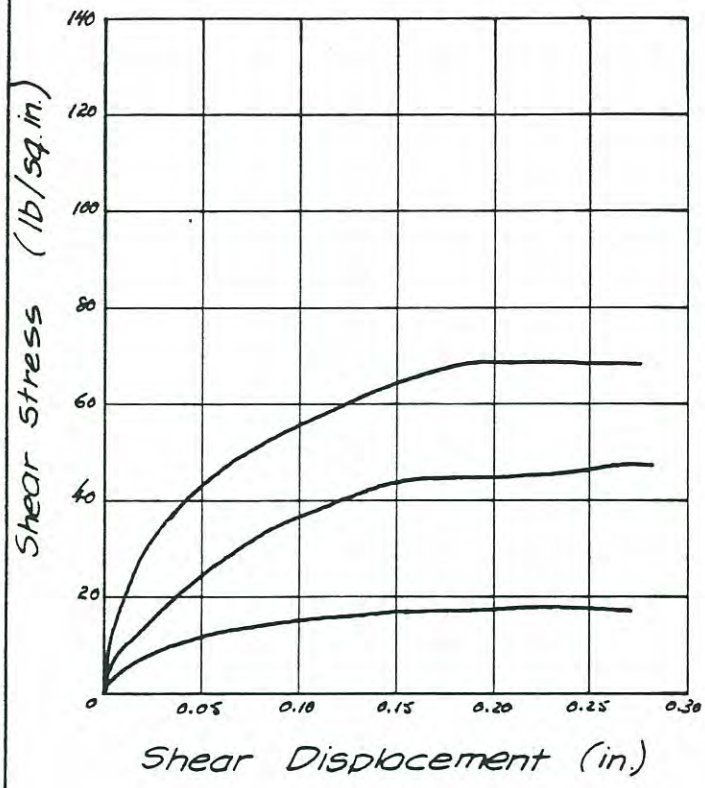


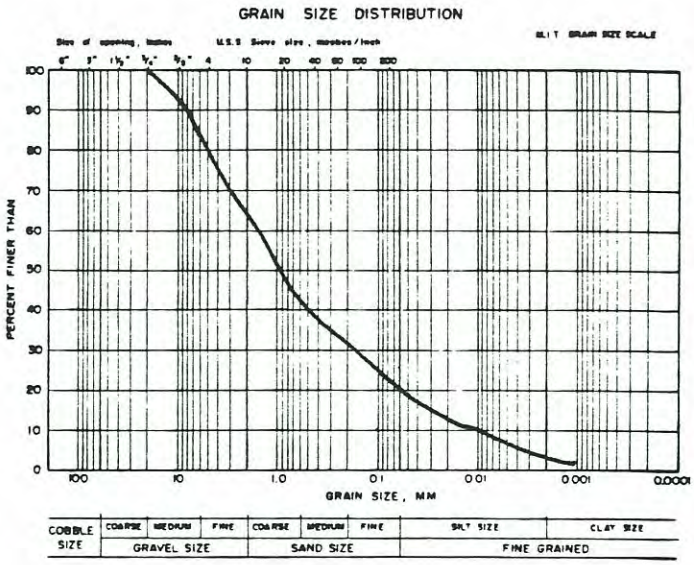
Borehole No. 12 (T-5)
Location TAILING PILE
Sample No. 1
Depth 36.5' - 39'
Soil Type FLUVIAL LACUSTRINE GRAVEL

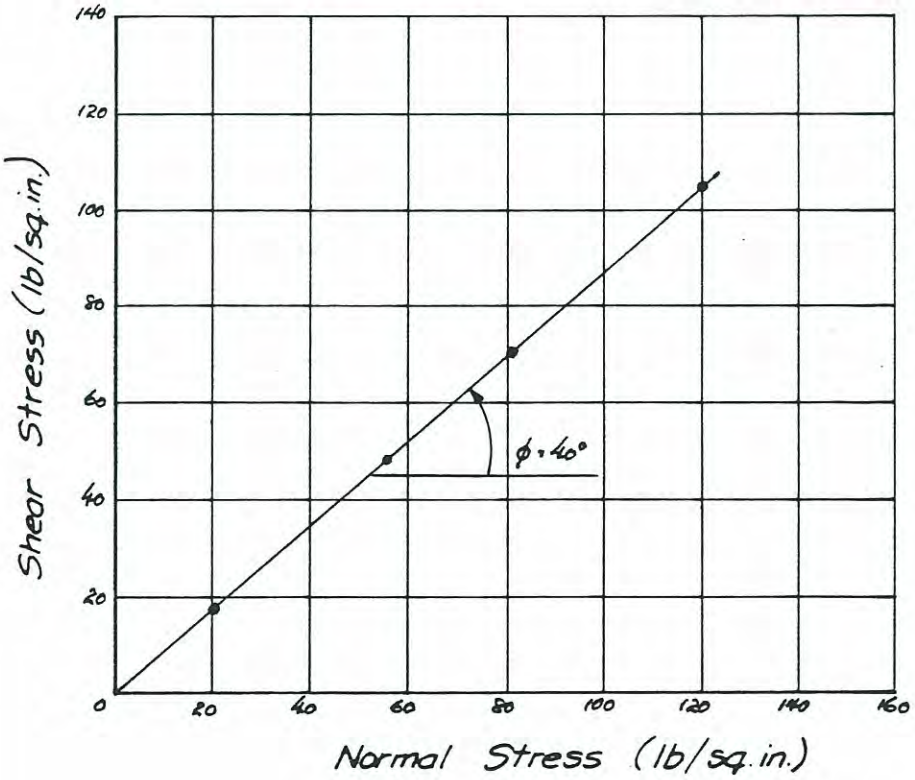
Project No. V77016 Drawn R.D. Reviewed EBF Date JUNE '78

GRAIN SIZE DISTRIBUTION & DIRECT SHEAR TEST RESULTS

Figure B - 2





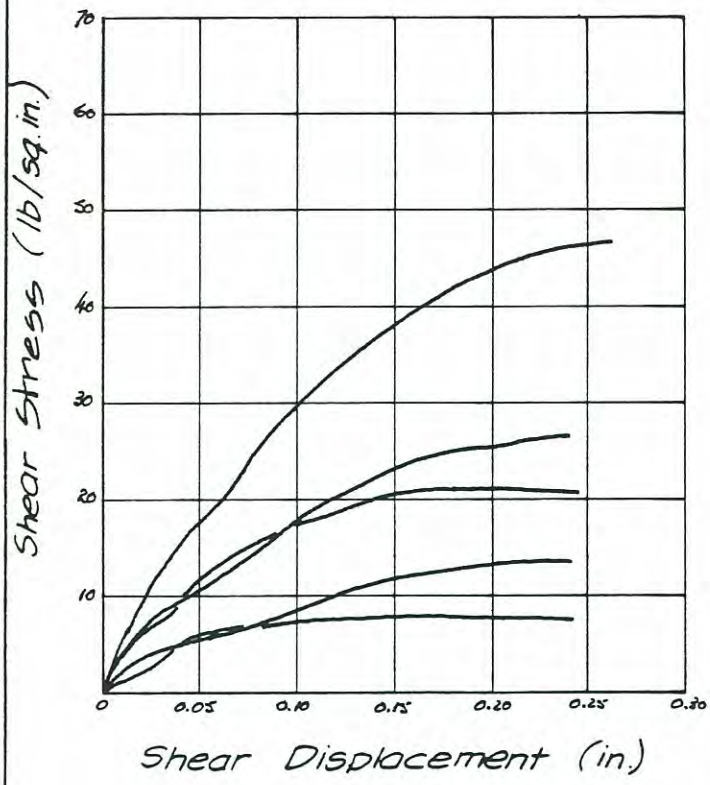


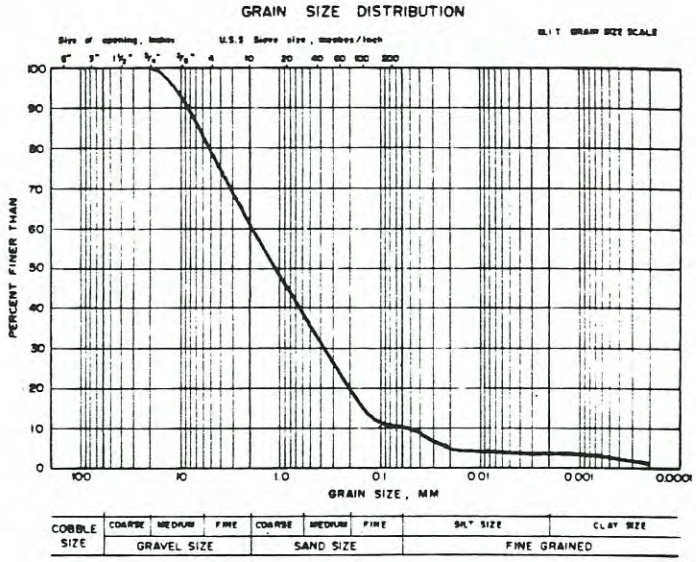
Borehole No. _____
Location CLINTON WASTE DUMP
Sample No. _____
Depth _____
Soil Type Weathered Argillite Bedrock

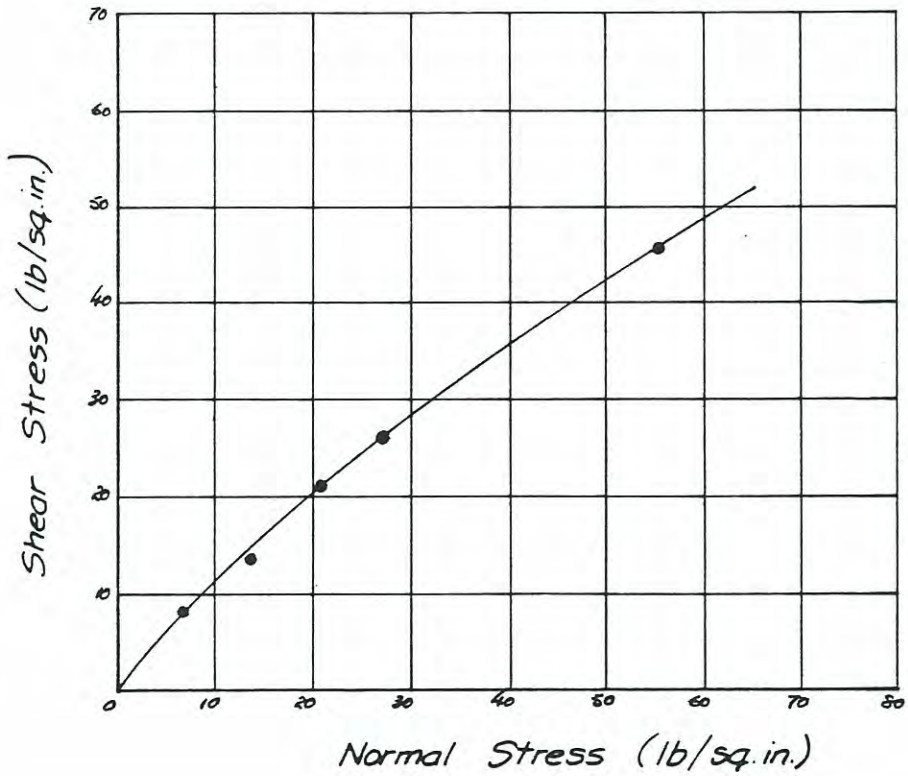
Project No. V77016 Drawn R.D. Reviewed EBF Date June '78

GRAIN SIZE DISTRIBUTION & DIRECT SHEAR TEST RESULTS

Figure B - 3





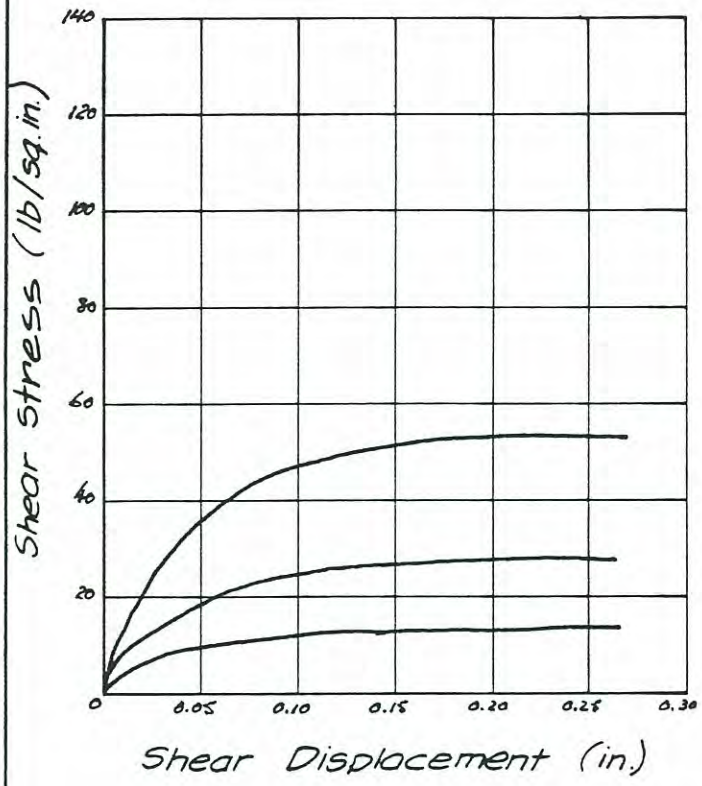


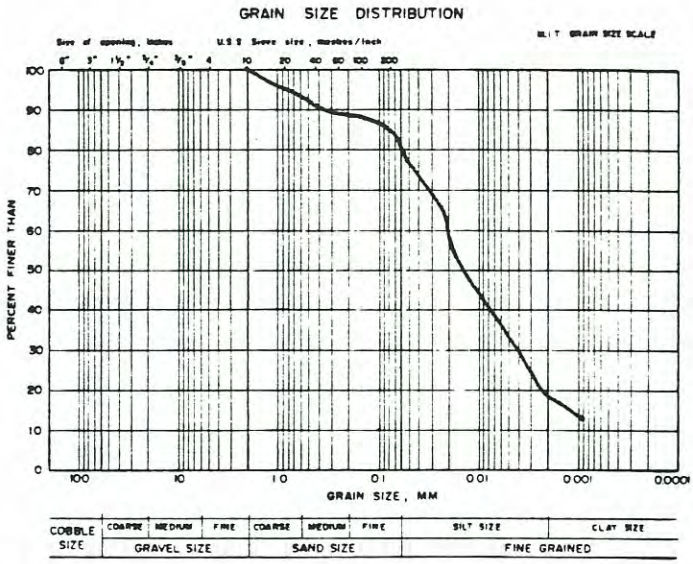
Borehole No. _____
Location _____
Sample No. _____
Depth _____
Soil Type MILL TAILINGS
_____

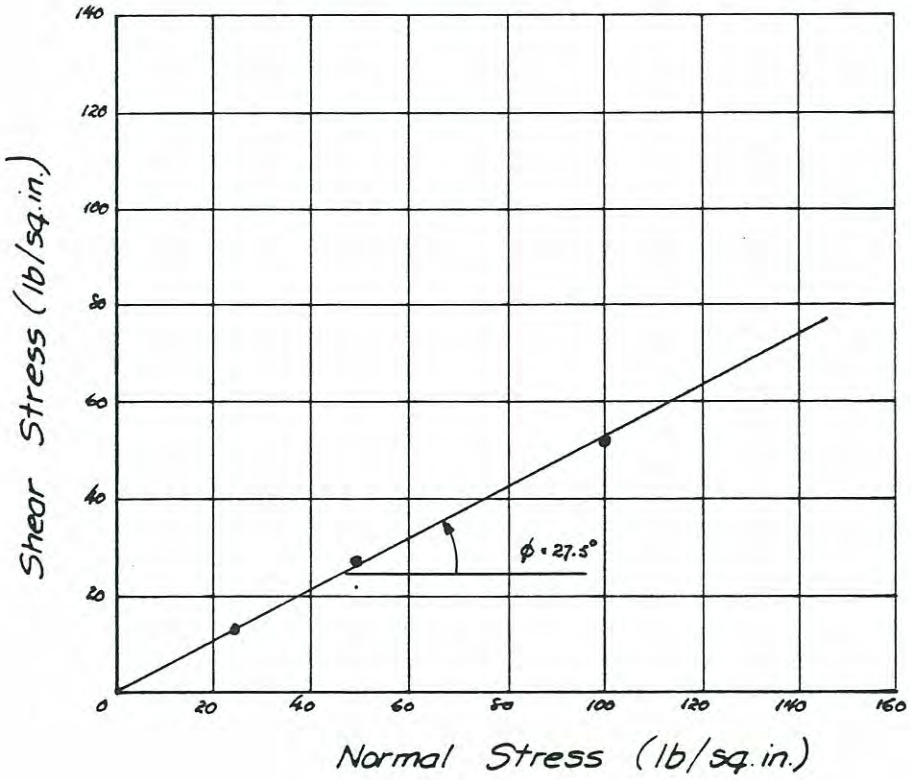
Project No. V77016 Drawn RD Reviewed EBF Date June '78

GRAIN SIZE DISTRIBUTION & DIRECT SHEAR TEST RESULTS

Figure B - 4





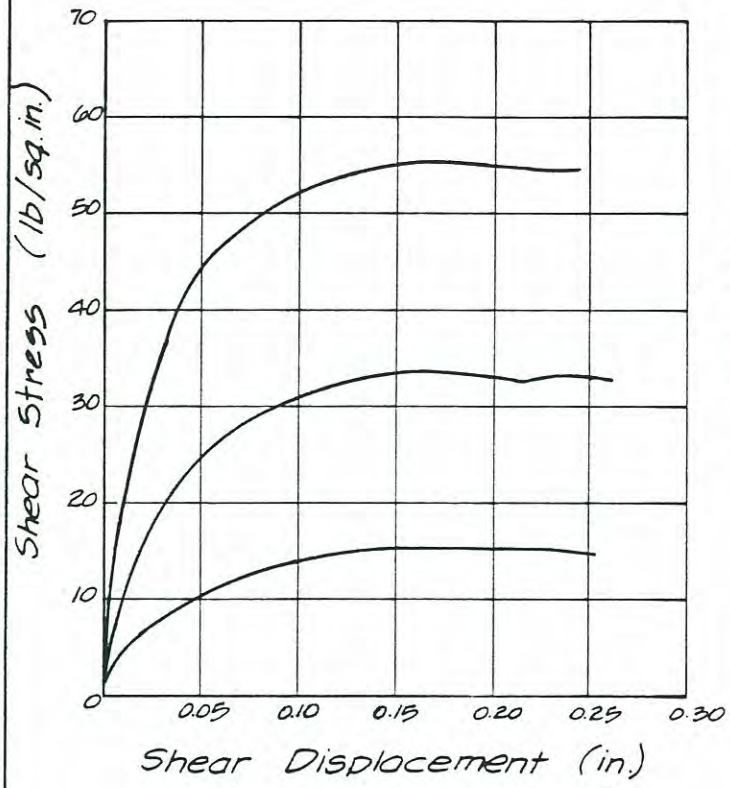


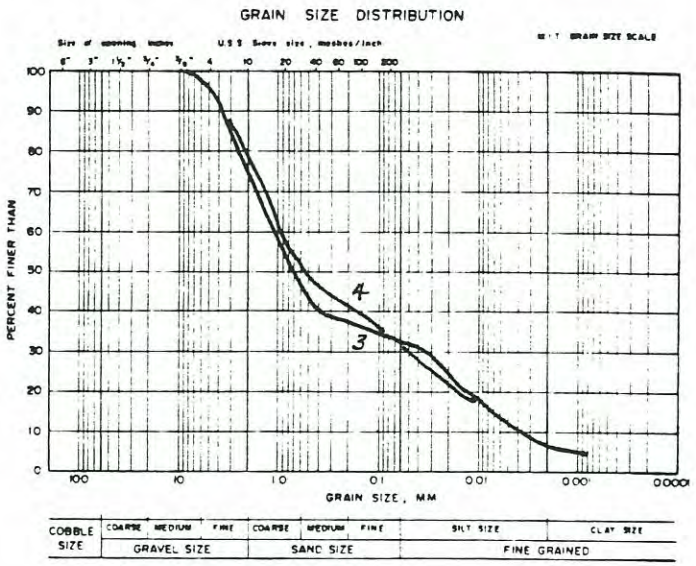
Borehole No. 13 (T-6)
Location NORTH OF TAILING PILE
Sample No. 2
Depth 15'-20'
Soil Type FLUVIAL-LACUSTRINE GRAVEL

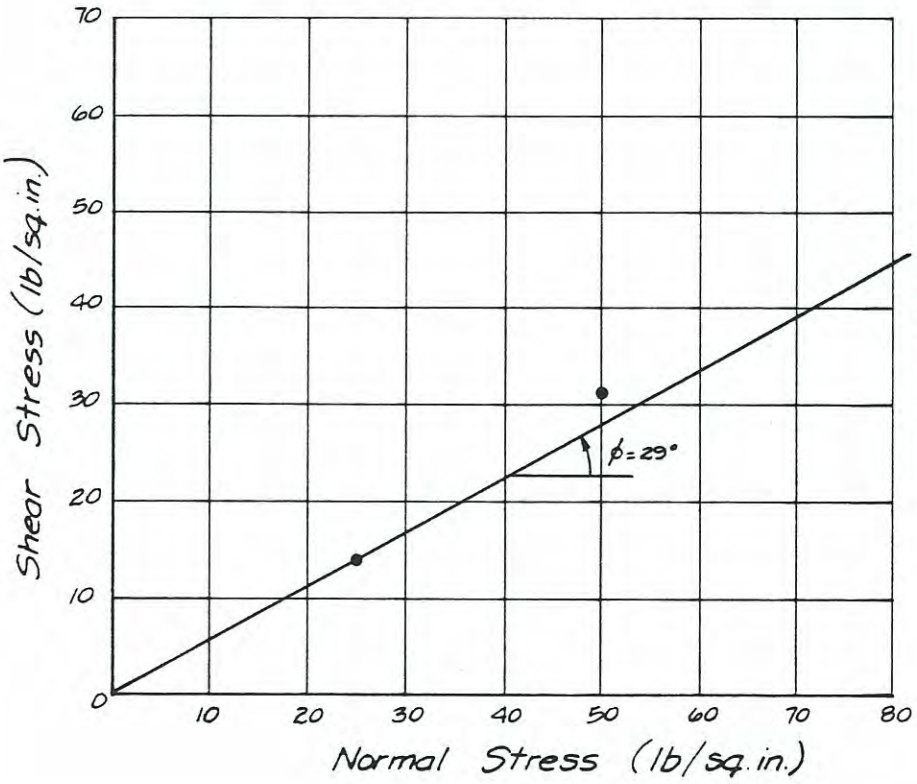
Project No. V77016 Drawn R.D. Reviewed E.B.F. Date June '78

GRAIN SIZE DISTRIBUTION & DIRECT SHEAR TEST RESULTS

Figure B - 5





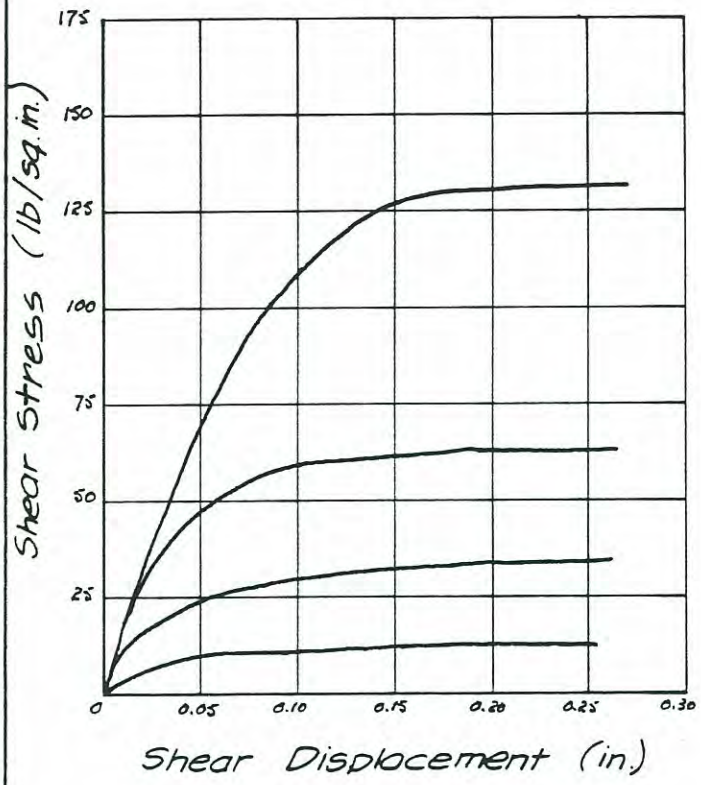


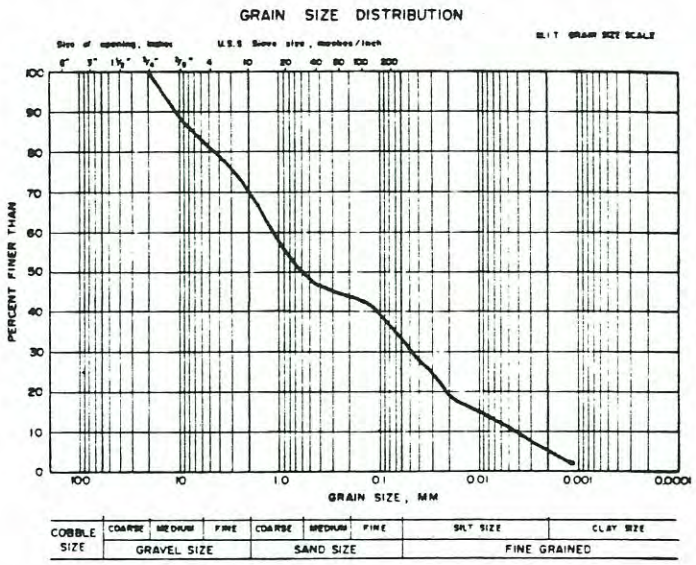
Borehole No. 13 (T-6)
Location NORTH OF TAILING PILE
Sample No. 3 & 4
Depth 23-25' & 32-34'
Soil Type FLUVIAL-LACUSTRINE GRAVEL

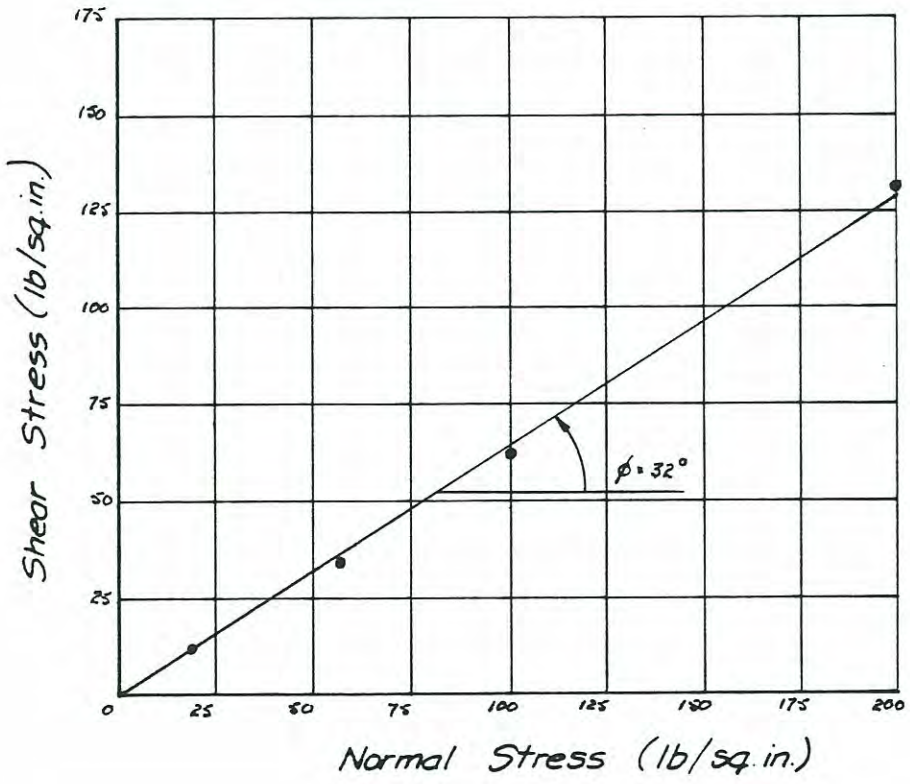
Project No. V77016 Drawn R.D. Reviewed EBF Date June '78

GRAIN SIZE DISTRIBUTION & DIRECT SHEAR TEST RESULTS

Figure B - 6





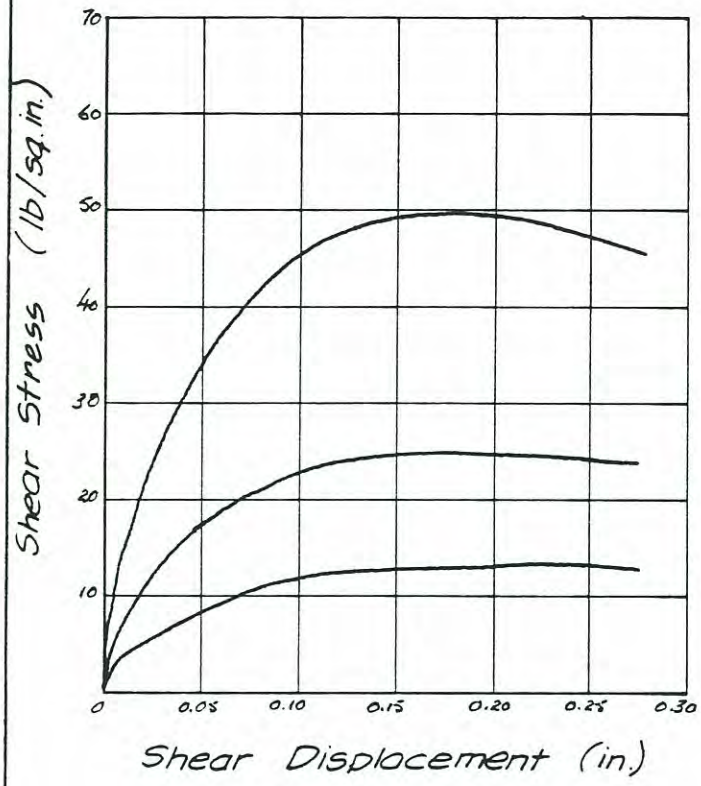


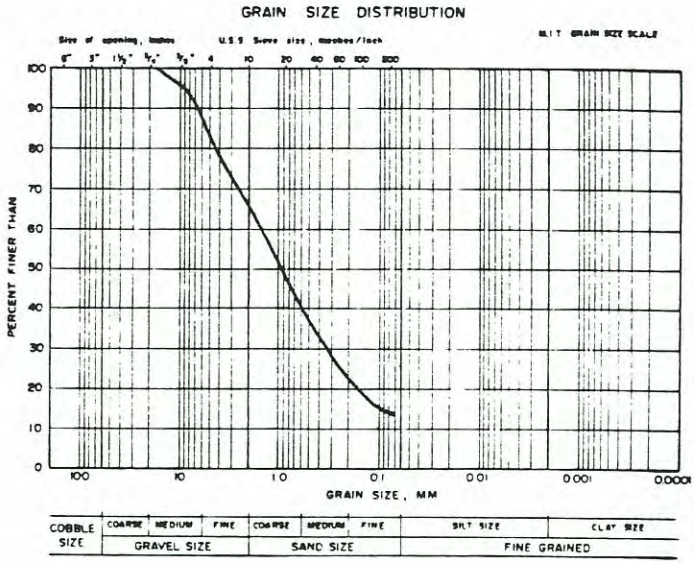
Borehole No. 14 (T-7)
Location TAILING PILE
Sample No. 1
Depth 46'-48'
Soil Type FLUVIAL-LACUSTRINE GRAVEL

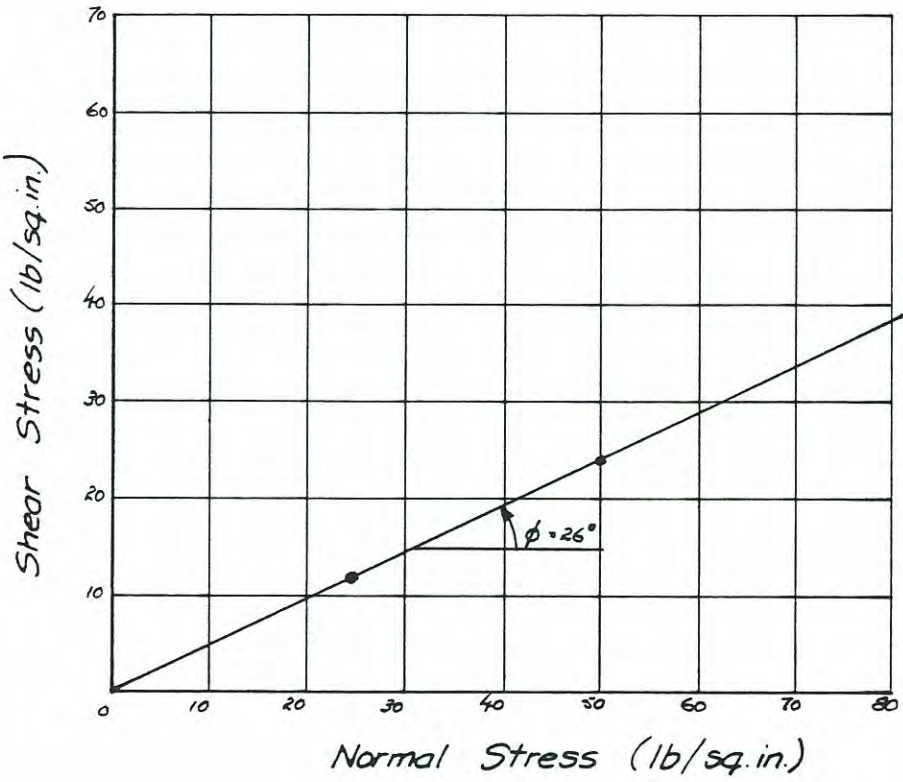
Project No. V77016 Drawn R.D. Reviewed E.B.F. Date June '78

GRAIN SIZE DISTRIBUTION & DIRECT SHEAR TEST RESULTS

Figure B - 7





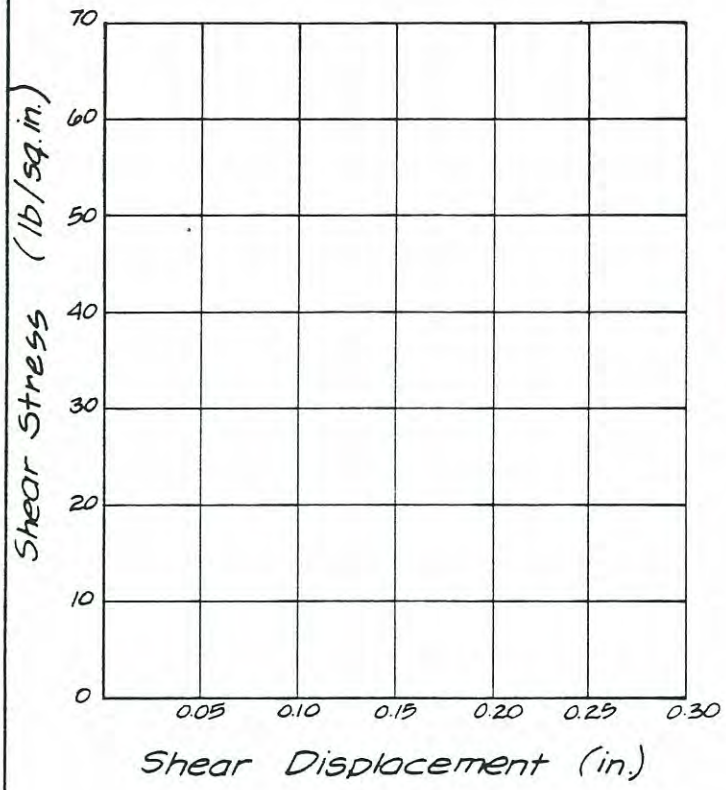


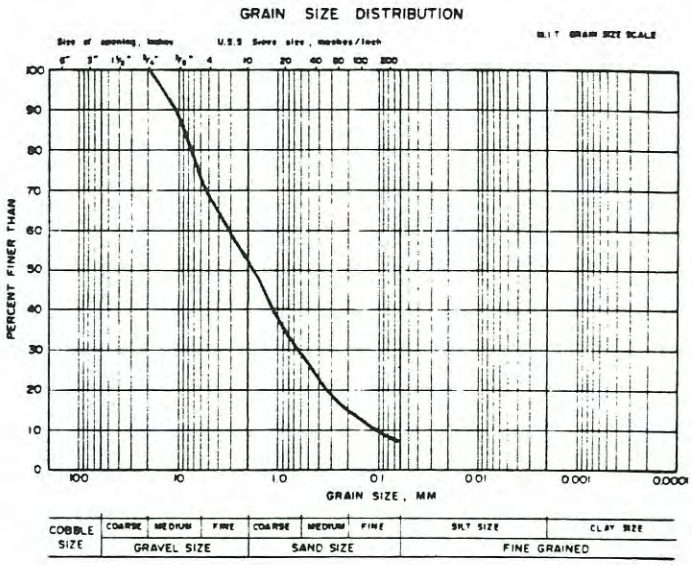
Borehole No. 15 (ST-8)
Location TAILING PILE
Sample No. 1
Depth 6'-9'
Soil Type WEATHERED ARGILLITE

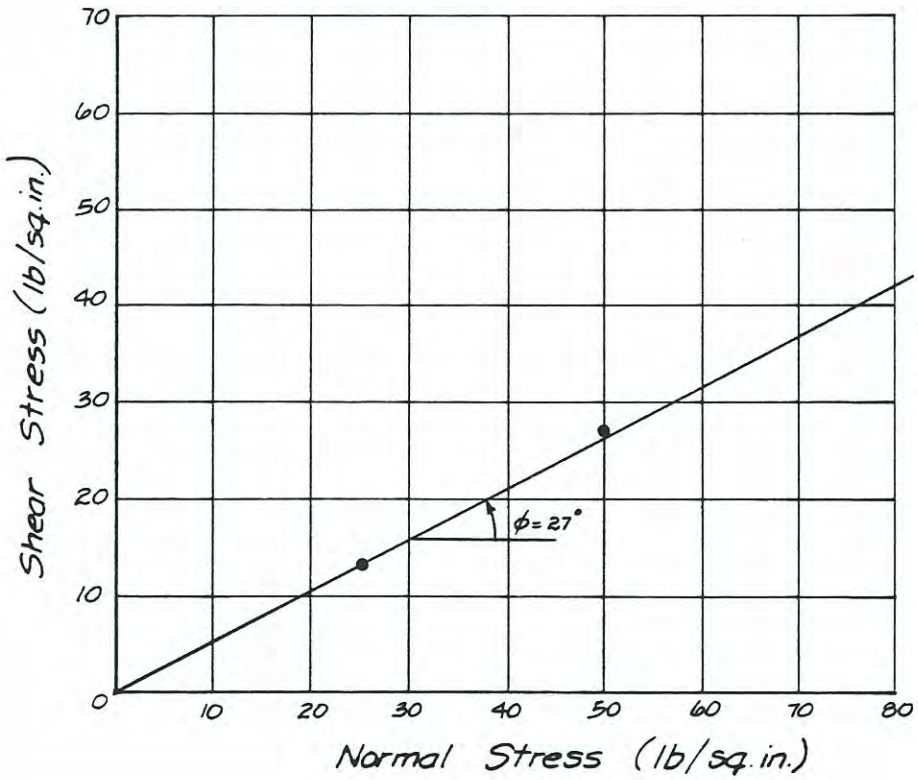
Project No. V77016 Drawn R.D. Reviewed EBF Date June '78.

GRAIN SIZE DISTRIBUTION & DIRECT SHEAR TEST RESULTS

Figure B - 8





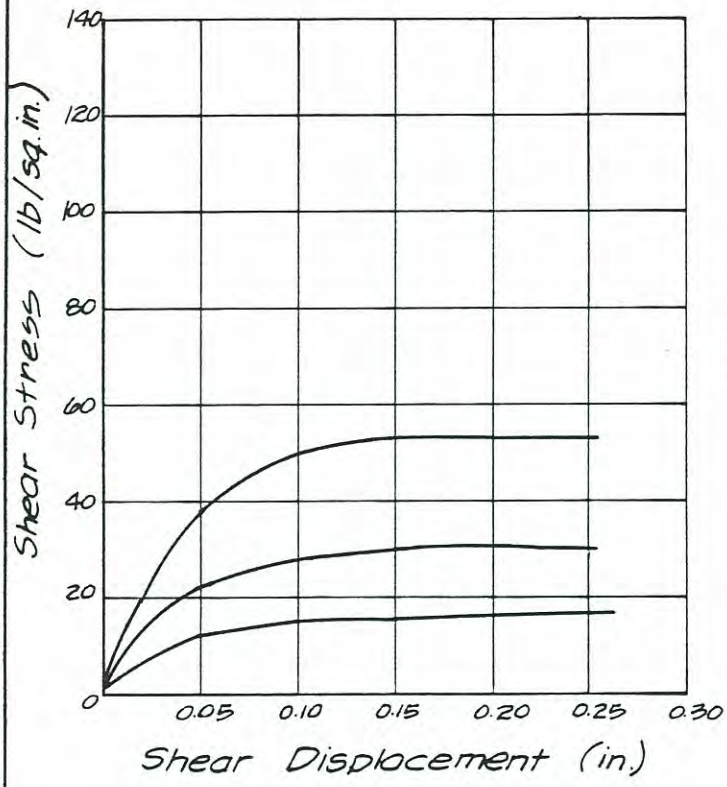


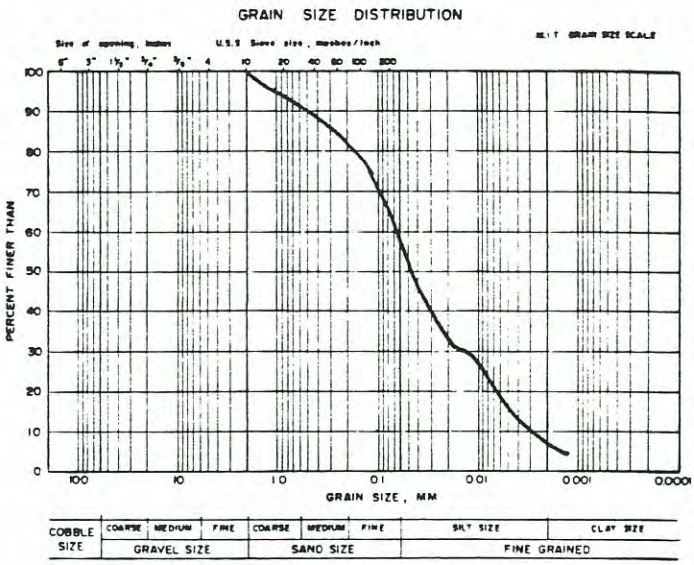
Borehole No. 15
Location TAILING PILE
Sample No. 2
Depth 20'-21'
Soil Type WEATHERED ARGILLITE

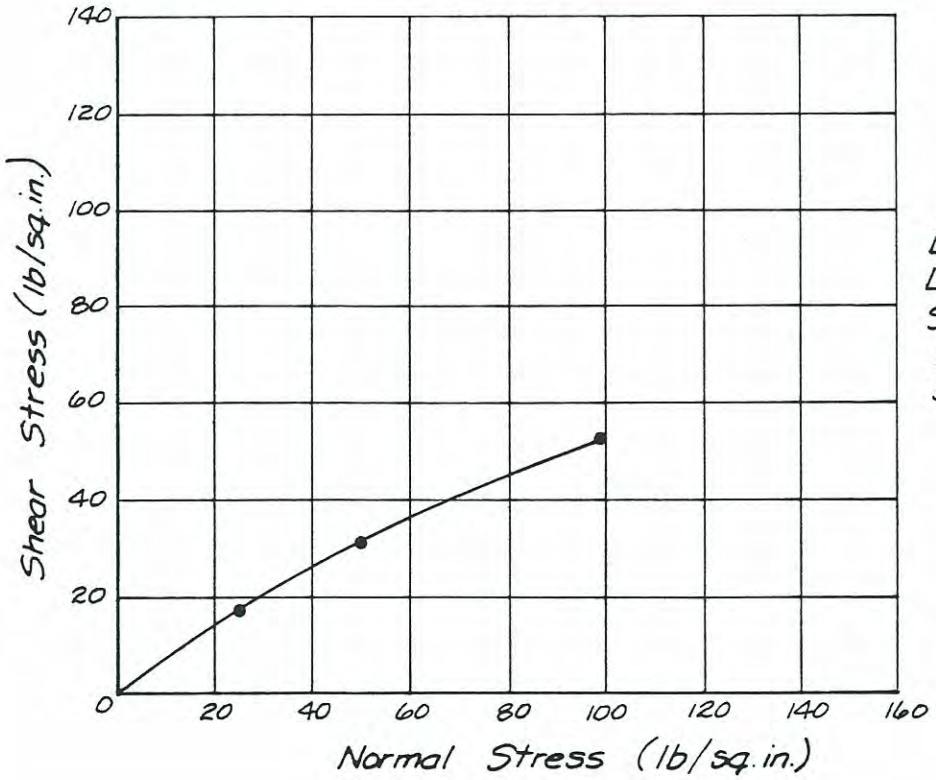
Project No. V77016 Drawn R.D. Reviewed EBF Date June '78

GRAIN SIZE DISTRIBUTION & DIRECT SHEAR TEST RESULTS

Figure B - 9







Borehole No. 16(T-8)
Location TAILING PILE
Sample No. 1
Depth 66'-68'
Soil Type FLUVIAL - LACUSTRINE GRAVEL

Project No. V77016 Drawn R.D. Reviewed EBF Date June '78

TEST PROCEDURES AND RESULTS

Moisture content, Atterberg Limits and grain size distribution test results are shown on Plates 1 and 2. Moisture content is the ratio of the weight of water contained in a sample to the over-dry sample weight. The moisture content for both material samples is 9.0%.

The plasticity index of a material is the liquid limit minus the plastic limit. The liquid limit of a material is expressed as the water content at which two halves of a soil cake will flow together for a distance of 0.5 in. (12.7 mm) along the bottom of the groove separating the two halves under specified mechanically induced vibrations.

The plastic limit of a material is the lowest moisture content at which the material can be rolled into threads 0.125 in. (3.175 mm) in diameter without the threads breaking into pieces.

The plasticity index for the overburden material is 8.6. The liquid limit and plastic limit is 27.3 and 18.7 respectively. According to the Modified Unified Classification System for Soils the remolded material exhibits characteristics of a low plastic inorganic sandy clay.

Grain size distribution is calculated from two methods as described below. The distribution of particle sizes larger than 0.375 in. (9.525 mm) is determined by standard sieving while the distribution of particle sizes smaller than 0.375 in. (9.525 mm) is determined by a sedimentation process, using a hydrometer. The resulting grain size curves show that the overburden sample is composed of particles corresponding to 52.5% sand size, 31.5% silt size and 16% clay size. This material breaks down rapidly by slaking. These results cannot be considered representative of the mass but only of the sample tested for strength properties. The tailings material contains 59% sand sized particles, 34% gravel sizes and 7% fine sizes. This material (predominately serpentine) is the most stable of the overburden wastes and is therefore more representative of the mass of tailings.

Direct shear strength tests were conducted on both remolded samples. The results including visual descriptions and shear stress versus horizontal displacement and shear stress versus normal stress curves are shown on Plates 3 and 4. The tests were oriented towards determining the residual shear characteristics of the materials and thus peak shear properties are only approximate.

Preparation for direct shear testing involved trimming the specimen to tightly fit a 2.36 in. (60.0 mm) square box. The shear apparatus was then mounted in the shear testing machine, submerged, and the specimen consolidated under a normal load.

The testing procedure is detailed below. The specimen was initially sheared forward until 0.3 in. (7.6 mm) horizontal displacement occurred. The shear motion was then reversed and the specimen was sheared backwards until the horizontal displacement was -0.3 in. (-7.6 mm). Finally, the specimen was sheared forward at a reduced rate until it passed the starting point. The resulting shear stress at zero horizontal displacement indicates the residual shear strength at that normal load.

The tailings material was tested at two normal loads (σ_n = 69 KPa (10 psi) and 207 KPa (30 psi) and the overburden sample at three normal loads {σ_n = 138, 276 and 414 KPa (20, 40 and 60 psi)}. Generally, only one specimen was necessary for all normal loads, however, in one case lifting problems required the preparation of two specimens.

Results indicate the residual angle of shear resistance (ϕ_L) is 30 and 23 degrees for the tailings and

overburden materials respectively.

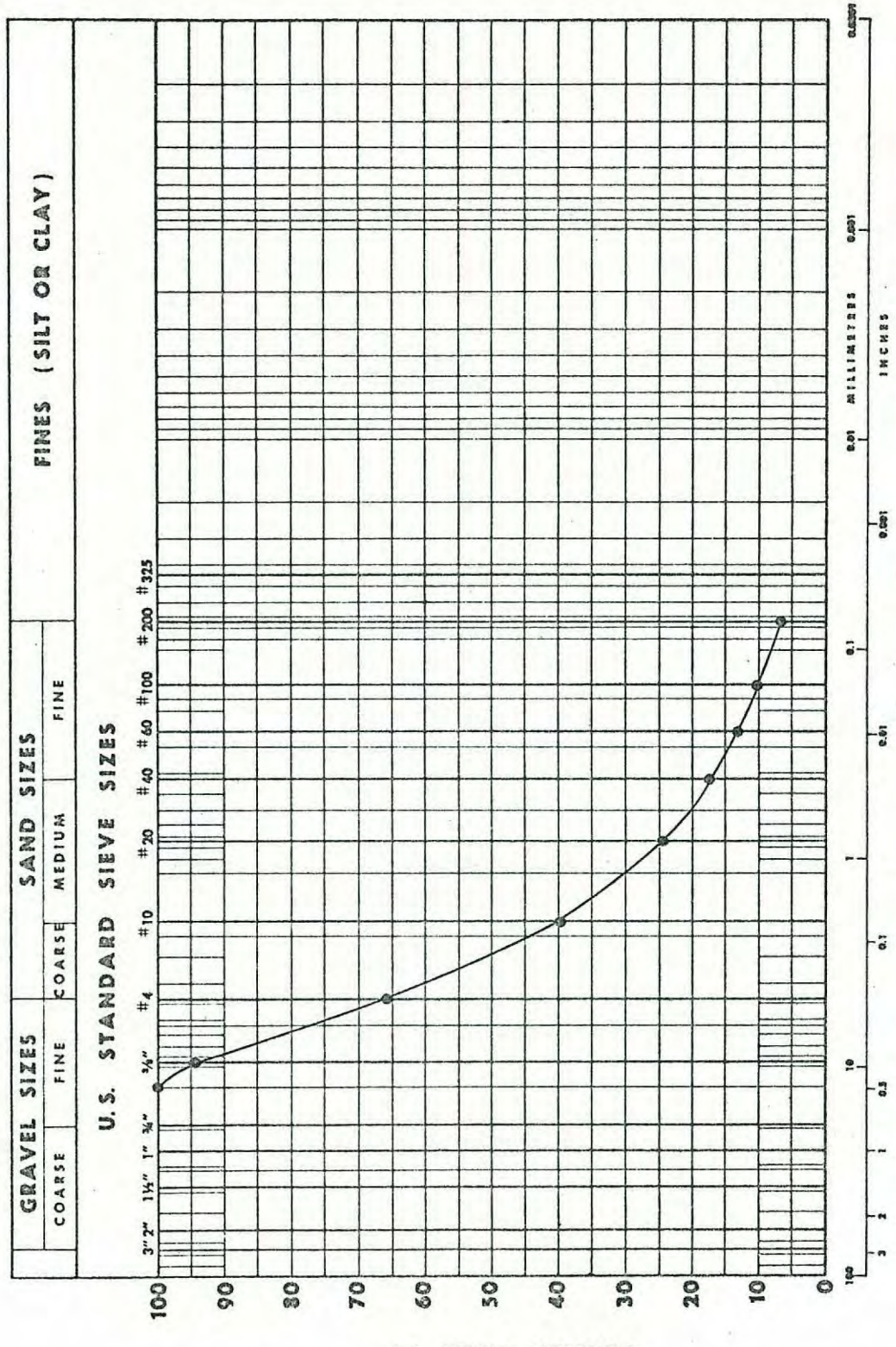
Residual cohesion values are close to zero for both materials. (Cohesion in terms of effective residual strength for these materials is expected to be zero.) Cases where greater than zero cohesion has been obtained may indicate that the pore pressures have not fully dissipated during testing.

The rate of shear varied depending upon the degree of perviousness of the samples, however, it was expected to be slow enough to allow the natural dissipation of increase in pore pressures.

R.M. HARDY & ASSOCIATES LTD.
CONSULTING ENGINEERING & TESTING

GRAIN SIZE CURVE

LAB ORDER NO.	K 3986
CLIENT	Clinton Creek Mine
SAMPLE	#1
SOURCE	Tailings
TECHNICIAN	M.L.
DATE TESTED	10/12/77



REMARKS:

Gravel Size 34%

Sand Size 59%

Fines 7%

Moisture Content 9.0%

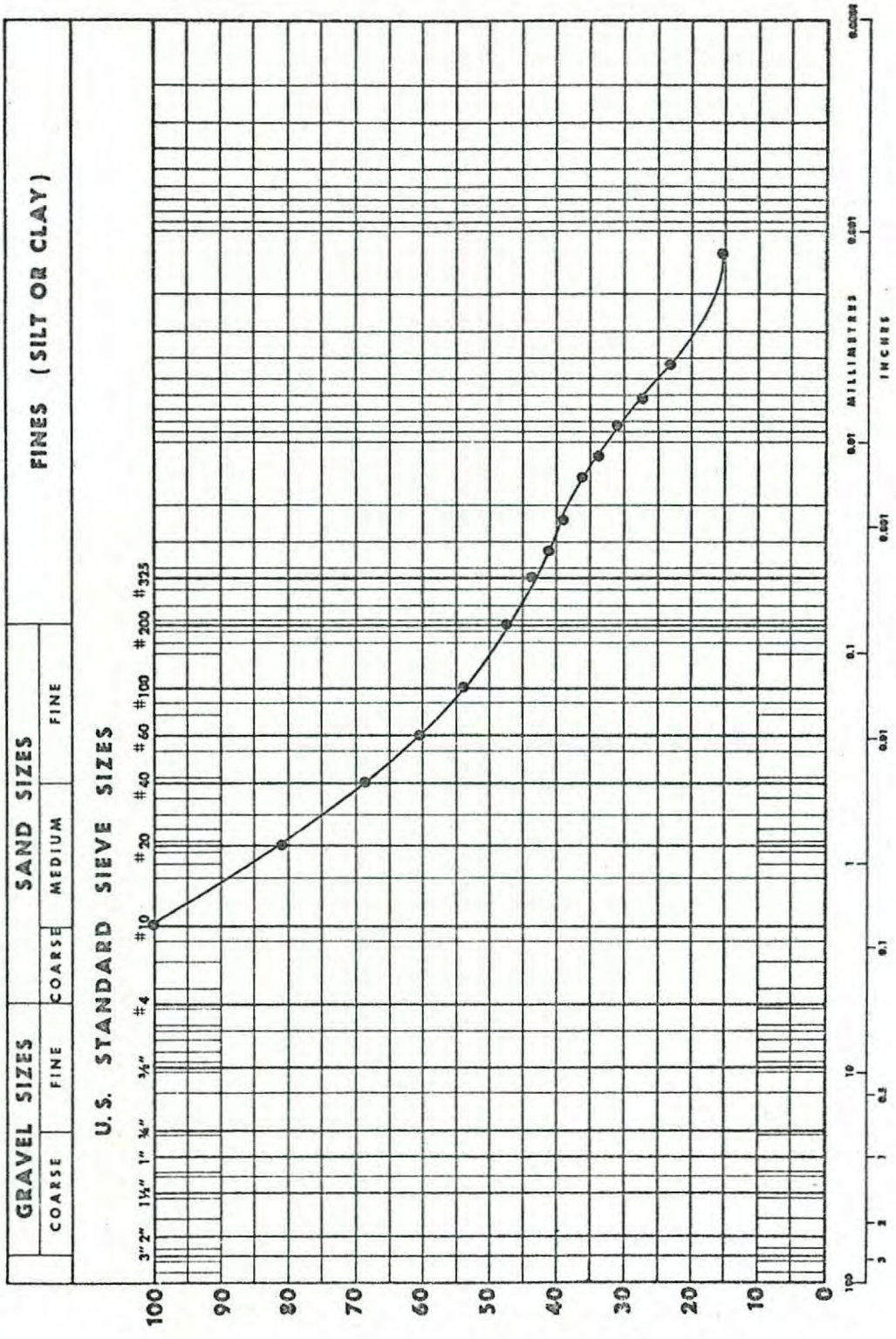
NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

PLATE 1

R.M. HARDY & ASSOCIATES LTD.
CONSULTING ENGINEERING & TESTING

GRAIN SIZE CURVE

LAB ORDER NO.	K 3986
CLIENT	Clinton Creek Mine
SAMPLE	#2
SOURCE	Overburden
TECHNICIAN	M.L.
DATE TESTED	10/12/77



D_{10} = ____ mm.
D_{30} = ____ mm.
D_{60} = ____ mm.
C_u = ____
C_c = ____

GRAIN SIZE

Liquid Limit 27.3 Sand size 52.5%

Plastic Limit 18.7 Silt size 31.5%

Index of Plasticity 8.6 Clay size 16%

Moisture Content 9.0%

REMARKS:

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

PLATE 2

RESULTS OF ANALYSIS - Sediment/Soil

File No. J8625

		CLMS-1S	CLMS-2S	CLMS-3S	CLMS-5S	CLMS-9S
		98 09 12 10:45	98 09 12 11:30	98 09 12 12:10	98 09 12 12:35	98 09 12 16:00
Physical Tests						
Moisture	%	43.4	27.0	9.8	15.5	15.4
pH		8.86	9.08	8.59	7.93	8.43
Total Metals						
Antimony	T-Sb	<100	<100	<100	<40	<80
Arsenic	T-As	74	14	3.2	160	265
Barium	T-Ba	981	207	279	502	228
Beryllium	T-Be	<3	<3	<3	<1	<2
Cadmium	T-Cd	<0.1	<0.1	<0.1	2.0	<0.1
Chromium	T-Cr	1410	1380	1650	771	928
Cobalt	T-Co	103	81	87	60	76
Copper	T-Cu	7	<5	<5	30	<4
Lead	T-Pb	<300	<300	<300	<100	<200
Mercury	T-Hg	0.109	0.018	0.018	0.172	0.409
Molybdenum	T-Mo	<20	<20	<20	<8	<20
Nickel	T-Ni	2210	2030	2140	1150	1740
Selenium	T-Se	<0.1	<0.1	<0.1	3.5	<0.1
Silver	T-Ag	<10	<10	<10	<4	<8
Tin	T-Sn	<50	<50	<50	<20	<40
Vanadium	T-V	26	21	11	34	<8
Zinc	T-Zn	30	13	14	133	6

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.

RESULTS OF ANALYSIS - Sediment/Soil File No. J8625

		CLMS-10S	CLMS-11S	CLMS-12S	CLMS-13S	CLWC-1S
		98 09 12 16:05	98 09 12 16:50	98 09 12 17:20	98 09 12 18:30	98 09 12 16:05
Physical Tests						
Moisture	%	13.3	7.7	10.6	9.5	45.5
pH		8.52	9.55	8.56	7.02	6.46
Total Metals						
Antimony	T-Sb	<60	<40	<100	<20	<20
Arsenic	T-As	321	2.4	2.4	7	11
Barium	T-Ba	588	5	346	270	223
Beryllium	T-Be	<2	<1	<3	0.8	<0.5
Cadmium	T-Cd	<0.1	<0.1	<0.1	0.4	0.6
Chromium	T-Cr	1430	1530	1470	36	62
Cobalt	T-Co	99	65	111	19	11
Copper	T-Cu	3	<2	<5	42	26
Lead	T-Pb	<200	<100	<300	<50	<50
Mercury	T-Hg	0.444	<0.005	0.034	0.057	0.080
Molybdenum	T-Mo	<20	<8	<20	<4	5
Nickel	T-Ni	2200	1640	2300	54	70
Selenium	T-Se	<0.1	<0.1	0.1	1.1	1.6
Silver	T-Ag	<6	<4	<10	<2	<2
Tin	T-Sn	<30	<20	<50	<10	<10
Vanadium	T-V	19	8	20	43	30
Zinc	T-Zn	12	9	14	122	97

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.

RESULTS OF ANALYSIS - Sediment/Soil

File No. J8625

		CLWC-2S	CLWC-3S	CLMS-14	CLWR-3S	CLWR-4S
		98 09 12 19:15	98 09 12 19:20	98 09 10 10:40	98 09 13 12:00	98 09 13 12:05
Physical Tests						
Moisture	%	29.2	27.2	-	8.1	7.8
pH		8.53	8.37	-	7.92	8.03
Total Metals						
Antimony	T-Sb	<100	<100	-	<20	<20
Arsenic	T-As	11	9	-	13	14
Barium	T-Ba	41	49	-	84	103
Beryllium	T-Be	<3	<3	-	0.5	0.7
Cadmium	T-Cd	<0.1	<0.1	-	2.3	2.5
Chromium	T-Cr	1580	1670	-	19	22
Cobalt	T-Co	88	89	-	15	15
Copper	T-Cu	<5	5	-	58	62
Lead	T-Pb	<300	<300	-	<50	<50
Mercury	T-Hg	0.011	0.016	-	0.299	0.343
Molybdenum	T-Mo	<20	<20	-	14	16
Nickel	T-Ni	1920	1860	-	65	64
Selenium	T-Se	0.1	0.2	-	8	8
Silver	T-Ag	<10	<10	-	<2	<2
Tin	T-Sn	<50	<50	-	<10	<10
Vanadium	T-V	14	21	-	30	36
Zinc	T-Zn	19	25	-	248	238
Polychlorinated Biphenyls						
Total Polychlorinated Biphenyls		-	-	<0.05	-	-

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.

RESULTS OF ANALYSIS - Sediment/Soil

File No. J8625

		CLWR-5S	CLWR-6S	CLWR-7S	CLWR-10S	CLWR-11S
		98 09 13 13:50	98 09 13 14:25	98 09 13 15:20	98 09 13 16:00	98 09 13 16:25
Physical Tests						
Moisture	%	18.7	17.6	29.7	6.6	16.5
pH		8.44	7.86	8.42	8.38	8.01
Total Metals						
Antimony	T-Sb	<80	<100	<100	<80	<20
Arsenic	T-As	28	13	17	15	18
Barium	T-Ba	65	397	1060	10	296
Beryllium	T-Be	<2	<3	<3	<2	0.8
Cadmium	T-Cd	0.2	<0.1	0.5	<0.1	1.6
Chromium	T-Cr	1110	1810	625	1180	486
Cobalt	T-Co	55	105	46	76	49
Copper	T-Cu	25	10	21	14	48
Lead	T-Pb	<200	<300	<300	<200	<50
Mercury	T-Hg	0.046	0.142	0.167	0.197	0.297
Molybdenum	T-Mo	<20	<20	<20	<20	12
Nickel	T-Ni	1230	852	867	1710	834
Selenium	T-Se	0.3	0.1	1.2	<0.1	4.4
Silver	T-Ag	<8	<10	<10	<8	<2
Tin	T-Sn	<40	<50	<50	<40	<10
Vanadium	T-V	23	66	47	<8	38
Zinc	T-Zn	29	27	71	8	143

Remarks regarding the analyses appear at the beginning of this report.
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< = Less than the detection limit indicated.

RESULTS OF ANALYSIS - Sediment/Soil File No. J8625

		CBLK-1S	CBLK-2S	CBLK-3S
		98 09 13 17:30	98 09 13 18:20	98 09 13 18:30
Physical Tests				
Moisture	%	5.6	10.7	8.6
pH		8.69	8.90	7.64
Total Metals				
Antimony	T-Sb	<200	<20	<100
Arsenic	T-As	167	15	20
Barium	T-Ba	3160	893	76
Beryllium	T-Be	<4	0.8	<3
Cadmium	T-Cd	<0.1	2.4	<0.1
Chromium	T-Cr	3010	132	1420
Cobalt	T-Co	134	12	70
Copper	T-Cu	20	39	7
Lead	T-Pb	<400	<50	<300
Mercury	T-Hg	0.078	0.162	0.051
Molybdenum	T-Mo	<30	6	<20
Nickel	T-Ni	2560	183	1760
Selenium	T-Se	0.2	9	<0.1
Silver	T-Ag	<20	<2	<10
Tin	T-Sn	<70	<10	<50
Vanadium	T-V	51	40	13
Zinc	T-Zn	37	103	16

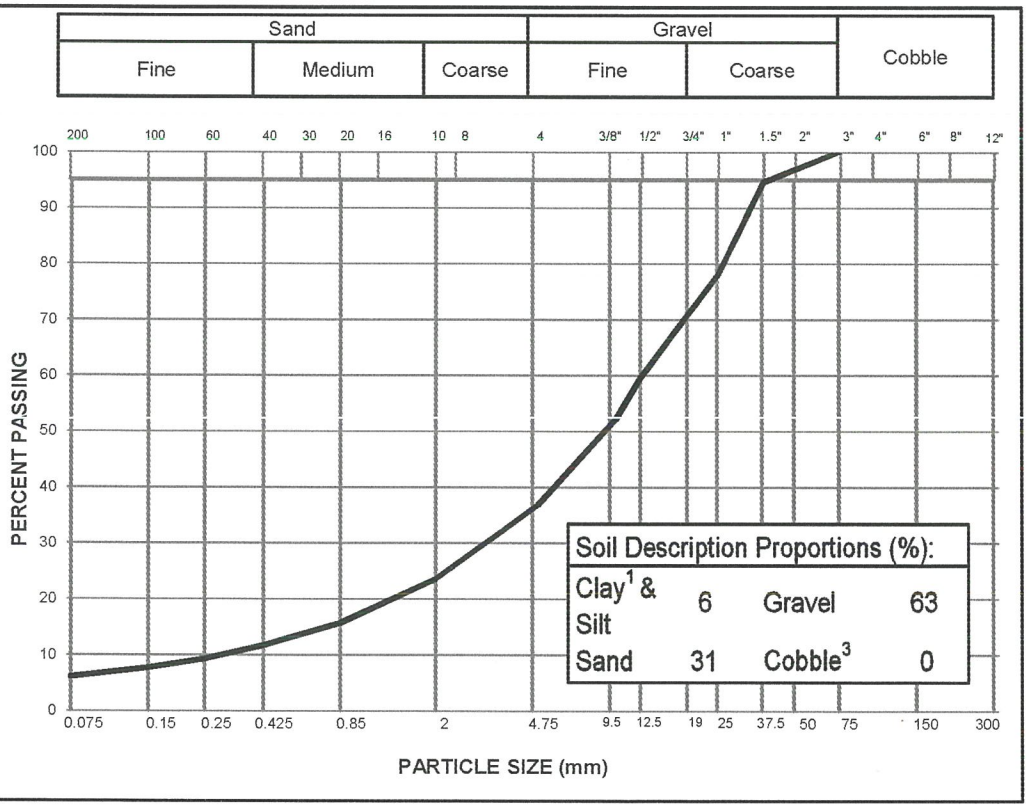
Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.

PARTICLE SIZE ANALYSIS REPORT

ASTM D422, C136 & C117

Project:	Clinton Creek	Sample No.:	SA02
Project No.:	W14103619-01	Material Type:	
Site:	Clinton Creek Road	Sample Loc.:	Entrance Pit
Client:	WorleyParsons	Sample Depth:	
Client Rep.:	Margret McBride	Sampling Method:	Grab
Date Tested:	June 3, 2015 By: AMT	Date sampled:	May 31, 2015
Soil Description[2]:	GRAVEL - sandy, trace silt	Sampled By:	Client
		USC Classification:	Cu: 42.3
Moisture Content:	1.5%		Cc: 3.1

Particle Size (mm)	Percent Passing
300	
200	
150	
100	
75	100
50	
38	95
25	78
19	71
12.5	60
10	52
5	37
2	24
0.85	16
0.425	12
0.25	9
0.15	8
0.075	6.1



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

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

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

Specification: _____

Remarks: _____

_____

Reviewed By: _____ P.Eng.

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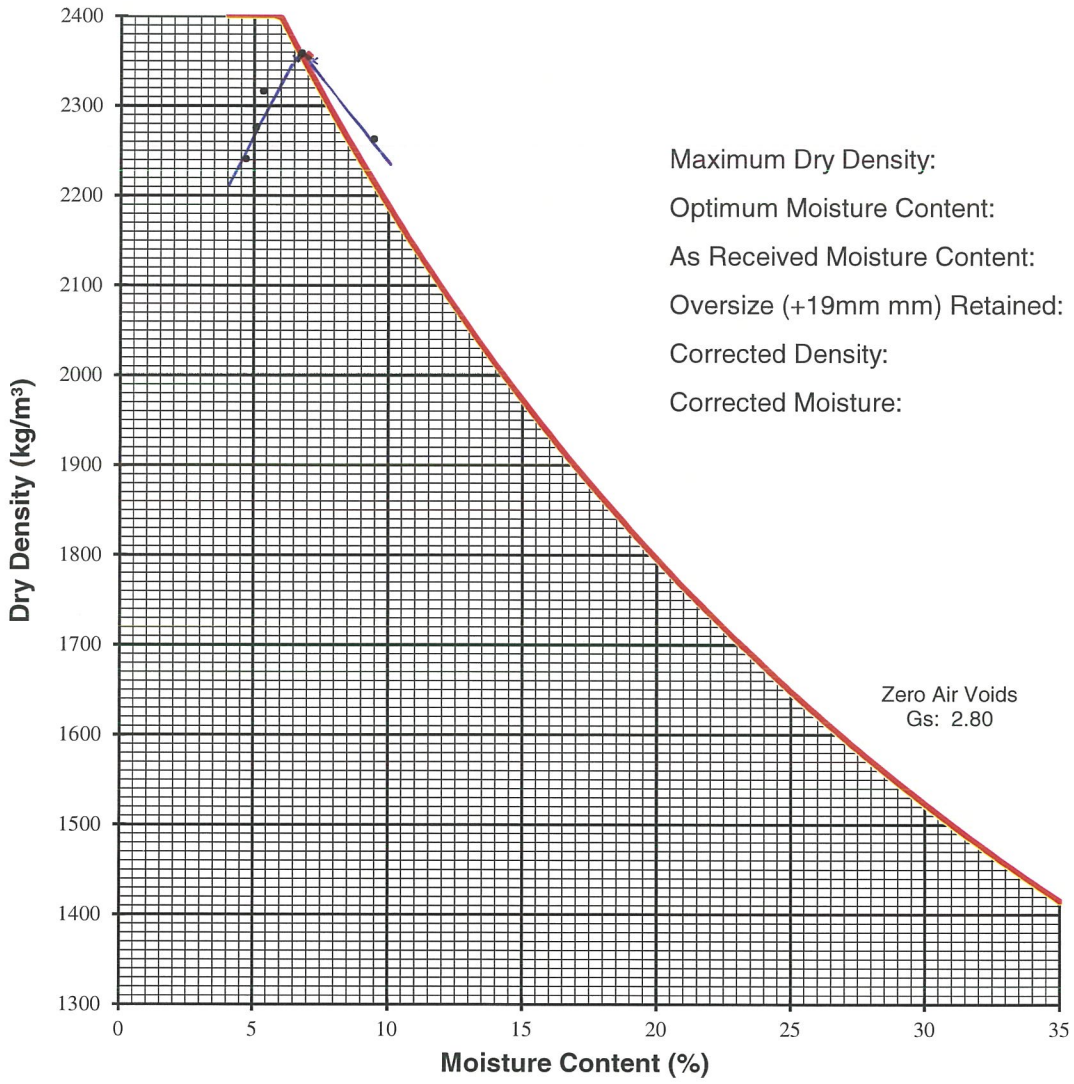
TETRA TECH

MOISTURE-DENSITY RELATIONSHIP (Proctor) REPORT

ASTM D1557 Modified

Project:	Clinton Creek, Dawson City	Sample No.:	SA02
Client:	WorleyParsons	Sampled By:	RMD
Attention:	Margaret McBride	Sample Date:	June 2, 2015
Project No.:	W14103619-01	Test Date:	June 5, 2015
Description:	GRAVEL - sandy, trace silt	Preparation:	Oven Dry
Source:	Entrance Pit	Compaction:	Manual



Maximum Dry Density:	**2355**	kg/m³
Optimum Moisture Content:	**7.0**	%
As Received Moisture Content:		%
Oversize (+19mm mm) Retained:	**30**	%
Corrected Density:	**2475**	%
Corrected Moisture:	**5.2**	%

Remarks:

Reviewed By: _____ C.E.T.

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TETRA TECH

ASTM C136

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

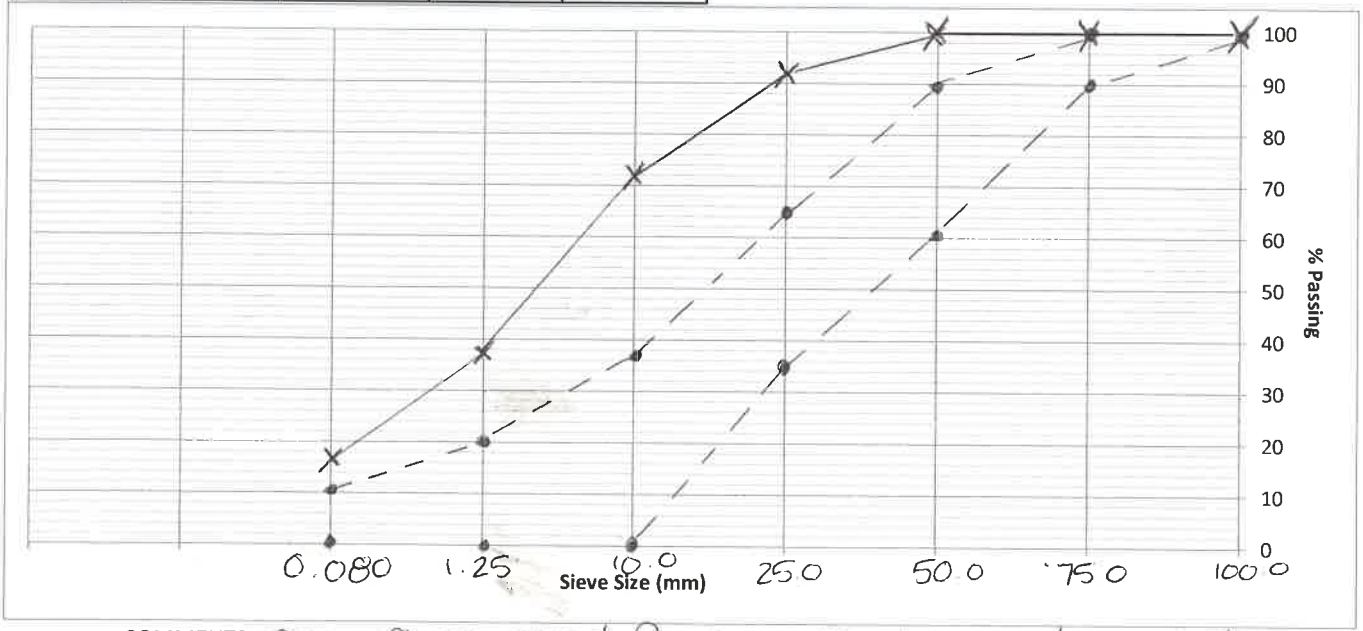
PROJECT NUMBER: YT15070
DATE SAMPLED: Aug-13-15
DATE TESTED: Aug 20-15
TECHNICIAN: J. Pottier

LOCATION: Clinton Creek
MATERIAL TYPE: Waste Rock
SAMPLE No.: 1/4
SAMPLE TIME: —

I	J	K	L	M
Sieve No.	Cumulative Mass (g)	Percent Retained (%) (100-L)	Percent Passing (%) (D-J)/D	Granular Specification
100.0	0	0	100	- 100
75.0	0	0	100	90 - 100
50.0	0	0	100	60 - 90
25.0	323.3	7.6	92.4	35 - 65
10.0	1179.9	27.8	72.2	0 - 35
1.25	2637.9	62.2	37.8	0 - 20
0.080	3510.8	82.8	17.2	0 - 10
PAN	3540.9	—	—	-
				-
				-
				-
				-

A	Mass Wet Aggregate and Tare (g):		4583.9
B	Mass Dry Aggregate and Tare	(A/1+F)	4239.7
C	Mass Tare (g):		0
D	Mass Dry Aggregate Before Wash (g):		4239.7
E	Mass Moisture (g):	(A-B)	344.2
F	Moisture Content (%):	(E/D)*100	8.1 %
G	Mass Dry Aggregate Afer Wash (g):		3540.9
H	Fineness Modulus*		—

*Fineness Modulus = (Total % of sample retained on a series of sieves/100)



COMMENTS: One Over sized Rock, 152.4 mm at widest point, not included in sample, would not pass 100 mm Sieve.

REVIEWED BY & DATE:

ASTM C136

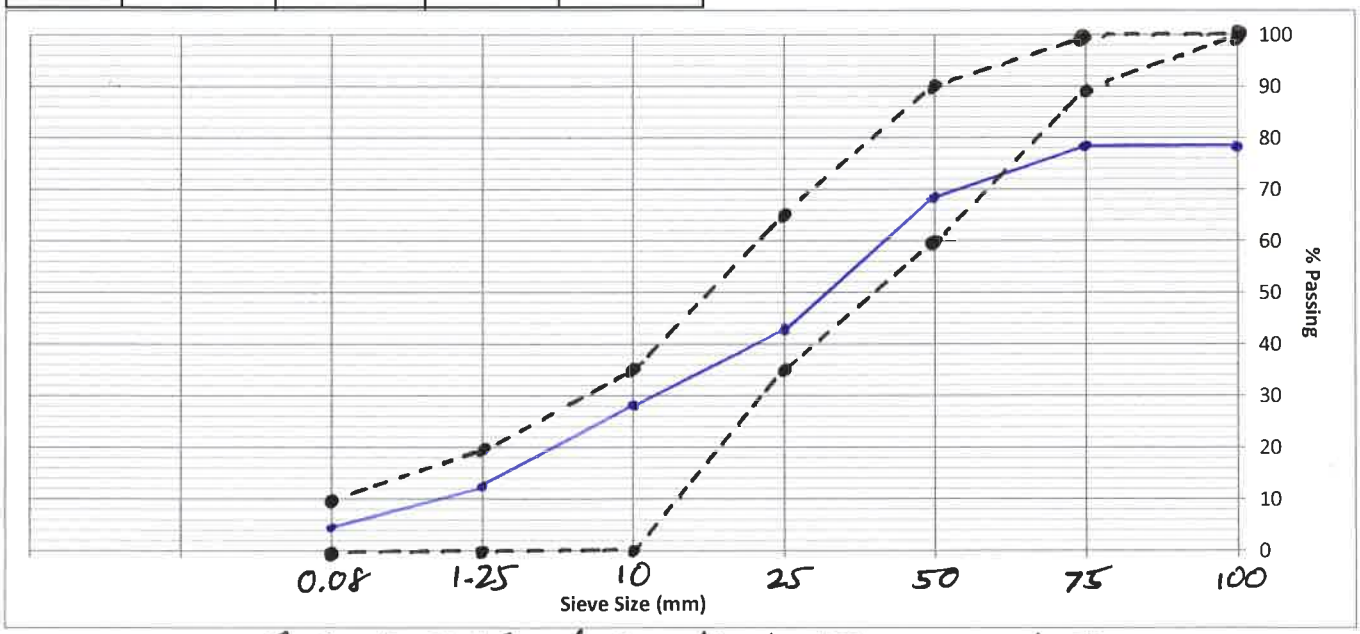
SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

PROJECT NUMBER:	YT15070	LOCATION:	Clinton Creek
DATE SAMPLED:	09/09/2015	MATERIAL TYPE:	Waste Rock
DATE TESTED:	16/09/2015	SAMPLE No.:	2 of 3
TECHNICIAN:	Parth Joshi	SAMPLE TIME:	-

I	J	K	L	M
Sieve No.	Cumulative Mass (g)	Percent Retained (%) (100-L)	Percent Passing (%) (D-J)/D	Granular Specification
100.0mm	1175.00 *	21.27	78.73	100 - 100
75.0mm	1175.00	21.27	78.73	90 - 100
50.0mm	1711.20	30.97	69.03	60 - 90
25.0mm	3130.20	56.66	43.34	35 - 65
20.0mm				-
12.5mm				-
10.0mm	3964.30	71.76	28.24	0 - 35
5.0mm				-
2.5mm				-
1.25mm	4859.10	87.95	12.05	0 - 20
0.315mm				-
0.080mm	5290.60	95.76	4.24	0 - 10
Pan	5360.30			---

A	Mass Wet Aggregate and Tare (g):		7064.70
B	Mass Dry Aggregate and Tare	(A/1+F)	6885.3
C	Mass Tare (g):		1360.70
D	Mass Dry Aggregate Before Wash (g):		5524.60
E	Mass Moisture (g):	(A-B)	179.40
F	Moisture Content (%):	(E/D)*100	3.25%
G	Mass Dry Aggregate Afer Wash (g):		5367.9
H	Fineness Modulus*		

*Fineness Modulus = (Total % of sample retained on a series of sieves/100)



COMMENTS: One oversized rock ≒ 174mm at the narrowest is not included. & 51 kg

* One rock ≒ 110mm retained by 100mm sieve. included

REVIEWED BY & DATE:

ASTM C136

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE

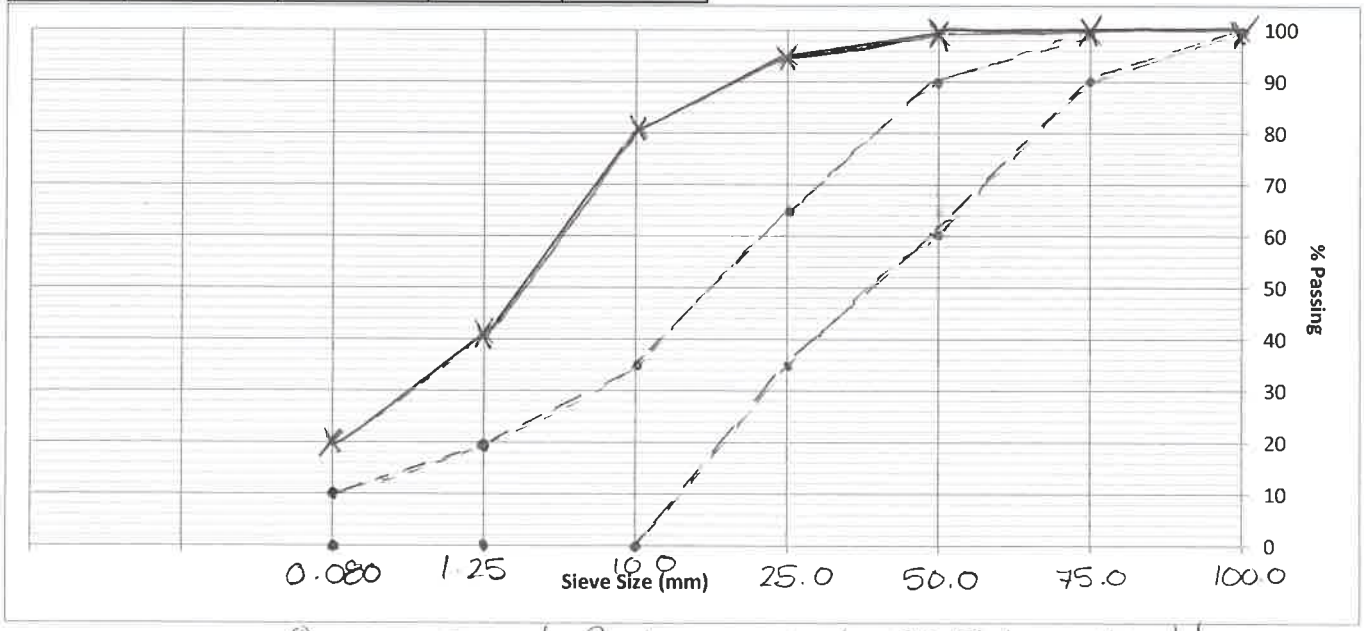
PROJECT NUMBER: VT 15070
DATE SAMPLED: 13-Aug-15
DATE TESTED: 18-Aug-15
TECHNICIAN: J. Pothier

LOCATION: Clinton Creek
MATERIAL TYPE: Waste Rock
SAMPLE No.: 4/4
SAMPLE TIME: —

I	J	K	L	M
Sieve No.	Cumulative Mass (g)	Percent Retained (%) (100-L)	Percent Passing (%) (D-J)/D	Granular Specification
100.0	0	0	100	- 100
75.0	0	0	100	90 - 100
50.0	0	0	100	60 - 90
25.0	220.0	5.0	95.0	35 - 65
10.0	854.8	19.4	80.6	0 - 35
1.25	2468.1	56.1	43.9	0 - 20
0.080	3516.7	80	20.0	0 - 10
PAN	3620.9			-
				-
				-
				-
				-

A	Mass Wet Aggregate and Tare (g):		4657.7
B	Mass Dry Aggregate and Tare	(A/1+F)	4397.7
C	Mass Tare (g):		0
D	Mass Dry Aggregate Before Wash (g):		4397.7
E	Mass Moisture (g):	(A-B)	259.5
F	Moisture Content (%):	(E/D)*100	5.9 %
G	Mass Dry Aggregate Afer Wash (g):		3621.0
H	Fineness Modulus*		—

*Fineness Modulus = (Total % of sample retained on a series of sieves/100)



COMMENTS: One oversized Rock weighed 2647.1 g. Would not pass through the 100.0mm sieve.

REVIEWED BY & DATE:

T: 0.00%

MOISTURE - DENSITY RELATION TEST

M-41

PROJECT NO:	YT15070	CONTRACT NO:	--	TEST NO:	1
DATE SAMPLED:	Aug-13-15	SAMPLE NO:	1	CONTRACTOR:	Sidhu Trucking
DATE TESTED:	Aug-19-15	SAMPLE SOURCE:	Slope	Consultant:	CAP Engineering

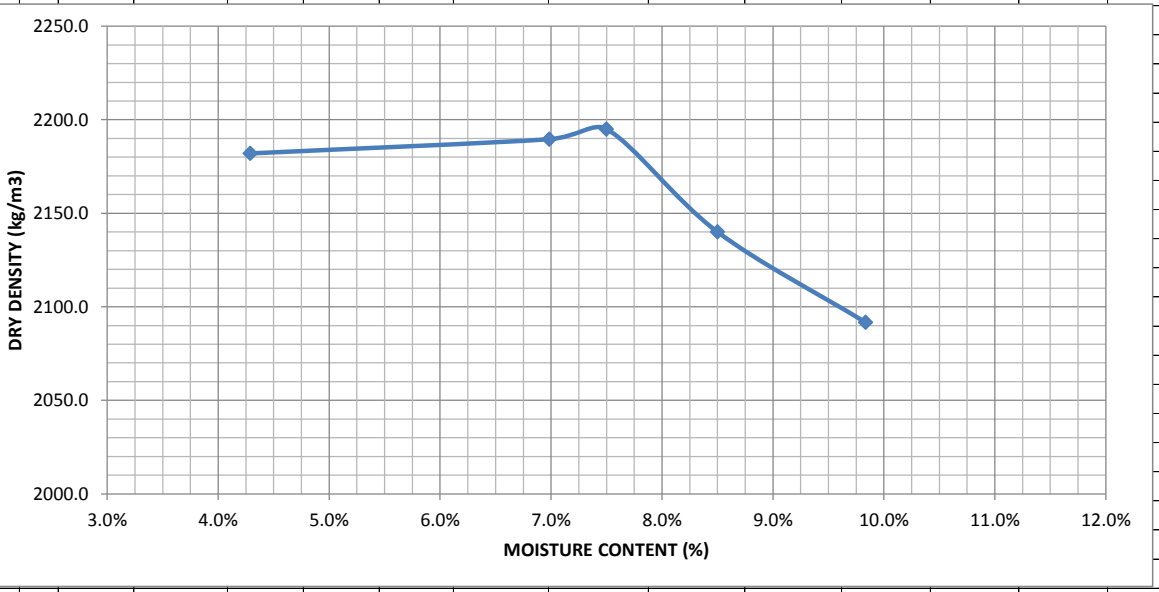
COMPACTION STANDARD: ☐ ASTM D698 ☑ ASTM D1557 METHOD: C

RAMMER TYPE: ☑ MANUAL ☐ AUTO VISUAL SOIL CLASSIFICATION: Waste Material

PREPARATION: ☑ MOIST ☐ DRY AS RECEIVED MOISTURE CONTENT: 7.00%

DENSITY	A	VOLUME OF MOLD (cm^3)	2124.0	2124.0	2124.0	2124.0	2124.0	
	B	WEIGHT OF WET SAMPLE + MOLD (g)	11461.5	11601.5	11638.1	11559.8	11507.6	
	C	WEIGHT OF MOLD (g)	6628.2	6626.0	6626.2	6628.0	6627.9	
	D	WEIGHT OF WET SAMPLE (g)	4833.3	4975.5	5011.9	4931.8	4879.7	
	E	WET DENSITY (kg/m^3)	2275.56	2342.514	2359.65	2321.94	2297.41	
	F	DRY DENSITY (kg/m^3)	2182.0	2189.6	2195.0	2140.0	2091.7	
MOISTURE CONTENT	G	MOISTURE ADDED / RUN NUMBER (g)	4%	Insitu	~7.5%	~9%	~10%	
	H	CONTAINER NUMBER	1	2	3	5	4	
	I	WEIGHT OF WET SAMPLE + TARE (g)	1070	1364.9	933.8	0	880	
	J	WEIGHT OF DRY SAMPLE + TARE (g)	1026	1275.8	870	0	801.2	
	K	TARE OF CONTAINER (g)	0	0	0	0	0	
	L	WEIGHT OF WATER (g)	44.0	89.1	63.8	0.0	78.8	
	M	WEIGHT OF DRY SOIL (g)	1026.0	1275.8	870.0	0.0	801.2	
	N	MOISTURE CONTENT (%)	4.3%	7.0%	7.5%	8.5%	9.8%	

% RETAINED:					
4.75mm SIEVE:	12.6%				
9.5mm SIEVE:	27.1%	OPTIMUM MOISTURE CONTENT (%)	7.5%	*CORRECTED OPTIMUM M/C (%)	8.3%
19.0mm SIEVE:	63.4%	MAXIMUM DRY DENSITY (kg/m^3)	2195.0	*CORRECTED DRY DENSITY (kg/m^3)	2259.3
				*OVERSIZE ROCK CORRECTION PER ASTM D4718	



HAS AN IDENTICAL SAMPLE BEEN SENT TO A TESTING LABORATORY?		YES			
IF YES, LAB NAME:	MT.Sima	BAG NO.	1	DATE:	Aug-19-15
REMARKS:					
TESTED BY:	Jessica Pottier	CONTRACTOR PROJECT MANAGER:			
REVIEWED BY:		DATE:			

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T: 0.00%

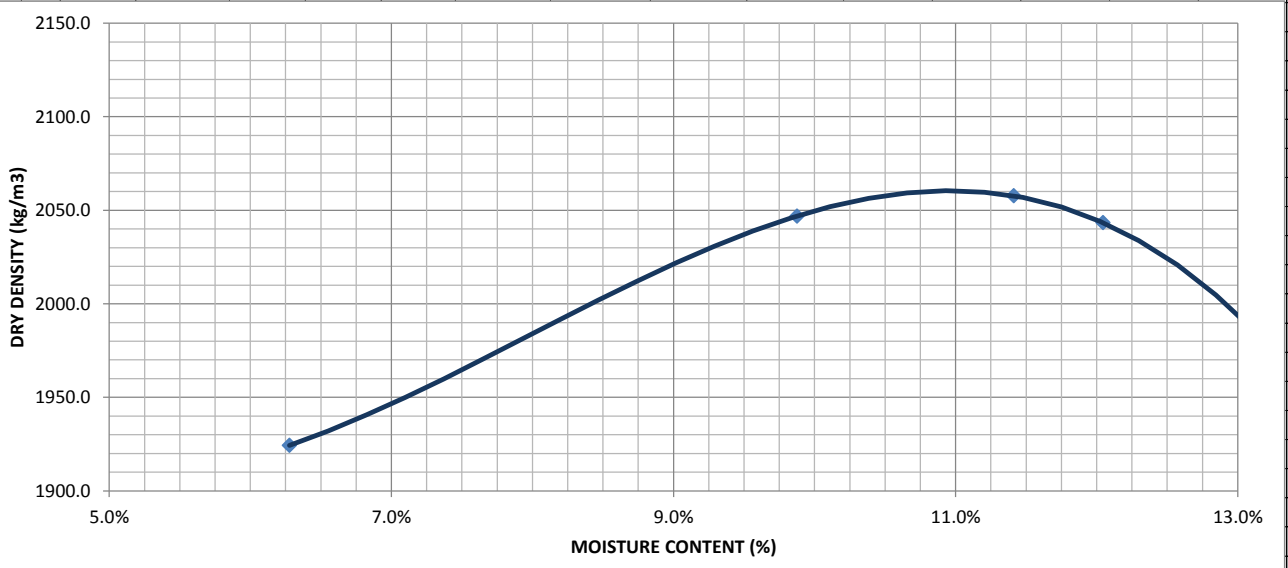
MOISTURE - DENSITY RELATION TEST

M-41

PROJECT NO:	YT15070	CONTRACT NO:				TEST NO:	1
DATE SAMPLED:	SEPT-9-15	SAMPLE NO:	2 and 3			CONTRACTOR:	Siddhu
DATE TESTED:	SEPT-16-15	SAMPLE SOURCE:	Waste Rock			Consultant:	CAP Engineering
COMPACTION STANDARD:	☑ ASTM D698	☐ ASTM D1557	METHOD:	C			
RAMMER TYPE:	☑ MANUAL	☐ AUTO			VISUAL SOIL CLASSIFICATION:		Pit run
PREPARATION:	☑ MOIST	☐ DRY			AS RECEIVED MOISTURE CONTENT:		3.25%

DENSITY	A	VOLUME OF MOLD (cm^3)	2124.0	2124.0	2124.0	2124.0
	B	WEIGHT OF WET SAMPLE + MOLD (g)	10970	11403	11495.4	11489
	C	WEIGHT OF MOLD (g)	6626.0	6626.0	6626.0	6626.0
	D	WEIGHT OF WET SAMPLE (g)	4344.0	4777.0	4869.4	4863.0
	E	WET DENSITY (kg/m^3)	2045.2	2249.058	2292.56	2289.55
	F	DRY DENSITY (kg/m^3)	1924.4	2046.9	2057.7	2043.4
MOISTURE CONTENT	G	MOISTURE ADDED / RUN NUMBER (g)	Insitu	~4%	~6%	~8%
	H	CONTAINER NUMBER	L-4	L-7	L-6	L-5
	I	WEIGHT OF WET SAMPLE + TARE (g)	594.3	599.4	738.3	816.4
	J	WEIGHT OF DRY SAMPLE + TARE (g)	572.2	565.3	685.4	752.2
	K	TARE OF CONTAINER (g)	220.2	220	221.9	219.2
	L	WEIGHT OF WATER (g)	22.1	34.1	52.9	64.2
	M	WEIGHT OF DRY SOIL (g)	352.0	345.3	463.5	533.0
	N	MOISTURE CONTENT (%)	6.3%	9.9%	11.4%	12.0%

% RETAINED:					
4.75mm SIEVE:	44.3%				
9.5mm SIEVE:	60.0%	OPTIMUM MOISTURE CONTENT (%)	11.0%	*CORRECTED OPTIMUM M/C (%)	
19.0mm SIEVE:	81.3%	MAXIMUM DRY DENSITY (kg/m^3)	2070.0	*CORRECTED DRY DENSITY (kg/m^3)	
				*OVERSIZE ROCK CORRECTION PER ASTM D4718	



HAS AN IDENTICAL SAMPLE BEEN SENT TO A TESTING LABORATORY?		NO			
IF YES, LAB NAME:	MT.Sima	BAG NO.	NA	DATE:	Sep-17-15
REMARKS:					
TESTED BY:	Parth Joshi	CONTRACTOR PROJECT MANAGER:			
REVIEWED BY:		DATE:			

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CHILKOOT GEOLOGICAL ENGINEERS LTD.

5b Bennett Road, Whitehorse, Yukon - Y1A 5Z4

GEOTECHNICAL EVALUATION - BORROW SOURCE ASSESSMENT
CLINTON CREEK AREA - DAWSON, YUKON - 2015
TABLE II - SUMMARY OF LABORATORY RESULTS AND TEST PITS

Site	Test Pit	Sample	Depth (m)	Moisture (%)	Fines (%)	Sand (%)	Gravel (%)	(USCS) Description	USCS	Comments
10	1	1	0.3	7.1	5.7	75.7	18.6	Gravelly Sand trace Silt	SP-SM	Top of Terrace
	2	2	0.3	3.5	2.8	53.8	43.3	Gravelly Sand	SP	Top of Terrace
	3	3	0.5	3.5	2.1	53.7	44.2	Gravelly Sand	SP	Base of Slope
11	Tetra Tech	SA01	NA	7.4	11	53	37	Gravelly Sand some Silt	NA	Tetra Tech analysis for Worley Parsons
11	1	NA	0.0 - 0.1	NA	NA	NA	NA	Organics and Organic Silt	ORG	Overburden
		1	0.0-0.1	19.1	64.2	32.5	3.3	Sandy Silt	ML	Overburden
		2	0.2-0.4	4.7	6.4	74.8	18.8	Gravelly Sand trace Silt	SP-SM	Granular Source
	2	NA	0.0 - 0.1	NA	NA	NA	NA	Organics and Organic Silt	ORG	Overburden
		3	0.1-0.2	20.6	80.8	18.9	0.2	Sandy Silt	ML	Overburden
		4	0.2-0.4	5.2	11.0	74.5	14.5	Sand some Silt and Gravel	SP-SM	Granular Source
	3	NA	0.0 - 0.1	NA	NA	NA	NA	Organics and Organic Silt	ORG	Overburden
		5	0.1-0.2	19.8	83.7	14.3	2.0	Silt some Sand	ML	Overburden
		6	0.2-0.4	3.9	6.4	61.1	32.5	Gravelly Sand trace Silt	SP-SM	Granular Source
	4	7	0.3	2.5	2.0	51.6	46.4	Gravelly Sand	SP	Granular Source
	5	8	0.3	2.6	2.0	51.5	46.5	Gravelly Sand	SP	Disturbed granular source materials pushed overbank.
	6	9	0.3	2.7	1.6	38.1	60.3	Sandy Gravel	GP	Granular Source
12	1	1	See Comments	3.6	8.6	37.7	53.6	Sandy Gravel trace Silt	GW-GM	Obtained 2 up a 4 meter tall working face.
	2	2	See Comments	4.0	1.7	48.6	49.7	Sandy Gravel	GW	Obtained from 0.2 meters below pit floor at groundwater.
14a	1	NA	0.0 - 0.2	NA	NA	NA	NA	Organics and Organic Silt	ORG	Organics
		1	0.2 - 0.3	12.0	NA	NA	NA	Silty Gravelly Sand	SM	Test Pit RHS of trail
	2	2	Side cut	8.7	NA	NA	NA	Gravelly Silty Sand	SM	Trail Sidecut
	3	3	Side cut	12.7	34.1	42.0	23.9	Silty Gravelly Sand	SM	Trail Sidecut
14b	1	1	0.6	4.3	6.0	39.1	54.9	Sandy Gravel trace Silt	GW-GM	Former Borrow
16	1	NA	0.0 - 0.3	NA	NA	NA	NA	Organics and Organic Silt	ORG	Spruce w/ interspersed Birch - lichen and moss floor
		1	0.3 - 0.4	25.8	NA	NA	NA	Sandy Silt	ML	Slope Aspect 5° to 7° dipping to the north-east
		2	0.4 - 0.75	27.4	NA	NA	NA	Silt trace fine Sand - low plasticity	ML	Local relief of 0.5 meters
17	1	NA	0.0 - 0.25	NA	NA	NA	NA	Organics and Organic Silt	ORG	Spruce w/ interspersed Birch - lichen and moss floor
		1	0.25 - 0.35	18.6	NA	NA	NA	Detritus - moist Sandy Silt trace rootlets	ML	Slope Aspect 10° to 15° dipping to the north-east
		2	0.35 - 0.5	11.0	NA	NA	NA	Detritus - wet Sandy Silt to Silty Sand - Fractured Rock	SM/ML	'chloritic' schist - increasing plasticity
Airfield	1	1	0.0	4.8	7.0	52.7	40.3	Gravelly Sand trace Silt	GW-GM	10-15 mm of BST
km 46	stockpile	1	NA	3.3	6.2	33.4	60.4	Sandy Gravel trace Silt	NA	20 mm minus crushed surfacing agg
	stockpile	2	NA	1.1	2.7	25.6	71.7	Sandy Gravel	NA	3" Minus Sub-base Aggregate
km 62	1	1	0.1	8.5	17.6	74.5	7.9	Silty Sand trace Gravel	SM	Overburden
MS 1	1	1	0.2	4.8	6.5	44.0	49.5	Sandy Gravel trace Silt	GW-GM	Shale
	stockpile	2	NA	4.3	4.3	18.7	77.0	Sandy Gravel	GW	100 mm minus rip-rap
MS 1	Tetra Tech	SA02	NA	1.5	6	31	63	Sandy Gravel trace Silt	GW	Tetra Tech analysis for Worley Parsons
MS 2	1	1	0.0	6.5	NA	NA	NA	weathered serpentine	NA	Waste Rock - weathered serpentine
	2	2	0.0	6.2	NA	NA	NA	weathered serpentine	NA	Waste Rock - weathered serpentine
	3	3	0.2	5.5	24.7	62.6	12.7	Silty Sand some Gravel	SM	Waste Rock - weathered shale
	4	4	0.2	3.5	16.1	36.8	47	Sandy Silty Gravel	GM	Waste Rock - weathered shale
MS 3	1	1	0.3	5.2	18.0	42.4	39.6	Gravelly Silty Sand	SM	Waste Rock - shale
	2	2	0.3	7.5	14.4	37.4	48.3	Sandy Gravel some Silt	GM	Waste Rock - shale
South of Drop Structure	CAP	1	NA	7.0	NA	NA	NA	Proctor Analysis	NA	CAP analysis for Sidhu Trucking - Waste Material
	CAP	1	NA	8.1	17.2	14.8	68.0	Silty Gravel some Sand	NA	CAP analysis for Sidhu Trucking - Waste Rock
	CAP	4	NA	5.9	20	8	72	Silty Gravel trace Sand odd Cobble	NA	CAP analysis for Sidhu Trucking - Waste Rock
MS 4	stockpile	1	NA	8.3	8.8	28.0	63.2	Sandy Gravel trace Silt	GW-GM	80 mm nominal quartzite stockpile
MS 5	1	1	0.4	7.5	14.7	71.1	14.3	Sand some Silt and Gravel	SM	Former Borrow Area - West Side
	2	2	0.4	8.3	15.7	80.0	4.3	Silty Sand	SM	Former Borrow Area - Central Area
	3	3	0.4	4.4	13.2	35.0	51.8	Sandy Gravel some Silt	GM	Former Borrow Area - East Side
Tailings	1	1	0.3	8.9	13.4	52.6	34.0	Gravelly Sand some Silt with Asbestos fibers	SM	Mine Tailings - Northern Lobe
	2	2	0.3	8.3	15.5	53.8	30.6	Gravelly Silty Sand with Asbestos fibers	SM	
	3	3	0.3	10.3	23.9	41.0	35.0	Gravelly Silty Sand with Asbestos fibers	SM	Mine Tailings - Central Area
	4	4	0.3	12.6	30.1	49.4	20.6	Silty Gravelly Sand with Asbestos fibers	SM	Mine Tailings - Southern Lobe
	5	5	0.3	12.6	24.5	58.1	17.4	Silty Gravelly Sand with Asbestos fibers	SM	
	stockpile	6	0.2	1.6	0.8	1.8	97.4	Gravel with Asbestos fibers	GP	Mine Tailings - (nominal) 25 mm minus Serpentine waste pile

Prepared by T.Dhara, P.Eng. - October 15, 2015

CHILKOOT GEOLOGICAL ENGINEERS LTD.
5b Bennett Road, Whitehorse, Yukon - Y1A 5Z4

GEOTECHNICAL EVALUATION - BORROW SOURCE ASSESSMENT
CLINTON CREEK AREA - DAWSON, YUKON - 2015
TABLE III - SUMMARY OF GRAIN SIZE DISTRIBUTION ANALYSIS

Site/Sample		10-1	10-2	10-3	11-1	11-2	11-3	11-4	11-5	11-6	11-7	11-8	11-9	12-1	12-2	14A-3	14B-1
Sieve Size (mm)	80	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	56	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	40	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	28	94.7	97.6	100.0	100.0	100.0	100.0	100.0	100.0	92.1	92.7	100.0	94.5	84.5	92.0	95.2	88.8
	20	94.7	83.5	92.2	100.0	100.0	100.0	96.9	100.0	92.1	76.2	94.7	65.2	79.6	90.5	91.2	72.8
	12.5	91.2	71.3	78.1	100.0	93.5	100.0	91.1	100.0	81.3	66.9	74.7	59.3	66.1	81.5	87.5	62.8
	10	89.3	68.5	72.0	98.7	91.5	100.0	90.2	100.0	78.2	63.4	69.9	54.6	61.5	73.8	83.7	58.1
	5	81.4	56.6	55.8	96.7	91.2	99.8	85.5	98.0	67.5	53.6	53.5	39.7	46.4	50.3	76.1	45.1
	2.5	68.9	41.2	42.3	94.1	68.3	98.5	80.5	96.5	58.4	44.9	42.0	27.6	34.7	28.8	66.7	35.0
	1.25	47.3	20.5	28.5	90.6	51.8	96.3	69.7	94.7	51.3	36.7	32.8	16.7	26.7	13.2	57.9	26.8
	0.63	23.7	8.5	12.5	83.0	33.2	92.7	45.8	92.5	40.7	18.8	20.9	7.4	20.1	6.4	50.1	21.4
	0.315	13.3	5.1	4.7	70.6	16.0	89.0	23.1	89.2	15.5	5.7	6.4	3.5	14.6	3.5	44.5	13.9
	0.16	8.4	3.8	2.9	66.7	9.1	85.6	14.6	86.6	8.7	2.8	2.9	2.2	11.0	2.3	39.3	8.3
	0.08	5.7	2.8	2.1	64.2	6.4	80.8	11.0	83.7	6.4	2.0	2.0	1.6	8.6	1.7	34.1	6.0
Moisture		7.1	3.5	3.5	19.1	4.7	20.6	5.2	19.8	3.9	2.5	2.6	2.7	3.6	4.0	12.7	4.3
Fines		5.7	2.8	2.1	64.2	6.4	80.8	11.0	83.7	6.4	2.0	2.0	1.6	8.6	1.7	34.1	6.0
Sand		75.7	53.8	53.7	32.5	74.8	18.9	74.5	14.3	61.1	51.6	51.5	38.1	37.7	48.6	42.0	39.1
Gravel		18.6	43.4	44.2	3.3	18.8	0.2	14.5	2.0	32.5	46.4	46.5	60.3	53.6	49.7	23.9	54.9
USCS		SP-SM	SP	SP	ML	SP-SM	ML	SP-SM	ML	SP	SP	SP	GP	GP-GM	GP	SM	GP-GM
Description		Gravelly Sand trace Silt	Gravelly Sand	Gravelly Sand	Sandy Silt	Gravelly Sand trace Silt	Sandy Silt	Sand some Silt and Gravel	Silt some Sand	Gravelly Sand trace Silt	Gravelly Sand	Gravelly Sand	Sandy Gravel	Sandy Gravel trace Silt	Sandy Gravel	Silty Gravelly Sand	Sandy Gravel trace Silt

Compiled Dec.29, 2015 by T.Dhara, P.Eng.

CHILKOOT GEOLOGICAL ENGINEERS LTD.
5b Bennett Road, Whitehorse, Yukon - Y1A 5Z4

GEOTECHNICAL EVALUATION - BORROW SOURCE ASSESSMENT
CLINTON CREEK AREA - DAWSON, YUKON - 2015
TABLE III - SUMMARY OF GRAIN SIZE DISTRIBUTION ANALYSIS

Site/Sample		Airfield	MS 1-1	MS 1-2	MS 2-3	MS 2-4	MS 3-1	MS 3-2	MS 4-1	MS 5-1	MS 5-2	MS 5-3
Sieve Size (mm)	80	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	56	100.0	100.0	69.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	40	100.0	100.0	62.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	28	85.3	100.0	60.7	100.0	76.5	84.6	75.6	100.0	100.0	100.0	88.8
	20	80.9	96.8	50.4	100.0	74.2	80.4	75.6	84.1	100.0	100.0	74.0
	12.5	75.6	81.7	40.5	98.0	70.4	74.5	66.1	64.8	95.5	97.7	64.8
	10	73.3	71.9	35.2	95.1	66.6	71.2	61.6	52.8	93.2	97.5	61.1
	5	59.7	50.5	23.0	87.3	53.0	60.4	51.7	49.3	85.7	95.7	48.2
	2.5	45.2	34.8	15.9	77.3	44.0	49.4	41.8	36.8	73.5	90.8	38.6
	1.25	28.4	23.4	11.7	64.3	36.1	39.0	33.4	30.5	51.8	61.4	31.2
	0.63	14.7	15.5	8.9	51.2	29.3	31.5	26.6	24.8	33.3	34.2	26.2
	0.315	9.8	11.0	6.9	39.4	23.6	25.6	21.3	19.9	24.3	25.3	20.6
	0.16	8.0	8.2	5.3	30.5	19.2	20.8	17.2	15.8	18.4	19.8	16.0
	0.08	7.0	6.5	4.3	24.7	16.1	18.0	14.4	12.0	14.7	15.7	13.2
Moisture		4.8	4.8	4.3	6.5	6.2	5.5	3.5	5.2	7.5	8.3	4.4
Fines		7.0	6.5	4.3	24.7	16.1	18.0	14.4	12.0	14.7	15.7	13.2
Sand		52.7	44.0	18.7	62.6	36.8	42.4	37.4	28.0	71.1	80.0	35.0
Gravel		40.3	49.5	77.0	12.7	47.0	39.6	48.3	63.2	14.3	4.3	51.8
USCS		GP-GM	GP-GM	GP	SM	GM	SM	GM	GP-GM	SM	SM	GM
Description		Sandy Gravel trace Silt	Sandy Gravel trace Silt	Sandy Gravel	Silty Sand some Gravel	Sandy Silty Gravel	Gravelly Silty Sand	Sandy Gravel some Silt	Sandy Gravel trace Silt	Sand some Silt and Gravel	Silty Sand	Sandy Gravel some Silt

Compiled Dec.29, 2015 by T.Dhara, P.Eng.

CHILKOOT GEOLOGICAL ENGINEERS LTD.
5b Bennett Road, Whitehorse, Yukon - Y1A 5Z4

GEOTECHNICAL EVALUATION - BORROW SOURCE ASSESSMENT
CLINTON CREEK AREA - DAWSON, YUKON - 2015
TABLE III - SUMMARY OF GRAIN SIZE DISTRIBUTION ANALYSIS

Site/Sample		T 1	T 2	T 3	T 4	T 5	T 6	km 46	km 46	62-1
Sieve Size (mm)	80	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	56	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	40	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	28	100.0	100.0	100.0	100.0	100.0	72.0	90.0	100.0	100.0
	20	93.9	100.0	100.0	100.0	100.0	53.9	73.5	100.0	97.5
	12.5	82.5	92.6	82.3	97.7	100.0	17.0	52.5	76.5	94.1
	10	79.6	89.6	78.5	94.6	96.2	7.2	42.5	68.4	93.3
	5	66.0	69.4	65.0	79.4	82.6	2.6	28.3	39.6	92.1
	2.5	50.3	51.2	54.3	60.6	64.6	2.0	19.6	26.7	89.4
	1.25	41.2	40.7	45.5	52.9	61.1	1.7	14.1	18.3	75.4
	0.63	33.1	31.6	37.1	48.2	55.3	1.4	9.8	13.2	54.2
	0.315	25.0	24.2	30.8	42.8	45.2	1.2	6.9	10.1	39.0
	0.16	17.1	18.4	26.3	35.0	31.0	1.0	4.4	8.0	25.9
	0.08	13.4	15.5	23.9	30.1	24.5	0.8	2.7	6.2	17.6
Moisture		8.9	8.3	10.3	12.6	12.6	1.6	1.1	3.3	8.5
Fines		13.4	15.5	23.9	30.1	24.5	0.8	2.7	6.2	17.6
Sand		52.6	53.8	41.0	49.4	58.1	1.8	25.6	33.4	74.5
Gravel		34.0	30.6	35.0	20.6	17.4	97.4	71.7	60.4	7.9
USCS		SM	SM	SM	SM	SM	GP	Gran C	Gran A	SM
Description		Gravelly Sand some Silt	Gravelly Silty Sand	Gravelly Silty Sand	Sillty Gravelly Sand	Silty Gravelly Sand	Gravel	3" Minus Sub-base	20 mm Crush	Silty Sand trace Gravel

Notes - T = Tailings

Compiled Dec.29, 2015 by T.Dhara, P.Eng.

RESISTANCE TO DEGRADATION OF LARGE-SIZE COARSE AGGREGATE BY ABRASION & IMPACT IN THE LOS ANGELES MACHINE

ASTM C 535

November 2, 2015
Project number: 1403695/3000

CHILKOOT GEOLOGICAL ENGINEERS LTD.
5B Bennett Road
Whitehorse, YT
Y1A 5Z4

ATTENTION: Mr. Tares Dhara, P.Eng.

PROJECT: Borrow Source Assessment – Clinton Creek Area, Yukon - 2015

Sample:	**SA #3 – Quartzite**
Source:	**Clinton Creek Mine Site – Entrance Pit**

Date sampled: September 10 & 12, 2015
Date tested: October 30, 2015

Sampled by: Client
Tested by: IC

Grading	**1**
Number of Revolutions	1000
Loss After 1000 Revolutions (%)	**22.6**

Reported by: I. Chung

Reviewed by: _____
L. Hu, M.Sc.E., P.Eng.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SPECIFIC GRAVITY AND ABSORPTION OF ROCK FOR EROSION CONTROL

ASTM D 6473

October 28, 2015
Project number: 1403695/3000

CHILKOOT GEOLOGICAL ENGINEERS LTD.
5B Bennett Road
Whitehorse, YT
Y1A 5Z4

ATTENTION: Mr. Tares Dhara, P.Eng.

PROJECT: Borrow Source Assessment – Clinton Creek Area, Yukon - 2015

Sample:	**SA #3 – Quartzite**
Source:	**Clinton Creek Mine Site – Entrance Pit**

Date sampled: September 10 & 12, 2015
Date tested: October 23, 2015

Sampled by: Client
Tested by: IC

Trial No.	Mass (g)	Relative Density (Dry Basis)	Relative Density (SSD Basis)	Apparent Relative Density	Absorption (%)
1	1429.7	2.820	2.851	2.911	1.11
2	2671.3	2.854	2.871	2.902	0.57
3	4404.7	2.792	2.822	2.878	1.07
4	1964.9	2.821	2.848	2.900	0.98
5	1891.2	2.838	2.861	2.905	0.81
AVERAGE		**2.825**	**2.851**	**2.899**	**0.91**

Reported by: I. Chung

Reviewed by: _____
L. Hu, M.Sc.E., P.Eng.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SPECIFIC GRAVITY AND ABSORPTION OF ROCK FOR EROSION CONTROL

ASTM D 6473

October 28, 2015
Project number: 1403695/3000

CHILKOOT GEOLOGICAL ENGINEERS LTD.
5B Bennett Road
Whitehorse, YT
Y1A 5Z4

ATTENTION: Mr. Tares Dhara, P.Eng.

PROJECT: Borrow Source Assessment – Clinton Creek Area, Yukon - 2015

Sample:	**SA #4 – Serpentine**
Source:	**Clinton Creek Mine Site – Entrance Pit**

Date sampled: September 10 & 12, 2015
Date tested: October 23, 2015

Sampled by: Client
Tested by: IC

Trial No.	Mass (g)	Relative Density (Dry Basis)	Relative Density (SSD Basis)	Apparent Relative Density	Absorption (%)
1	1902.5	2.502	2.538	2.594	1.41
2	2675.5	2.511	2.543	2.595	1.28
3	1105.2	2.528	2.582	2.673	2.14
4	2425.3	2.538	2.584	2.660	1.81
5	893.0	2.499	2.547	2.626	1.94
AVERAGE		**2.516**	**2.559**	**2.630**	**1.72**

Reported by: I. Chung

Reviewed by: _____
L. Hu, M.Sc.E., P.Eng.

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones/periods. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

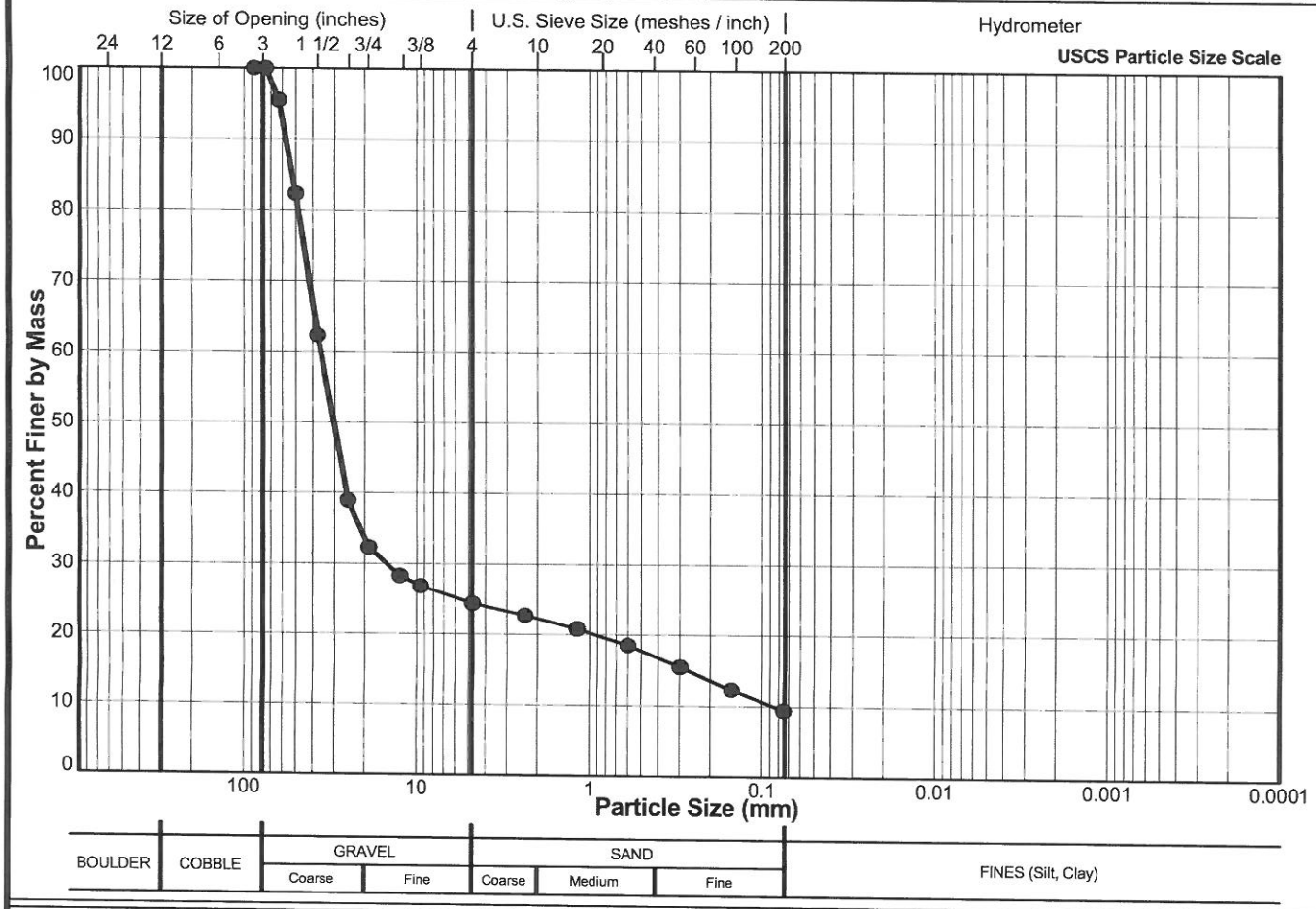
Golder Associates

SUMMARY OF PARTICLE SIZE DISTRIBUTION

Client:	Chilkoot Geological Engineers Ltd.
Project:	Borrow Source Assessment
Location:	Clinton Creek Area, Yukon
Project No.:	1403965 **Phase:** 3000

Reference(s)
ASTM C136

Sample Location:	Borrow Clinton Creek
Sample No.:	Quartzite
Depth (m):	N/A
Lab Schedule No.:	437



Legend

Sieve Size (USS)	(mm)	Particle Size (mm)	Percent Passing
3.5"	87.5		100.0
3"	75		100.0
2 1/2"	63		95.5
2"	50		82.3
1 1/2"	37.5		62.3
1"	25		38.9
3/4"	19		32.3
1/2"	12.5		28.3
3/8"	9.5		26.8
#4 US MESH	4.75		24.3
#8 US MESH	2.36		22.7
#16 US MESH	1.18		20.8
#30 US MESH	0.6		18.5
#50 US MESH	0.3		15.5
#100 US MESH	0.15		12.3
#200 US MESH	0.075		9.4

	IC/RZ	**11/3/2015**	**LH**	**11/4/2015**
	Tech	Date	Checked	Date

National IM Server:GINT_GAL_NATIONALIM Unique Project ID:1105 Output Form:_LAB_PARTICLE SIZE (W/ GRADATIONS) thu 11/4/15

Golder Associates Ltd.
300-3811 North Fraser Way Burnaby, British Columbia Canada V5J 5J2
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Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

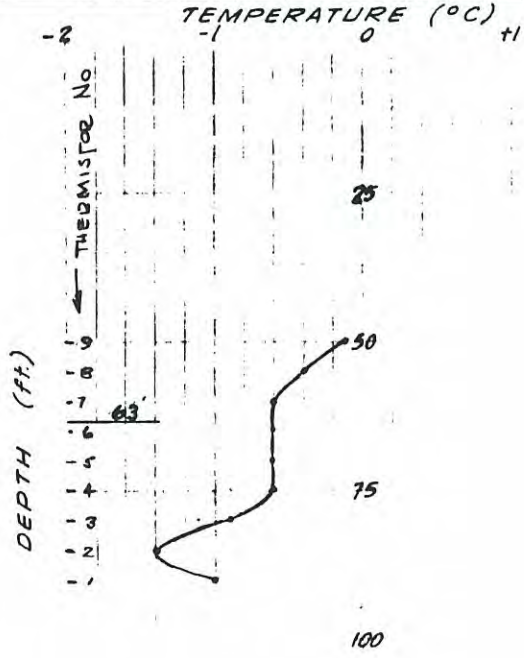
APPENDIX C
HISTORIC GROUND TEMPERATURE DATA

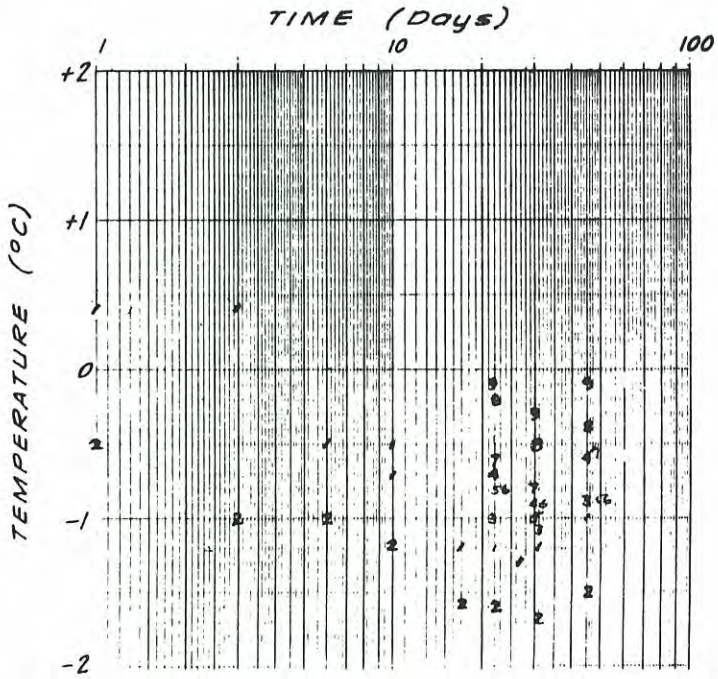
RECORD OF THERMISTOR DATA

THERMISTOR INSTALLATION No. 1
DATE OF INSTALLATION 4 April 78 (94)
LOCATION N109626.75, E107872.04

Date of Temperature Measurement/Number of Days Subsequent to Installation

Thermistor No.	Depth (ft.)	4 Apr	5 Apr	7 Apr	10 Apr	14 Apr	21 Apr	1 MAY	5 MAY	15 MAY	19 MAY	2 JUNE	19 June			
			1	3	6	10	17	27	31	41	45	59	76			
9	50	+0.5	+0.5	+0.5	+0.5	+0.3	-0.1	-0.3	-0.3	-0.1	-0.1	-0.1	-0.1			
8	55	+1.5	+0.5	+0.5	+0.5	+0.2	-0.2	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4			
7	60	+0.6	+0.5	+0.3	+0.2	-0.3	-0.6	-0.8	-0.8	-0.6	-0.6	-0.6	-0.6			
6	65	+0.5	0.0	0.0	0.0	-0.4	-0.8	-0.9	-0.9	-0.9	-0.6	-0.6	-0.6			
5	70	+0.3	0.0	0.0	0.0	-0.5	-0.8	-1.0	-1.0	-0.9	-0.6	-0.6	-0.6			
4	75	+0.5	0.0	0.0	0.0	-0.4	-0.7	-0.9	-0.9	-0.6	-0.6	-0.6	-0.6			
3	80	+0.5	0.0	0.0	-0.4	-0.6	-1.0	-1.1	-1.1	-0.9	-0.9	-0.9	-0.9			
2	85	0.0	-0.5	-1.0	-1.0	-1.2	-1.6	-1.7	-1.7	-1.5	-1.5	-1.5	-1.4			
1	90	+1.5	+0.4	+0.4	-0.5	-0.7	-1.2	-1.3	-1.2	-1.0	-1.1	-1.0	-1.0			



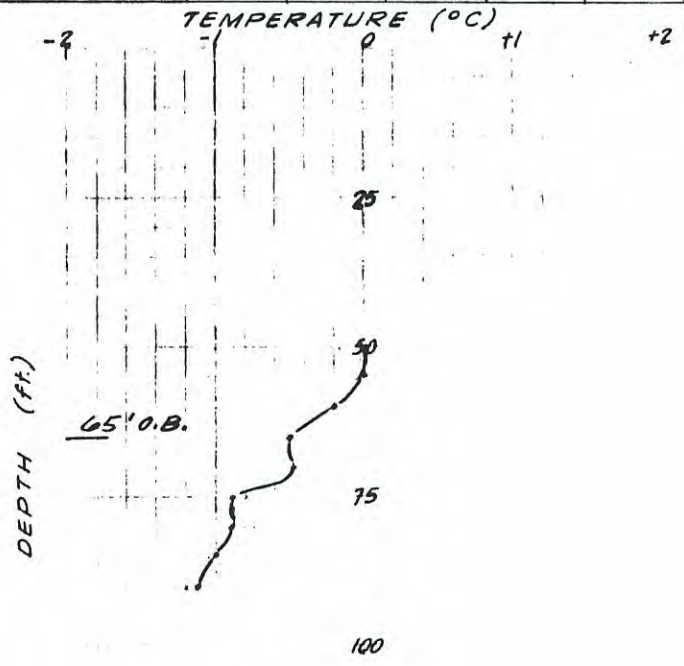


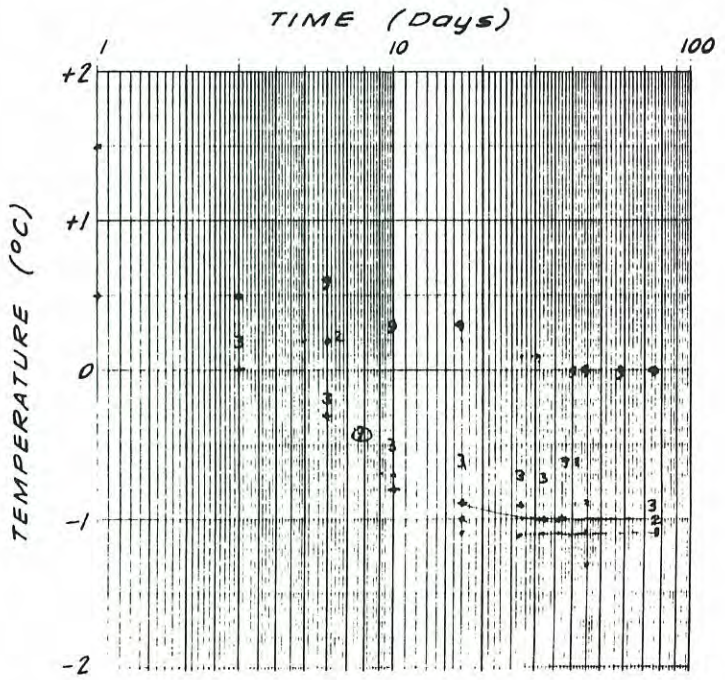
RECORD OF THERMISTOR DATA

THERMISTOR INSTALLATION No. 2
DATE OF INSTALLATION 4 APR 78 (94)
LOCATION N. 109692.92, E. 107513.05

Date of Temperature Measurement/Number of Days Subsequent to Installation

Thermistor No.	Depth (ft.)	4 APR	5 APR	7 APR	10 APR	14 APR	21 APR	1 MAY	6 MAY	12 MAY	15 MAY	19 MAY	2 JUNE	19 June		
			1	3	6	10	17	27	32	38	41	45	59	76		
9	50		+0.5	+0.5	+0.6	+0.3	+0.3	+0.1	+0.1	0.0	0.0	0.0	0.0	0.0		
8	55		+1.0	+0.5	+0.5	+0.3	+0.2	0.0	0.0	0.0	0.0	-0.1	0.0	0.0		
7	60		0.0	+0.4	+0.2	+0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.4	-0.2	-0.2		
6	65		0.0	+0.2	+0.1	-0.1	-0.1	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5	-0.5		
5	70		+1.0	+0.3	+0.1	-0.2	-0.3	-0.4	-0.4	-0.4	-0.4	-0.6	-0.5	-0.5		
4	75		+1.2	+0.4	+0.2	-0.3	-0.5	-0.6	-0.7	-0.6	-0.6	-0.9	-0.9	-0.9		
3	80		+0.5	+0.2	-0.2	-0.5	-0.6	-0.7	-0.7	-0.6	-0.6	-0.9	-0.9	-0.9		
2	85		+0.5	0.0	-0.3	-0.8	-0.9	-0.9	-1.0	-1.0	-1.0	-1.1	-1.0	-1.0		
1	90		+1.5	+0.5	+0.2	-0.7	-1.0	-1.1	-1.1	-1.0	-1.1	-1.3	-1.2	-1.1		



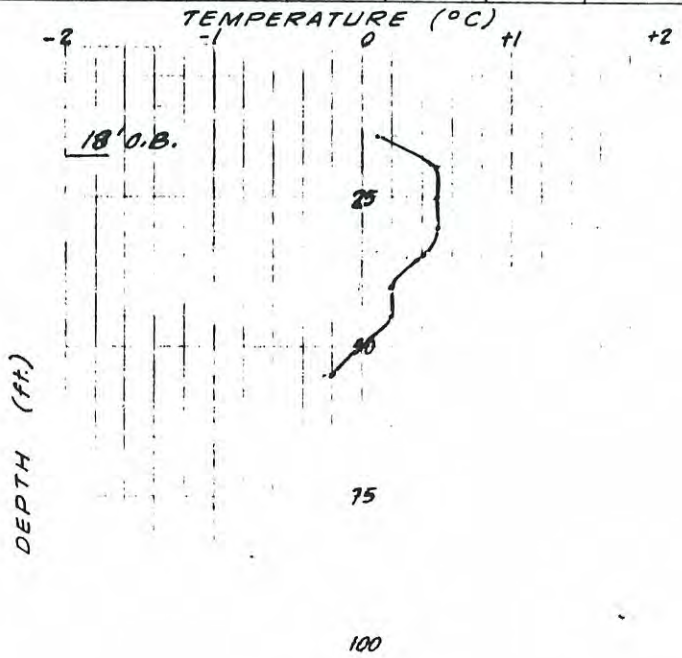


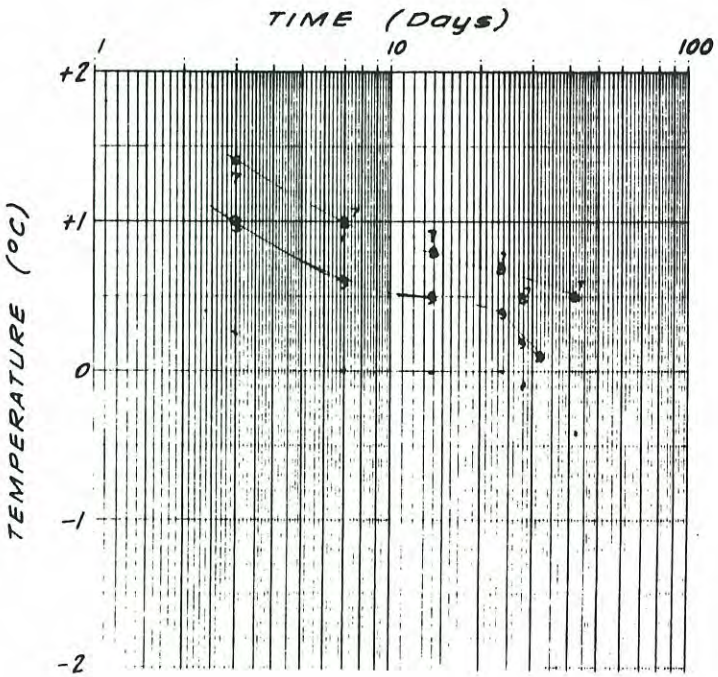
RECORD OF THERMISTOR DATA

THERMISTOR INSTALLATION No. 3
DATE OF INSTALLATION 7APR. 78 (97)
LOCATION (ON DUMP) N.109647.94
E.106690.27

Date of Temperature Measurement/Number of Days Subsequent to Installation

Thermistor No.	Depth (ft.)			7 APR	10 APR	14 APR	21 APR	1 MAY	5 MAY	19 MAY	2 JUNE	19 June				
					3	7	14	24	28	42	56	73				
9	15			+1.0	+1.0	+0.6	+0.5	+0.4	+0.2	+0.1	+0.1	+0.1				
8	20			+1.5	+1.4	+1.0	+0.8	+0.7	+0.5	+0.5	+0.4	+0.5				
7	25			+3.5	+1.3	+1.0	+0.9	+0.7	+0.5	+0.5	+0.4	+0.5				
6	30			+4.0	+1.4	+1.0	+0.8	+0.7	+0.5	+0.5	+0.5	+0.5				
5	35			+3.5	+1.1	+0.7	+0.6	+0.5	+0.3	+0.3	+0.3	+0.4				
4	40			+4.0	+0.9	+0.5	+0.4	+0.3	+0.2	+0.2	+0.2	+0.2				
3	45			+1.5	+0.5	+0.2	+0.3	+0.2	+0.1	+0.1	+0.1	+0.2				
2	50			+4.0	+0.25	0.0	+0.2	+0.2	0.0	0.0	0.0	0.0				
1	55			+5.0	+0.25	0.0	0.0	0.0	-0.1	-0.4	-0.4	-0.2				





RECORD OF THERMISTOR DATA

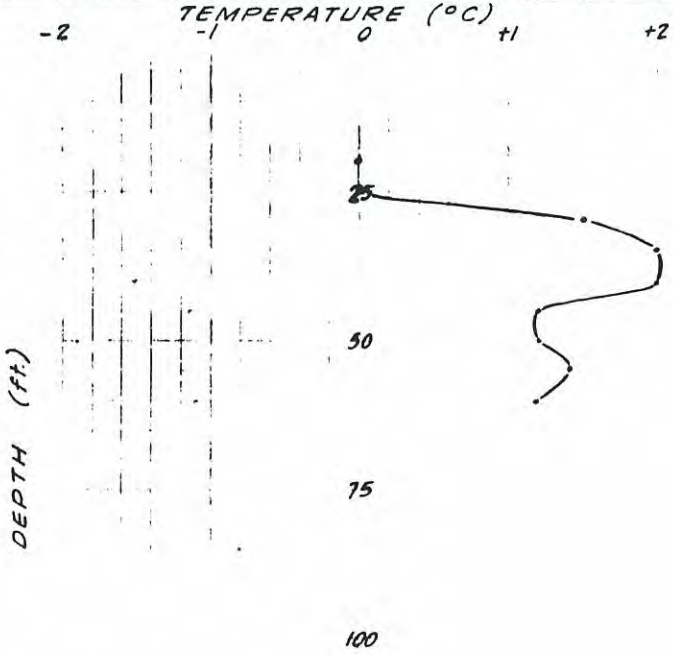
THERMISTOR INSTALLATION No. 4
DATE OF INSTALLATION 10 APR. 78
LOCATION N.110917.76, E.107487.30

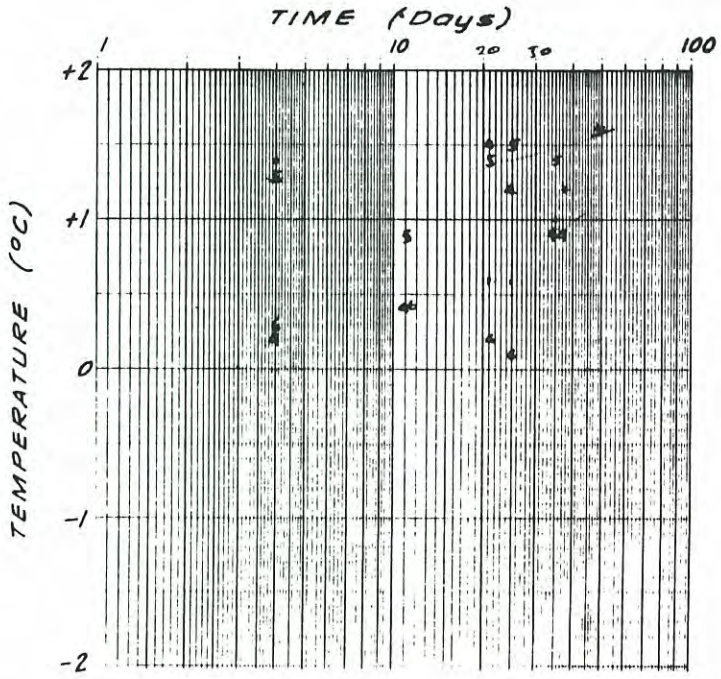
(IN WATER)

Date of Temperature Measurement/Number of Days Subsequent to Installation

Thermistor No.	Depth (ft.)				10 APR	14 APR	21 APR	1 MAY	5 MAY	15 MAY	17 MAY	19 MAY	2 JUNE	19 June		
						4	11	21	25	35	37	39	53	70		
9	20				+2.5	+0.2	+0.2	0.0	0.0	-0.4	-0.4	0.0	-0.1	0.0		
8	25				+2.4	+0.2	+0.2	0.0	-0.1	-0.4	-0.4	-0.1	-0.2	0.0		
7	30				+2.0	+0.2	+0.3	+0.1	0.0	-0.1	-0.1	0.0	0.0	+1.5		
6	35				+2.3	+0.3	+0.4	+0.2	+0.1	+2.9	+2.9	+2.2	+1.6	+2.0		
5	40				+2.0	+1.3	+0.9	+1.4	+1.5	+1.4	+1.4	+1.6	+1.6	+2.0		
4	45				+2.4	+0.2	+0.4	+1.5	+1.2	+0.9	+0.9	+1.2	+0.9	+1.2		
3	50				+2.5	+0.25	+1.7	+0.8	+1.2	+1.5	+1.5	+2.4	+1.2	+1.2		
2	55				+2.3	+1.0	+1.7	+2.0	+1.6	+1.0	+1.0	+1.4	+1.1	+1.4		
1	60				+1.6	+1.4	+0.9	+0.6	+0.6	+1.0	+1.0	+1.2	+0.9	+1.2		

?

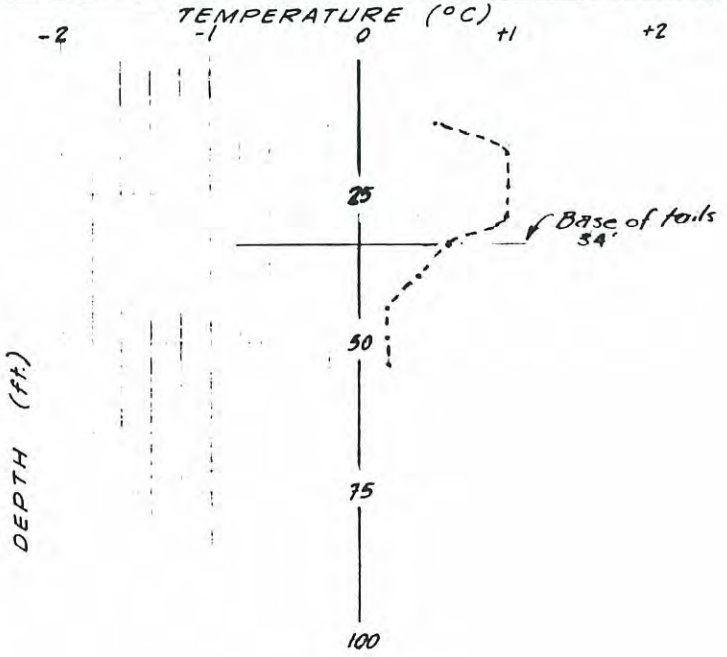


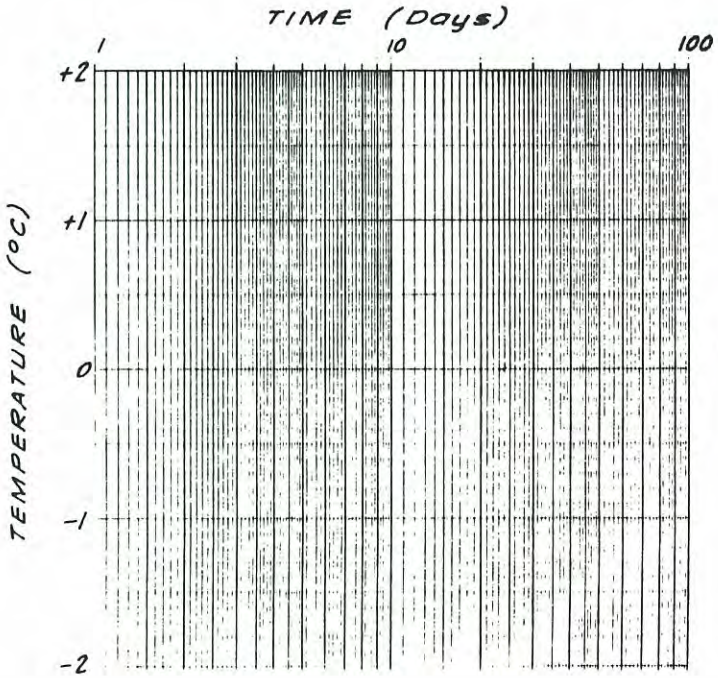


RECORD OF THERMISTOR DATA

THERMISTOR INSTALLATION No. 5 (RH 12)
DATE OF INSTALLATION 9 MAY 78 (129)
LOCATION (THILING PILE) N. 113521.34, E. 107717.23
TAILS IN PLACE 4-5 YRS

Thermistor No.	Depth (ft.)	Date of Temperature Measurement/Number of Days Subsequent to Installation															
		11 MAY	17 MAY	19 MAY	26 MAY	5 JUNE	19 June										
		2	8	10	17	27	41										
9	14	+1.1	+0.5	+0.5	+0.5	+0.5	+0.5										
8	19	+1.7	+1.0	+1.1	+1.1	+1.0	+1.0										
7	24	+1.7	+1.1	+1.1	+1.1	+1.0	+1.0										
6	29	+1.5	+1.0	+1.0	+1.0	+1.0	+1.0										
* 5	34	+1.1	+0.6	+0.7	+0.7	+0.6	+0.6										
4	39	+0.6	+0.4	+0.4	+0.4	+0.4	+0.4										
3	44	+0.3	+0.2	+0.2	+0.2	+0.2	+0.2										
2	49	+0.2	+0.1	+0.2	+0.2	+0.2	+0.2										
1	54	+0.2	+0.1	+0.2	+0.2	+0.2	+0.2										



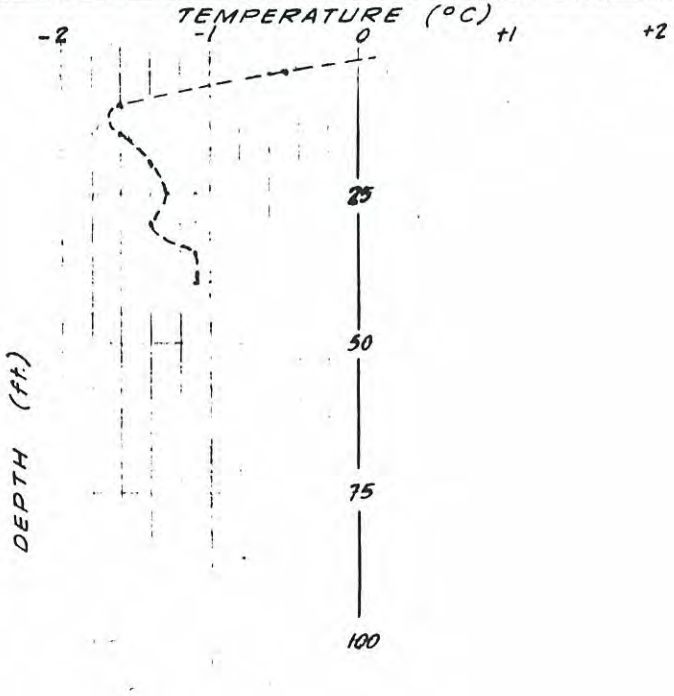


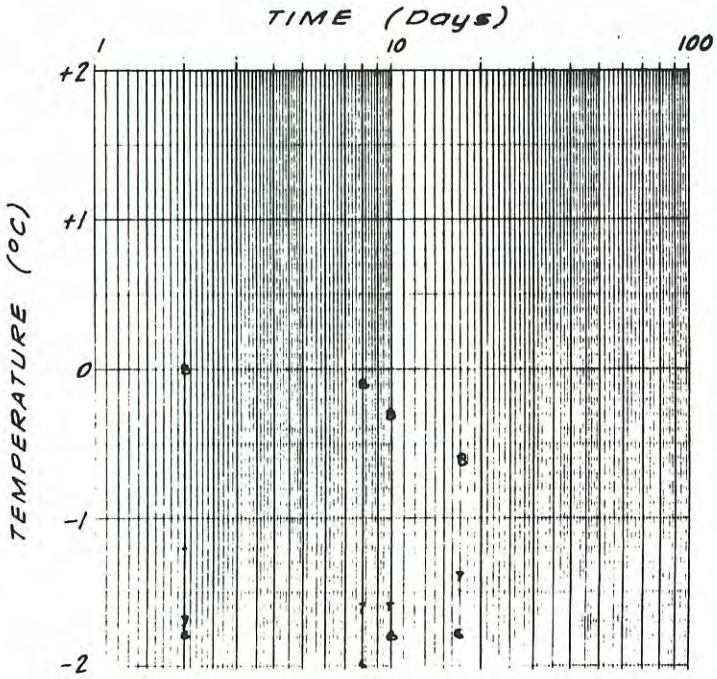
RECORD OF THERMISTOR DATA

THERMISTOR INSTALLATION No. 6 (BH-13)
DATE OF INSTALLATION 9 MAY 78 (129)
LOCATION ~ 200' NORTH OF DRILLING RIG N.115070.50
IN UNDISTURBED GROUND E.107162.86

Date of Temperature Measurement/Number of Days Subsequent to Installation

Thermistor No.	Depth (ft.)	11MAY	17MAY	19MAY	26MAY	5 JUNE	19 June									
		2	8	10	17	27	41									
9	0	+1.7	+6.6	+5.4	+7.5	+8.4	+0.1									
8	5	0.0	-0.1	-0.3	-0.6	-0.6	-0.5									
7	10	-1.7	-1.6	-1.6	-1.4	-1.4	+1.6									
6	15	-1.8	-2.0	-1.8	-1.8	-1.6	-1.6									
5	20	-1.2	-1.4	-1.4	-1.4	-1.4	-1.4									
4	25	-1.0	-1.0	-1.1	-1.1	-1.1	-1.3									
3	30	-1.1	-1.1	-1.1	-1.1	-1.1	-1.4									
2	35	-1.1	-1.1	-1.0	-1.0	-1.1	-1.1									
1	40	-1.0	-1.0	-1.0	-1.0	-1.0	-1.1									



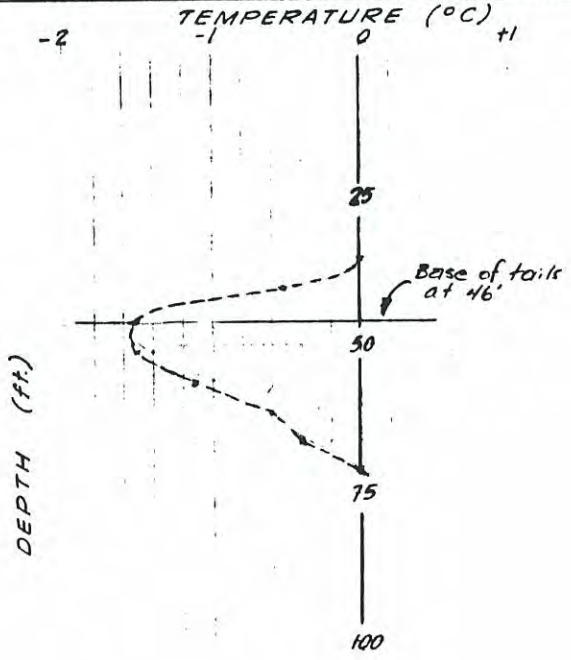


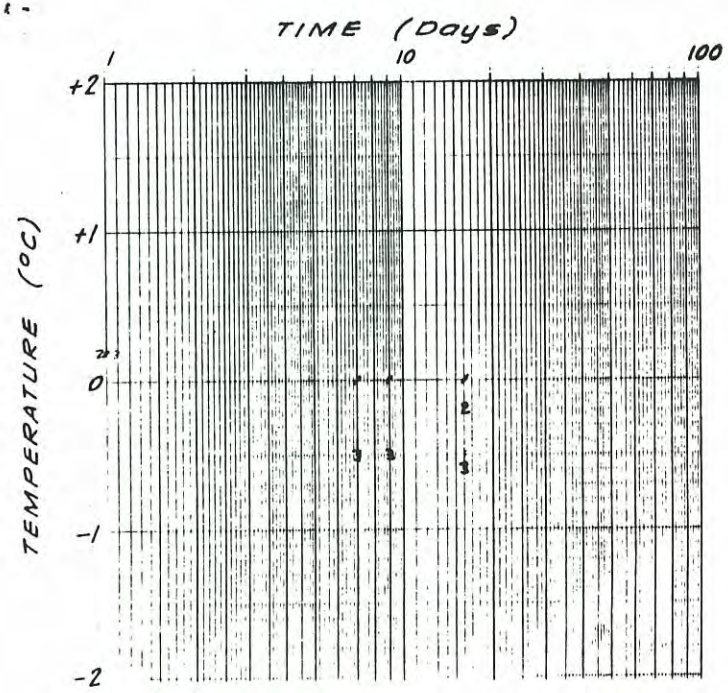
RECORD OF THERMISTOR DATA

THERMISTOR INSTALLATION No. 7 (B.H.14)
DATE OF INSTALLATION 10 MAY 70 19 70
LOCATION (TAILING PILE) N.114965.16, E.108473.94
TAILS IN PLACE 1102 YRS

Date of Temperature Measurement/Number of Days Subsequent to Installation

Thermistor No.	Depth (ft.)	11MAY	17MAY	19MAY	26MAY	5JUNE	19June									
		1	7	9	16	26	40									
9	31	+2.1	-0.1	0.0	0.0	0.0										
8	36	+2.2	+0.2	+0.1	+0.1	+0.1	0.0									
7	41	+0.3	-0.2	-0.2	-0.4	-0.4	-0.5									
* 6 -	46	+0.2	-1.9	-1.6	-1.5	-1.4	-1.5									
5	51	+0.1	-1.5	-1.5	-1.4	-1.4	-1.5									
4	56	+0.2	-1.0	-1.0	-1.0	-1.0	-1.1									
3	61	+0.2	-0.5	-0.5	-0.6	-0.6	-0.6									
2	66	+0.2	0.0	0.0	-0.2	-0.3	-0.4									
1	71	+0.2	0.0	0.0	0.0	0.0	0.0									



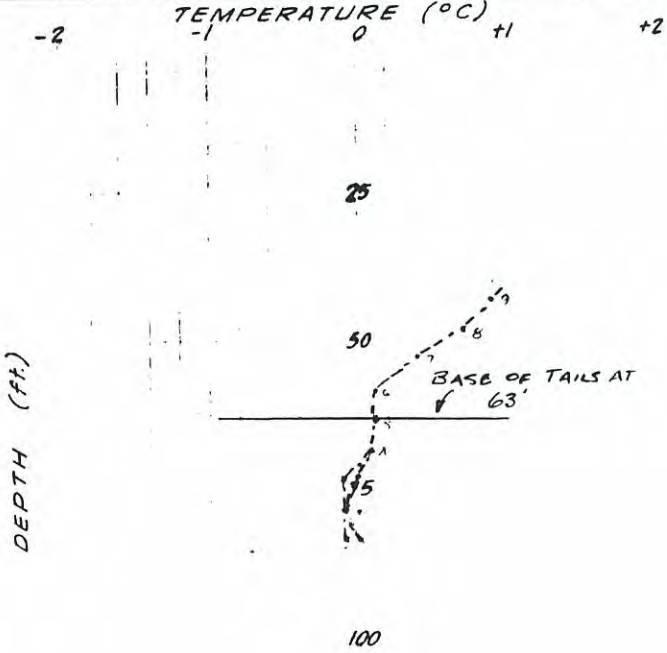


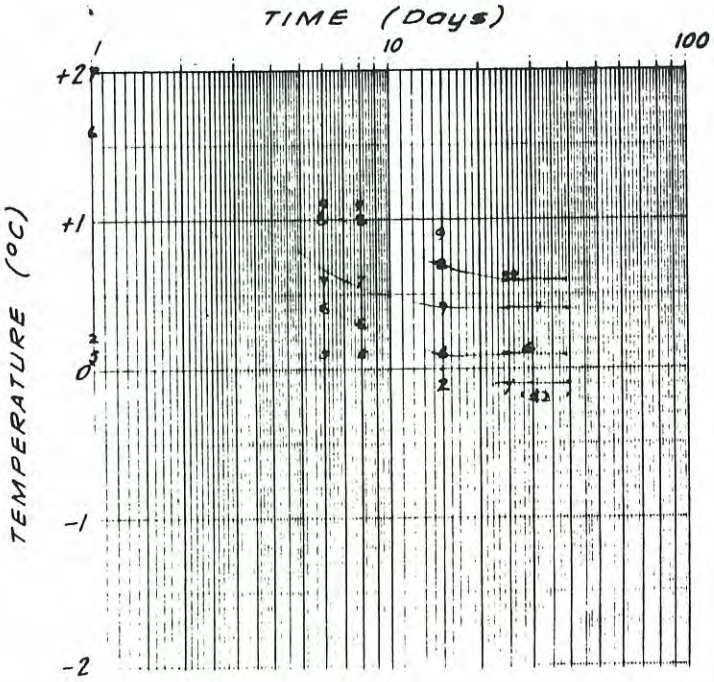
RECORD OF THERMISTOR DATA

THERMISTOR INSTALLATION No. 8 (B.H. 16)
DATE OF INSTALLATION 11 MAY 78 (131)
LOCATION TAILING PILE - 1974 FAILURE LOBE N.113481.47 E.108871.16
TAILS IN PLACE ~4 YRS

Date of Temperature Measurement/Number of Days Subsequent to Installation

Thermistor No.	Depth (ft.)	12 MAY	17 MAY	19 MAY	26 MAY	5 JUNE	19 June									
		1	6	8	15	25	39									
9	43	+3.0	+1.1	+1.1	+0.9	+0.6	+0.6									
8	48	+2.4	+1.0	+1.0	+0.7	+0.6	+0.6									
7	53	+2.0	+0.6	+0.6	+0.4	+0.4	+0.4									
6	58	+1.6	+0.4	+0.3	+0.1	+0.1	+0.1									
* 5	63	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1									
4	68	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1									
3	73	+0.1	+0.1	+0.1	0.0	-0.1	-0.1									
2	78	+0.2	+0.1	+0.1	-0.1	-0.1	-0.1									
1	83	+0.2	+0.3	+0.4	0	-0.1	-0.1									





APPENDIX D1

MONITORING DATA – CLINTON CREEK WASTE ROCK PILE

CLINTON CREEK WASTE ROCK DUMP - SUMMARY OF HISTORICAL MOVEMENT DATA									
Monitoring Period	**Annual Horizontal Movement Rates (m/year)**								
	Upper			**Mid**			**Lower**		
	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.
1976				2.37	2.40	2.35			
1977	2.3			1.59	2.65	0.02			
1978	1.2			1.41	1.61	1.19			
1979	1.3			1.29	1.34	1.24			
1980				1.09	1.12	1.07			
1981				0.82	0.82	0.82			
1982	0.80			0.75	0.92	0.23			
1983	0.68			0.50	0.59	0.40			
1984	0.39			0.51	0.94	0.09			
1984 to 1986	0.42			0.28	0.46	0.02			
1986 to 1999	0.05	0.05	0.05	0.04	0.08	0.00			
1999 to 2001	0.06	0.06	0.05	0.08	0.11	0.01	0.07	0.13	0.02
2001 to 2003	0.05	0.06	0.05	0.05	0.10	0.02	0.04	0.11	0.01
July 2004 to July 2006	0.02	0.03	0.01	0.03	0.07	0.01	0.02	0.07	0.01
July 2006 to July 2008	0.02	0.03	0.01	0.03	0.05	0.01	0.02	0.06	0.00
July 2008 to July 2010	0.02	0.04	0.01	0.02	0.06	0.01	0.02	0.08	0.00
July 2010 to Sept 2010	0.20	0.35	0.07	0.10	0.29	0.01	0.16	0.28	0.03
Sept 2010 to Aug 2011	0.05	0.07	0.02	0.03	0.06	0.01	0.03	0.08	0.00
Aug 2011 to Aug 2012	0.04	0.06	0.02	0.04	0.07	0.01	0.04	0.11	0.01
Aug 2012 to Sept 2014	0.03	0.09	0.01	0.02	0.05	0.01	0.03	0.10	0.00
Sept 2014 to Sept 2015	0.05	0.15	0.01						

Note: Monitoring Points vary throughout the years, as some were replaced, new ones were added, etc.
-no survey between 1986 and 1999, or in 2013
-blank cells are a result of no available data
-values in red indicate that data was not available and was calculated based on reported survey data

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - UPPER SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
81-1	15-Aug-81	33589.05	32475.63	458.54							
	15-Jun-82	33589.69	32475.82	458.30	0.67	0.67	0.67	-0.24	-0.24	-0.29	
	9-Jun-83	33590.31	32476.00	458.06	1.31	0.64	1.31	-0.48	-0.24	-0.24	
	23-Sep-83	33590.49	32476.09	458.01	1.51	0.20	1.51	-0.53	-0.05	-0.18	
	14-Jun-84	33590.77	32476.09	457.64	1.78	0.29	1.78	-0.90	-0.37	-0.51	
	15-Jul-86	33591.60	32476.39	457.41	2.65	0.88	2.65	-1.12	-0.22	-0.11	
	17-Jul-99	33591.86	32477.03	456.37	3.14	0.69	3.14	-2.17	-1.04	-0.08	
	19-Jun-01	7147034.71	512978.88	455.25	0.00	0.12	0.06	0.00	0.14	0.07	
	20-Aug-03	7147034.82	512978.93	455.27	0.12	0.12	0.06	0.02	0.02	0.01	
	28-Jul-04	7147034.76	512978.92	455.23	0.07	0.06	0.07	-0.03	-0.04	-0.05	
	28-Jul-06	7147034.80	512978.92	455.18	0.10	0.05	0.02	-0.07	-0.04	-0.02	
	9-Jul-08	7147034.83	512978.93	455.22	0.13	0.03	0.01	-0.04	0.04	0.02	
	20-Jul-10	7147034.84	512978.93	455.17	0.14	0.02	0.01	-0.08	-0.04	-0.02	
	25-Sep-10	7147034.83	512978.94	455.17	0.14	0.02	0.08	-0.08	0.00	0.00	
	11-Aug-11	7147034.86	512978.99	455.14	0.18	0.06	0.07	-0.11	-0.03	-0.04	
	6-Aug-12	7147034.86	512978.94	455.09	0.16	0.05	0.05	-0.16	-0.05	-0.05	
	11-Sep-14	7147034.84	512978.96	455.04	0.19	0.03	0.01	-0.21	-0.05	-0.03	
	17-Sep-15	7147034.85	512978.97	455.04	0.20	0.01	0.01	-0.21	0.00	0.00	
223	19-Jun-01	n/a									
	20-Aug-03	7146978.05	512942.74	467.22	0.00			0.00			
	28-Jul-04	7146978.08	512942.73	467.20	0.03	0.03	0.03	-0.02	-0.02	-0.02	
	28-Jul-06	7146978.12	512942.73	467.21	0.07	0.04	0.02	-0.01	0.00	0.00	
	9-Jul-08	7146978.16	512942.75	467.15	0.11	0.05	0.02	-0.07	-0.05	-0.03	
	20-Jul-10	7146978.19	512942.75	467.13	0.14	0.03	0.02	-0.09	-0.02	-0.01	
	25-Sep-10	7146978.17	512942.78	467.10	0.12	0.04	0.21	-0.12	-0.03	-0.15	
	11-Aug-11	7146978.22	512942.79	467.08	0.17	0.05	0.06	-0.14	-0.02	-0.03	
	6-Aug-12	7146978.25	512942.76	467.05	0.20	0.04	0.04	-0.17	-0.03	-0.03	
	11-Sep-14	7146978.27	512942.79	467.01	0.23	0.03	0.02	-0.21	-0.04	-0.02	
	17-Sep-15	7146978.30	512942.77	467.02	0.27	0.03	0.03	-0.20	0.00	0.00	
225	19-Jun-01	n/a									
	20-Aug-03	7146918.72	512905.22	475.17	0.00			0.00			
	28-Jul-04	7146918.73	512905.18	475.14	0.04	0.04	0.04	-0.03	-0.03	-0.03	
	28-Jul-06	7146918.77	512905.18	475.15	0.07	0.04	0.02	-0.03	0.00	0.00	
	9-Jul-08	7146918.81	512905.20	475.10	0.09	0.04	0.02	-0.07	-0.05	-0.03	
	20-Jul-10	7146918.83	512905.19	475.07	0.12	0.03	0.02	-0.11	-0.03	-0.01	
	25-Sep-10	7146918.84	512905.24	475.06	0.13	0.05	0.27	-0.11	-0.01	-0.04	
	11-Aug-11	7146918.86	512905.25	475.03	0.15	0.02	0.03	-0.14	-0.03	-0.03	
	6-Aug-12	7146918.89	512905.21	475.02	0.18	0.06	0.06	-0.16	-0.02	-0.02	
	11-Sep-14	7146918.90	512905.21	474.98	0.19	0.01	0.01	-0.20	-0.04	-0.02	
	17-Sep-15	7146918.92	512905.23	474.98	0.22	0.03	0.03	-0.20	0.00	0.00	
1195	19-Jun-01	7147111.83	512899.53	456.62	0.00	0.10	0.05	0.00	0.16	0.08	
	20-Aug-03	7147111.94	512899.53	456.59	0.11	0.11	0.05	-0.03	-0.03	-0.01	
	28-Jul-04	7147111.95	512899.52	456.60	0.12	0.02	0.02	-0.02	0.01	0.01	
	28-Jul-06	7147111.95	512899.50	456.56	0.13	0.03	0.01	-0.06	-0.04	-0.02	
	4-Jul-07	7147112.01	512899.50	456.54	0.18	0.06	0.06	-0.08	-0.02	-0.03	
	9-Jul-08	7147112.03	512899.52	456.51	0.20	0.03	0.03	-0.11	-0.03	-0.03	
	20-Jul-10	7147112.05	512899.52	456.48	0.22	0.02	0.01	-0.14	-0.03	-0.02	

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - UPPER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	25-Sep-10	7147112.03	512899.52	456.43	0.21	0.01	0.07	-0.18	-0.04	-0.23
	11-Aug-11	7147112.05	512899.53	456.41	0.23	0.02	0.02	-0.21	-0.03	-0.03
	6-Aug-12	7147112.06	512899.52	456.39	0.24	0.02	0.02	-0.22	-0.01	-0.01
	11-Sep-14	7147112.09	512899.55	456.34	0.28	0.04	0.02	-0.27	-0.05	-0.02
	17-Sep-15	7147112.11	512899.53	456.35	0.31	0.03	0.03	-0.26	0.00	0.00
1834	19-Jun-01	n/a								
	20-Aug-03	7146973.62	512893.43	461.12	0.00			0.00		
	28-Jul-04	7146973.64	512893.38	461.09	0.06	0.06	0.06	-0.03	-0.03	-0.03
	28-Jul-06	7146973.69	512893.36	461.09	0.11	0.06	0.03	-0.03	0.00	0.00
	4-Jul-07	7146973.72	512893.36	461.08	0.13	0.03	0.03	-0.04	-0.01	-0.01
	9-Jul-08	7146973.74	512893.38	461.06	0.13	0.03	0.03	-0.06	-0.01	-0.01
	20-Jul-10	7146973.79	512893.34	461.04	0.20	0.07	0.04	-0.08	-0.02	-0.01
	25-Sep-10	7146973.78	512893.40	461.03	0.16	0.06	0.35	-0.09	-0.01	-0.07
	11-Aug-11	7146973.83	512893.42	461.04	0.22	0.06	0.07	-0.08	0.01	0.01
	6-Aug-12	7146973.82	512893.36	460.96	0.21	0.06	0.06	-0.16	-0.08	-0.08
	11-Sep-14	7146973.86	512893.36	460.94	0.25	0.04	0.02	-0.18	-0.02	-0.01
	17-Sep-15	7146973.87	512893.36	460.96	0.26	0.01	0.01	-0.16	0.02	0.01
186	6-Aug-12	7146818.49	513088.62							
	11-Sep-14	7146818.51	513088.81	477.50	0.19	0.19	0.09	477.50	477.50	227.53
	17-Sep-15	7146818.51	513088.86	477.45	0.24	0.06	0.05	477.45	-0.06	-0.06
300	6-Aug-12	7146927.56	513026.96							
	11-Sep-14	7146927.57	513026.98	468.83	0.02	0.02	0.01	468.83	468.83	223.40
	17-Sep-15	7146927.61	513026.96	468.85	0.06	0.04	0.04	468.85	0.02	0.01
2836	6-Aug-12	7146814.71	513092.92							
	11-Sep-14	7146814.74	513093.05	477.32	0.14	0.14	0.07	477.32	477.32	227.44
	17-Sep-15	7146814.78	513093.17	477.31	0.26	0.12	0.12	477.31	-0.01	-0.01
BH-4	19-Jun-01	n/a	n/a							
	20-Aug-03	n/a	n/a							
	28-Jul-04	n/a	n/a							
	28-Jul-06	n/a	n/a							
	9-Jul-08	n/a	n/a							
	20-Jul-10	n/a	n/a							
	25-Sep-10	n/a	n/a							
	11-Aug-11	n/a	n/a							
	6-Aug-12	7146871.29	513025.11							
	11-Sep-14	7146871.27	513025.14	470.96	0.03	0.03	0.01	470.96	470.96	224.41
	17-Sep-15	7146871.26	513025.12	470.99	0.05	0.02	0.02	470.99	0.03	0.03
BH-4 CABLE	19-Jun-01	n/a	n/a							
	20-Aug-03	n/a	n/a							
	28-Jul-04	n/a	n/a							
	28-Jul-06	n/a	n/a							
	9-Jul-08	n/a	n/a							
	20-Jul-10	n/a	n/a							
	25-Sep-10	n/a	n/a							
	11-Aug-11	n/a	n/a							
	6-Aug-12	7146871.33	513025.22							
	11-Sep-14	7146871.37	513025.21	470.96	0.04	0.04	0.02	470.96	470.96	224.41

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - UPPER SLOPE										
Monitor ID	**Date**	**UTM Coordinates**			**Horizontal Movement**			**Vertical Movement**		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	17-Sep-15	7146871.37	513025.21	470.95	0.04	0.00	0.00	470.95	-0.01	-0.01

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - MID SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
4	19-Jun-01	7147211.31	513193.67	435.30	0.00	0.06	0.03	0.00	-0.17	-0.09
	20-Aug-03	7147211.28	513193.64	435.18	0.05	0.05	0.02	-0.12	-0.12	-0.06
	28-Jul-04	7147211.22	513193.64	435.08	0.10	0.06	0.07	-0.22	-0.10	-0.11
	28-Jul-06	7147211.16	513193.61	435.06	0.16	0.07	0.03	-0.24	-0.02	-0.01
	9-Jul-08	7147211.10	513193.62	434.97	0.21	0.06	0.03	-0.33	-0.09	-0.05
	20-Jul-10	7147211.05	513193.59	434.91	0.28	0.06	0.03	-0.39	-0.06	-0.03
	25-Sep-10	7147211.04	513193.60	434.90	0.28	0.02	0.10	-0.40	-0.01	-0.06
	11-Aug-11	7147211.02	513193.60	434.88	0.30	0.02	0.03	-0.42	-0.01	-0.01
	6-Aug-12	7147211.01	513193.62	434.87	0.30	0.02	0.02	-0.43	-0.02	-0.02
	11-Sep-14	7147210.98	513193.59	434.82	0.34	0.04	0.02	-0.48	-0.05	-0.02
19/19B	24-Nov-76	33674.33	32858.63							
	25-Jan-77	33674.44	32858.79		0.19	0.19	1.13			
	24-Feb-77	33674.51	32858.82		0.08	0.26	0.94			
	23-Mar-77	33674.55	32858.92		0.10	0.36	1.41			
	10-May-77	33674.63	32858.98		0.10	0.45	0.76			
	24-May-77	33674.63	32859.04		0.06	0.50	1.59			
	19-Jul-77	33674.76	32859.13		0.16	0.66	1.05			
	18-Nov-77	33675.10	32859.65		0.62	1.27	1.85			
	20-Jan-78	33675.25	32859.73		0.18	1.43	1.02			
	20-Apr-78	33675.36	32859.98		0.27	1.69	1.11			
	26-May-78	33675.41	32860.04		0.08	1.77	0.79			
	6-Jun-78	33675.36	32860.01		0.05	1.73	1.81			
	27-Jul-78	33675.49	32860.13		0.17	1.89	1.20			
	22-Sep-78	33675.57	32860.19		0.10	1.99	0.67			
	19-Oct-78	33675.62	32860.25		0.08	2.07	1.03			
	1-Feb-79	33675.75	32860.38		0.19	2.25	0.65			
	22-Apr-79	33675.82	32860.48		0.12	2.37	0.54			
	16-May-79	33676.00	32860.51		0.18	2.51	2.79			
	18-Jun-79	33676.01	32860.55		0.04	2.55	0.43			
	1-Aug-79	33675.97	32860.59		0.07	2.55	0.55			
	7-Sep-79	33676.04	32860.64		0.09	2.64	0.87			
	10-Nov-79	33676.13	32860.73		0.13	2.76	0.71			
	4-Apr-80	33676.34	32860.87		0.25	3.01	0.63			
	24-May-80	33676.39	32860.99		0.13	3.13	0.97			
	17-Jul-80	33676.43	32861.06		0.08	3.21	0.53			
	1-Sep-83	33677.54	32862.14		1.55	4.75	0.50			
	14-Jun-84	33677.87	32862.50		0.49	5.24	0.62		-0.17	-0.21
	15-Jul-86	33678.20	32862.86		0.49	5.73	0.23		-0.43	-0.20
	16-Jul-99	33679.42	32864.30		1.89	7.62	0.15		-1.86	-0.14
	19-Jun-01	7147124.18	513365.54	430.10	0.00	0.22	0.11	0.00	-0.32	-0.16
	20-Aug-03	7147124.35	513365.64	429.24	0.19	0.19	0.09	-0.86	-0.86	-0.40
	28-Jul-04	7147124.36	513365.70	429.13	0.24	0.06	0.06	-0.97	-0.11	-0.11
	28-Jul-06	not surveyed in 2006								
	9-Jul-08	7147124.48	513365.75	428.78	0.36	0.13	0.03	-1.32	-0.35	-0.09
	20-Jul-10	7147124.46	513365.72	428.66	0.33	0.04	0.02	-1.44	-0.12	-0.06
	25-Sep-10	7147124.43	513365.74	428.64	0.32	0.03	0.18	-1.47	-0.03	-0.14
	11-Aug-11	7147124.41	513365.74	428.58	0.30	0.02	0.02	-1.52	-0.06	-0.07

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - MID SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
	6-Aug-12	7147124.41	513365.73	428.52	0.30	0.01	0.01	-1.58	-0.06	-0.06	
	11-Sep-14	7147124.35	513365.73	428.40	0.36	0.06	0.03	-1.70	-0.12	-0.06	
19A	11-Sep-14	7147126.60	513363.54	428.29							
20/20A	24-Nov-76	33739.41	32554.64								
	29-Dec-76	33739.61	32554.74		0.23	0.23					
	25-Jan-77	33739.75	32554.83		0.39	0.17					
	24-Feb-77	33739.90	32554.88		0.55	0.15					
	23-Mar-77	33740.03	32554.94		0.69	0.15					
	10-May-77	33740.23	32555.06		0.93	0.24					
	24-May-77	33740.31	32555.13		1.03	0.10					
	19-Jul-77	33740.60	32555.27		1.35	0.32					
	18-Nov-77	33758.04	32552.33								
	20-Jan-78	33758.29	32552.49		1.64		2.35				
	20-Apr-78	33758.62	32552.70		2.04	0.40	2.29		0.07	-0.40	
	26-May-78	33758.72	32552.76		2.15	0.11	1.85				
	6-Jun-78	33758.74	32552.79		2.19	0.04	2.00				
	27-Jul-78	33758.88	32552.79		2.31	0.12	1.79				
	22-Sep-78	33759.12	32552.99		2.62	0.31	2.65				
	19-Oct-78	33759.19	32553.04		2.70	0.09	2.10				
	1-Feb-79	33759.53	32553.20		3.07	0.37					
	22-Apr-79	33759.76	32553.36		3.35	0.28					
	16-May-79	33759.82	32553.38		3.41	0.06	1.62				
	18-Jun-79	33759.96	32553.43		3.56	0.15	1.14				
	1-Aug-79	33760.08	32553.51		3.70	0.14	1.17				
	7-Sep-79	33760.24	32553.61		3.89	0.19	0.87				
	10-Nov-79	33760.36	32553.65		4.03	0.13	1.97				
	4-Apr-80	33760.78	32553.90		4.51	0.49	1.17				
	24-May-80	33760.93	32553.98		4.68	0.17	1.28				
	17-Jul-80	33761.07	32554.04		4.83	0.15	1.28				
	15-Aug-81	33762.30	32554.65		6.20	1.38	0.88		-0.24	-0.21	
	15-Jun-82	33762.64	32554.77		6.55	0.35	1.68		-0.10	-0.12	
	9-Jun-83	33763.36	32555.10		7.34	0.79	1.16		-0.20	-0.21	
	23-Sep-83	33763.31	32555.09		7.29	-0.05	1.88		-0.08	-0.27	
	14-Jun-84	33763.68	32555.22		7.68	0.39	0.76		-0.32	-0.43	
	15-Jul-86	33764.43	32555.57		8.52	0.83	1.22		-0.18	-0.09	
	16-Jul-99	33764.52	32556.00		8.80	0.28	1.21		-1.14	-0.09	
	19-Jun-01	7147207.71	513057.05	445.86	0.00	0.22	1.00	0.00	0.05	0.03	
	20-Aug-03	7147207.86	513057.14	445.83	0.17	0.17	1.28	-0.03	-0.03	-0.01	
	28-Jul-04	7147207.85	513057.12	445.74	0.15	0.02	0.42	-0.11	-0.09	-0.09	
	28-Jul-06	7147207.88	513057.14	445.69	0.19	0.05	0.80	-0.17	-0.05	-0.03	
	4-Jul-07	7147207.91	513057.16	445.66	0.22	0.03	0.17	-0.20	-0.03	-0.03	
	9-Jul-08	7147207.92	513057.18	445.63	0.25	0.03	0.54	-0.23	-0.03	-0.03	
	20-Jul-10	7147207.95	513057.18	445.57	0.27	0.03	0.40	-0.29	-0.06	-0.03	
	25-Sep-10	7147207.93	513057.18	445.55	0.25	0.02	0.02	-0.31	-0.02	-0.12	
	11-Aug-11	7147207.94	513057.20	445.53	0.27	0.02	0.03	-0.32	-0.02	-0.02	
	6-Aug-12	7147207.98	513057.21	445.50	0.31	0.04	0.04	-0.35	-0.03	-0.03	
	11-Sep-14	7147207.97	513057.23	445.42	0.33	0.02	0.01	-0.43	-0.08	-0.04	

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - MID SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
21/21A	24-Nov-76	33776.76	32425.61								
	29-Dec-76	33776.98	32425.69		0.23	0.23	2.40				
	25-Jan-77	33777.16	32425.75		0.42	0.19	2.57				
	24-Feb-77	33777.34	32425.77		0.60	0.18	2.23				
	23-Mar-77	33777.54	32425.83		0.80	0.20	2.72				
	10-May-77	33777.78	32425.92		1.06	0.26	1.95				
	24-May-77	33777.83	32425.92		1.11	0.05	1.27				
	3-Jun-77	33777.94	32426.07		1.26	0.15	5.56				
	19-Jul-77	33778.16	32426.05		1.46	0.20	1.57				
	18-Nov-77	33777.83	32414.45		0.00	0.00	0.00				
	20-Jan-78	33778.17	32414.37		1.82	0.35	2.05				
	20-Apr-78	33778.58	32414.44		2.22	0.40	1.62				
	26-May-78	33778.71	32414.43		2.35	0.13	1.33				
	6-Jun-78	33778.76	32414.40		2.40	0.05	1.65				
	27-Jul-78	33779.02	32414.43		2.66	0.26	1.87				
	22-Sep-78	33779.26	32414.41		2.90	0.24	1.52				
	19-Oct-78	33779.34	32414.42		2.97	0.08	1.03				
	1-Feb-79	33779.75	32414.39		3.38	0.41	1.43				
	22-Apr-79	33780.00	32414.42		3.64	0.25	1.15				
	16-May-79	33780.12	32414.44		3.76	0.12	1.85				
	18-Jun-79	33780.24	32414.43		3.87	0.12	1.28				
	1-Aug-79	33780.39	32414.45		4.02	0.15	1.21				
	7-Sep-79	33780.57	32414.47		4.20	0.18	1.77				
	10-Nov-79	33780.76	32414.47		4.39	0.19	1.08				
	4-Apr-80	33781.21	32414.50		4.85	0.46	1.09				
	24-May-80	33781.33	32414.50		4.97	0.12	0.89				
	17-Jul-80	33781.49	32414.50	450.74	5.12	0.15	1.03	0.00	0.00	0.00	
	15-Aug-81	33782.55	32414.48	450.42	6.18	1.06	0.98	-0.31	-0.31	-0.29	
	15-Jun-82	33783.21	32414.48	450.22	6.84	0.66	0.79	-0.52	-0.21	-0.25	
	9-Jun-83	33783.90	32414.48	449.94	7.54	0.69	0.71	-0.80	-0.28	-0.29	
	23-Sep-83	33783.96	32414.46	449.94	7.60	0.06	0.21	-0.80	0.00	0.00	
	14-Jun-84	33784.30	32414.39	449.63	7.93	0.33	0.46	-1.11	-0.31	-0.43	
	15-Jul-86	33785.16	32414.38	449.35	8.79	0.86	0.41	-1.38	-0.27	-0.13	
	16-Jul-99	33785.62	32414.14	447.57	9.26	0.47	0.04	-3.17	-1.78	-0.14	
	19-Jun-01	7147228.14	512915.05	446.57	0.00	0.20	0.10	0.00	0.05	0.02	
	20-Aug-03	7147228.20	512915.15	446.54	0.11	0.11	0.05	-0.03	-0.03	-0.02	
	28-Jul-04	7147228.18	512915.11	446.43	0.07	0.04	0.05	-0.14	-0.11	-0.11	
	28-Jul-06	7147228.26	512915.11	446.38	0.13	0.08	0.04	-0.19	-0.05	-0.02	
	4-Jul-07	7147228.30	512915.11	446.37	0.17	0.12	0.13	-0.21	-0.06	-0.02	
	9-Jul-08	7147228.31	512915.12	446.32	0.18	0.05	0.05	-0.25	-0.06	-0.07	
	20-Jul-10	7147228.36	512915.09	446.26	0.22	0.02	0.02	-0.31	-0.05	-0.04	
	25-Sep-10	7147228.34	512915.10	446.23	0.21	0.02	0.09	-0.35	-0.03	-0.19	
	11-Aug-11	7147228.38	512915.08	446.19	0.24	0.04	0.05	-0.38	-0.03	-0.04	
	6-Aug-12	7147228.43	512915.07	446.16	0.29	0.05	0.05	-0.41	-0.03	-0.03	
	11-Sep-14	7147228.48	512915.07	446.10	0.34	0.05	0.02	-0.47	-0.06	-0.03	
22/22A	24-Nov-76	33783.11	32340.66								
	29-Dec-76	33783.35	32340.60		0.25	0.25	2.61				

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - MID SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
	25-Jan-77	33783.60	32340.54		0.50	0.25	3.44				
	24-Feb-77	33783.83	32340.48		0.74	0.24	2.91				
	23-Mar-77	33784.08	32340.49		0.99	0.24	3.32				
	10-May-77	33784.52	32340.40		1.44	0.45	3.40				
	24-May-77	33784.52	32340.39		1.44	0.00	0.06				
	3-Jun-77	33784.57	32340.39		1.49	0.05	1.90				
	19-Jul-77	33784.89	32340.33		1.81	0.32	2.54				
	18-Nov-77	33772.38	32343.50		0.00	0.00	0.00				
	20-Jan-78	33772.82	32343.41		2.26	0.00	0.00				
	20-Apr-78	33773.29	32343.32		2.75	0.48	1.97				
	26-May-78	33773.51	32343.30		2.96	0.21	2.18				
	6-Jun-78	33773.53	32343.24		3.00	0.04	1.19				
	27-Jul-78	33773.84	32343.20		3.31	0.31	2.22				
	22-Sep-78	33774.18	32343.12		3.65	0.34	2.20				
	19-Oct-78	33774.31	32343.05		3.79	0.14	1.94				
	1-Feb-79	33774.78	32342.92		4.29	0.49	1.71				
	22-Apr-79	33775.11	32342.86		4.62	0.33	1.50				
	16-May-79	33775.24	32342.81		4.76	0.14	2.11				
	18-Jun-79	33775.41	32342.78		4.93	0.17	1.89				
	1-Aug-79	33775.58	32342.71		5.11	0.19	1.56				
	7-Sep-79	33775.79	32342.71		5.31	0.20	1.95				
	10-Nov-79	33776.06	32342.65		5.59	0.28	1.61				
	4-Apr-80	33776.47	32342.51		6.02	0.43	1.07				
	24-May-80	33776.77	32342.47		6.32	0.29	2.19				
	17-Jul-80	33776.94	32342.41	450.52	6.51	0.19	1.26				
	15-Aug-81	33778.13	32342.08	449.99	7.74	1.24	1.14		-0.54	-0.50	
	15-Jun-82	33778.87	32341.89	449.76	8.50	0.76	0.92		-0.23	-0.27	
	9-Jun-83	33779.72	32341.68	449.37	9.37	0.87	0.89		-0.39	-0.40	
	23-Sep-83	33779.73	32341.71	449.35	9.37	0.00	0.00		-0.02	-0.06	
	14-Jun-84	33780.17	32341.57	448.90	9.84	0.46	0.64		-0.45	-0.62	
	15-Jul-86	33781.09	32341.34	448.45	10.78	0.95	0.46		-0.45	-0.21	
	16-Jul-99	33781.94	32340.47	446.11	11.85	1.06	0.08		-2.35	-0.18	
	19-Jun-01	7147224.10	512841.41	445.02	0.00	0.19	0.10	0.00	-0.03	-0.02	
	20-Aug-03	7147224.29	512841.31	444.99	0.22	0.22	0.10	-0.03	-0.03	-0.01	
	28-Jul-04	7147224.27	512841.30	444.88	0.21	0.02	0.02	-0.14	-0.11	-0.12	
	28-Jul-06	7147224.40	512841.26	444.81	0.33	0.13	0.07	-0.21	-0.07	-0.03	
	4-Jul-07	7147224.45	512841.23	444.77	0.39	0.05	0.06	-0.25	-0.04	-0.05	
	9-Jul-08	7147224.48	512841.23	444.72	0.42	0.04	0.04	-0.30	-0.05	-0.05	
	20-Jul-10	7147224.57	512841.21	444.62	0.51	0.09	0.04	-0.40	-0.09	-0.05	
	25-Sep-10	7147224.59	512841.24	444.59	0.52	0.04	0.23	-0.44	-0.04	-0.21	
	11-Aug-11	7147224.62	512841.23	444.54	0.55	0.03	0.04	-0.48	-0.05	-0.05	
	6-Aug-12	7147224.67	512841.20	444.50	0.61	0.06	0.07	-0.52	-0.04	-0.04	
	11-Sep-14	7147224.77	512841.18	444.38	0.71	0.10	0.05	-0.64	-0.12	-0.06	
68	20-Apr-78	33813.16	32636.15								
	26-May-78	33813.25	32636.26		0.15	0.15	1.56				
	6-Jun-78	33813.23	32636.31		0.19	0.05	1.73				
	27-Jul-78	33813.33	32636.43		0.34	0.15	1.10				

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - MID SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
	22-Sep-78	33813.54	32636.65		0.63	0.30	1.89				
	19-Oct-78	33813.62	32636.70		0.73	0.10	1.36				
	1-Feb-79	33813.88	32636.96		1.09	0.37	1.29				
	22-Apr-79	33814.02	32637.14		1.32	0.22	1.02				
	16-May-79	33814.06	32637.22		1.40	0.09	1.34				
	18-Jun-79	33814.18	32637.35		1.58	0.18	1.96				
	1-Aug-79	33814.26	32637.44		1.70	0.12	1.01				
	7-Sep-79	33814.38	32637.57		1.88	0.18	1.74				
	10-Nov-79	33814.51	32637.71		2.06	0.19	1.06				
	4-Apr-80	33814.82	32638.03		2.51	0.45	1.12				
	24-May-80	33814.87	32638.12		2.61	0.10	0.74				
	17-Jul-80	33815.04	32638.26	438.09	2.83	0.22	1.52				
	15-Aug-81	33815.78	32638.97	438.15	3.85	1.02	0.95	0.06		0.06	
	15-Jun-82	33816.33	32639.48	438.20	4.60	0.75	0.90	0.06		0.05	
	9-Jun-83	33816.92	32640.05	437.81	5.43	0.83	0.84	-0.40		-0.39	
	23-Sep-83	33817.19	32639.95	437.72	5.54	0.28	0.98	-0.09		-0.33	
	14-Jun-84	33817.68	32640.43	437.56	6.23	0.68	0.94	-0.15		-0.22	
	15-Jul-86	33818.16	32640.91	437.26	6.91	0.68	0.33	-0.30		-0.14	
	17-Jul-99	33818.50	32641.89	435.67	7.85	1.04	0.08	-1.58		-0.12	
	19-Jun-01	7147261.98	513142.46	434.49	0.00	0.02	0.01	0.00	-0.15	-0.08	
	20-Aug-03	7147262.03	513142.42	434.42	0.07	0.07	0.03	-0.07	-0.07	-0.03	
	28-Jul-04	7147262.00	513142.42	434.33	0.05	0.03	0.04	-0.16	-0.09	-0.09	
	28-Jul-06	7147262.02	513142.36	434.31	0.11	0.06	0.03	-0.18	-0.02	-0.01	
	4-Jul-07	7147262.06	513142.33	434.27	0.15	0.10	0.04	-0.22	-0.06	-0.02	
	9-Jul-08	7147262.05	513142.32	434.22	0.17	0.02	0.01	-0.27	-0.05	-0.03	
	20-Jul-10	7147262.07	513142.27	434.16	0.22	0.05	0.02	-0.33	-0.06	-0.02	
	25-Sep-10	7147262.07	513142.29	434.13	0.20	0.02	0.01	-0.36	-0.03	-0.01	
	11-Aug-11	7147262.10	513142.27	434.09	0.22	0.03	0.03	-0.40	-0.03	-0.04	
	6-Aug-12	7147262.12	513142.28	434.07	0.24	0.03	0.03	-0.42	-0.02	-0.02	
	11-Sep-14	7147262.14	513142.23	434.02	0.29	0.05	0.02	-0.47	-0.05	-0.02	
81-2	15-Aug-81	33760.03	32509.39	446.92							
	15-Jun-82	33760.68	32509.63	446.69	0.70	0.70	0.84	-0.23	-0.23	-0.27	
	9-Jun-83	33761.39	32509.92	446.55	1.46	0.76	0.77	-0.37	-0.14	-0.15	
	23-Sep-83	33761.23	32509.97	446.22	1.33	0.17	0.58	-0.70	-0.33	-1.14	
	14-Jun-84	33761.59	32510.09	446.16	1.71	0.38	0.52	-0.76	-0.06	-0.08	
	15-Jul-86	33762.32	32510.41	445.89	2.51	0.80	0.38	-1.03	-0.27	-0.13	
	17-Jul-99	33762.26	32510.62	444.84	2.55	0.22	0.02	-2.08	-1.05	-0.08	
	19-Jun-01	7147205.22	513011.60	443.70	0.00	0.15	0.08	0.00	0.04	0.02	
	20-Aug-03	7147205.29	513011.56	443.75	0.07	0.07	0.03	0.05	0.05	0.02	
	28-Jul-04	7147205.26	513011.60	443.71	0.03	0.05	0.05	0.01	-0.04	-0.05	
	28-Jul-06	7147205.28	513011.59	443.71	0.05	0.02	0.01	0.01	0.00	0.00	
	4-Jul-07	7147205.31	513011.58	443.69	0.09	0.03	0.04	-0.01	-0.02	-0.02	
	9-Jul-08	7147205.32	513011.59	443.68	0.09	0.02	0.02	-0.02	-0.01	-0.01	
	20-Jul-10	7147205.32	513011.61	443.64	0.10	0.01	0.01	-0.06	-0.04	-0.02	
	25-Sep-10	7147205.33	513011.60	443.61	0.10	0.00	0.02	-0.09	-0.03	-0.16	
	11-Aug-11	7147205.34	513011.60	443.61	0.11	0.01	0.02	-0.09	-0.01	-0.01	
	6-Aug-12	7147205.37	513011.60	443.59	0.15	0.03	0.03	-0.11	-0.02	-0.02	

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - MID SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
	11-Sep-14	7147205.39	513011.59	443.53	0.17	0.02	0.01	-0.17	-0.06	-0.03	
224	19-Jun-01	n/a									
	20-Aug-03	7147241.09	512963.33	444.85	0.00			0.00			
	28-Jul-04	7147241.12	512963.29	444.82	0.04	0.04	0.05	-0.03	-0.03	-0.03	
	28-Jul-06	7147241.17	512963.29	444.79	0.09	0.05	0.03	-0.06	-0.03	-0.02	
	4-Jul-07	7147241.19	512963.25	444.74	0.12	0.04	0.04	-0.11	-0.05	-0.05	
	9-Jul-08	7147241.21	512963.27	444.72	0.13	0.03	0.03	-0.13	-0.02	-0.02	
	20-Jul-10	7147241.22	512963.26	444.67	0.15	0.02	0.01	-0.18	-0.05	-0.02	
	25-Sep-10	7147241.23	512963.26	444.64	0.15	0.01	0.03	-0.21	-0.04	-0.20	
	11-Aug-11	7147241.24	512963.26	444.61	0.17	0.02	0.02	-0.24	-0.03	-0.04	
	6-Aug-12	7147241.29	512963.24	444.59	0.22	0.05	0.05	-0.26	-0.01	-0.01	
	11-Sep-14	7147241.31	512963.19	444.52	0.27	0.05	0.03	-0.33	-0.07	-0.03	
227	19-Jun-01	n/a									
	20-Aug-03	7147076.84	513124.78	439.48	0.00			0.00			
	28-Jul-04	7147076.78	513124.77	439.44	0.07	0.07	0.07	-0.04	-0.04	-0.04	
	28-Jul-06	7147076.82	513124.77	439.45	0.03	0.04	0.02	-0.03	0.01	0.01	
	9-Jul-08	7147076.83	513124.80	439.42	0.02	0.03	0.01	-0.06	-0.03	-0.02	
	20-Jul-10	7147076.85	513124.79	439.40	0.02	0.02	0.01	-0.08	-0.02	-0.01	
	25-Sep-10	7147076.87	513124.80	439.35	0.04	0.02	0.13	-0.13	-0.06	-0.30	
	11-Aug-11	7147076.87	513124.80	439.35	0.03	0.01	0.01	-0.13	0.00	0.00	
	6-Aug-12	7147076.89	513124.81	439.33	0.06	0.03	0.03	-0.15	-0.02	-0.02	
	11-Sep-14	7147076.92	513124.76	439.31	0.12	0.06	0.03	-0.17	-0.02	-0.01	
229	19-Jun-01	n/a									
	20-Aug-03	7147113.53	512719.14	437.43	0.00			0.00			
	28-Jul-04	7147113.49	512719.14	437.37	0.04	0.04	0.05	-0.06	-0.06	-0.06	
	28-Jul-06	7147113.55	512719.11	437.39	0.04	0.07	0.04	-0.05	0.02	0.01	
	4-Jul-07	7147113.52	512719.04	437.37	0.11	0.08	0.08	-0.06	-0.02	-0.02	
	9-Jul-08	7147113.56	512719.06	437.33	0.09	0.04	0.04	-0.10	-0.04	-0.04	
	20-Jul-10	7147113.60	512719.03	437.30	0.14	0.05	0.03	-0.13	-0.03	-0.02	
	25-Sep-10	7147113.60	512719.02	437.27	0.14	0.01	0.04	-0.16	-0.03	-0.15	
	11-Aug-11	7147113.61	512719.02	437.24	0.15	0.01	0.02	-0.19	-0.02	-0.03	
	6-Aug-12	7147113.63	512718.97	437.23	0.20	0.05	0.05	-0.20	-0.01	-0.01	
	11-Sep-14	7147113.60	512718.91	437.19	0.27	0.07	0.03	-0.24	-0.04	-0.02	
1194	19-Jun-01	7147017.22	513472.45	433.19	0.00	0.09	0.05	0.00	-0.18	-0.09	
	20-Aug-03	7147017.32	513472.44	433.19	0.10	0.10	0.05	0.00	0.00	0.00	
	28-Jul-04	7147017.35	513472.44	433.12	0.13	0.03	0.03	-0.07	-0.07	-0.07	
	28-Jul-06	7147017.43	513472.44	433.08	0.21	0.08	0.04	-0.11	-0.04	-0.02	
	9-Jul-08	7147017.49	513472.46	433.04	0.27	0.07	0.03	-0.15	-0.04	-0.02	
	20-Jul-10	7147017.56	513472.46	433.07	0.34	0.07	0.03	-0.12	0.02	0.01	
	25-Sep-10	7147017.54	513472.46	432.96	0.32	0.02	0.10	-0.23	-0.10	-0.56	
	11-Aug-11	7147017.57	513472.46	432.97	0.35	0.03	0.03	-0.22	0.00	0.00	
	6-Aug-12	7147017.63	513472.47	433.02	0.41	0.06	0.06	-0.17	0.05	0.05	
	11-Sep-14	7147017.62	513472.48	432.90	0.42	0.01	0.01	-0.29	-0.12	-0.06	
1196	19-Jun-01	7147231.16	513066.14	444.13	0.00	0.17	0.09	0.00	0.03	0.01	
	20-Aug-03	7147231.23	513066.18	444.08	0.08	0.08	0.04	-0.05	-0.05	-0.02	
	28-Jul-04	7147231.26	513066.20	444.05	0.12	0.04	0.04	-0.08	-0.03	-0.03	
	28-Jul-06	7147231.28	513066.23	443.97	0.16	0.04	0.02	-0.17	-0.08	-0.04	

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - MID SLOPE										
Monitor ID	**Date**	**UTM Coordinates**			**Horizontal Movement**			**Vertical Movement**		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	4-Jul-07	7147231.35	513066.26	443.93	0.23	0.07	0.08	-0.20	-0.04	-0.04
	9-Jul-08	7147231.36	513066.28	443.87	0.25	0.02	0.02	-0.26	-0.06	-0.06
	20-Jul-10	7147231.40	513066.31	443.80	0.30	0.05	0.03	-0.33	-0.07	-0.03
	25-Sep-10	7147231.39	513066.32	443.77	0.30	0.01	0.03	-0.36	-0.03	-0.17
	11-Aug-11	7147231.42	513066.33	443.73	0.32	0.02	0.03	-0.40	-0.04	-0.05
	6-Aug-12	7147231.44	513066.35	443.70	0.36	0.04	0.04	-0.44	-0.03	-0.03
	11-Sep-14	7147231.50	513066.38	443.61	0.42	0.06	0.03	-0.53	-0.09	-0.04
1831	19-Jun-01	n/a								
	20-Aug-03	7147227.18	512766.65	432.85	0.00			0.00		
	28-Jul-04	7147227.23	512766.60	432.79	0.07	0.07	0.08	-0.06	-0.06	-0.07
	28-Jul-06	7147227.36	512766.55	432.71	0.20	0.13	0.07	-0.14	-0.07	-0.04
	4-Jul-07	7147227.41	512766.51	432.67	0.27	0.06	0.07	-0.18	-0.04	-0.04
	9-Jul-08	7147227.44	512766.52	432.61	0.29	0.03	0.03	-0.24	-0.06	-0.06
	20-Jul-10	7147227.55	512766.46	432.76	0.41	0.12	0.06	-0.09	0.15	0.07
	25-Sep-10	7147227.54	512766.51	432.50	0.39	0.05	0.29	-0.35	-0.26	-1.41
	11-Aug-11	7147227.57	512766.47	432.47	0.43	0.05	0.06	-0.38	-0.04	-0.04
	6-Aug-12	7147227.62	512766.44	432.45	0.49	0.06	0.06	-0.40	-0.02	-0.02
	11-Sep-14	7147227.68	512766.42	432.35	0.55	0.06	0.03	-0.50	-0.10	-0.05
BH-1	11-Sep-14	7146863.98	513381.47	422.80						
BH-1 Cable	11-Sep-14	7146863.95	513380.95	422.84						
226	11-Sep-14	7147311.80	513066.61	425.93						
2835	11-Sep-14	7147272.79	513147.06	432.67						
570S?	11-Sep-14	7146977.71	513497.38	436.54						
1192	11-Sep-14	7147563.98	512278.76	441.23						
188	11-Sep-14	7146813.85	513201.39	443.10						

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - LOWER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
69	19-Jun-01	7,147,335.52	513,140.55	414.88	0.00	0.19	0.10	0.00	-0.05	-0.03
	20-Aug-03	7,147,335.53	513,140.58	414.90	0.03	0.03	0.01	0.02	0.02	0.01
	28-Jul-04	7,147,335.53	513,140.56	414.87	0.01	0.02	0.02	-0.01	-0.03	-0.04
	28-Jul-06	7,147,335.49	513,140.52	414.91	0.04	0.05	0.03	0.03	0.05	0.02
	9-Jul-08	7,147,335.48	513,140.50	414.89	0.06	0.02	0.01	0.01	-0.02	-0.01
RELOCATED	20-Jul-10	7,147,329.16	513,138.51	416.48	0.00	0.00	0.00	0.00	0.00	0.00
	25-Sep-10	7,147,329.17	513,138.53	416.43	0.02	0.02	0.12	-0.05	-0.05	-0.27
	11-Aug-11	7,147,329.20	513,138.54	416.43	0.05	0.03	0.03	-0.05	0.00	0.00
	6-Aug-12	7,147,329.21	513,138.52	416.40	0.05	0.02	0.02	-0.08	-0.03	-0.03
	11-Sep-14	7,147,329.22	513,138.55	416.37	0.08	0.03	0.02	-0.11	-0.03	-0.02
80-13	19-Jun-01	n/a								
	20-Aug-03	7,147,299.40	513,183.84	413.08	0.00			0.00		
	28-Jul-04	7,147,299.39	513,183.83	413.06	0.02	0.02	0.02	-0.02	-0.02	-0.03
	28-Jul-06	7,147,299.35	513,183.82	413.10	0.06	0.04	0.02	0.02	0.05	0.02
	9-Jul-08	7,147,299.35	513,183.81	413.07	0.06	0.01	0.01	-0.01	-0.03	-0.02
	20-Jul-10	7,147,299.32	513,183.77	413.21	0.10	0.05	0.03	0.13	0.13	0.07
	25-Sep-10	7,147,299.32	513,183.81	413.18	0.09	0.04	0.21	0.10	-0.03	-0.14
	11-Aug-11	7,147,299.33	513,183.83	413.15	0.07	0.02	0.02	0.07	-0.03	-0.04
	11-Jul-12	7,147,299.35	513,183.82	413.13	0.06	0.02	0.02	0.05	-0.02	-0.02
	11-Sep-14	7,147,299.32	513,183.80	413.10	0.09	0.03	0.01	0.02	-0.03	-0.01
80-14	19-Jun-01	n/a								
	20-Aug-03	7,147,267.77	513,283.11	403.77	0.00			0.00		
	28-Jul-04	7,147,267.79	513,283.08	403.74	0.03	0.03	0.03	-0.03	-0.03	-0.03
	28-Jul-06	7,147,267.65	513,283.10	403.80	0.12	0.14	0.07	0.03	0.05	0.03
	9-Jul-08	7,147,267.63	513,283.14	403.83	0.14	0.04	0.02	0.06	0.04	0.02
	20-Jul-10	7,147,267.74	513,283.03	403.82	0.09	0.16	0.08	0.05	-0.01	0.00
	25-Sep-10	7,147,267.75	513,283.05	403.83	0.06	0.03	0.15	0.06	0.01	0.06
	11-Aug-11	destroyed or lost-*Replaced with 991 in 2012*								
991	6-Aug-12	7,147,266.39	513,284.24	403.60	0.00	0.00	0.00	0.00	0.00	0.00
	11-Sep-14	7,147,266.39	513,284.24	403.60	0.00	0.00	0.00	0.00	0.00	0.00
84-1	19-Jun-01	7,147,201.04	513,504.62	381.71	0.00	0.13	0.07	0.00	-0.01	-0.01
	20-Aug-03	7,147,201.07	513,504.65	381.77	0.04	0.04	0.02	0.06	0.06	0.03
	28-Jul-04	7,147,201.08	513,504.64	381.72	0.05	0.01	0.02	0.00	-0.06	-0.06
	28-Jul-06	7,147,201.09	513,504.63	381.83	0.05	0.01	0.01	0.11	0.11	0.06
	9-Jul-08	7,147,201.07	513,504.62	381.78	0.03	0.02	0.01	0.07	-0.04	-0.02
	20-Jul-10	7,147,201.10	513,504.61	381.79	0.06	0.03	0.01	0.08	0.00	0.00
	25-Sep-10	destroyed - Replaced with 987 in 2012								
987/ 189	6-Aug-12	7,147,177.89	513,504.73	380.79	0.00	0.00	0.00	0.00	0.00	0.00
	11-Sep-14	7,147,169.92	513,499.26	386.09	9.67	9.67	0.09	5.30	5.30	0.05
217	19-Jun-01	7,147,314.81	513,183.13	414.83	0.00	0.05	0.02	0.00	-0.05	-0.03
	20-Aug-03	7,147,314.73	513,183.18	414.87	0.09	0.09	0.04	0.04	0.04	0.02
	28-Jul-04	7,147,314.77	513,183.18	414.84	0.06	0.03	0.04	0.01	-0.03	-0.03
	28-Jul-06	7,147,314.72	513,183.16	414.86	0.09	0.05	0.03	0.03	0.02	0.01
	9-Jul-08	7,147,314.72	513,183.17	414.86	0.09	0.01	0.01	0.04	0.01	0.00
	20-Jul-10	7,147,314.72	513,183.15	414.86	0.09	0.01	0.01	0.04	0.00	0.00
	25-Sep-10	destroyed - Replaced with 993 in 2012								
993	6-Aug-12	7,147,307.43	513,182.31	414.60	0.00	0.00	0.00	0.00	0.00	0.00

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - LOWER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	11-Sep-14	7,147,307.44	513,182.35	414.58	0.04	0.04	0.02	-0.03	-0.03	-0.01
218	19-Jun-01	7,147,222.17	513,433.25	387.99	0.00	0.07	0.04	0.00	0.05	0.02
	20-Aug-03	7,147,222.21	513,433.19	388.04	0.07	0.07	0.03	0.05	0.05	0.02
	28-Jul-04	7,147,222.22	513,433.18	388.03	0.08	0.00	0.00	0.03	-0.01	-0.01
	28-Jul-06	7,147,222.20	513,433.18	388.09	0.08	0.02	0.01	0.10	0.06	0.03
	9-Jul-08	7,147,222.21	513,433.18	388.09	0.08	0.01	0.01	0.09	0.00	0.00
	20-Jul-10	7,147,222.20	513,433.18	388.10	0.08	0.00	0.00	0.10	0.01	0.00
	25-Sep-10	destroyed or lost - Replaced with 990 in 2012								
990	6-Aug-12	7,147,211.00	513,440.57	388.36	0.00	0.00	0.00	0.00	0.00	0.00
	11-Sep-14	7,147,211.00	513,440.58	388.35	0.01	0.01	0.01	-0.01	-0.01	0.00
219	19-Jun-01	7,147,292.13	513,274.61	404.48	0.00	0.17	0.09	0.00	-0.05	-0.03
	20-Aug-03	7,147,292.12	513,274.65	404.60	0.03	0.03	0.02	0.17	0.12	0.06
	28-Jul-04	7,147,292.13	513,274.65	404.55	0.04	0.01	0.01	0.00	-0.05	-0.05
	28-Jul-06	7,147,292.12	513,274.62	404.62	0.01	0.03	0.02	0.12	0.07	0.04
	9-Jul-08	7,147,292.14	513,274.63	404.62	0.01	0.02	0.01	0.05	0.00	0.00
	20-Jul-10	7,147,292.15	513,274.65	404.60	0.04	0.02	0.01	0.02	-0.01	-0.01
	25-Sep-10	7,147,292.14	513,274.64	404.57	0.03	0.01	0.07	0.09	-0.03	-0.17
RELOCATED	25-Sep-10	7,147,288.58	513,273.60	405.59	0.00	0.00	0.00	0.00	0.00	0.00
	11-Aug-11	7,147,288.59	513,273.59	405.61	0.16	0.01	0.02	0.06	0.02	0.02
	6-Aug-12	7147288.622	513273.575	405.589	0.05	0.03	0.03	0.00	-0.02	-0.02
	11-Sep-14	7147288.625	513273.603	405.604	0.08	0.03	0.01	0.01	0.01	0.01
220	19-Jun-01	7,147,223.43	513,431.01	388.55	0.00	0.25	0.13	0.00	0.06	0.03
	20-Aug-03	7,147,223.42	513,430.90	388.65	0.11	0.11	0.05	0.10	0.10	0.05
	28-Jul-04	7,147,223.43	513,430.90	388.60	0.11	0.01	0.01	0.06	-0.05	-0.05
	28-Jul-06	7,147,223.42	513,430.88	388.68	0.13	0.02	0.01	0.13	0.08	0.04
	9-Jul-08	7,147,223.43	513,430.88	388.67	0.13	0.01	0.01	0.12	-0.01	-0.01
	20-Jul-10	7,147,223.43	513,430.88	388.68	0.13	0.01	0.00	0.13	0.02	0.01
	25-Sep-10	destroyed - Replaced with 988 in 2012								
988	6-Aug-12	7,147,208.18	513,432.05	388.90	0.00	0.00	0.00	0.00	0.00	0.00
	11-Sep-14	7,147,208.18	513,432.06	388.86	0.01	0.01	0.00	-0.04	-0.04	-0.02
222	19-Jun-01	7,147,269.46	513,334.94	397.91	0.00	0.06	0.03	0.00	-0.05	-0.02
	20-Aug-03	7,147,269.49	513,334.96	398.01	0.04	0.04	0.02	0.10	0.10	0.04
	28-Jul-04	7,147,269.52	513,334.97	397.96	0.06	0.03	0.03	0.04	-0.05	-0.05
	28-Jul-06	7,147,269.51	513,334.93	397.99	0.05	0.03	0.02	0.08	0.03	0.02
	9-Jul-08	7,147,269.53	513,334.95	397.99	0.07	0.02	0.01	0.08	0.00	0.00
	20-Jul-10	7,147,269.54	513,334.95	397.98	0.09	0.02	0.01	0.07	-0.01	0.00
RELOCATED	20-Jul-10	7,147,265.33	513,333.03	399.65						
	11-Aug-11	7,147,265.33	513,333.04	399.66	0.01	0.01	0.00	0.00	0.00	0.00
	6-Aug-12	7,147,265.38	513,333.03	399.68	0.05	0.05	0.05	0.02	0.02	0.02
	11-Sep-14	7,147,265.38	513,333.05	399.65	0.07	0.02	0.01	-0.01	-0.03	-0.01
226	19-Jun-01	n/a								
	20-Aug-03	7,147,311.53	513,066.36	426.46	0.00			0.00		
	28-Jul-04	7,147,311.54	513,066.40	426.43	0.04	0.04	0.05	-0.03	-0.03	-0.03
	28-Jul-06	7,147,311.56	513,066.42	426.36	0.07	0.03	0.01	--0.10	-0.07	-0.04
	4-Jul-07	7,147,311.62	513,066.44	426.32	0.13	0.07	0.07	-0.14	-0.04	-0.04
	9-Jul-08	7,147,311.61	513,066.47	426.27	0.15	0.03	0.03	-0.19	-0.05	-0.05
	20-Jul-10	7,147,311.67	513,066.49	426.18	0.20	0.06	0.03	-0.28	-0.09	-0.04

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - LOWER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	25-Sep-10	7,147,311.68	513,066.53	426.14	0.23	0.03	0.18	-0.32	-0.05	-0.26
	11-Aug-11	7,147,311.73	513,066.55	426.08	0.28	0.05	0.06	-0.38	-0.05	-0.06
	6-Aug-12	7,147,311.76	513,066.58	426.03	0.33	0.05	0.05	-0.43	-0.05	-0.05
228	19-Jun-01	n/a								
	20-Aug-03	7,147,347.00	512,836.84	413.95	0			0		
	28-Jul-04	7,147,347.03	512,836.79	413.88	0.06	0.06	0.07	-0.07	-0.07	-0.08
	28-Jul-06	7,147,347.13	512,836.73	413.92	0.18	0.12	0.06	-0.03	0.04	0.02
	4-Jul-07	7,147,347.15	512,836.70	413.86	0.21	0.04	0.04	-0.09	-0.06	-0.07
	9-Jul-08	7,147,347.20	512,836.68	413.83	0.26	0.04	0.04	-0.12	-0.02	-0.02
	20-Jul-10	7,147,347.29	512,836.62	413.78	0.37	0.11	0.05	-0.17	-0.05	-0.02
	25-Sep-10	7,147,347.31	512,836.66	413.76	0.36	0.05	0.25	-0.19	-0.02	--0.10
	11-Aug-11	destroyed or lost - Replaced with 995 in 2012								
995	6-Aug-12	7,147,323.08	512,802.48	413.77	0.00	0.00	0.00	0.00	0.00	0.00
	11-Sep-14	7,147,323.24	512,802.36	413.60	0.20	0.20	0.10	-0.17	-0.17	-0.08
1833	19-Jun-01	n/a								
	20-Aug-03	7,147,302.70	512,921.25	418.34	0			0		
	28-Jul-04	7,147,302.69	512,921.27	418.30	0.02	0.02	0.02	-0.04	-0.04	-0.04
	28-Jul-06	7,147,302.78	512,921.24	418.35	0.08	0.10	0.05	0.01	0.04	0.02
	4-Jul-07	7,147,302.84	512,921.20	418.34	0.15	0.07	0.07	0.00	-0.01	-0.01
	9-Jul-08	7,147,302.86	512,921.23	418.44	0.16	0.03	0.03	0.10	0.10	0.10
	20-Jul-10	7,147,302.92	512,921.21	418.39	0.23	0.07	0.04	0.05	-0.05	-0.02
	25-Sep-10	7,147,302.93	512,921.21	418.37	0.23	0.01	0.05	0.03	-0.01	-0.08
	11-Aug-11	7,147,302.96	512,921.20	418.44	0.26	0.03	0.04	0.10	0.06	0.07
	6-Aug-12	7,147,303.02	512,921.18	418.42	0.33	0.07	0.07	0.08	-0.01	-0.01
	11-Sep-14	7,147,303.04	512,921.08	418.41	0.43	0.10	0.05	0.06	-0.02	-0.01
BH-10 (P2)	19-Jun-01	7,147,354.12	512,999.27	416.14	0.00	0.17	0.09	0.00	-0.09	-0.05
	20-Aug-03	7,147,354.36	512,999.35	416.10	0.25	0.25	0.11	-0.04	-0.04	-0.02
	28-Jul-04	7,147,354.41	512,999.36	415.98	0.30	0.05	0.05	-0.16	-0.12	-0.13
	28-Jul-06	7,147,354.50	512,999.34	415.99	0.39	0.10	0.05	-0.15	0.00	0.00
	4-Jul-07	7,147,354.63	512,999.38	416.05	0.52	0.13	0.14	-0.09	0.06	0.07
	9-Jul-08	7,147,354.57	512,999.39	415.98	0.46	0.06	0.06	-0.16	-0.07	-0.07
	20-Jul-10	7,147,354.70	512,999.38	415.90	0.59	0.13	0.07	-0.24	-0.08	-0.04
	25-Sep-10	7,147,354.71	512,999.43	415.93	0.60	0.05	0.28	-0.21	0.03	0.16
	11-Aug-11	7,147,354.74	512,999.37	415.94	0.63	0.07	0.08	--0.20	0.01	0.01
	6-Aug-12	7,147,354.84	512,999.43	415.81	0.73	0.11	0.11	-0.32	-0.13	-0.13
	11-Sep-14	7,147,354.88	512,999.36	415.78	0.81	0.08	0.04	-0.35	-0.03	-0.02
BH-9 (P3)	19-Jun-01	7,147,309.29	513,135.55	415.34	0.00	0.11	0.06	0.00	-0.11	-0.06
	20-Aug-03	7,147,309.32	513,135.58	415.35	0.04	0.04	0.02	0.01	0.01	0.00
	28-Jul-04	7,147,309.30	513,135.56	415.24	0.01	0.03	0.03	--0.10	-0.11	-0.11
	28-Jul-06	7,147,309.30	513,135.53	415.19	0.02	0.02	0.01	-0.15	-0.05	-0.03
	9-Jul-08	7,147,309.31	513,135.55	415.17	0.01	0.02	0.01	-0.17	-0.02	-0.01
	20-Jul-10	7,147,309.32	513,135.51	415.06	0.05	0.04	0.02	-0.28	-0.11	-0.05
	25-Sep-10	7,147,309.33	513,135.54	415.03	0.03	0.03	0.15	-0.31	-0.03	-0.15
	11-Aug-11	7,147,309.35	513,135.54	414.99	0.06	0.02	0.02	-0.35	-0.04	-0.05
	6-Aug-12	7,147,309.37	513,135.54	414.94	0.08	0.02	0.02	--0.40	-0.05	-0.05
	11-Sep-14	7,147,309.41	513,135.54	414.91	0.12	0.04	0.02	-0.43	-0.03	-0.02
BH-7 (P4)	19-Jun-01	7,147,239.53	513,347.49	397.05	0			0		

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - LOWER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	20-Aug-03	7,147,239.50	513,347.56	397.28	0.07	0.07	0.02	0.23	0.23	0.06
	28-Jul-04	7,147,239.49	513,347.51	397.31	0.05	0.05	0.05	0.26	0.03	0.03
	28-Jul-06	7,147,239.44	513,347.50	397.34	0.09	0.05	0.02	0.29	0.03	0.01
	9-Jul-08	7,147,239.44	513,347.49	397.31	0.09	0.01	0.00	0.26	-0.03	-0.01
	20-Jul-10	7,147,239.44	513,347.46	397.30	0.09	0.04	0.02	0.25	-0.01	-0.01
	25-Sep-10	7,147,239.41	513,347.49	397.32	0.12	0.05	0.25	0.27	0.02	0.10
	11-Aug-11	7,147,239.43	513,347.51	397.18	0.10	0.02	0.03	0.12	-0.14	-0.16
	6-Aug-12	7,147,239.44	513,347.50	397.17	0.09	0.02	0.02	0.11	-0.01	-0.01
	11-Sep-14	7,147,239.40	513,347.46	397.18	0.15	0.06	0.03	0.11	0.00	0.00
BH-8 (P5)	19-Jun-01	7,147,182.91	513,461.26	386.86	0			0		
	20-Aug-03	7,147,182.93	513,461.46	387.21	0.20	0.20	0.05	0.35	0.35	0.09
	28-Jul-04	7,147,182.95	513,461.42	387.20	0.17	0.04	0.05	0.34	-0.01	-0.01
	28-Jul-06	7,147,182.92	513,461.40	387.24	0.14	0.04	0.02	0.38	0.04	0.02
	9-Jul-08	7,147,182.92	513,461.40	387.23	0.14	0.01	0.00	0.37	-0.01	0.00
	20-Jul-10	7,147,182.92	513,461.38	387.24	0.12	0.01	0.01	0.38	0.01	0.00
	25-Sep-10	7,147,182.91	513,461.41	387.19	0.15	0.03	0.15	0.33	-0.05	-0.27
	11-Aug-11	7,147,182.92	513,461.40	387.22	0.14	0.02	0.02	0.36	0.03	0.03
	6-Aug-12	7,147,182.94	513,461.40	387.21	0.14	0.02	0.02	0.35	-0.01	-0.01
	11-Sep-14	7,147,182.89	513,461.41	387.19	0.19	0.05	0.02	0.33	-0.02	-0.01
XS-A	19-Jun-01	n/a								
	20-Aug-03	7,147,320.21	513,190.99	411.33	0			0		
	28-Jul-04	7,147,320.32	513,191.01	411.24	0.10	0.10	0.11	-0.09	-0.09	-0.09
relocated	28-Jul-06	7,147,315.67	513,189.82	413.35						
	9-Jul-08	7,147,315.71	513,189.83	413.35	0.14	0.04	0.02	0.08	0.01	0.00
	20-Jul-10	7,147,315.72	513,189.82	413.36	0.05	0.01	0.01	0.01	0.01	0.00
	25-Sep-10	destroyed - Replaced with 992 in 2012								
992	6-Aug-12	7,147,304.46	513,189.11	413.73	0.00	0.00	0.00	0.00	0.00	0.00
	11-Sep-14	7,147,304.49	513,189.14	413.71	0.04	0.04	0.02	-0.02	-0.02	-0.01
XS-B	19-Jun-01	n/a								
	20-Aug-03	7,147,293.65	513,274.20	404.28	0.00			0.00		
	28-Jul-04	7,147,293.70	513,274.20	404.29	0.06	0.06	0.06	0.01	0.01	0.01
	28-Jul-06	7,147,293.67	513,274.18	404.31	0.03	0.04	0.02	0.03	0.02	0.01
	9-Jul-08	7,147,293.68	513,274.18	404.31	0.04	0.01	0.01	0.03	0.00	0.00
	20-Jul-10	7,147,293.69	513,274.18	404.33	0.04	0.01	0.00	0.05	0.02	0.01
	25-Sep-10	7,147,293.69	513,274.18	404.30	0.04	0.01	0.03	0.02	-0.02	-0.13
	11-Aug-11	7,147,293.71	513,274.19	404.29	0.06	0.02	0.03	0.01	-0.02	-0.02
	6-Aug-12	7,147,293.71	513,274.19	404.29	0.06	0.01	0.01	0.01	0.00	0.00
	11-Sep-14	7,147,293.73	513,274.21	404.30	0.09	0.03	0.01	0.02	0.01	0.01
XS-E	19-Jun-01	n/a								
	20-Aug-03	7,147,224.70	513,432.22	387.53	0.00			0.00		
	28-Jul-04	7,147,224.67	513,432.18	387.52	0.06	0.06	0.06	-0.01	-0.01	-0.01
	28-Jul-06	7,147,224.66	513,432.16	387.59	0.07	0.01	0.01	0.06	0.07	0.04
	9-Jul-08	7,147,224.67	513,432.16	387.53	0.07	0.01	0.00	0.00	-0.06	-0.03
	20-Jul-10	7,147,224.68	513,432.16	387.54	0.06	0.02	0.01	0.01	0.01	0.01
	25-Sep-10	destroyed - Replaced with 989 in 2012								
989	6-Aug-12	7,147,209.02	513,433.40	388.67	0.00	0.00	0.00	0.00	0.00	0.00
	11-Sep-14	7147209.039	513433.414	388.682	0.02	0.02	0.01	0.01	0.01	0.01

CLINTON CREEK WASTE ROCK DUMP SURVEY DATA - LOWER SLOPE										
Monitor ID	**Date**	**UTM Coordinates**			**Horizontal Movement**			**Vertical Movement**		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
XS-G	19-Jun-01	7,147,355.94	513,038.74	416.55	0.00	0.19	0.10	0.00	-0.12	-0.06
	20-Aug-03	7,147,356.11	513,038.84	416.54	0.20	0.20	0.09	-0.01	-0.01	0.00
	28-Jul-06	destroyed - Replaced with 994 in 2012								
994	6-Aug-12	7,147,353.72	513,040.01	416.13	0.00	0.00	0.00	0.00	0.00	0.00
	11-Sep-14	7147353.85	513040.053	416.007	0.13	0.13	0.06	-0.12	-0.12	-0.06
1824	11-Aug-11	7,147,343.24	513,082.29	415.91	0.00	0.00	0.00	0.00	0.00	0.00
	6-Aug-12	7,147,343.34	513,082.32	415.86	0.10	0.10	0.11	-0.05	-0.05	-0.05
	11-Sep-14	7147343.39	513082.351	415.723	0.16	0.06	0.03	-0.19	-0.14	-0.07
187	11-Sep-14	7147292.215	513274.665	404.58						

APPENDIX D2

MONITORING DATA – WOLVERINE CREEK TAILINGS PILE

WOLVERINE TAILINGS PILE - NORTH LOBE - SUMMARY OF HISTORICAL MOVEMENT DATA									
Monitoring Period	**Annual Horizontal Movement Rates (m/year)**								
	Upper			**Mid**			**Lower**		
	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.
Summer 78 to Winter 79	1.2	2.0	0.5	5.43	9.63	3.17	7.16	10.27	4.05
Summer 79 to Winter 80	0.2	0.3	0.1	4.86	5.33	4.42	5.38	5.49	5.27
July 80 To Aug 81	1.5	1.6	1.3	16.87	18.81	14.87			
Aug 81 to June 82	0.1	0.2	0.0	17.26	23.90	0.27			
June 82 to June 83	0.9	2.0	0.2	20.27	33.51	0.60			
June 83 to Sept 83	1.1	3.6	0.1	18.92	29.00	0.35			
Sept 83 to June 84	0.1	0.2	0.1	14.47	33.13	0.32			
June 84 to June 85	0.4	0.5	0.3	12.81	22.90	0.11			
June 85 to July 86	0.1	0.1	0.0	10.59	18.93	0.38			
July 86 to 1999									
1999 to 2001									
2001 to 2003									
Aug 2003 to July 2004	0.04	0.11	0.00	0.21	0.63	0.02	0.11	0.17	0.03
July 2004 to Sept 2004	0.16	0.23	0.06	0.16	0.56	0.03	0.09	0.26	0.08
Sept 2004 to Sept 2005	0.07	0.12	0.03	0.18	0.53	0.00	0.13	0.18	0.05
Sept 2005 to July 2006	0.05	0.18	0.03	0.13	0.43	0.00	0.09	0.13	0.04
July 2006 to July 2008	0.03	0.05	0.02	0.10	0.31	0.00	0.07	0.10	0.03
July 2008 to July 2010	0.03	0.10	0.01	0.06	0.21	0.00	0.05	0.07	0.14
July 2010 to Sept 2010	0.16	0.22	0.08	0.33	1.10	0.13	0.22	0.27	0.02
Sept 2010 to Aug 2011	0.03	0.06	0.01	0.07	0.24	0.00	0.03	0.05	0.04
Aug 2011 to Aug 2012	0.03	0.05	0.02	0.08	0.25	0.02	0.06	0.07	0.00
Aug 2012 to Sept 2014	0.04	0.10	0.01	0.04	0.19	0.01	0.03	0.06	0.01
Sept 2014 to Sept 2015	0.04	0.07	0.01						

Note: Monitoring Points vary throughout the years, as some were replaced, new ones were added, etc.
-no survey between 1986 and 1999, or in 2013
-blank cells are a result of no available data
-values in red indicate that data was not available and was calculated based on reported survey data

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - UPPER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
1483	21-Aug-03	7148233.01	513412.67	609.08						
	28-Jul-04	7148233.01	513412.69	609.02	0.03	0.03	0.03	-0.06	-0.06	-0.06
	23-Sep-04	7148233.02	513412.68	609.00	0.02	0.02	0.10	-0.08	-0.03	-0.16
	17-Sep-05	7148233.03	513412.71	608.96	0.05	0.03	0.03	-0.12	-0.04	-0.04
	28-Jul-06	7148233.06	513412.70	609.00	0.06	0.03	0.04	-0.08	0.04	0.05
	9-Jul-08	7148233.04	513412.75	608.94	0.08	0.05	0.02	-0.14	-0.06	-0.03
	20-Jul-10	7148233.04	513412.71	608.90	0.06	0.03	0.02	-0.18	-0.04	-0.02
	25-Sep-10	7148233.05	513412.74	608.87	0.08	0.02	0.12	-0.21	-0.02	-0.12
	11-Aug-11	7148233.04	513412.75	608.85	0.09	0.02	0.02	-0.23	-0.02	-0.03
	6-Aug-12	7148233.06	513412.77	608.79	0.12	0.04	0.04	-0.29	-0.06	-0.06
	13-Sep-14	7148233.05	513412.78	608.72	0.13	0.01	0.01			
	17-Sep-15	7148233.08	513412.79	608.70	0.16	0.03	0.03			
26	Summer 1978						1.98			
	Winter 1978/79						0.49			
	Summer 1979						0.34			
	Winter1979/80						0.15			
	Summer 1980						0.52			-0.18
	Winter 1980/81						0.37			-0.06
	1-Aug-81						1.40			0.26
	1-Jun-82						0.03			-0.09
	1-Jun-83	34896.48	32986.79	576.60			1.10			-0.10
	1-Sep-83	114491.70	108227.57	576.62			3.63			0.05
	1-Jun-84						0.08			-0.20
	1-Jun-85						0.47			0.09
	1-Jul-86	108226.26	1891.24	576.45			0.06			-0.11
	21-Aug-03	7148341.45	513483.53	575.11						
	28-Jul-04	7148341.48	513483.55	575.10	0.04	0.04	0.04	-0.01	-0.01	-0.01
	23-Sep-04	7148341.49	513483.55	575.08	0.05	0.02	0.10	-0.03	-0.01	-0.10
	17-Sep-05	7148341.47	513483.57	575.01	0.04	0.04	0.04	-0.10	-0.07	-0.07
	28-Jul-06	7148341.50	513483.58	575.07	0.07	0.04	0.04	-0.04	0.06	0.07
	9-Jul-08	7148341.50	513483.61	575.02	0.10	0.04	0.02	-0.09	-0.05	-0.03
	20-Jul-10	7148341.49	513483.62	575.01	0.10	0.02	0.01	-0.10	-0.01	-0.01
	25-Sep-10	7148341.49	513483.66	574.97	0.14	0.04	0.19	-0.14	-0.04	-0.20
	11-Aug-11	7148341.50	513483.66	574.96	0.14	0.01	0.01	-0.15	-0.01	-0.01
	6-Aug-12	7148341.53	513483.69	574.91	0.18	0.04	0.04	-0.20	-0.05	-0.05
	13-Sep-14	7148341.52	513483.72	574.91	0.22	0.04	0.02			
	17-Sep-15	7148341.56	513483.73	574.83	0.26	0.04	0.04			
80-2	Summer 1980						0.12			-0.06
	Winter 1980/81						0.37			-0.12
	1-Aug-81						1.34			0.00
	1-Jun-82						0.03			-0.02
	1-Jun-83	34844.15	33051.39	554.41			1.98			-0.07
	1-Sep-83	34963.13	33046.48	554.36			0.14			-0.18
	1-Jun-84						0.12			-0.05
	1-Jun-85						0.43			-0.02
	1-Jul-86	114320.91	108441.53	554.27			0.02			-0.07
	21-Aug-03	7148290.05	513549.41	552.78						

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - UPPER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	28-Jul-04	7148290.09	513549.50	552.65	0.09	0.09	0.10	-0.13	-0.13	-0.14
	23-Sep-04	7148290.08	513549.48	552.63	0.08	0.01	0.09	-0.15	-0.02	-0.12
	17-Sep-05	7148290.08	513549.57	552.50	0.16	0.09	0.09	-0.28	-0.14	-0.14
	28-Jul-06	7148290.09	513549.60	552.54	0.20	0.03	0.04	-0.24	0.05	0.05
	9-Jul-08	7148290.08	513549.69	552.45	0.28	0.09	0.05	-0.33	-0.10	-0.05
	20-Jul-10	7148290.09	513549.75	552.37	0.34	0.06	0.03	-0.41	-0.08	-0.04
	25-Sep-10	7148290.08	513549.78	552.33	0.37	0.03	0.16	-0.45	-0.03	-0.19
	11-Aug-11	7148290.09	513549.83	552.28	0.42	0.05	0.05	-0.50	-0.05	-0.06
	6-Aug-12	7148290.08	513549.88	552.23	0.47	0.06	0.06	-0.55	-0.05	-0.05
	13-Sep-14	7148290.07	513550.02	552.14	0.61	0.14	0.07			
	17-Sep-15	7148290.11	513549.99	552.07	0.66	0.04	0.04			
26-A	Summer 1978						1.74			
	Winter 1978/79						0.49			
	Summer 1979						0.34			
	Winter1979/80						0.12			
	Summer 1980						0.40			-0.09
	Winter 1980/81									0.15
	1-Aug-81						1.49			0.16
	1-Jun-82						0.09			-0.13
	1-Jun-83	44038.60	33044.73	559.81			0.19			-0.11
	1-Sep-83	34894.54	33044.79	560.05			0.28			0.83
	1-Jun-84						0.05			-0.43
	1-Jun-85						0.26			-0.03
	1-Jul-86	114482.69	108413.54	559.59			0.12			-0.12
	21-Aug-03	7148339.30	513540.50	557.82						
	28-Jul-04	7148339.32	513540.52	557.75	0.03	0.03	0.03	-0.07	-0.07	-0.08
	23-Sep-04	7148339.32	513540.49	557.74	0.02	0.02	0.15	-0.08	-0.01	-0.06
	17-Sep-05	7148339.34	513540.56	557.65	0.07	0.07	0.07	-0.18	-0.10	-0.10
	28-Jul-06	7148339.33	513540.54	557.71	0.05	0.02	0.03	-0.11	0.06	0.07
	9-Jul-08	7148339.35	513540.59	557.67	0.10	0.05	0.03	-0.15	-0.04	-0.02
	20-Jul-10	7148339.36	513540.57	557.61	0.09	0.03	0.02	-0.21	-0.06	-0.03
	25-Sep-10	7148339.35	513540.60	557.60	0.11	0.04	0.19	-0.22	-0.01	-0.04
	11-Aug-11	7148339.37	513540.61	557.59	0.12	0.02	0.02	-0.23	-0.01	-0.01
	6-Aug-12	7148339.37	513540.63	557.56	0.15	0.02	0.02	-0.26	-0.04	-0.04
	13-Sep-14	7148339.34	513540.67	557.53	0.20	0.05	0.02			
	17-Sep-15	7148339.40	513540.63	557.51	0.27	0.07	0.07			
80-1	Summer 1980						0.15			-0.27
	Winter 1980/81						0.37			-0.09
	1-Aug-81						1.65			-0.10
	1-Jun-82						0.18			-0.16
	1-Jun-83	34963.16	33046.42	558.68			0.23			-0.20
	1-Sep-83	34963.13	33046.48	558.70			0.23			0.04
	1-Jun-84						0.21			-0.19
	1-Jun-85						0.26			-0.05
	1-Jul-86	114707.93	108419.85	558.17			0.06			-0.34
	21-Aug-03	7148407.98	513543.04	555.71						
	28-Jul-04	7148408.01	513543.07	555.61	0.04	0.04	0.05	-0.10	-0.10	-0.10

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - UPPER SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
	23-Sep-04	7148408.03	513543.06	555.61	0.06	0.03	0.16	-0.10	0.00	0.00	
	17-Sep-05	7148408.01	513543.12	555.49	0.09	0.06	0.06	-0.22	-0.12	-0.13	
	28-Jul-06	7148408.02	513543.14	555.55	0.11	0.03	0.03	-0.16	0.06	0.07	
	9-Jul-08	7148408.04	513543.21	555.48	0.18	0.07	0.04	-0.23	-0.08	-0.04	
	20-Jul-10	7148408.03	513543.24	555.43	0.21	0.03	0.01	-0.29	-0.05	-0.03	
	25-Sep-10	7148408.04	513543.27	555.40	0.24	0.03	0.17	-0.31	-0.03	-0.15	
	11-Aug-11	7148408.05	513543.29	555.37	0.26	0.02	0.02	-0.34	-0.03	-0.03	
	6-Aug-12	7148408.07	513543.32	555.33	0.29	0.04	0.04	-0.38	-0.04	-0.04	
	13-Sep-14	7148408.06	513543.40	555.26	0.37	0.08	0.04				
	17-Sep-15	7148408.10	513543.37	555.25	0.41	0.05	0.05				
BH-14 (T7)	21-Aug-03	7148488.36	513563.01	530.33							
	28-Jul-04	7148488.36	513563.01	530.29	0.01	0.01	0.01	-0.04	-0.04	-0.05	
	23-Sep-04	7148488.33	513562.99	530.30	0.03	0.03	0.22	-0.03	0.01	0.08	
	17-Sep-05	7148488.34	513562.87	530.24	0.14	0.12	0.12	-0.09	-0.06	-0.06	
	28-Jul-06	7148488.37	513563.02	530.34	0.02	0.16	0.18	0.01	0.10	0.11	
	9-Jul-08	7148488.43	513563.07	530.36	0.10	0.07	0.04	0.03	0.02	0.01	
	20-Jul-10	7148488.36	513562.88	530.38	0.14	0.21	0.10	0.05	0.02	0.01	
	25-Sep-10	7148488.36	513562.91	530.35	0.11	0.03	0.16	0.02	-0.03	-0.17	
	11-Aug-11	7148488.37	513562.90	530.35	0.11	0.01	0.01	0.02	0.00	0.00	
	6-Aug-12	7148488.39	513562.91	530.33	0.11	0.02	0.02	0.00	-0.02	-0.02	
	13-Sep-14	7148488.48	513563.10	530.31	0.12	0.01	0.01				
	17-Sep-15	7148488.51	513563.09	530.32	0.15	0.03	0.03				
1495	21-Aug-03	7148526.59	513528.92	529.06							
	28-Jul-04	7148526.62	513528.97	529.05	0.06	0.06	0.06	-0.01	-0.01	-0.01	
	23-Sep-04	7148526.65	513528.95	529.07	0.06	0.03	0.20	0.01	0.01	0.08	
	17-Sep-05	7148526.65	513529.00	528.97	0.10	0.05	0.05	-0.09	-0.10	-0.10	
	28-Jul-06	7148526.67	513529.02	529.06	0.13	0.03	0.03	0.00	0.09	0.11	
	9-Jul-08	7148526.69	513529.07	529.04	0.18	0.06	0.03	-0.02	-0.01	-0.01	
	20-Jul-10	7148526.71	513529.10	529.06	0.22	0.03	0.02	0.00	0.01	0.01	
	25-Sep-10	7148526.72	513529.11	529.03	0.23	0.01	0.08	-0.03	-0.02	-0.14	
	11-Aug-11	7148526.71	513529.13	529.01	0.24	0.02	0.02	-0.05	-0.02	-0.02	
	6-Aug-12	7148526.73	513529.16	529.00	0.28	0.04	0.04	-0.06	-0.02	-0.02	
	13-Sep-14	7148526.80	513529.19	529.00	0.36	0.08	0.04				
	17-Sep-15	7148526.79	513529.19	528.98	0.36	0.01	0.01				

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - MID SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
80-4	Summer 1980						0.18			-0.21
	Winter 1980/81						0.18			-0.18
	1-Aug-81									
	1-Jun-82						0.27			-0.26
	1-Jun-83	34753.40	33178.76	508.15			0.60			-0.19
	1-Sep-83	34753.39	33178.86	508.13			0.35			-0.07
	1-Jun-84						0.32			-0.16
	1-Jun-85						0.11			-0.12
	1-Jul-86	34753.44	33179.58	507.62			0.38			-0.27
	21-Aug-03	7148201.56	513688.82	501.73			0.75			-0.28
	28-Jul-04	7148201.69	513689.40	501.49	0.59	0.59	0.63	-0.24	-0.24	-0.26
	23-Sep-04	7148201.73	513689.47	501.42	0.67	0.09	0.56	-0.31	-0.07	-0.47
	17-Sep-05	7148201.81	513689.99	501.18	1.19	0.52	0.53	-0.55	-0.24	-0.24
	28-Jul-06	7148201.90	513690.35	501.14	1.56	0.37	0.43	-0.59	-0.04	-0.05
	9-Jul-08	7148202.02	513690.93	500.95	2.16	0.60	0.31	-0.78	-0.19	-0.10
	20-Jul-10	7148202.11	513691.36	500.78	2.59	0.43	0.21	-0.95	-0.17	-0.08
	25-Sep-10	7148202.14	513691.44	500.75	2.68	0.09	0.48	-0.98	-0.04	-0.21
	11-Aug-11	7148202.18	513691.65	500.66	2.89	0.21	0.24	-1.08	-0.09	-0.10
	6-Aug-12	7148202.24	513691.89	500.56	3.14	0.25	0.25	-1.18	-0.10	-0.10
	1-Sep-14	7148202.34	513692.28	500.39	3.54	0.40	0.19	-1.35	-0.17	-0.08
80-5	1-Aug-81									
	1-Jun-82									
	1-Jun-83	34798.80	33203.08	0.25			9.95			-9.81
	1-Sep-83	34799.03	33204.16	492.48			3.79			-3.71
	1-Jun-84						2.55			-2.86
	1-Jun-85						1.78			-1.91
	1-Jul-86	34800.57	33208.95	487.15			2.48			-1.35
	21-Aug-03	7148249.32	513718.34	481.19			0.91			-0.30
	28-Jul-04	7148249.41	513718.73	481.10	0.40	0.40	0.43	-0.09	-0.09	-0.10
	23-Sep-04	7148249.42	513718.77	481.07	0.44	0.04	0.28	-0.12	-0.02	-0.16
	17-Sep-05	7148249. 90	513719.16	480.92	0.84	0.39	0.40	-0.27	-0.16	-0.16
	28-Jul-06	7148249.55	513719.41	480.96	1.09	0.26	0.30	-0.23	0.04	0.05
	9-Jul-08	7148249.63	513719.85	480.86	1.54	0.45	0.23	-0.33	-0.10	-0.05
	20-Jul-10	7148249.68	513720.15	480.77	1.85	0.31	0.15	-0.42	-0.08	0.00
	25-Sep-10	7148249.67	513720.21	480.72	1.91	0.06	0.33	-0.47	-0.05	-0.29
	11-Aug-11	7148249.71	513720.37	480.69	2.07	0.16	0.18	-0.50	-0.03	0.00
	6-Aug-12	7148249.75	513720.53	480.62	2.23	0.16	0.17	-0.57	-0.07	-0.07
	1-Sep-14	7148249.78	513720.80	480.55	2.51	0.27	0.13	-0.64	-0.07	-0.03
1085	21-Aug-03	7148346.05	513666.41	488.88						
	28-Jul-04	7148346.06	513666.43	488.84	0.02	0.02	0.02	-0.04	-0.04	-0.04
	23-Sep-04	7148346.06	513666.41	488.82	0.01	0.14	0.14	-0.06	-0.01	-0.09
	17-Sep-05	7148346.06	513666.46	488.72	0.05	0.05	0.05	-0.16	-0.10	-0.10
	28-Jul-06	7148346.08	513666.47	488.82	0.06	0.02	0.02	-0.06	0.09	0.11
	9-Jul-08	7148346.05	513666.51	488.82	0.10	0.05	0.03	-0.06	0.00	0.00
	20-Jul-10	7148346.05	513666.52	488.78	0.10	0.01	0.00	-0.10	-0.04	-0.02
	25-Sep-10	7148346.05	513666.54	488.75	0.13	0.02	0.13	-0.13	-0.03	-0.15
	11-Aug-11	7148346.06	513666.56	488.72	0.15	0.02	0.03	-0.16	-0.03	-0.04

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - MID SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	6-Aug-12	7148346.05	513666.58	488.69	0.17	0.02	0.02	-0.19	-0.03	-0.03
	1-Sep-14	7148346.06	513666.61	488.64	0.20	0.03	0.01	-0.24	-0.05	-0.02
650-1	Summer 1978						9.63			
	Winter 1978/79						3.72			
	Summer 1979						4.72			
	Winter1979/80						4.42			
	Summer 1980						8.02			-5.43
	Winter 1980/81						8.81			-5.49
	1-Aug-81						14.97			-6.01
	1-Jun-82						16.06			-8.09
	1-Jun-83	34965.69	33174.65	498.50			15.32			-5.12
	1-Sep-83	34965.10	33177.47	497.58			9.93			-3.16
	1-Jun-84						5.68			-1.73
	1-Jun-85						4.30			-1.15
	1-Jul-86	34963.03	33190.96	493.48			5.22			-1.69
	21-Aug-03	7148408.73	513701.26	483.95			1.31			-0.60
	28-Jul-04	7148498.75	513701.33	483.92	0.06	0.06	0.07	-0.03	-0.03	-0.03
	23-Sep-04	7148408.75	513701.31	483.91	0.05	0.02	0.13	-0.04	-0.01	-0.07
	17-Sep-05	7148408.75	513701.34	483.87	0.08	0.04	0.04	-0.08	-0.03	-0.03
	28-Jul-06	7148408.77	513701.35	483.89	0.09	0.02	0.03	-0.06	0.02	0.02
	9-Jul-08	7148408.75	513701.39	483.87	0.13	0.05	0.02	-0.08	-0.02	-0.01
	20-Jul-10	7148408.75	513701.40	483.84	0.14	0.02	0.01	-0.12	-0.04	-0.02
	25-Sep-10	7148498.75	513701.44	483.80	0.18	0.04	0.21	-0.15	-0.03	-0.19
	11-Aug-11	7148408.74	513701.46	483.77	0.19	0.01	0.02	-0.18	-0.03	-0.03
	6-Aug-12	7148408.76	513701.49	483.75	0.23	0.04	0.04	-0.20	-0.02	-0.02
	1-Sep-14	7148408.75	513701.53	483.70	0.27	0.04	0.02	-0.25	-0.05	-0.02
650-2	Summer 1978						6.58			
	Winter 1978/79						3.17			
	Summer 1979						5.00			
	Winter1979/80						4.88			
	Summer 1980						8.84			
	Winter 1980/81									
	1-Aug-81						18.81			-6.43
	1-Jun-82						22.01			-9.18
	1-Jun-83	34963.81	33265.81	469.27			27.01			-13.10
	1-Sep-83	34963.46	33271.80	466.08			20.32			-11.05
	1-Jun-84									
	1-Jun-85						20.99			-9.60
	1-Jul-86	34958.25	33299.25	452.03			6.98			-4.46
	21-Aug-03	7148400.26	513815.95	439.87			2.00			-0.62
	28-Jul-04	7148400.25	513816.10	439.75	0.15	0.15	0.16	-0.12	-0.12	-0.12
	23-Sep-04	7148400.25	513816.08	439.72	0.13	0.02	0.12	-0.15	-0.04	-0.24
	17-Sep-05	7148400.24	513816.21	439.67	0.26	0.13	0.13	-0.20	-0.04	-0.05
	28-Jul-06	7148400.25	513816.27	439.70	0.32	0.06	0.07	-0.17	0.02	0.03
	9-Jul-08	7148400.20	513816.38	439.64	0.43	0.12	0.06	-0.23	-0.06	-0.03
	20-Jul-10	7148400.19	513816.43	439.58	0.48	0.06	0.03	-0.29	-0.07	-0.03
	25-Sep-10	7148400.17	513816.46	439.53	0.52	0.04	0.20	-0.34	-0.04	-0.23

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - MID SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
	11-Aug-11	7148400.18	513816.49	439.54	0.54	0.02	0.03	-0.33	0.00	0.00	
	6-Aug-12	7148400.18	513816.52	439.47	0.57	0.03	0.03	-0.40	-0.07	-0.07	
	1-Sep-14	7148400.20	513816.58	439.43	0.63	0.06	0.03	-0.44	-0.04	-0.02	
350-1A	Summer 1978						5.76				
	Winter 1978/79						3.51				
	Summer 1979						4.51				
	Winter1979/80						4.57				
	Summer 1980						7.77			-3.90	
	Winter 1980/81						9.33			-3.51	
	1-Aug-81						14.87			-4.51	
	1-Jun-82										
	1-Jun-83	34858.10	33235.31	482.50			16.76			-12.10	
	1-Sep-83	34857.30	33242.30	480.43			24.22			-7.15	
	1-Jun-84						27.88			-10.38	
	1-Jun-85						19.89			-7.53	
	1-Jul-86	34853.42	33291.98	473.05			16.73			5.61	
	21-Aug-03	7148298.59	513822.46	448.09			3.75			-1.33	
	28-Jul-04	7148298.61	513822.64	448.01	0.19	0.19	0.20	-0.08	-0.08	-0.09	
	23-Sep-04	7148298.61	513822.64	448.00	0.19	0.00	0.03	-0.09	0.00	-0.03	
	17-Sep-05	7148298.64	513822.81	447.93	0.35	0.17	0.17	-0.16	-0.07	-0.08	
	28-Jul-06	7148298.65	513822.90	447.93	0.45	0.10	0.11	-0.16	0.00	0.00	
	9-Jul-08	7148298.68	513823.08	447.87	0.62	0.17	0.09	-0.22	-0.06	-0.03	
	20-Jul-10	7148298.70	513823.18	447.83	0.73	0.11	0.05	-0.26	-0.05	-0.02	
	25-Sep-10	7148298.69	513823.22	447.79	0.77	0.05	0.26	-0.30	-0.03	-0.19	
	11-Aug-11	7148298.70	513823.27	447.77	0.82	0.05	0.05	-0.32	-0.02	-0.03	
	6-Aug-12	7148298.72	513823.33	447.74	0.88	0.06	0.06	-0.35	-0.03	-0.03	
	1-Sep-14	7148298.75	513823.40	447.66	0.96	0.08	0.04	-0.43	-0.08	-0.04	
350-2A	Summer 1978						7.04				
	Winter 1978/79						3.54				
	Summer 1979						5.06				
	Winter1979/80						5.33				
	Summer 1980						8.99			-3.14	
	Winter 1980/81						11.25			-3.63	
	1-Aug-81						17.47			-5.22	
	1-Jun-82						20.09			-8.28	
	1-Jun-83	34851.01	33281.49	466.74			28.03			-11.45	
	1-Sep-83	34851.17	33289.85	464.14			29.00			-8.96	
	21-Aug-03	7148300.52	513873.67	428.71			3.80			-1.52	
	28-Jul-04	7148300.53	513873.83	428.58	0.16	0.16	0.17	-0.13	-0.13	-0.14	
	23-Sep-04	7148300.54	513873.85	428.58	0.17	0.01	0.09	-0.13	-0.01	-0.04	
	17-Sep-05	7148300.52	513873.98	428.51	0.31	0.14	0.14	-0.20	-0.06	-0.07	
	28-Jul-06	7148300.52	513874.08	428.52	0.41	0.10	0.12	-0.19	0.01	0.01	
	9-Jul-08	7148300.50	513874.23	428.47	0.56	0.15	0.08	-0.25	-0.06	-0.03	
	20-Jul-10	7148300.49	513874.35	428.42	0.68	0.12	0.06	-0.29	-0.04	-0.02	
	25-Sep-10	7148300.48	513874.39	428.38	0.72	0.04	0.23	-0.33	-0.04	-0.23	
	11-Aug-11	7148300.48	513874.44	428.37	0.77	0.05	0.05	-0.34	-0.01	-0.01	
	6-Aug-12	7148300.48	513874.50	428.35	0.83	0.06	0.06	-0.36	-0.02	-0.02	

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - MID SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
	1-Sep-14	7148300.49	513874.54	428.32	0.87	0.04	0.02	-0.39	-0.03	-0.01	
500-1	Summer 1978						8.72				
	Winter 1978/79						3.54				
	Summer 1979						5.27				
	Winter1979/80						4.88				
	Summer 1980						9.02			-4.69	
	Winter 1980/81						9.17			-5.55	
	1-Aug-81						14.90			-8.00	
	1-Jun-82						16.89			-10.00	
	1-Jun-83	34903.21	33175.10	495.09			17.42			-7.47	
	1-Sep-83	34902.92	33179.53	493.64			15.30			-4.99	
	1-Jun-84						10.16			-4.69	
	1-Jun-85						10.38			-2.35	
	1-Jul-86	34899.51	33209.80	482.22			12.73			-5.66	
	21-Aug-03	7148343.22	513725.53	474.09			2.29			-0.79	
	28-Jul-04	7148343.24	513725.54	474.02	0.02	0.02	0.02	-0.07	-0.07	-0.07	
	23-Sep-04	7148343.24	513725.53	474.01	0.01	0.01	0.09	-0.08	-0.01	-0.06	
	17-Sep-05	7148343.24	513725.55	473.95	0.03	0.02	0.02	-0.14	-0.06	-0.06	
	28-Jul-06	7148343.24	513725.56	474.10	0.04	0.02	0.02	0.01	0.14	0.16	
	9-Jul-08	7148343.25	513725.57	474.08	0.05	0.01	0.01	-0.01	-0.01	-0.01	
	20-Jul-10	7148343.23	513725.56	474.10	0.04	0.02	0.01	0.01	0.01	0.01	
	25-Sep-10	7148343.22	513725.59	474.05	0.06	0.03	0.14	-0.04	-0.04	-0.23	
	11-Aug-11	7148343.22	513725.59	474.08	0.07	0.00	0.00	-0.01	0.02	0.03	
	6-Aug-12	7148343.24	513725.62	474.04	0.11	0.04	0.04	-0.05	-0.04	-0.04	
	1-Sep-14	7148343.22	513725.62	474.02	0.13	0.02	0.01	-0.07	-0.02	-0.01	
500-2	Summer 1978						6.58				
	Winter 1978/79						3.35				
	Summer 1979						4.69				
	Winter1979/80						5.03				
	Summer 1980						9.36			-2.62	
	Winter 1980/81						10.82			-3.08	
	1-Aug-81						17.56			-8.00	
	1-Jun-82										
	1-Jun-83	34898.77	33259.05	476.33			22.67			-16.63	
	1-Sep-83	34898.98	33267.35	472.47			28.57			-13.26	
	1-Jun-84						17.82			-8.93	
	1-Jun-85						17.86			-7.88	
	1-Jul-86	34898.04	33316.99	450.90			18.93			-7.05	
	21-Aug-03	7148344.36	513842.07	438.14			3.49			-1.40	
	28-Jul-04	7148344.36	513842.27	438.06	0.20	0.20	0.21	-0.08	-0.08	-0.08	
	23-Sep-04	7148344.37	513842.26	438.05	0.19	0.02	0.10	-0.09	-0.01	-0.08	
	17-Sep-05	7148344.37	513842.43	438.00	0.36	0.17	0.18	-0.14	-0.05	-0.05	
	28-Jul-06	7148344.39	513842.53	438.02	0.46	0.10	0.11	-0.12	0.03	0.03	
	9-Jul-08	7148344.41	513842.70	437.96	0.64	0.18	0.09	-0.18	-0.07	-0.03	
	20-Jul-10	7148344.40	513842.82	437.91	0.75	0.12	0.06	-0.23	-0.05	-0.02	
	25-Sep-10	7148344.40	513842.86	437.87	0.79	0.04	0.22	-0.27	-0.04	-0.21	
	11-Aug-11	7148344.40	513842.91	437.87	0.84	0.05	0.05	-0.27	0.00	0.00	

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - MID SLOPE										
Monitor ID	**Date**	**UTM Coordinates**			**Horizontal Movement**			**Vertical Movement**		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	6-Aug-12	7148344.42	513842.96	437.81	0.89	0.05	0.05	-0.33	-0.06	-0.06
	1-Sep-14	7148344.43	513843.03	437.78	0.97	0.07	0.04	-0.36	-0.03	-0.02
1491	21-Aug-03	7148376.83	513868.79	432.49						
	28-Jul-04	7148376.82	513869.00	432.34	0.21	0.21	0.22	-0.15	-0.15	-0.16
	23-Sep-04	7148376.82	513868.99	432.32	0.20	0.01	0.05	-0.17	-0.02	-0.13
	17-Sep-05	7148376.85	513869.15	432.27	0.36	0.17	0.17	-0.22	-0.05	-0.05
	28-Jul-06	7148376.90	513869.24	432.34	0.45	0.09	0.11	-0.15	0.07	-0.08
	9-Jul-08	7148376.96	513869.39	432.28	0.62	0.17	0.09	-0.21	-0.06	-0.03
	20-Jul-10	7148376.92	513869.51	432.21	0.72	0.12	0.06	-0.29	-0.07	-0.04
	25-Sep-10	7148376.94	513869.71	432.10	0.92	0.20	1.10	-0.39	-0.10	-0.57
	11-Aug-11	7148376.96	513869.76	432.10	0.98	0.06	0.06	-0.39	0.00	0.00
	6-Aug-12	7148376.96	513869.82	432.04	1.04	0.06	0.06	-0.45	-0.06	-0.06
	1-Sep-14	7148377.00	513869.90	431.98	1.13	0.09	0.04	-0.51	-0.06	-0.03

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - LOWER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
80-7	Summer 1980						10.45			-3.99
	Winter 1980/81						11.83			-4.69
	1-Aug-81						17.95			-6.99
	1-Jun-82						21.64			-11.51
	1-Jun-83	34898.72	33309.47	455.41			31.48			-13.09
	1-Sep-83	34899.37	33317.81	452.30			28.80			-10.72
	1-Jun-84						18.25			-7.54
	1-Jun-85						17.05			-7.01
	1-Jul-86	34900.08	33363.48	434.62			15.41			-5.19
	21-Aug-03	7148344.01	513890.73	422.54			3.38			-1.22
	28-Jul-04	7148344.00	513890.89	422.43						
	23-Sep-04	7148344.01	513890.89	422.40	0.16	0.01	0.04	-0.14	-0.03	-0.21
	17-Sep-05	7148344.00	513891.07	422.38	0.34	0.17	0.18	-0.16	-0.02	-0.02
	28-Jul-06	7148343.99	513891.16	422.37	0.43	0.09	0.11	-0.17	-0.01	-0.01
	9-Jul-08	7148344.00	513891.36	422.35	0.63	0.20	0.10	-0.19	-0.03	-0.01
	20-Jul-10	7148343.96	513891.47	422.29	0.74	0.12	0.06	-0.25	-0.06	-0.03
	25-Sep-10	7148343.95	513891.51	422.25	0.78	0.04	0.21	-0.29	-0.03	-0.19
	11-Aug-11	7148343.95	513891.56	422.24	0.83	0.05	0.05	-0.31	-0.02	-0.02
	6-Aug-12	7148343.96	513891.61	422.20	0.88	0.05	0.05	-0.34	-0.04	-0.04
	1-Sep-14	7148343.96	513891.70	422.20	0.97	0.09	0.04	-0.34	0.00	0.00
350-3A	Summer 1978						10.27			
	Winter 1978/79						4.05			
	Summer 1979						5.27			
	Winter1979/80						5.49			
	Summer 1980						9.54			-3.87
	Winter 1980/81						11.92			-3.29
	1-Aug-81						18.47			-33.32
	1-Jun-82						23.90			-32.90
	1-Jun-83	34867.28	33312.68	455.97			33.51			-44.09
	1-Sep-83	34867.68	33321.08	452.15			28.97			-13.14
	1-Jun-84						33.13			-8.85
	1-Jun-85						22.90			-9.92
	1-Jul-86	34868.87	33376.02	429.21			16.47			-6.60
	21-Aug-03	7148312.23	513899.00	417.39			3.51			-1.44
	28-Jul-04	7148312.20	513899.14	417.31	0.14	0.14	0.15	-0.08	-0.08	-0.08
	23-Sep-04	7148312.20	513899.14	417.28	0.14	0.01	0.03	-0.12	-0.04	-0.25
	17-Sep-05	7148312.19	513899.26	417.28	0.26	0.12	0.12	-0.11	0.00	0.00
	28-Jul-06	7148312.16	513899.34	417.29	0.35	0.09	0.10	-0.10	0.01	0.01
	9-Jul-08	7148312.15	513899.49	417.25	0.50	0.15	0.08	-0.14	-0.04	-0.02
	20-Jul-10	7148312.07	513899.60	417.19	0.62	0.14	0.07	-0.20	-0.06	-0.03
	25-Sep-10	7148312.07	513899.64	417.16	0.66	0.04	0.23	-0.23	-0.04	-0.20
	11-Aug-11	7148312.06	513899.67	417.15	0.69	0.03	0.03	-0.24	-0.01	-0.01
	6-Aug-12	7148312.08	513899.72	417.09	0.73	0.05	0.05	-0.30	-0.06	-0.06
	1-Sep-14	7148312.06	513899.80	417.07	0.81	0.08	0.04	-0.32	-0.02	-0.01
1489	21-Aug-03	7148305.23	513928.45	413.70						
	28-Jul-04	7148305.19	513928.51	413.66	0.08	0.08	0.08	-0.04	-0.04	-0.04
	23-Sep-04	7148305.20	513928.50	413.64	0.06	0.01	0.09	-0.06	-0.03	-0.16

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - LOWER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	17-Sep-05	7148305.15	513928.58	413.62	0.15	0.09	0.09	-0.08	-0.02	-0.02
	28-Jul-06	7148305.12	513928.62	413.62	0.20	0.04	0.05	-0.08	0.00	0.00
	9-Jul-08	7148305.09	513928.68	413.60	0.27	0.07	0.04	-0.10	-0.02	-0.01
	20-Jul-10	7148305.03	513928.67	413.55	0.30	0.06	0.03	-0.15	-0.05	-0.02
	25-Sep-10	7148305.03	513928.69	413.52	0.32	0.03	0.14	-0.18	-0.03	-0.19
	11-Aug-11	7148305.02	513928.71	413.53	0.33	0.02	0.02	-0.17	0.01	0.01
	6-Aug-12	7148305.03	513928.74	413.51	0.36	0.04	0.04	-0.19	-0.02	-0.02
	1-Sep-14	7148305.01	513928.75	413.47	0.38	0.02	0.01	-0.23	-0.04	-0.02
NL-1	28-Jul-04	7148365.73	513942.45	413.19						
	23-Sep-04	7148365.73	513942.45	413.16	0.01	0.01	0.03	-0.02	-0.02	-0.15
	17-Sep-05	7148365.72	513942.59	413.16	0.14	0.14	0.14	-0.03	0.00	-0.01
	28-Jul-06	7148365.70	513942.70	413.15	0.24	0.11	0.13	-0.03	-0.01	-0.01
	9-Jul-08	7148365.72	513942.85	413.10	0.40	0.16	0.08	-0.09	-0.05	-0.03
	20-Jul-10	7148365.71	513942.97	413.05	0.52	0.12	0.06	-0.14	-0.05	-0.03
	25-Sep-10	7148365.69	513943.01	413.00	0.56	0.05	0.27	-0.19	-0.05	-0.29
	11-Aug-11	7148365.71	513943.03	412.99	0.58	0.02	0.02	-0.19	0.00	0.00
	6-Aug-12	7148365.73	513943.10	412.94	0.64	0.07	0.07	-0.25	-0.06	-0.06
	1-Sep-14	7148365.71	513943.23	412.87	0.77	0.13	0.06	-0.32	-0.07	-0.03
1083 (NL-2)	21-Aug-03	7148354.01	513936.37	414.10						
	28-Jul-04	7148354.00	513936.52	414.10	0.15	0.15	0.16	0.00	0.00	-0.01
	23-Sep-04	7148354.01	513936.52	414.08	0.15	0.01	0.09	-0.02	-0.02	-0.11
	17-Sep-05	7148354.02	513936.65	414.05	0.28	0.13	0.14	-0.05	-0.03	-0.03
	28-Jul-06	7148354.03	513936.74	414.06	0.37	0.09	0.11	-0.04	0.01	0.02
	9-Jul-08	7148354.05	513936.89	414.04	0.52	0.15	0.07	-0.06	-0.02	-0.01
	20-Jul-10	7148354.05	513937.00	414.00	0.63	0.11	0.05	-0.10	-0.04	-0.02
	25-Sep-10	7148354.04	513937.03	413.97	0.66	0.03	0.19	-0.13	-0.03	-0.17
	11-Aug-11	7148354.05	513937.05	413.97	0.68	0.02	0.02	-0.13	0.00	0.00
	6-Aug-12	7148354.07	513937.11	413.94	0.75	0.06	0.07	-0.17	-0.03	-0.03
1083	1-Sep-14	7148354.06	513937.18	413.92	0.82	0.07	0.03	-0.19	-0.02	-0.01
NL-2	1-Sep-14	7148354.35	513937.35	413.82						
NL-3	28-Jul-04	7148334.73	513926.88	417.07						
	23-Sep-04	7148334.73	513926.88	417.05	0.00	0.00	0.03	-0.02	-0.02	-0.13
	17-Sep-05	7148334.75	513926.99	417.08	0.10	0.11	0.11	0.01	0.03	0.03
	28-Jul-06	7148334.75	513927.08	417.08	0.20	0.09	0.11	0.02	0.01	0.01
	9-Jul-08	7148334.74	513927.20	417.08	0.32	0.12	0.06	0.01	0.00	0.00
	20-Jul-10	7148334.71	513927.28	417.04	0.40	0.09	0.04	-0.03	-0.04	-0.02
	25-Sep-10	7148334.71	513927.33	417.00	0.44	0.05	0.25	-0.07	-0.04	-0.23
	11-Aug-11	7148334.72	513927.36	417.00	0.48	0.03	0.04	-0.07	0.00	0.00
	6-Aug-12	7148334.73	513927.42	416.98	0.53	0.06	0.06	-0.09	-0.02	-0.02
	1-Sep-14	7148334.74	513927.45	416.96	0.56	0.03	0.01	-0.11	-0.02	-0.01
NL-4	28-Jul-04	7148307.20	513913.00	416.19						
	23-Sep-04	7148307.19	513912.99	416.16	0.02	0.02	0.13	-0.03	-0.03	-0.20
	17-Sep-05	7148307.14	513913.12	416.11	0.13	0.14	0.14	-0.08	-0.05	-0.05
	28-Jul-06	7148307.12	513913.19	416.11	0.21	0.08	0.09	-0.08	0.01	0.01
	9-Jul-08	7148307.10	513913.33	416.07	0.34	0.13	0.07	-0.13	-0.05	-0.02
	20-Jul-10	7148307.00	513913.43	415.98	0.47	0.14	0.07	-0.21	-0.08	-0.04
	25-Sep-10	7148307.01	513913.47	415.94	0.50	0.04	0.21	-0.25	-0.05	-0.25

WOLVERINE TAILINGS PILE SURVEY DATA - NORTH LOBE - LOWER SLOPE										
Monitor ID	**Date**	**UTM Coordinates**			**Horizontal Movement**			**Vertical Movement**		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	11-Aug-11	7148306.99	513913.50	415.92	0.54	0.04	0.04	-0.27	-0.01	-0.01
	6-Aug-12	7148307.00	513913.56	415.89	0.59	0.06	0.06	-0.30	-0.03	-0.03
	1-Sep-14	7148306.98	513913.60	415.86	0.64	0.05	0.02	-0.33	-0.03	-0.01
NL-5	28-Jul-04	7148275.21	513896.96	415.46						
	23-Sep-04	7148275.17	513896.96	415.42	0.04	0.04	0.26	-0.04	-0.04	-0.26
	17-Sep-05	7148275.16	513897.05	415.39	0.10	0.08	0.08	-0.07	-0.03	-0.03
	28-Jul-06	7148275.14	513897.10	415.41	0.16	0.06	0.07	-0.04	0.03	0.03
	9-Jul-08	7148275.11	513897.19	415.40	0.26	0.09	0.05	-0.06	-0.02	-0.01
	20-Jul-10	7148275.05	513897.28	415.33	0.36	0.10	0.05	-0.12	-0.06	-0.03
	25-Sep-10	7148275.03	513897.32	415.27	0.41	0.05	0.25	-0.19	-0.06	-0.34
	11-Aug-11	7148275.01	513897.34	415.27	0.43	0.02	0.03	-0.19	0.00	0.00
	6-Aug-12	7148275.02	513897.39	415.23	0.47	0.05	0.05	-0.23	-0.04	-0.04
	1-Sep-14	7148275.00	513897.41	415.18	0.50	0.03	0.01	-0.28	-0.05	-0.02

WOLVERINE TAILINGS PILE - SOUTH LOBE - SUMMARY OF HISTORICAL MOVEMENT DATA									
Monitoring Period	**Annual Horizontal Movement Rates (m/year)**								
	Upper			**Mid**			**Lower**		
	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.
Summer 78 to Winter 79	0.21	0.21	0.21	1.44	1.68	1.10	1.45	2.10	0.49
Summer 79 to Winter 80	0.20	0.40	0.00	2.20	2.32	1.92	1.43	1.65	1.22
July 80 to Aug 81	0.76	0.76	0.76	3.77	4.05	3.44	2.37	3.41	1.31
Aug 81 to June 82	0.27	0.27	0.27	3.36	3.78	2.77	1.63	2.71	0.64
June 82 to June 83	0.27	0.27	0.27	4.30	5.00	3.31	1.69	3.18	0.83
June 83 to Sept 83				5.57	6.56	4.36	2.62	4.30	1.12
Sept 83 to June 84				5.65	5.85	5.46	1.55	2.05	1.05
June 84 to June 85				5.20	6.12	3.58	1.57	2.21	0.92
June 85 to July 86				5.93	6.55	4.87	2.62	2.62	2.62
1986 to 1999									
1999 to 2001									
2001 to 2003									
Aug 2003 to July 2004	0.15	0.24	0.07	0.87	1.02	0.43	0.46	0.76	0.07
July 2004 to Sept 2004	0.17	0.19	0.14	0.70	0.89	0.18	0.72	1.38	0.20
Sept 2004 to Sept 2005	0.13	0.18	0.09	0.76	0.93	0.35	0.45	0.66	0.05
Sept 2005 to July 2006	0.10	0.18	0.02	0.59	0.81	0.04	0.35	0.57	0.03
July 2006 to July 2008	0.07	0.09	0.05	0.45	0.62	0.03	0.28	0.44	0.02
July 2008 to July 2010	0.04	0.06	0.03	0.36	0.52	0.02	0.23	0.36	0.00
July 2010 to Sept 2010	0.11	0.12	0.10	0.53	0.71	0.11	0.36	0.52	0.05
Sept 2010 to Aug 2011	0.05	0.05	0.04	0.42	1.11	0.02	0.24	0.38	0.01
Aug 2011 to Aug 2012	0.04	0.05	0.04	0.30	0.45	0.02	0.20	0.32	0.01
Aug 2012 to Sept 2014	0.04	0.10	0.01	0.25	0.37	0.03	0.16	0.25	0.01
Sept 2015 to Sept 2015	0.04	0.07	0.01						

Note: Monitoring Points vary throughout the years, as some were replaced, new ones were added, etc.
-no survey between 1986 and 1999, or in 2013
-blank cells are a result of no available data
-values in red indicate that data was not available and was calculated based on reported survey data

WOLVERINE TAILINGS PILE SURVEY DATA - SOUTH LOBE - UPPER SLOPE										
Monitor ID	**Date**	**UTM Coordinates**			**Horizontal Movement**			**Vertical Movement**		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
1492	21-Aug-03	7148053.74	513,409.91	610.07						
	28-Jul-04	7148053.72	513409.97	609.98	0.06	0.06	0.07	-0.09	-0.09	-0.09
	23-Sep-04	7148053.73	513409.95	609.98	0.04	0.02	0.14	-0.09	0.00	-0.01
	17-Sep-05	7148053.69	513410.03	609.80	0.12	0.08	0.09	-0.27	-0.18	-0.19
	28-Jul-06	7148053.68	513410.04	609.79	0.14	0.02	0.02	-0.28	-0.01	-0.01
	9-Jul-08	7148053.66	513410.14	609.70	0.24	0.10	0.05	-0.38	-0.09	-0.05
	20-Jul-10	7148053.64	513410.20	609.61	0.31	0.07	0.03	-0.46	-0.08	-0.04
	25-Sep-10	7148053.62	513410.21	609.59	0.32	0.02	0.10	-0.48	-0.02	-0.14
	11-Aug-11	7148053.61	513410.24	609.53	0.36	0.04	0.04	-0.54	-0.06	-0.07
	6-Aug-12	7148053.61	513410.28	609.47	0.39	0.04	0.04	-0.60	-0.06	-0.06
	1-Sep-14	7148053.59	513410.32	609.35	0.44	0.05	0.02	-0.72	-0.12	-0.06
24	Summer 1978						0.21			
	Winter 1978/79						0.21			
	Summer 1979						0.40			
	Winter1979/80						0.00			
	Summer 1980						0.27			-0.30
	Winter 1980/81						0.15			-0.18
	1-Aug-81						0.76			-0.04
	1-Jun-82						0.27			-0.35
	1-Jun-83	34589.37	33018.81	557.04						
	1-Sep-83	34589.26	33019.49	556.58			0.53			-1.17
	21-Aug-03	7148033.83	513525.34	549.69						
	28-Jul-04	7148033.87	513525.57	549.55	0.23	0.23	0.24	-0.14	-0.14	-0.15
	23-Sep-04	7148033.90	513525.56	549.55	0.23	0.03	0.19	-0.14	0.01	0.04
	17-Sep-05	7148033.91	513525.74	549.37	0.41	0.18	0.18	-0.33	-0.19	-0.19
	28-Jul-06	7148033.92	513525.89	549.37	0.56	0.15	0.18	-0.32	0.00	0.00
	9-Jul-08	7148033.94	513526.07	549.28	0.73	0.17	0.09	-0.41	-0.09	-0.05
	20-Jul-10	7148033.97	513526.17	549.24	0.84	0.11	0.06	-0.46	-0.04	-0.02
	25-Sep-10	7148033.95	513526.17	549.22	0.84	0.02	0.12	-0.47	-0.02	-0.10
	11-Aug-11	7148033.96	513526.22	549.17	0.89	0.05	0.05	-0.52	-0.04	-0.05
	6-Aug-12	7148033.98	513526.27	549.11	0.94	0.05	0.05	-0.58	-0.06	-0.06
	1-Sep-14	7148033.97	513526.32	549.12	0.99	0.05	0.02	-0.57	0.01	0.01

WOLVERINE TAILING PILE SURVEY DATA - SOUTH LOBE - MID SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
1084	21-Aug-03	7148017.97	513617.95	516.26						
	28-Jul-04	7148017.98	513618.35	516.10	0.40	0.40	0.43	-0.16	-0.16	-0.17
	23-Sep-04	7148017.99	513618.38	516.10	0.43	0.03	0.18	-0.16	-0.01	-0.06
	17-Sep-05	7148018.02	513618.72	516.02	0.77	0.34	0.35	-0.24	-0.08	-0.08
	28-Jul-06	7148018.00	513618.94	515.98	0.99	0.22	0.26	-0.28	-0.04	-0.04
	9-Jul-08	7148018.01	513619.24	515.89	1.29	0.30	0.15	-0.37	-0.10	-0.05
	20-Jul-10	7148018.02	513619.42	515.83	1.47	0.18	0.09	-0.43	-0.05	-0.03
	25-Sep-10	7148018.01	513619.44	515.80	1.49	0.03	0.14	-0.46	-0.03	-0.17
	11-Aug-11	7148018.00	513619.52	515.78	1.57	0.08	0.09	-0.48	-0.02	-0.03
	6-Aug-12	7148018.02	513619.58	515.73	1.63	0.06	0.06	-0.53	-0.05	-0.05
	1-Sep-14	7148018.00	513619.67	515.75	1.72	0.09	0.04	-0.51	0.02	0.01
1485	21-Aug-03	7148017.91	513702.37	480.46						
	28-Jul-04	7148018.00	513703.32	480.19	0.95	0.95	1.02	-0.27	-0.27	-0.29
	23-Sep-04	7148018.02	513703.46	480.10	1.09	0.14	0.89	-0.36	-0.09	-0.56
	17-Sep-05	7148018.12	513704.37	479.82	2.00	0.91	0.93	-0.64	-0.29	-0.29
	28-Jul-06	7148018.16	513705.01	479.62	2.65	0.65	0.75	-0.84	-0.19	-0.22
	9-Jul-08	7148018.25	513706.15	479.22	3.79	1.14	0.58	-1.24	-0.40	-0.20
	20-Jul-10	7148018.30	513707.09	478.84	4.74	0.95	0.47	-1.62	-0.39	-0.19
	25-Sep-10	7148018.30	513707.21	478.78	4.85	0.12	0.63	-1.68	-0.06	-0.33
	11-Aug-11	7148018.33	513707.61	478.60	5.25	0.40	0.46	-1.86	-0.17	-0.20
	6-Aug-12	7148018.37	513707.98	478.39	5.63	0.37	0.38	-2.07	-0.22	-0.22
	1-Sep-14	7148018.46	513708.60	478.04	6.25	0.62	0.30	-2.42	-0.35	-0.17
BH-16 (T8)	21-Aug-03	7148048.49	513760.30	464.94						
	28-Jul-04	7148048.61	513761.19	464.65	0.90	0.90	0.96	-0.29	-0.29	-0.31
	23-Sep-04	7148048.63	513761.31	464.59	1.02	0.12	0.77	-0.35	-0.05	-0.35
	17-Sep-05	7148048.72	513762.13	464.34	1.84	0.82	0.84	-0.60	-0.25	-0.26
	28-Jul-06	7148048.79	513762.77	464.20	2.49	0.64	0.75	-0.75	-0.14	-0.17
	9-Jul-08	7148048.93	513763.85	463.84	3.58	1.10	0.56	-1.10	-0.36	-0.18
	20-Jul-10	7148049.03	513764.78	463.53	4.52	0.94	0.46	-1.41	-0.31	-0.15
	25-Sep-10	7148049.03	513764.89	463.49	4.63	0.11	0.58	-1.45	-0.04	-0.25
	11-Aug-11	7148049.27	513765.84	463.55	5.59	0.98	1.11	-1.39	0.06	0.07
	6-Aug-12	7148049.31	513766.21	463.40	5.97	0.38	0.38	-1.54	-0.15	-0.15
	1-Sep-14	7148049.37	513766.87	463.19	6.63	0.66	0.32	-1.75	-0.21	-0.10
24A	Summer 1978						1.10			
	Winter 1978/79						1.55			
	Summer 1979						1.92			
	Winter1979/80						2.29			
	Summer 1980						2.19			-1.04
	Winter 1980/81						1.71			-1.04
	1-Aug-81						4.05			-1.16
	1-Jun-82						3.78			-1.38
	1-Jun-83	34577.12	33211.76	489.72			5.00			-1.76
	1-Sep-83	34577.48	33213.63	488.98			6.56			-2.56
	1-Jun-84						5.85			-2.08
	1-Jun-85						6.12			-2.27
	1-Jul-86	34581.14	33230.14	482.72			6.55			-2.47
	21-Aug-03	7148035.28	513774.68	465.27			3.20			-1.10

WOLVERINE TAILING PILE SURVEY DATA - SOUTH LOBE - MID SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	28-Jul-04	7148035.42	513775.58	464.94	0.91	0.91	0.97	-0.33	-0.33	-0.35
	23-Sep-04	7148035.44	513775.70	464.89	1.03	0.13	0.82	-0.38	-0.05	-0.34
	17-Sep-05	7148035.58	513776.55	464.66	1.90	0.86	0.87	-0.61	-0.23	-0.23
	28-Jul-06	7148035.66	513777.19	464.47	2.54	0.64	0.75	-0.80	-0.19	-0.22
	9-Jul-08	7148035.85	513778.31	464.12	3.67	1.13	0.58	-1.15	-0.35	-0.18
	20-Jul-10	7148035.99	513779.27	463.82	4.64	0.97	0.48	-1.45	-0.30	-0.15
	25-Sep-10	7148035.99	513779.39	463.76	4.76	0.12	0.66	-1.51	-0.06	-0.32
	11-Aug-11	7148036.06	513779.82	463.62	5.20	0.43	0.50	-1.65	-0.14	-0.16
	6-Aug-12	7148036.12	513780.20	463.47	5.58	0.38	0.39	-1.80	-0.15	-0.15
	1-Sep-14	7148036.21	513780.89	463.28	6.27	0.69	0.33	-1.99	-0.19	-0.09
24B	Summer 1978						1.68			
	Winter 1978/79						1.43			
	Summer 1979						2.32			
	Winter1979/80						2.29			
	Summer 1980						2.87			-1.01
	Winter 1980/81						2.83			-1.07
	1-Aug-81						3.81			-1.11
	1-Jun-82						3.54			-1.31
	1-Jun-83	34584.94	33270.56	469.47			4.58			-1.57
	1-Sep-83	34585.23	33272.22	468.90			5.80			-1.95
	1-Jun-84						5.46			-1.83
	1-Jun-85						5.89			-2.11
	1-Jul-86	34588.41	33288.14	463.38			6.39			-2.09
	21-Aug-03	7148045.09	513832.26	446.30			3.18			-1.04
	28-Jul-04	7148045.31	513833.13	446.00	0.90	0.90	0.96	-0.30	-0.30	-0.32
	23-Sep-04	7148045.33	513833.26	445.89	1.03	0.13	0.85	-0.41	-0.11	-0.69
	17-Sep-05	7148045.55	513834.05	445.62	1.85	0.82	0.83	-0.68	-0.27	-0.27
	28-Jul-06	7148045.69	513834.66	445.46	2.47	0.62	0.73	-0.84	-0.16	-0.19
	9-Jul-08	7148045.97	513835.72	445.06	3.56	1.09	0.56	-1.24	-0.39	-0.20
	20-Jul-10	7148046.19	513836.62	444.73	4.50	0.93	0.46	-1.57	-0.33	-0.16
	25-Sep-10	7148046.23	513836.74	444.67	4.62	0.12	0.65	-1.63	-0.06	-0.35
	11-Aug-11	7148046.31	513837.14	444.50	5.03	0.41	0.47	-1.80	-0.16	-0.19
	6-Aug-12	7148046.42	513837.51	444.35	5.42	0.39	0.39	-1.95	-0.15	-0.16
	1-Sep-14	7148046.56	513838.16	444.14	6.08	0.66	0.32	-2.16	-0.21	-0.10
NL-Base	17-Sep-05	7148154.79	513836.26	431.47						
	28-Jul-06	7148154.78	513836.23	431.38	0.03	0.03	0.04	-0.09	-0.09	-0.10
	9-Jul-08	7148154.80	513836.28	431.40	0.02	0.05	0.03	-0.07	0.02	0.01
	20-Jul-10	7148154.82	513836.31	431.41	0.06	0.04	0.02	-0.06	0.01	0.00
	25-Sep-10	7148154.81	513836.32	431.38	0.07	0.02	0.11	-0.09	-0.03	-0.16
	11-Aug-11	7148154.81	513836.34	431.38	0.08	0.01	0.02	-0.09	0.00	0.00
	6-Aug-12	7148154.81	513836.35	431.35	0.10	0.02	0.02	-0.12	-0.02	-0.02
	1-Sep-14	7148154.82	513836.41	431.37	0.16	0.06	0.03	-0.10	0.02	0.01
62 (2005-01)	17-Sep-05	7148100.15	513757.89	463.73						
	28-Jul-06	7148100.13	513758.45	463.64	0.56	0.56	0.65	-0.09	-0.09	-0.10
	9-Jul-08	7148100.09	513759.38	463.46	1.49	0.93	0.48	-0.27	-0.18	-0.09
	20-Jul-10	7148100.07	513760.16	463.30	2.26	0.78	0.38	-0.42	-0.15	-0.07
	25-Sep-10	7148100.04	513760.26	463.28	2.37	0.11	0.59	-0.44	-0.02	-0.11

WOLVERINE TAILING PILE SURVEY DATA - SOUTH LOBE - MID SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
	11-Aug-11	7148100.04	513760.61	463.19	2.71	0.35	0.39	-0.54	-0.09	-0.10	
	6-Aug-12	7148100.02	513760.92	463.12	3.03	0.32	0.32	-0.60	-0.07	-0.07	
	1-Sep-14	7148100.00	513761.48	463.03	3.59	0.56	0.27	-0.69	-0.09	-0.05	
63 (2005-02)	17-Sep-05	7148118.21	513816.95	447.89							
	28-Jul-06	7148118.32	513817.41	447.77	0.48	0.48	0.56	-0.12	-0.12	-0.14	
	9-Jul-08	7148118.56	513818.22	447.45	1.31	0.84	0.43	-0.44	-0.32	-0.17	
	20-Jul-10	7148118.75	513818.89	447.17	2.01	0.70	0.35	-0.72	-0.28	-0.14	
	25-Sep-10	7148118.77	513818.98	447.11	2.11	0.10	0.52	-0.78	-0.05	-0.29	
	11-Aug-11	7148118.85	513819.28	446.99	2.41	0.30	0.35	-0.90	-0.12	-0.14	
	6-Aug-12	7148118.93	513819.55	446.86	2.70	0.29	0.29	-1.03	-0.13	-0.13	
	1-Sep-14	7148119.06	513820.01	446.68	3.18	0.48	0.23	-1.21	-0.18	-0.09	
64 (2005-03)	17-Sep-05	7148108.16	513870.12	428.18							
	28-Jul-06	7148108.35	513870.58	428.04	0.50	0.50	0.58	-0.14	-0.14	-0.16	
	9-Jul-08	7148108.74	513871.41	427.72	1.41	0.91	0.47	-0.46	-0.32	-0.16	
	20-Jul-10	7148109.06	513872.11	427.45	2.18	0.77	0.38	-0.73	-0.27	-0.13	
	25-Sep-10	7148109.08	513872.21	427.40	2.29	0.11	0.58	-0.78	-0.05	-0.27	
	11-Aug-11	7148109.22	513872.53	427.29	2.63	0.35	0.40	-0.89	-0.12	-0.13	
	6-Aug-12	7148109.36	513872.82	427.16	2.95	0.32	0.32	-1.02	-0.12	-0.13	
	1-Sep-14	7148109.57	513873.30	426.99	3.48	0.53	0.25	-1.19	-0.17	-0.08	
66 (2005-04)	17-Sep-05	7148047.07	513876.04	428.36							
	28-Jul-06	7148047.27	513876.56	428.26	0.55	0.55	0.64	-0.10	-0.10	-0.12	
	9-Jul-08	7148047.65	513877.50	428.02	1.57	1.02	0.52	-0.34	-0.24	-0.13	
	20-Jul-10	7148047.97	513878.33	427.81	2.46	0.89	0.44	-0.55	-0.21	-0.10	
	25-Sep-10	7148048.02	513878.45	427.73	2.59	0.12	0.68	-0.63	-0.08	-0.45	
	11-Aug-11	7148048.13	513878.80	427.63	2.96	0.37	0.42	-0.73	-0.10	-0.11	
	6-Aug-12	7148048.28	513879.13	427.52	3.32	0.36	0.36	-0.84	-0.11	-0.11	
	1-Sep-14	7148048.50	513879.73	427.39	3.95	0.63	0.31	-0.97	-0.13	-0.06	
61 (2005-05)	17-Sep-05	7148000.57	513781.55	464.67							
	28-Jul-06	7148000.65	513782.24	464.51	0.70	0.70	0.81	-0.16	-0.16	-0.19	
	9-Jul-08	7148000.83	513783.44	464.19	1.91	1.22	0.62	-0.48	-0.32	-0.16	
	20-Jul-10	7148000.98	513784.48	463.91	2.96	1.05	0.52	-0.76	-0.29	-0.14	
	25-Sep-10	7148000.97	513784.61	463.86	3.09	0.13	0.71	-0.81	-0.05	-0.28	
	11-Aug-11	7148001.04	513785.08	463.72	3.56	0.47	0.54	-0.95	-0.14	-0.16	
	6-Aug-12	7148001.10	513785.52	463.59	4.01	0.45	0.45	-1.08	-0.13	-0.13	
	1-Sep-14	7148001.19	513786.28	463.43	4.78	0.77	0.37	-1.24	-0.16	-0.08	
65 (2005-06)	17-Sep-05	7147999.72	513865.78	433.29							
	28-Jul-06	7147999.74	513866.22	433.22	0.44	0.44	0.51	-0.07	-0.07	-0.08	
	9-Jul-08	7147999.88	513867.02	432.94	1.25	0.81	0.41	-0.35	-0.28	-0.14	
	20-Jul-10	7147999.95	513867.68	432.73	1.91	0.66	0.33	-0.56	-0.21	-0.10	
	25-Sep-10	7147999.94	513867.77	432.66	2.00	0.10	0.54	-0.63	-0.07	-0.38	
	11-Aug-11	7147999.96	513868.08	432.55	2.31	0.31	0.35	-0.74	-0.11	-0.12	
	6-Aug-12	7147999.98	513868.36	432.48	2.59	0.28	0.29	-0.81	-0.08	-0.08	
	1-Sep-14	7148000.03	513868.85	432.31	3.08	0.49	0.24	-0.98	-0.17	-0.08	

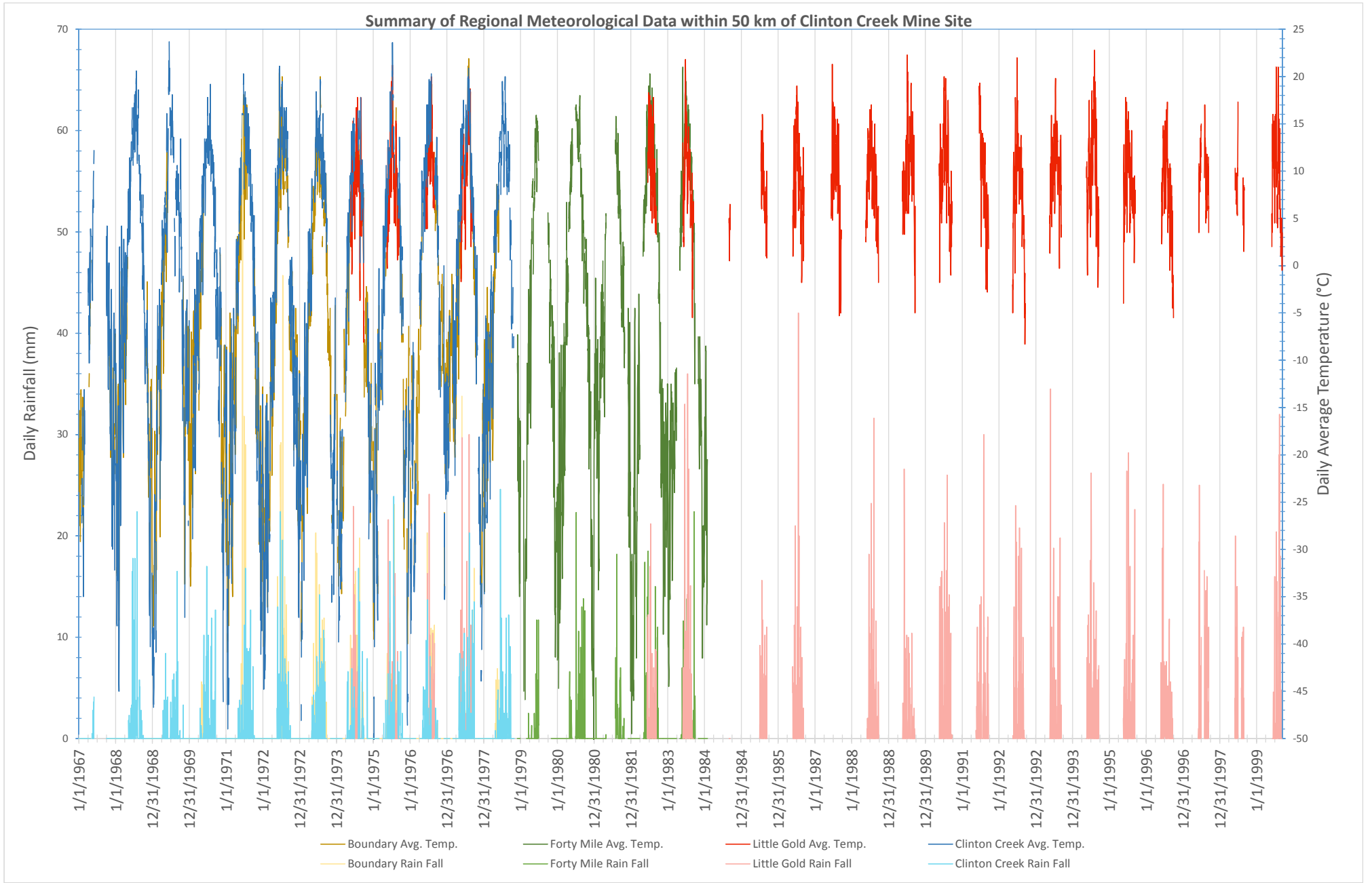
WOLVERINE TAILINGS PILE SURVEY DATA - SOUTH LOBE - LOWER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
24D	Summer 1978						2.77			
	Winter 1978/79						1.16			
	Summer 1979						2.10			
	Winter1979/80						1.98			
	Summer 1980						2.35			-0.85
	Winter 1980/81						2.10			-0.70
	1-Aug-81						3.44			-0.80
	1-Jun-82						2.77			-1.02
	1-Jun-83	34608.90	33374.66	434.96			3.31			-1.16
	1-Sep-83	34609.20	33375.89	434.62			4.36			-1.19
	1-Jun-85						3.58			-1.17
	1-Jul-86	34612.55	33387.45	430.71			4.87			-1.57
	21-Aug-03	7148071.59	513920.05	422.39			2.63			
	28-Jul-04	7148071.88	513920.59	422.29	0.61	0.61	0.65	-0.10	-0.10	-0.11
	23-Sep-04	7148071.93	513920.65	422.28	0.69	0.08	0.51	-0.11	-0.01	-0.06
	17-Sep-05	7148072.22	513921.17	422.27	1.28	0.59	0.60	-0.12	-0.01	-0.01
	28-Jul-06	7148072.45	513921.53	422.29	1.71	0.43	0.50	-0.10	0.03	0.03
	9-Jul-08	7148072.86	513922.19	422.25	2.49	0.77	0.40	-0.14	-0.04	-0.02
	20-Jul-10	7148073.24	513922.78	422.22	3.18	0.70	0.34	-0.18	-0.04	-0.02
	25-Sep-10	7148073.27	513922.87	422.18	3.28	0.10	0.52	-0.21	-0.04	-0.21
	11-Aug-11	7148073.45	513923.14	422.18	3.61	0.33	0.38	-0.21	0.00	0.00
	6-Aug-12	7148073.60	513923.39	422.12	3.90	0.29	0.29	-0.27	-0.06	-0.06
	1-Sep-14	7148073.89	513923.81	422.12	4.41	0.51	0.25	-0.27	0.00	0.00
25B	Summer 1978						2.77			
	Winter 1978/79						1.13			
	Summer 1979						1.98			
	Winter1979/80						1.16			
	Summer 1980						2.23			-0.64
	Winter 1980/81						2.04			-0.46
	1-Aug-81						3.41			-0.68
	1-Jun-82						2.71			-0.65
	1-Jun-83	34610.69	33413.90	422.24			3.18			-0.72
	1-Sep-83	34611.03	33415.10	422.07			4.30			-0.59
	21-Aug-03	7148065.68	513948.29	422.02			1.83			0.06
	28-Jul-04	7148065.72	513948.61	422.03	0.32	0.32	0.34	0.01	0.01	0.01
	23-Sep-04	7148065.75	513948.63	422.03	0.35	0.04	0.26	0.01	0.00	-0.01
	17-Sep-05	7148065.78	513948.89	422.10	0.60	0.25	0.26	0.08	0.07	0.07
	28-Jul-06	7148065.81	513949.05	422.15	0.76	0.16	0.19	0.13	0.05	0.06
	9-Jul-08	7148065.90	513949.39	422.20	1.11	0.35	0.18	0.18	0.05	0.02
	20-Jul-10	7148065.96	513949.65	422.22	1.38	0.27	0.13	0.20	0.03	0.01
	25-Sep-10	7148065.96	513949.68	422.20	1.42	0.03	0.19	0.18	-0.02	-0.13
	11-Aug-11	7148065.99	513949.79	422.21	1.52	0.11	0.12	0.19	0.01	0.01
	6-Aug-12	7148066.04	513949.90	422.20	1.64	0.12	0.12	0.18	0.00	0.00
	1-Sep-14	7148066.09	513950.04	422.22	1.79	0.15	0.07	0.20	0.02	0.01
25C	Summer 1978						2.10			
	Winter 1978/79						0.79			
	Summer 1979						1.65			

WOLVERINE TAILINGS PILE SURVEY DATA - SOUTH LOBE - LOWER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	Winter1979/80						1.22			
	Summer 1980						1.37			0.61
	Winter 1980/81						1.16			0.64
	1-Aug-81						2.38			0.81
	1-Jun-82						1.52			0.76
	1-Jun-83	34670.18	33467.38	411.80			1.05			0.80
	1-Sep-83	34670.27	33469.44	412.14			2.44			1.20
	1-Jun-84						2.05			0.82
	1-Jun-85						2.21			0.96
	1-Jul-86	34672.86	33475.20	414.47			2.62			0.77
80-9	Summer 1978						2.10			
	Winter 1978/79						0.79			
	Summer 1979						1.65			
	Winter1979/80						1.22			
	Summer 1980						1.37			0.61
	Winter 1980/81						1.16			0.64
	1-Aug-81						1.31			0.32
	1-Jun-82						0.64			0.31
	1-Jun-83	34556.22	33463.13	408.80			0.83			0.27
	1-Sep-83	34556.07	33463.42	408.97			1.12			0.59
	1-Jun-84						1.05			0.43
	1-Jun-85						0.92			0.44
	21-Aug-03	7147996.44	513970.69	411.11			0.63			0.16
	28-Jul-04	7147996.41	513970.75	411.09	0.06	0.06	0.07	-0.02	-0.02	-0.03
	23-Sep-04	7147996.38	513970.73	411.04	0.07	0.03	0.20	-0.07	-0.05	-0.33
	17-Sep-05	7147996.37	513970.77	411.06	0.11	0.05	0.05	-0.05	0.03	0.03
	28-Jul-06	7147996.36	513970.80	411.12	0.14	0.03	0.03	0.01	0.06	0.07
	9-Jul-08	7147996.33	513970.82	411.14	0.17	0.03	0.02	0.03	0.02	0.01
	20-Jul-10	7147996.32	513970.82	411.14	0.17	0.01	0.01	0.03	0.00	0.00
	25-Sep-10	7147996.31	513970.82	411.11	0.18	0.01	0.05	0.00	-0.03	-0.16
	11-Aug-11	7147996.30	513970.81	411.14	0.19	0.01	0.02	0.03	0.03	0.03
	6-Aug-12	7147996.29	513970.81	411.10	0.19	0.01	0.01	-0.01	-0.03	-0.03
	1-Sep-14	7147996.30	513970.80	411.11	0.21	0.02	0.01	0.00	0.01	0.00
1484	21-Aug-03	7148148.49	513961.52	417.94						
	28-Jul-04	7148149.07	513961.93	417.98	0.71	0.71	0.76	0.04	0.04	0.04
	23-Sep-04	7148149.18	513961.98	417.95	0.83	0.12	0.78	0.01	-0.03	-0.19
	17-Sep-05	7148149.71	513962.36	417.93	1.49	0.65	0.66	-0.01	-0.01	-0.02
	28-Jul-06	7148150.10	513962.63	417.98	1.96	0.47	0.55	0.04	0.05	0.05
	9-Jul-08	7148150.81	513963.12	417.96	2.82	0.86	0.44	0.02	-0.02	-0.01
	20-Jul-10	7148151.41	513963.53	417.88	3.54	0.72	0.36	-0.06	-0.08	-0.04
	25-Sep-10	7148151.47	513963.59	417.85	3.63	0.09	0.49	-0.09	-0.03	-0.15
	11-Aug-11	7148151.72	513963.77	417.81	3.94	0.31	0.35	-0.13	-0.04	-0.05
	6-Aug-12	7148151.97	513963.96	417.79	4.25	0.31	0.32	-0.15	-0.02	-0.02
	1-Sep-14	7148152.36	513964.26	417.74	4.74	0.49	0.24	-0.20	-0.05	-0.03
SL-1	28-Jul-04	7148078.88	513970.45	419.86						
	23-Sep-04	7148079.09	513970.46	419.76	0.20	0.20	1.30	-0.09	-0.09	-0.60
	17-Sep-05	7148078.87	513970.86	419.83	0.40	0.45	0.46	-0.03	0.06	0.06

WOLVERINE TAILINGS PILE SURVEY DATA - SOUTH LOBE - LOWER SLOPE											
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement			
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	
	28-Jul-06	7148078.84	513971.10	419.84	0.64	0.24	0.28	-0.02	0.01	0.01	
	9-Jul-08	7148078.82	513971.55	419.81	1.10	0.46	0.23	-0.04	-0.02	-0.01	
	20-Jul-10	7148078.78	513971.97	419.78	1.52	0.42	0.21	-0.08	-0.03	-0.02	
	25-Sep-10	7148078.74	513972.05	419.71	1.61	0.09	0.46	-0.15	-0.07	-0.37	
	11-Aug-11	7148078.73	513972.25	419.69	1.80	0.20	0.22	-0.17	-0.03	-0.03	
	6-Aug-12	7148078.73	513972.43	419.67	1.98	0.19	0.19	-0.18	-0.01	-0.01	
	1-Sep-14	7148077.64	513968.44	420.52	-new survey marker established						
SL-2	28-Jul-04	7148086.80	513956.84	422.53							
	23-Sep-04	7148087.01	513956.88	422.46	0.21	0.21	1.38	-0.07	-0.07	-0.45	
	17-Sep-05	7148086.98	513957.37	422.60	0.56	0.49	0.50	0.08	0.15	0.15	
	28-Jul-06	7148087.08	513957.68	422.65	0.89	0.33	0.38	0.13	0.05	0.06	
	9-Jul-08	7148087.23	513958.26	422.76	1.49	0.60	0.31	0.23	0.10	0.05	
	20-Jul-10	7148087.39	513958.80	422.85	2.05	0.56	0.28	0.33	0.10	0.05	
	25-Sep-10	7148087.37	513958.88	422.75	2.12	0.09	0.49	0.22	-0.10	-0.57	
	11-Aug-11	7148087.45	513959.14	422.76	2.39	0.27	0.31	0.24	0.01	0.02	
	6-Aug-12	7148087.54	513959.37	422.74	2.64	0.24	0.25	0.21	-0.02	-0.02	
	1-Sep-14	7148087.61	513959.77	422.77	3.05	0.41	0.20	0.24	0.03	0.01	
SL-3	28-Jul-04	7148100.47	513933.11	420.80							
	23-Sep-04	7148100.54	513933.16	420.78	0.09	0.09	0.59	-0.02	-0.02	-0.13	
	17-Sep-05	7148100.89	513933.63	420.83	0.67	0.58	0.59	0.03	0.05	0.05	
	28-Jul-06	7148101.13	513933.98	420.86	1.10	0.43	0.49	0.06	0.03	0.04	
	9-Jul-08	7148101.63	513934.59	420.87	1.88	0.79	0.40	0.07	0.01	0.00	
	20-Jul-10	7148102.06	513935.14	420.87	2.58	0.70	0.35	0.07	0.00	0.00	
	25-Sep-10	7148102.11	513935.22	420.84	2.68	0.09	0.52	0.04	-0.03	-0.15	
	11-Aug-11	7148102.31	513935.47	420.85	3.00	0.32	0.36	0.05	0.01	0.01	
	6-Aug-12	7148102.50	513935.72	420.81	3.31	0.31	0.32	0.01	-0.04	-0.04	
	1-Sep-14	7148102.79	513936.13	420.85	3.81	0.50	0.24	0.05	0.04	0.02	
SL-4	17-Sep-05	7148115.67	513907.57	416.88							
	28-Jul-06	7148115.91	513907.91	416.82	0.42	0.42	0.49	-0.06	-0.06	-0.07	
	9-Jul-08	7148116.34	513908.56	416.70	1.19	0.77	0.40	-0.18	-0.12	-0.06	
	20-Jul-10	7148116.72	513909.11	416.58	1.86	0.67	0.33	-0.30	-0.12	-0.06	
	25-Sep-10	7148116.76	513909.19	416.54	1.95	0.09	0.47	-0.34	-0.04	-0.20	
	11-Aug-11	7148116.92	513909.44	416.49	2.25	0.30	0.34	-0.39	-0.05	-0.05	
	6-Aug-12	7148117.07	513909.68	416.41	2.53	0.28	0.28	-0.47	-0.09	-0.09	
	1-Sep-14	7148117.34	513910.08	416.35	3.01	0.48	0.23	-0.53	-0.06	-0.03	
SL-5	17-Sep-05	7148133.63	513,876.08								
	28-Jul-06	7148133.86	513876.52	422.79	0.49	0.49	0.57	-0.12	-0.12	-0.14	
	9-Jul-08	7148134.25	513877.26	422.53	1.34	0.85	0.43	-0.38	-0.26	-0.13	
	20-Jul-10	7148134.60	513877.91	422.30	2.07	0.73	0.36	-0.61	-0.24	-0.12	
	25-Sep-10	7148134.62	513877.99	422.24	2.15	0.08	0.45	-0.67	-0.06	-0.31	
	11-Aug-11	7148134.77	513878.28	422.15	2.48	0.33	0.38	-0.77	-0.10	-0.11	
	6-Aug-12	7148134.91	513878.53	422.04	2.76	0.28	0.28	-0.87	-0.11	-0.11	
	1-Sep-14	7148135.14	513878.98	421.91	3.26	0.50	0.24	-1.00	-0.13	-0.06	
68 (2005-07)	17-Sep-05	7148000.11	513945.37	416.35							
	28-Jul-06	7148000.07	513945.39	416.36	0.04	0.04	0.05	0.01	0.01	0.01	
	9-Jul-08	7147999.99	513945.41	416.36	0.12	0.08	0.04	0.01	0.00	0.00	
	20-Jul-10	7147999.99	513945.41	416.37	0.12	0.00	0.00	0.02	0.00	0.00	

WOLVERINE TAILINGS PILE SURVEY DATA - SOUTH LOBE - LOWER SLOPE										
Monitor ID	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)	Cumulative (metres)	Incremental (metres)	Rate (metres/year)
	25-Sep-10	7147999.97	513945.41	416.33	0.14	0.02	0.11	-0.02	-0.03	-0.19
	11-Aug-11	7147999.97	513945.41	416.34	0.15	0.00	0.01	-0.01	0.00	0.01
	6-Aug-12	7147999.96	513945.39	416.30	0.15	0.02	0.02	-0.05	-0.04	-0.04
	1-Sep-14	7147999.94	513945.39	416.30	0.17	0.02	0.01	-0.05	0.00	0.00
67 (2005-08)	17-Sep-05	7148038.85	513970.98	415.77						
	28-Jul-06	7148038.81	513971.06	415.79	0.09	0.09	0.10	0.02	0.02	0.02
	9-Jul-08	7148038.79	513971.22	415.84	0.25	0.16	0.08	0.07	0.05	0.03
	20-Jul-10	7148038.76	513971.34	415.89	0.37	0.12	0.06	0.12	0.05	0.02
	25-Sep-10	7148038.75	513971.36	415.83	0.39	0.03	0.15	0.06	-0.07	-0.36
	11-Aug-11	7148038.75	513971.40	415.85	0.43	0.04	0.04	0.08	0.02	0.03
	6-Aug-12	7148038.74	513971.44	415.81	0.48	0.05	0.05	0.04	-0.03	-0.04
	1-Sep-14	7148038.72	513971.48	415.85	0.52	0.04	0.02	0.08	0.04	0.02
2005-09	17-Sep-05	7148124.38	513969.23	420.18						
	28-Jul-06	7148124.55	513969.46	420.28	0.29	0.29	0.34	0.10	0.10	0.12
	9-Jul-08	7148124.87	513969.90	420.40	0.83	0.54	0.28	0.22	0.12	0.06
	20-Jul-10	7148125.15	513970.34	420.45	1.35	0.52	0.26	0.26	0.05	0.02
	25-Sep-10	NOT FOUND								
	11-Aug-11	NOT FOUND								
996 (replace)	6-Aug-12	7148131.20	513969.10	419.46						
	1-Sep-14	7148131.38	513969.41	419.47	0.35	0.35	0.17	0.01	0.01	0.00
71 (2005-10)	17-Sep-05	7148146.69	513925.39	411.78						
	28-Jul-06	7148146.97	513925.66	411.80	0.39	0.39	0.45	0.02	0.02	0.02
	9-Jul-08	7148147.50	513926.16	411.83	1.12	0.73	0.37	0.05	0.03	0.02
	20-Jul-10	BURIED								
	25-Sep-10	BURIED								
	11-Aug-11	7148148.18	513926.85	411.82	2.08	0.96	0.31	0.04	-0.01	0.00
	6-Aug-12	7148148.35	513927.05	411.79	2.35	0.27	0.27	0.01	-0.03	-0.03
	1-Sep-14	7148148.68	513927.36	411.83	2.80	0.45	0.22	0.04	0.03	0.02
70 (2005-11)	17-Sep-05	7148176.10	513942.17	411.91						
	28-Jul-06	7148176.45	513942.33	411.80	0.39	0.39	0.45	-0.11	-0.11	-0.13
	9-Jul-08	7148177.04	513942.67	411.99	1.07	0.68	0.35	0.08	0.19	0.10
	20-Jul-10	7148177.53	513942.94	412.00	1.62	0.55	0.27	0.09	0.01	0.01
	25-Sep-10	7148177.58	513942.99	411.97	1.69	0.07	0.37	0.06	-0.03	-0.14
	11-Aug-11	7148177.79	513943.10	411.99	1.93	0.24	0.28	0.08	0.01	0.02
	6-Aug-12	7148178.00	513943.19	411.97	2.16	0.23	0.23	0.06	-0.02	-0.02
	1-Sep-14	7148178.34	513943.40	411.99	2.56	0.40	0.19	0.08	0.02	0.01

APPENDIX E
REGIONAL METEOROLOGICAL DATA


Summary of Regional Meteorological Data within 50 km of Clinton Creek Mine Site
Daily Rainfall (mm)
Daily Average Temperature (°C)
70
60
50
40
30
20
10
0
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
1/1/1967
1/1/1968
12/31/1968
12/31/1969
1/1/1971
1/1/1972
12/31/1972
12/31/1973
1/1/1975
1/1/1976
12/31/1976
12/31/1977
1/1/1979
1/1/1980
12/31/1980
12/31/1981
1/1/1983
1/1/1984
12/31/1984
12/31/1985
1/1/1987
1/1/1988
12/31/1988
12/31/1989
1/1/1991
1/1/1992
12/31/1992
12/31/1993
1/1/1995
1/1/1996
12/31/1996
12/31/1997
1/1/1999
Boundary Avg. Temp.
Forty Mile Avg. Temp.
Little Gold Avg. Temp.
Clinton Creek Avg. Temp.
Boundary Rain Fall
Forty Mile Rain Fall
Little Gold Rain Fall
Clinton Creek Rain Fall

APPENDIX F
SURFACE FLOW DATA

SURFACE FLOW DATA

AS EXTRACTED FROM

YUKON WATER RESOURCES HYDROMETRIC PROGRAM

HISTORICAL SUMMARY 1975 – 2004

PREPARED BY YUKON GOVERNMENT, ENVIRONMENT YUKON

29EC001 — Clinton Creek above Fortymile River

Location: ..... 64°24'N 140°37'W
Drainage Area: .....206 sq km
Record Length:..... 1978 – 1991 R
Flow:..... Partially Regulated

	Maximum Instantaneous		Minimum Instantaneous	
Year	Date	Discharge (m^3/s)	Date	Discharge (m^3/s)
1978	June 27	9.36	May 16	0.010
1979	May 7	15.3 A	July 17	0.390 A
1980	- -	-	- -	-
1981	July 22	11.8	June 24	0.060
1982	- -	-	- -	-
1983	- -	-	- -	-
1984	May 9	11.3 E	July 5	0.010 E
1985	May 24	14.7	Aug. 7	0.290
1986	June 25	1.50 E	Oct. 7	0.150 E
1987	May 10	6.56	July 7	0.59
1988	- -	-	- -	-
1989	June 29	2.19 A	July 22	0.11
1990	May 4	8.38	July 19	0.35
1991	April 28	11.50 A	July 31	

	Maximum Daily		Minimum Daily	
Year	Date	Discharge (m^3/s)	Date	Discharge (m^3/s)
1978	June 27	4.93	May 19	0.010
1979	May 19	9.83 A	July 18	0.450 A
1980	- -	-	- -	-
1981	July 22	10.3	June 25	0.060
1982	- -	-	- -	-
1983	- -	-	- -	-
1984	May 10	11.1 E	July 6	0.020 E
1985	May 24	13.4	Aug. 7	0.350
1986	June 25	1.43 E	Oct. 17	0.180 E
1987	May 10	6.10	July 7	0.59
1988	- -	-	- -	-
1989	June 29	1.90 A	July 23	0.11
1990	May 3	7.14	July 20	0.35
1991	Aug. 20	4.96 A	July 31	0.07

Note: No recorder data 1980, 1982, 1983; See Discharge Summary

29EC001 – Clinton Creek above Fortymile River

Discharge Summary

Year	Date	Discharge (m^3/s)	Year	Date	Discharge (m^3/s)
1980	June 8	0.296	1983	May 22	0.708
	July 7	0.319		June 23	5.90
	July 16	0.340		July 20	2.30
	Aug. 1	0.349		Aug. 24	0.503
	Aug. 27	0.819			
	Sept. 24	1.03			
1982	June 18	10.0			
	July 18	4.75			
	July 29	0.289			
	Sept. 21	0.324			

Clinton Creek above Fortymile River

1978 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		0.670	2.32	0.240	0.310	
2		1.16	1.92	0.240	0.310	
3		1.16	1.66	0.220	0.310	
4		1.18	1.41	0.210	0.310	
5		1.16	1.16	0.180	0.310	
6		1.10	1.06	0.200	0.360	
7		0.980	1.06	0.220	0.470	
8		0.860	1.10	0.200	0.540	
9		0.760	1.10	0.260	0.550	
10		0.670	1.10	0.300	0.510	
11	0.300	0.600	0.980	0.310	0.500	
12	0.340	0.570	0.820	0.290	0.480	
13	0.340	0.510	0.690	0.290	0.450	
14	0.270	0.460	0.650	0.410		
15	0.130	0.430	0.600	0.470		
16	0.030	0.410	0.570	0.470		
17	0.060	4.16	0.520	0.430		
18	0.020	3.70	0.480	0.400		
19	0.010	3.84	0.430	0.390		
20	0.030	3.70	0.400	0.350		
21	0.170	3.02	0.380	0.350		
22	0.300	2.40	0.370	0.350		
23	0.270	3.36	0.380	0.350		
24	0.320	2.92	0.330	0.350		
25	0.370	3.53	0.310	0.350		
26	0.320	2.92	0.330	0.350		
27	0.250	4.93	0.310	0.340		
28	0.180	4.45	0.310	0.310		
29	0.120	3.42	0.310	0.310		
30	0.130	2.75	0.290	0.310		
31	0.170		0.260	0.310		
Total	**4.160**	**63.150**	**23.650**	**9.800**		
Mean	**0.200**	**2.100**	**0.760**	**0.320**		
Max.	**0.370**	**4.930**	**2.320**	**0.470**	**0.550**	
Min.	**0.010**	**0.410**	**0.260**	**0.180**	**0.310**	

Clinton Creek above Fortymile River

1979 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		1.55	1.18	1.30	0.740	
2		1.27	0.970	1.56	0.790	
3		1.36	0.780	1.33	2.90	
4		1.37	0.710	1.13	4.13	
5		1.17	0.650	0.990	3.31	
6		0.980	1.61	1.33	2.98	
7		0.880	1.27	1.34	2.23	
8		0.790	0.960	1.20	1.72	
9		0.700	0.840	1.05	1.44	
10		0.630	0.800	0.930	1.22	
11	2.43	0.700	0.710	0.840	1.07	
12	5.65	1.22	0.680	0.710	1.00	
13	6.85	1.27	0.630	0.650	0.960	
14	6.41	1.39	0.600	0.620	0.880	
15	6.30	1.20	0.580	0.560	0.810	
16	6.00	0.980	0.550	0.670	0.790	
17	4.86	0.950	0.490	0.840	0.770	
18	9.32	1.63	0.450	0.890	0.930	
19	9.83	1.86	0.560	0.990	0.980	
20	7.34	1.72	0.530	0.970	0.940	
21	5.39	1.57	0.460	0.880	0.840	
22	4.24	1.30	0.570	0.830		
23	3.51	1.09	0.980	0.740		
24	3.29	1.02	0.980	0.670		
25	4.70	0.910	0.830	0.640		
26	3.56	0.870	0.760	0.570		
27	2.47	0.850	0.760	0.550		
28	1.92	0.890	0.690	0.550		
29	1.53	1.98	0.630	0.550		
30	1.84	1.59	0.610	0.550		
31	2.09		0.830	0.630		
Total	**99.53**	**35.690**	**26.630**	**27.060**	**31.420**	
Mean	**4.74**	**1.190**	**0.760**	**0.870**	**1.500**	
Max.	**9.83**	**1.980**	**1.610**	**1.560**	**4.130**	
Min.	**1.53**	**0.630**	**0.450**	**0.550**	**0.740**	

Clinton Creek above Fortymile River

1981 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		3.91	0.720	1.20		
2		3.63	0.670	1.04		
3		3.35	0.920	1.46		
4		2.76	2.39	1.48		
5		2.24	2.17	1.20		
6		2.21	1.83	1.02		
7		2.21	1.49	0.940		
8		1.82	1.62	0.830		
9		1.75	1.38	0.790		
10		1.45	1.13	0.670		
11		1.31	0.930	0.660		
12		1.19	0.900	0.810		
13		1.32	0.750	0.750		
14		1.24	0.600	0.750		
15		1.00	0.480	0.660		
16		0.760	0.370	0.620		
17		0.550	0.450	0.590		
18		0.390	0.620	0.590		
19		0.280	3.22	0.590		
20		0.190	3.01	0.590		
21		0.140	7.93	0.590		
22	3.04	0.110	10.3			
23	3.75	0.090	6.26			
24	3.46	0.060	5.61			
25	3.80	0.060	4.92			
26	4.76	0.060	3.51			
27	3.71	0.060	3.27			
28	2.88	0.100	2.69			
29	2.26	0.420	2.17			
30	1.75	0.620	1.76			
31	1.84		1.45			
Total		**35.290**	**75.460**	**17.820**		
Mean		**1.180**	**2.430**	**0.850**		
Max.	**4.76**	**3.910**	**10.270**	**1.480**		
Min.	**1.75**	**0.060**	**0.370**	**0.590**		

Clinton Creek above Fortymile River

1984 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1			0.390	1.71	0.460	
2		2.11	0.320	1.31	0.430	
3		1.55	0.200	1.09		
4		1.16	0.130	0.900		
5	5.83	0.900	0.090	0.780		
6	6.34	0.860	0.020	0.700		
7	7.26	0.720	0.120	0.600		
8	8.67	0.760	0.180	0.500		
9	10.4	1.18	0.120	0.440		
10	11.1	1.40	0.530	0.430		
11	9.28	1.44	2.02	0.480		
12		1.48	1.73	0.420		
13		2.15	1.36	0.340		
14		1.97	1.07	0.320		
15		1.73	1.67	0.300		
16		1.98	2.27	0.310		
17		1.83	5.23	0.270		
18		1.53	4.32	0.240		
19		1.45	3.20	0.200		
20		1.35	2.37	0.200		
21		1.14	1.82	0.200		
22		0.910	2.11	0.200		
23		0.710	2.13	0.200		
24		0.540	1.69	0.230		
25		0.430	1.34	0.310		
26		0.340	1.21	0.520		
27		0.410	1.33	0.660		
28		0.340	4.42	0.660		
29		0.270	3.44	0.590		
30		0.380	2.62	0.580		
31			2.12	0.500		
Total		**33.040**	**51.600**	**16.160**		
Mean		**1.140**	**1.660**	**0.520**		
Max.	**11.12**	**2.150**	**5.230**	**1.710**	**0.460**	
Min.	**5.83**	**0.270**	**0.020**	**0.200**	**0.430**	

Clinton Creek above Fortymile River

1985 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		4.93	2.12	0.630	0.540	0.800
2		4.48	1.77	0.540	0.570	0.790
3		3.71	1.52	0.500	0.570	0.750
4		3.08	1.32	0.470	0.570	0.660
5		2.50	1.09	0.430	0.540	0.590
6		2.29	1.00	0.370	0.500	0.510
7		1.97	0.880	0.350	0.440	0.500
8		1.66	0.790	0.420	0.430	0.440
9		1.38	1.72	0.430	0.460	
10		1.11	4.14	0.430	0.790	
11		0.910	3.57	0.420	0.870	
12		0.810	2.80	0.360	0.820	
13		0.790	2.22	0.360	0.770	
14		0.750	3.11	0.360	0.740	
15		0.720	2.92	0.360	1.39	
16		0.870	2.37	0.360	1.94	
17		0.950	2.27	0.360	1.74	
18		2.16	1.91	0.360	1.52	
19	9.99	3.88	1.56	0.360	1.29	
20	9.29	3.83	1.27	0.360	1.17	
21	7.77	3.65	1.04	0.370	1.04	
22	9.48	4.19	0.870	0.460	0.900	
23	11.8	4.10	0.750	0.540	0.870	
24	13.4	3.13	0.690	0.570	0.870	
25	12.8	2.67	0.870	0.570	1.22	
26	11.6	3.41	0.920	0.570	1.26	
27	10.1	3.93	0.940	0.570	1.23	
28	7.69	4.30	0.860	0.570	1.11	
29	6.34	3.44	0.770	0.520	0.970	
30	6.47	2.65	0.720	0.460	0.940	
31	5.65		0.650	0.500		
Total		**78.240**	**49.430**	**13.930**	**28.100**	
Mean		**2.610**	**1.590**	**0.450**	**0.940**	
Max.	**13.39**	**4.930**	**4.140**	**0.630**	**1.940**	**0.800**
Min.	**5.65**	**0.720**	**0.650**	**0.350**	**0.430**	**0.440**

Clinton Creek above Fortymile River

1986 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1					0.500	0.300
2				0.600	0.470	0.300
3				0.570	0.500	0.270
4				0.570	0.480	0.260
5				0.570	0.440	0.260
6				0.570	0.440	0.230
7				0.480	0.440	0.200
8				0.440	0.440	0.220
9				0.440	0.440	0.210
10				0.440	0.440	0.220
11				0.440	0.440	0.220
12				0.460	0.430	0.250
13				0.500	0.410	0.260
14				0.470	0.370	0.260
15				0.430	0.340	0.260
16				0.490	0.340	0.230
17				0.570	0.300	0.180
18				0.570	0.340	0.200
19				0.560	0.340	0.200
20		0.590		0.500	0.340	0.200
21		0.710		0.550	0.380	
22		0.860		0.700	0.380	
23		0.740		0.620	0.370	
24		0.950		0.560	0.340	
25		1.43		0.470	0.280	
26		1.36		0.440	0.250	
27				0.390	0.280	
28				0.440	0.300	
29				0.500	0.280	
30				0.500	0.300	
31				0.500		
Total				**15.390**	**11.400**	**4.740**
Mean				**0.510**	**0.380**	**0.240**
Max.		**1.430**		**0.700**	**0.500**	**0.300**
Min.		**0.590**		**0.390**	**0.250**	**0.180**

Clinton Creek above Fortymile River

1987 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		4.49	0.88	3.69	0.82	
2		3.67	1.02	2.93	0.82	
3		3.53	0.84	2.40	0.80	
4		4.00	0.76	2.01	0.74	
5		3.43	0.66	1.73	0.74	
6		2.78	0.62	1.49	0.74	
7		2.21	0.59	1.33	0.74	
8		1.75	0.59	1.27	0.68	
9		1.60	0.63	1.20	0.66	
10	6.10	1.57	1.72	1.12	0.78	
11	5.37	1.37	2.95	1.00	0.84	
12	4.84	1.17	2.49	0.95	0.90	
13	3.95	1.14	2.37	0.90	0.84	
14	3.22	1.04	2.04	1.45	0.88	
15	2.55	0.98	1.63	2.04	0.90	
16	2.13	3.23	1.37	2.32	0.90	
17	1.79	4.68	1.14	1.81	0.99	
18	1.76	3.80	0.98	1.50	1.20	
19	2.14	2.99	0.92	1.40	1.10	
20	2.68	2.28	0.82	1.63	1.02	
21	2.93	1.75	0.83	1.41	0.98	
22	2.96	1.36	0.82	1.23	0.90	
23	2.85	1.02	1.09	1.13	0.86	
24	3.15	0.92	1.07	1.04	0.82	
25	3.72	1.43	0.97	0.98	0.91	
26	3.19	1.62	0.87	0.96	0.98	
27	2.86	1.19	0.80	0.90	1.10	
28	3.31	0.99	0.74	0.90	1.64	
29	3.76	0.87	0.73	0.89	1.52	
30	3.57	0.78	0.83	0.90	1.29	
31	4.84		4.86	0.83		
Total	**73.70**	**63.63**	**38.63**	**45.32**	**28.09**	
Mean	**3.35**	**2.12**	**1.25**	**1.46**	**0.94**	
Max.	**6.10**	**4.68**	**4.86**	**3.69**	**1.64**	
Min.	**1.76**	**0.78**	**0.59**	**0.83**	**0.66**	

Clinton Creek above Fortymile River

1989 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1			1.13	0.39	0.33	
2			1.02	0.54	0.27	
3			0.90	0.75	0.27	
4			0.73	0.68	0.27	
5			0.61	0.58	0.27	
6			0.64	0.47	0.27	
7				0.43	0.21	
8				0.35	0.21	
9				0.33	0.21	
10				0.29	0.24	
11				0.21	0.27	
12				0.21	0.27	
13				0.16	0.27	
14				0.16	0.27	
15				0.16	0.29	
16				0.16	0.36	
17				0.11	0.41	
18				0.11	0.39	
19				0.11	0.35	
20			0.16	0.29	0.30	
21			0.16	0.56	0.33	
22			0.12	0.48	0.36	
23		0.80	0.11	0.36	0.39	
24		0.62	0.14	0.33	0.39	
25		0.86	0.75	0.30	0.44	
26		1.68	0.86	0.27		
27		1.42	0.75	0.27		
28		1.51	0.70	0.27		
29		1.90	0.60	0.26		
30		1.31	0.49	0.21		
31			0.46	0.27		
Total			**10.33**	**10.09**	**7.67**	
Mean			**0.57**	**0.33**	**0.31**	
Max.		**1.90**	**1.13**	**0.75**	**0.44**	
Min.		**0.62**	**0.11**	**0.11**	**0.21**	

Clinton Creek above Fortymile River

1990 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1			0.61	2.76	1.76	1.65
2	6.77		0.62	2.13	1.76	
3	7.14		0.61	1.78	1.76	
4	6.61		0.59	1.61	1.76	
5	5.15		0.50	1.73	2.21	
6	3.87	0.87	0.42	1.69	3.11	
7	3.04	0.87	0.42	2.06	3.19	
8	3.17	0.87	0.42	3.36	2.88	
9	4.20	0.87	0.42	2.79	2.64	
10	4.81	0.85	0.43	2.44	2.97	
11	4.95	0.84	0.54	2.15	3.71	
12	4.84	0.86	0.45	1.91	3.78	
13	4.18	0.77	0.42	1.69	3.59	
14	4.11	0.71	0.42	1.53	3.26	
15	4.12	1.03	0.42	1.44	3.15	
16	3.61	2.03	0.42	1.33	2.81	
17	3.11	1.68	0.42	1.24	2.57	
18	2.65	1.40	0.42	1.21	2.31	
19	2.21	1.24	0.39	1.15	2.09	
20		1.14	0.35	1.58	1.92	
21		1.19	0.35	3.29	1.81	
22		1.65	0.35	3.39	1.68	
23		1.86	0.35	2.95	1.65	
24		1.65	0.35	2.52	1.71	
25		1.39	0.61	2.34	1.86	
26		1.16	1.10	2.16	1.88	
27		0.98	1.05	2.37	1.81	
28		0.85	1.05	2.34	1.72	
29		0.74	1.05	2.13	1.65	
30		0.70	0.97	1.94	1.65	
31			1.65	1.85		
Total	**78.54**	**28.19**	**18.19**	**64.86**	**70.63**	
Mean	**4.36**	**1.13**	**0.59**	**2.09**	**2.35**	
Max.	**7.14**	**2.03**	**1.65**	**3.39**	**3.78**	**1.65**
Min.	**2.21**	**0.70**	**0.35**	**1.15**	**1.65**	**1.65**

Clinton Creek above Fortymile River

1991 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1			0.20 E	0.08 E	0.70 E	
2			0.20 E	0.08 E	0.70 E	
3			0.20 E	0.10 E	0.60 E	
4			0.20 E	0.18 E	0.70 E	
5			0.20 E	1.39 E	0.70 E	
6			0.20 E	2.29 E	0.70 E	
7			0.20 E	3.24 E	0.70 E	
8			0.25 E	3.46 E	0.80 E	
9			0.40 E	2.99 E	0.90 E	
10			0.32 E	2.52 E	1.00 E	
11			0.26 E	2.18 E	1.10 E	
12			0.28 E	2.00 E	1.20 E	
13			0.23 E	1.90 E	1.16 E	
14			0.22 E	1.90 E	2.00 E	
15			0.21 E	1.80 E	2.00 E	
16			0.19 E	1.80 E	1.70 E	
17			0.19 E	1.80 E	1.60 E	
18			0.17 E	1.90 E	1.40 E	
19		0.76 E	0.15 E	2.00 E	1.20 E	
20		0.63 E	0.14 E	1.80 E	1.25 E	
21		0.57 E	0.13 E	1.30 E	1.18 E	
22		0.50 E	0.12 E	1.20 E	1.11 E	
23		0.42 E	0.12 E	1.00 E	1.04 E	
24		0.36 E	0.11 E	0.86 E	0.98 E	
25		0.32 E	0.11 E	0.86 E	0.88 E	
26		0.32 E	0.10 E	0.76 E	0.81 E	
27		0.32 E	0.09 E	0.60 E	0.81 E	
25		0.26 E	0.08 E	0.60 E		
29		0.25 E	0.08 E	0.60 E		
30		0.22 E	0.07 E	0.60 E		
31			0.07 E	0.70 E		
Total			**8.67**	**64.21**	**41.81**	
Mean			**0.28**	**2.07**	**1.55**	
Max.		**0.76**	**1.34**	**4.96**	**4.63**	
Min.		**0.22**	**0.03**	**0.03**	**0.40**	

**Note this data has been estimated due to recorder problems at site. Use with caution.*

Max. Instantaneous Discharge likely higher.

29EC001 A – Clinton Creek near Mine

Location: ..... 64°25'54"N 140°40'11"W
Drainage Area: ..... 150 sq km
Record Length: ..... 1992 – R
Flow: ..... Partially Regulated

	Maximum Instantaneous		Minimum Instantaneous	
Year	Date	Discharge (m^3/s)	Date	Discharge (m^3/s)
1992	- -	-	- -	-
1993	Aug. 25	1.21	July 31	0.101
1994	July 7	6.67	July 27	0.177
1995	May 15	20.6	July 7	0.071
1996	June 12	2.87	Aug. 7	0.102
1997	- -	-	- -	-
1998	June 23	6.01	July 20	0.356

	Maximum Daily		Minimum Daily	
Year	Date	Discharge (m^3/s)	Date	Discharge (m^3/s)
1992	- -	-	- -	-
1993	Aug. 25	1.14	July 31	0.102
1994	July 7	6.15	Aug. 5	0.196
1995	May 15	17.4	July 10	0.08
1996	June 12	2.57	Aug. 7	0.105
1997	- -	-	- -	-
1998	June 23	5.16	July 20	0.367

Clinton Creek near Mine

1993 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		0.515	0.508	0.105	0.885	
2		0.513	0.503	0.108	0.970	
3		0.513	0.502	0.111	0.926	
4		0.508	0.502	0.115	0.769	
5		0.507	0.502	0.118	0.690	
6		0.464	0.494	0.121	0.688	
7		0.467	0.492	0.124	0.649	
8		0.467	0.492	0.127	0.625	
9		0.471	0.501	0.131	0.621	
10		0.472	0.453	0.134	0.699	
11		0.473	0.392	0.137	0.777	
12		0.472	0.334	0.143	0.726	
13		0.476	0.302	0.139	0.726	
14		0.477	0.268	0.156	0.676	
15		0.482	0.252	0.151	0.608	
16		0.478	0.230	0.154	0.543	
17		0.482	0.213	0.170	0.496	
18		0.502	0.190	0.174	0.483	
19		0.502	0.170	0.162	0.474	
20		0.502	0.142	0.160	0.467	
21		0.493	0.137	0.155	0.454	
22		0.492	0.133	0.158	0.413	
23		0.492	0.129	0.368	0.312	
24		0.492	0.126	0.846	0.322	
25	0.535	0.492	0.122	1.14	0.296	
26	0.535	0.487	0.119	1.08	0.286	
27	0.527	0.482	0.115	0.909	0.278	
28	0.524	0.482	0.112	0.813	0.243	
29	0.524	0.484	0.108	0.686	0.278	
30	0.524	0.513	0.105	0.666		
31	0.518		0.102	0.731		
Total	**3.687**	**14.652**	**8.750**	**10.292**	**16.380**	
Mean	**0.527**	**0.488**	**0.282**	**0.332**	**0.565**	
Max.	**0.535**	**0.515**	**0.508**	**1.14**	**0.970**	
Min.	**0.518**	**0.464**	**0.102**	**0.105**	**0.243**	

Clinton Creek near Mine

1994 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1			1.05	0.200	0.353	
2			0.834	0.200	0.370	
3		3.19	0.732	0.224	0.343	
4		3.32	0.619	0.203	0.339	
5		2.64	0.827	0.196	0.349	
6		2.30	3.46	0.202	0.386	
7		2.57	6.15	0.208	0.380	
8		1.95	4.02	0.246	0.371	
9		1.41	2.37	0.260	0.362	
10		1.06	1.54	0.274	0.371	
11		0.914	1.11	0.269	0.388	
12		0.807	0.848	0.259	0.406	
13		0.673	0.622	0.293	0.350	
14		0.556	0.492	0.308	0.333	
15		0.486	0.419	0.301	0.390	
16		0.491	0.396	0.272	0.370	
17		0.442	0.369	0.271	0.384	
18		0.368	0.392	0.305	0.383	
19		0.380	0.411	0.285	0.406	
20		0.333	0.338	0.285		
21		0.335	0.294	0.299		
22		0.304	0.286	0.312		
23		0.288	0.245	0.320		
24		0.268	0.217	0.301		
25		0.308	0.213	0.348		
26		0.415	0.204	0.321		
27		0.429	0.204	0.286		
28		0.638	0.208	0.319		
29		1.25	0.215	0.290		
30		1.41	0.205	0.305		
31			0.203	0.313		
Total		**29.535**	**29.493**	**8.475**	**7.034**	
Mean		**1.05**	**0.951**	**0.273**	**0.370**	
Max.		**3.32**	**6.15**	**0.348**	**0.406**	
Min.		**0.268**	**0.203**	**0.196**	**0.333**	

Clinton Creek near Mine

1995 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		0.696	0.255	0.673	0.251	
2		0.534	0.230	0.638	0.302	
3		0.407	0.197	0.584	0.364	
4	6.26	0.308	0.162	0.490	0.331	
5	5.57	0.269	0.117	0.429	0.344	
6	6.75	0.265	0.087	0.405	0.370	
7	5.82	0.277	0.085	0.313	0.364	
8	4.31	0.306	0.086	0.271	0.339	
9	3.53	0.366	0.088	0.274	0.458	
10	3.00	0.347	0.080	0.276	0.687	
11	2.37	0.267	0.094	0.270	1.35	
12	1.90	0.222	0.110	0.317	2.18	
13	1.60	0.198	0.182	0.276	1.89	
14	3.27	0.145	0.266	0.267	1.48	
15	17.4	0.112	0.691	0.272		
16	9.42	0.124	0.982	0.269		
17	4.65	0.154	0.818	0.259		
18	2.92	0.185	0.536	0.218		
19	1.86	0.196	0.411	0.196		
20	1.26	0.180	0.355	0.220		
21	0.985	0.150	0.271	0.253		
22	0.735	0.127	0.294	0.250		
23	0.536	0.315	0.349	0.260		
24	0.395	0.768	0.399	0.249		
25	0.335	0.862	0.527	0.230		
26	0.307	0.700	1.45	0.216		
27	0.347	0.562	1.56	0.216		
28	0.522	0.421	1.22	0.238		
29	0.734	0.323	1.09	0.202		
30	0.940	0.274	0.926	0.209		
31	0.875		0.820	0.244		
Total	**88.601**	**10.060**	**14.738**	**9.484**	**10.710**	
Mean	**3.16**	**0.335**	**0.475**	**0.306**	**0.765**	
Max.	**17.4**	**0.862**	**1.56**	**0.673**	**2.18**	
Min.	**0.307**	**0.112**	**0.080**	**0.196**	**0.251**	

Clinton Creek near Mine

1996 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1			0.712	0.111	0.146	
2			0.645	0.111	0.150	
3			0.530	0.113	0.160	
4			0.475	0.116	0.169	
5			0.387	0.112	0.172	
6			0.317	0.108	0.178	
7			0.290	0.086	0.175	
8			0.275	0.107	0.166	
9			0.264	0.112	0.146	
10			0.274	0.122	0.120	
11			0.675	0.119	0.122	
12			2.57	0.118	0.124	
13			2.08	0.121	0.123	
14		1.49	1.45	0.122	0.124	
15		1.32	1.07	0.122	0.125	
16		1.04	0.796	0.122	0.126	
17		0.836	0.566	0.122	0.126	
18		0.800	0.460	0.122	0.130	
19		1.00	0.392	0.108	0.134	
20		1.20	0.341	0.113	0.137	
21		1.22	0.307	0.123	0.129	
22		1.23	0.304	0.131	0.131	
23		1.24	0.428	0.142	0.135	
24		1.21	0.508	0.161	0.140	
25		1.04	0.485	0.161		
26		0.821	0.416	0.161		
27		0.760	0.349	0.153		
28		0.918	0.290	0.148		
29		0.942	0.269	0.142		
30		0.857	0.263	0.130		
31		0.790		0.139		
Total		**17.224**	**18.188**	**3.897**	**3.148**	
Mean		**1.01**	**0.606**	**0.126**	**0.141**	
Max.		**1.32**	**2.57**	**0.161**	**0.178**	
Min.		**0.760**	**0.263**	**0.105**	**0.120**	

Note: No recorder data 1997.

Clinton Creek near Mine

1998 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		1.91	0.765	0.519E	2.05E	
2		1.81	0.662	0.532E	1.79E	
3		1.83	0.577	0.546E	1.56E	
4		1.51	0.512	0.560E	1.38E	
5		1.25	0.464	0.573E	1.23E	
6		1.03	0.459E	0.587E	1.13E	
7		0.858	0.453E	0.600E	1.72E	
8		0.727	0.448E	0.614E	2.71E	
9		1.72	0.442E	0.673E	2.76E	
10		4.73	0.437E	0.760E	2.52E	
11		4.78	0.431E	0.806E	2.20E	
12		3.56	0.426E	0.700E	2.09E	
13		2.63	0.420E	0.698E	2.27E	
14		2.09	0.415E	0.654E	2.36E	
15		1.73	0.409E	0.620E	2.27E	
16		2.51	0.404E	0.640E	2.08E	
17		2.79	0.398E	0.678E	1.85E	
18		2.47	0.393	1.15E	1.71E	
19		2.13	0.370	1.11E	1.56E	
20		1.71	0.367	0.986E	1.45E	
21		1.41	0.369	0.873E	1.38E	
22		1.85	0.383E	0.888E	1.34E	
23		5.16	0.396E	1.27E	1.29E	
24		4.75	0.410E	1.34E	1.26	
25		3.51	0.423E	1.27E		
26		2.53	0.437E	1.19E		
27	1.89	1.85	0.451E	1.15E		
28	1.56	1.40	0.464E	1.50E		
29	1.27	1.11	0.478E	2.09E		
30	1.11	0.928	0.492E	2.63E		
31	1.95		0.505E	2.37E		
Total	**7.78**	**68.113**	**14.060**	**30.627**	**42.70**	
Mean	**1.56**	**2.27**	**0.454**	**0.988**	**1.86**	
Max.	**1.95**	**5.16**	**0.765**	**2.63**	**2.76**	
Min.	**1.11**	**0.727**	**0.367**	**0.519**	**1.13**	

29EC001 B – Clinton Creek Middle — Near Townsite

Location: ..... 64°25'24"N 140°39'10.3"W
Drainage Area: .....179 sq km
Record Length:..... 2001 – R
Flow:..... Partially Regulated

	Maximum Instantaneous		Minimum Instantaneous	
Year	**Date**	**Discharge (m^3/s)**	**Date**	**Discharge (m^3/s)**
1999	Sept. 24	4.17	July 12	0.092
2000	June 16	7.81	July 16	0.133
2001	May 24	10.6	June 29	0.13
2002	Aug. 25	7.45	Aug. 7	0.123
2003	Apr. 29	14E	Aug. 11	0.196
2004	May 13	9.95	July 16	0.197

	Maximum Daily		Minimum Daily	
Year	**Date**	**Discharge (m^3/s)**	**Date**	**Discharge (m^3/s)**
1999	Sept. 24	3.79	July 12	0.096
2000	June 16	7.52	July 16	0.15
2001	May 24	10.5	June 29	0.145
2002	Aug. 25	7.23	Aug. 6	0.133
2003	April 29	14E	Aug. 11	0.196
2004	May 13	9.54	July 16	0.197

Clinton Creek Middle — Near Townsite

1999 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		1.38	0.144	0.570	0.524	0.981
2		1.21	0.130	0.445	0.462	0.910
3		1.11	0.119	0.376	0.777	0.850
4		1.00	0.113	0.319	1.50	0.775
5		0.859	0.112	0.274	1.67	0.706
6		0.732	0.111	0.245	1.51	0.555
7		0.631	0.108	0.234	1.28	
8		0.555	0.106	0.239	1.07	
9		0.512	0.102	0.216	0.940	
10		0.468	0.099	0.211	0.825	
11		0.447	0.097	0.197	0.739	
12		0.425	0.096	0.179	0.648	
13		0.397	0.112	0.306	0.573	
14		0.373	0.107	0.482	0.538	
15		0.351	0.102	0.414	0.616	
16		0.324	0.103	0.505	1.02	
17		0.315	0.128	0.573	1.14	
18		0.301	0.177	0.456	1.08	
19	1.40	0.274	0.177	0.379	0.969	
20	1.15	0.260	0.184	0.328	0.869	
21	0.949	0.261	0.201	0.306	0.814	
22	0.825	0.266	0.244	0.286	0.788	
23	0.767	0.257	0.379	0.290	2.81	
24	0.748	0.234	0.493	1.20	3.79	
25	0.958	0.214	0.808	1.63	3.06	
26	1.27	0.202	1.31	1.43	2.46	
27	1.30	0.192	1.69	1.17	2.02	
28	1.69	0.188	1.72	0.951	1.72	
29	1.73	0.176	1.21	0.773	1.41	
30	1.42	0.161	0.951	0.656	1.16	
31	1.34		0.732	0.573		
Total	**14.147**	**14.075**	**12.005**	**16.224**	**38.782**	**4.222**
Mean	**1.18**	**0.469**	**0.387**	**0.523**	**1.29**	**0.844**
Max.	**1.73**	**1.38**	**1.69**	**1.63**	**3.79**	**0.981**
Min.	**0.748**	**0.161**	**0.096**	**0.190**	**0.462**	**0.706**

Clinton Creek Middle — Near Townsite

2000 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1			0.537	1.70	0.237	
2		2.28	0.444	1.63	0.228	
3		2.14	0.424	1.53	0.210	
4		1.98	0.394	1.32	0.208	
5		1.74	0.404	1.17	0.204	
6		1.45	1.28	1.08	0.205	
7		1.25	0.985	0.937	0.236	
8		1.10	0.753	0.825	0.231	
9		0.982	0.581	0.701	0.226	
10		0.955	0.470	0.603	0.209	
11		0.936	0.487	0.542	0.251	
12		0.885	0.373	0.493	0.317	
13		0.902	0.284	0.629	0.310	
14		1.70	0.221	0.854	0.313	
15		6.52	0.182	0.878	0.323	
16		7.52	0.150	0.830	0.322	
17		5.73	0.167	0.770	0.333	
18		4.30	0.430	0.764	0.318	
19		3.52	0.499	0.812	0.293	
20		2.89	0.468	0.771	0.266	
21		2.41	0.359	0.689	0.252	
22		2.61	0.285	0.611	0.277	
23		2.28	0.310	0.537	0.308	
24		1.81	1.10	0.490	0.303	
25		1.39	2.71	0.457	0.331	
26		1.06	2.56	0.420		
27		0.822	2.19	0.377		
28		0.861	1.90	0.344		
29		0.849	1.63	0.313		
30		0.695	1.36	0.292		
31			1.27	0.258		
Total		**63.567**	**25.207**	**23.627**	**6.711**	
Mean		**2.19**	**0.813**	**0.762**	**0.268**	
Max.		**7.52**	**2.71**	**1.70**	**0.333**	
Min.		**0.695**	**0.150**	**0.258**	**0.204**	

29EC001 B – Clinton Creek Middle

Location: ..... 64°25'24"N 140°39'10"W
Drainage Area: .....179 sq km
Record Length:..... 2001 – R
Flow:..... Partially Regulated

	Maximum Instantaneous		Minimum Instantaneous	
Year	**Date**	**Discharge (m^3/s)**	**Date**	**Discharge (m^3/s)**
2001	May 24	10.6	June 29	0.13
2002	Aug. 25	7.45	Aug. 7	0.123
2003	April 29	14E	Aug. 11	0.196
2004	May 13	9.95	July 16	0.197

	Maximum Daily		Minimum Daily	
Year	**Date**	**Discharge (m^3/s)**	**Date**	**Discharge (m^3/s)**
2001	May 24	10.5	June 29	0.145
2002	Aug. 25	7.23	Aug. 6	0.133
2003	April 29	14E	Aug. 11	0.196
2004	May 13	9.54	July 16	0.197

Clinton Creek Middle

2001 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		4.62	0.211	3.10	0.350	0.335
2		4.12	0.194	2.62	0.435	0.318
3		3.40	0.173	2.19	0.552	
4		3.55	0.272	1.86	0.618	
5		4.52	1.10	1.59	0.757	
6		4.08	1.96	1.38	1.05	
7		3.33	3.02	1.22	1.25	
8		2.74	3.54	1.03	1.24	
9		2.42	2.80	0.897	1.16	
10		2.10	2.04	0.799	1.05	
11		1.80	1.52	0.704	0.934	
12		2.08	1.21	0.665	0.851	
13		4.27	0.977	0.632	0.774	
14		5.62	0.862	0.578	0.697	
15		4.56	0.755	0.539	0.624	
16		3.37	0.638	0.508	0.570	
17		2.44	0.530	0.531	0.530	
18		1.80	0.446	0.498	0.489	
19		1.39	0.379	0.572	0.477	
20		1.10	0.316	0.569	0.458	
21		0.873	0.276	0.530	0.436	
22		0.692	0.526	0.496	0.460	
23		0.543	1.92	0.468	0.514	
24	10.5	0.425	5.48	0.456	0.501	
25	9.68	0.323	8.93	0.453	0.506	
26	7.76	0.253	7.45	0.443	0.512	
27	6.86	0.206	5.70	0.429	0.455	
28	6.41	0.172	4.84	0.407	0.403	
29	4.92	0.145	4.02	0.388	0.373	
30	4.27	0.176	3.43	0.373	0.327	
31	4.46		3.25	0.367		
Total	**54.86**	**67.118**	**68.765**	**27.292**	**19.353**	**0.653**
Mean	**6.86**	**2.24**	**2.22**	**0.880**	**0.645**	**0.327**
Max.	**10.5**	**5.62**	**8.93**	**3.10**	**1.25**	**0.335**
Min.	**4.27**	**0.145**	**0.173**	**0.367**	**0.327**	**0.318**

Clinton Creek Middle

2002 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		0.448	0.484	0.153	1.51	0.595
2		0.419	0.531	0.149	1.40	1.65
3		0.503	0.591	0.146	1.22	2.10
4		0.657	1.49	0.140	1.08	1.60E
5		0.567	1.71	0.135	0.920	
6		0.525	1.47	0.133	1.07	
7		0.471	1.12	0.137	1.83	
8		0.427	0.865	0.155	2.16	
9		0.442	0.721	0.246	2.26	
10		0.499	0.671	0.257	1.88	
11		1.38	0.564	0.350	1.74	
12		2.84	0.473	0.450	1.44	
13		2.87	0.402	0.573	0.900	
14		2.14	0.362	0.615	0.868	
15		1.53	0.325	0.607	0.742	
16		1.10	0.303	0.582	0.323	
17		0.833	0.282	0.856	0.349	
18		0.639	0.267	0.950	0.501	
19		0.516	0.245	1.45	0.633	
20		0.528	0.230	1.74	0.627	
21		0.544	0.225	1.89	0.610	
22		0.632	0.218	4.60	0.576	
23		0.570	0.214	5.69	0.527	
24		0.503	0.208	6.36	0.523	
25		0.505	0.227	7.23	0.607	
26		0.463	0.215	6.54	0.627	
27		0.421	0.199	4.79	0.634	
28		0.387	0.189	3.59	0.617	
29	0.599	0.388	0.187	2.77	0.591	
30	0.548	0.400	0.172	2.11	0.573	
31	0.503		0.161	1.69		
Total	**1.650**	**24.147**	**15.321**	**57.084**	**29.338**	**5.945**
Mean	**0.550**	**0.805**	**0.494**	**1.84**	**0.978**	**1.49**
Max.	**0.599**	**2.87**	**1.71**	**7.23**	**2.26**	**2.10**
Min.	**0.503**	**0.387**	**0.161**	**0.133**	**0.323**	**0.595**

Clinton Creek Middle

2003 Daily Discharge in CMS

Day	April	May	June	July	Aug.	Sept.	Oct.
1				0.289	0.382	3.30	0.456M
2				0.281	0.297	9.63	
3				0.408	0.219	8.10	
4			0.967M	1.19	0.210	5.90	
5			0.819	1.00	0.201	4.86	
6			2.72	0.856	0.201	4.19	
7			4.57	0.820	0.199	3.50	
8			6.98	0.864	0.198	3.18	
9			6.73	0.730	0.197	3.18	
10			4.51	0.660	0.197	2.89	
11			3.04	0.640	0.196	2.54	
12			2.11	0.626	0.196	2.29	
13			1.55	0.626	0.196	2.27	
14			1.22	0.641	0.200	1.96	
15			1.04	0.634	0.484	1.66	
16			1.14	0.633	0.461	1.46	
17			1.03	0.618	0.373	1.35	
18			0.916	0.547	0.319	1.15	
19			0.807	0.492	0.327	0.927	
20			0.707	0.429	0.305	0.885	
21			0.624	0.361	0.322	0.880	
22			0.544	0.488	0.337	0.802	
23			0.484	0.533	0.341	0.553	
24			0.433	0.496	0.363	0.535	
25			0.375	0.451	0.385	0.535	
26			0.346	0.390	0.387	0.535	
27			0.404	0.351	0.389	0.530	
28	12.0E		0.392	0.330	0.400	0.514	
29	14.0E		0.352	0.314	0.374	0.502	
30			0.309	0.292	0.354	0.502	
31				0.358	0.449		
Total	**26.0**		**45.119**	**17.348**	**9.459**	**71.110**	**0.456**
Mean.	**13.0**		**1.67**	**0.560**	**0.305**	**2.37**	**0.456**
Max.	**14.0**		**6.98**	**1.19**	**0.484**	**9.63**	**0.456**
Min.	**12.0**		**0.309**	**0.281**	**0.196**	**0.502**	**0.456**

Clinton Creek Middle

2004 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		1.03	0.223	2.41	0.199	
2		1.84	0.226	2.97	0.199	
3		4.14	0.219	2.39		
4		3.62	0.211	1.81		
5		2.59	0.207	1.32		
6	6.83	1.88	0.205	0.929		
7	8.95	1.43	0.200	0.698		
8	7.62	1.18	0.200	0.558		
9	5.56	1.11	0.200	0.480		
10	4.75	0.795	0.200	0.419		
11	5.24	0.667	0.202	0.381		
12	8.06	0.567	0.200	0.350		
13	9.54	0.470	0.200	0.337		
14	9.21	0.393	0.199	0.312		
15	8.96	0.359	0.198	0.302		
16	8.40	0.335	0.197	0.294		
17	7.22	0.351	0.197	0.290		
18	5.71	0.287	0.197	0.282		
19	4.48	0.272	0.197	0.265		
20	3.48	0.256	0.197	0.235		
21	2.67	0.249	0.197	0.215		
22	2.17	0.248	0.440	0.205		
23	1.98	0.240	0.663	0.200		
24	2.00	0.237	0.295	0.200		
25	2.32	0.234	0.233	0.199		
26	2.92	0.231	0.216	0.199		
27	2.58	0.228	0.206	0.202		
28	2.03	0.226	0.210	0.205		
29	1.73	0.225	0.479	0.201		
30	1.46	0.221	1.30	0.200		
31	1.21	2.44	0.199			
Total	**127.08**	**25.911**	**10.754**	**19.257**	**0.398**	
Mean	**4.89**	**0.864**	**0.347**	**0.621**	**0.199**	
Max.	**9.54**	**4.14**	**2.44**	**2.97**	**0.199**	
Min.	**1.21**	**0.221**	**0.197**	**0.199**	**0.199**	

SURFACE FLOW DATA

PREPARED BY TETRA TECH EBA

BASED ON RAW DATA PROVIDED BY

GOVERNMENT OF YUKON, ASSESSMENT AND ABANDONED MINES

Clinton Creek above Fortymile River

2005 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		2.34	0.113	0.138	0.166	1.10
2		2.17	0.116	0.136	0.162	1.11
3		1.92	0.119	0.138	0.161	1.04
4		1.54	0.124	0.137	0.165	0.962
5		1.21	0.131	0.142	0.167	0.849
6		0.995	0.135	0.143	0.165	
7		0.919	0.138	0.143	0.165	
8		0.837	0.14	0.137	0.167	
9		0.748	0.147	0.134	0.171	
10		0.603	0.15	0.132	0.189	
11		0.489	0.148	0.132	0.192	
12		1.03	0.144	0.131	0.193	
13	2.74	1.11	0.142	0.132	0.22	
14	2.49	0.861	0.139	0.131	0.212	
15	2.18	0.588	0.183	0.129	0.215	
16	1.77	0.334	0.125	0.13	0.222	
17	1.89	0.26	0.145	0.132	0.23	
18	2.85	0.215	0.145	0.132	0.274	
19	2.69	0.188	0.142	0.13	0.336	
20	2.15	0.176	0.14	0.13	0.385	
21	1.67	0.167	0.141	0.13	0.44	
22	1.41	0.141	0.142	0.13	0.659	
23	1.24	0.136	0.14	0.131	0.848	
24	1.28	0.127	0.139	0.134	0.976	
25	1.64	0.121	0.14	0.141	1.01	
26	2.58	0.118	0.139	0.145	1.00	
27	2.36	0.115	0.139	0.142	0.923	
28	2.65	0.114	0.137	0.14	0.981	
29	3.11	0.113	0.135	0.142	1.10	
30	2.42	0.114	0.134	0.145	1.12	
31	2.06		0.132	0.149		
Total	**41.18**	**19.799**	**4.284**	**4.218**	**13.214**	**5.061**
Mean	**2.17**	**0.660**	**0.138**	**0.14**	**0.440**	**1.012**
Max.	**3.11**	**2.34**	**0.183**	**0.149**	**1.12**	**1.11**
Min.	**1.24**	**0.113**	**0.113**	**0.129**	**0.161**	**0.849**

Clinton Creek above Fortymile River

2006 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		0.61	1.63	0.497	1.11	1.55
2		0.598	1.29	0.537	0.993	1.45
3		0.561	1.02	0.567	0.927	1.30
4		0.506	0.864	0.546	0.883	1.80
5		0.399	0.78	0.506	0.855	
6		0.335	0.717	0.47	0.857	
7		0.288	0.637	0.452	0.842	
8		0.253	0.662	0.43	0.825	
9		0.231	0.632	0.431	0.8	
10	6.29	0.224	0.528	0.40	0.797	
11	6.17	0.207	0.453	0.389	0.782	
12	5.68	0.196	0.422	0.424	0.783	
13	5.47	0.187	0.407	0.417	0.769	
14	5.29	0.175	0.389	0.421	0.759	
15	6.04	0.175	0.373	0.442	0.735	
16	6.65	0.23	0.363	0.485	0.727	
17	11.3 E	0.336	0.348	0.521	1.27	
18	10.00 E	0.417	0.359	0.559	1.56	
19	8.86 E	0.441	0.359	0.562	1.74	
20	7.44 E	0.419	0.345	0.756	1.84	
21	6.19 E	0.418	0.33	1.29	1.79	
22	5.09 E	0.706	0.333	2.54	1.66	
23	4.14 E	0.944	0.323	2.62	1.53	
24	3.32 E	0.859	0.311	2.49	1.39	
25	2.62 E	0.76	0.304	2.2	1.24	
26	2.06 E	0.782	0.302	2.2	1.11	
27	1.59 E	1.81	0.323	2.09	1.12	
28	1.22 E	2.21	0.32	1.84	1.24	
29	0.926 E	2.16	0.353	1.60	1.38	
30	0.715 E	2.02	0.408	1.40	1.50	
31	0.57 E		0.47	1.22		
Total	**107.631**	**19.457**	**16.355**	**31.302**	**33.814**	**6.1**
Mean	**4.89**	**0.649**	**0.528**	**1.01**	**1.127**	**1.525**
Max.	**11.3**	**2.21**	**1.63**	**2.62**	**1.84**	**1.8**
Min.	**0.57**	**0.175**	**0.302**	**0.389**	**0.727**	**1.300**

Clinton Creek above Fortymile River

2007 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1	0.986	1.03	0.321	0.275	0.468	0.762
2	1.1	0.815	0.316	0.466	0.453	0.597
3	1.35	0.682	0.357	0.434	0.444	
4	1.86	0.595	0.432	0.414	0.438	
5	2.36	0.537	0.454	0.396	0.433	
6	2.67	0.498	0.811	0.395	0.537	
7	3.01	0.491	2.26	0.423	0.566	
8	2.84	0.516	1.65	0.424	0.538	
9	2.43	0.485	1.42	0.422	0.572	
10	2.28	0.45	1.35	0.418	0.579	
11	2.76	0.409	1.34	0.413	0.575	
12	3.05	0.411	1.14	0.403	0.568	
13	2.55	0.486	0.882	0.446	0.615	
14	1.97	0.635	0.737	1.23	0.70	
15	1.76	0.58	0.641	1.55	0.796	
16	1.62	0.509	0.59	1.45	1.23	
17	1.29	0.451	0.544	1.24	1.42	
18	1.02	0.405	0.51	1.03	1.44	
19	0.906	0.37	0.51	0.875	1.83	
20	0.828	0.347	0.499	0.782	2.63	
21	0.769	0.31	0.468	0.697	2.59	
22	0.72	0.314	0.431	0.654	2.14	
23	0.676	0.346	0.501	0.655	1.67	
24	0.647	0.323	0.741	0.641	1.47	
25	0.595	0.326	0.919	0.618	1.33	
26	0.586	0.351	0.801	0.587	1.18	
27	0.582	0.36	0.592	0.554	0.998	
28	1.75	0.354	0.447	0.532	0.886	
29	2.65	0.338	0.35	0.515	0.85	
30	1.74	0.326	0.281	0.496	0.819	
31	1.26		0.239	0.481		
Total	**50.615**	**14.05**	**22.534**	**19.916**	**30.765**	**1.359**
Mean	**1.63**	**0.468**	**0.727**	**0.64**	**1.026**	**0.680**
Max.	**3.05**	**1.03**	**2.26**	**1.55**	**2.63**	**0.762**
Min.	**0.582**	**0.310**	**0.239**	**0.275**	**0.433**	**0.597**

Clinton Creek above Fortymile River

2008 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		0.184	1.49	1.99	0.504	
2		0.175	9.22	1.68	0.479	
3		0.167	5.83	1.56	0.464	
4		0.164	3.26	1.50	0.444	
5		0.185	1.94	1.46	0.42	
6	2.56	0.21	1.36	2.14	0.413	
7	2.10	0.207	1.03	2.27	0.408	
8	2.14	0.212	0.814	2.02	0.412	
9	2.01	0.214	1.10	1.81	0.426	
10	1.79	0.212	1.23	1.76	0.437	
11	1.56	0.214	3.03	1.67	0.626	
12	1.36	0.225	2.78	1.55	0.999	
13	1.47	0.229	1.97	1.44	1.15	
14	1.91	0.221	1.46	1.37	1.19	
15	1.59	0.214	1.21	1.29	1.18	
16	1.24	0.191	0.993	1.21		
17	0.982	0.182	0.748	1.14		
18	0.811	0.201	1.55	1.11		
19	0.677	0.247	3.31	1.05		
20	0.593	0.28	6.02	0.922		
21	0.52	0.241	8.19	0.86		
22	0.488	0.265	6.05	0.797		
23	0.452	0.277	4.48	0.733		
24	0.422	0.524	3.61	0.69		
25	0.406	0.487	2.87	0.667		
26	0.359	0.441	2.38	0.647		
27	0.322	0.403	2.06	0.62		
28	0.284	0.38	1.89	0.6		
29	0.257	0.434	2.02	0.574		
30	0.226	0.461	2.03	0.544		
31	0.197		2.16	0.522		
Total	**26.726**	**8.047**	**88.085**	**38.196**	**9.552**	
Mean	**1.03**	**0.268**	**2.841**	**1.23**	**0.637**	
Max.	**2.56**	**0.524**	**9.22**	**2.27**	**1.19**	
Min.	**0.197**	**0.164**	**0.748**	**0.522**	**0.408**	

Clinton Creek above Fortymile River

2011 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		0.523	3.51	0.522	0.651	
2		0.477	2.77	0.505	0.614	
3		0.423	2.5	0.485	0.661	
4		0.395	2.34	0.463	0.764	
5		0.415	2.06	0.444	0.714	
6		0.556	1.63	0.478	0.755	
7		0.662	1.32	0.457	0.735	
8		0.618	1.31	0.428	0.667	
9		0.645	3.42	0.404	0.599	
10		0.613	6.39	0.387	0.519	
11		0.55	4.68	0.382	0.545	
12	3.34	0.502	3.09	0.378	0.562	
13	2.37	0.671	2.09	0.375	0.515	
14	1.88	1.47	1.51	0.388	0.493	
15	2.12	3.45	1.16	0.4	0.424	
16	3.04	1.73	1.03	0.438	0.417	
17	4.22	1.46	1.69	0.459	0.42	
18	5.78	3.06	1.28	0.476	0.425	
19	7.11	2.55	1.4	0.511	0.443	
20	6.45	2.23	1.56	0.62	0.485	
21	4.59	6.68	1.3	1.5	1.24	
22	3.37	6.45	1.04	1.76	1.89	
23	2.68	5.15	0.832	1.56	1.64	
24	2.18	5.91	0.696	1.71	1.09	
25	1.76	4.2	0.615	1.59	0.855	
26	1.42	2.68	0.634	1.41	0.735	
27	1.12	3.4	0.655	1.22	0.663	
28	0.904	16.0	0.623	1.02	0.605	
29	0.763	13.0	0.554	0.871	0.549	
30	0.669	5.9	0.518	0.752		
31	0.594		0.53	0.667		
Total	**56.36**	**92.37**	**54.737**	**23.06**	**20.675**	
Mean	**2.82**	**3.079**	**1.766**	**0.74**	**0.71**	
Max.	**7.11**	**16**	**6.39**	**1.76**	**1.89**	
Min.	**0.594**	**0.395**	**0.518**	**0.375**	**0.417**	

Clinton Creek Middle

2012 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		0.688	0.882	2.76	0.592 E	1.24 E
2		0.576	0.885	4.57	0.55 E	1.20 E
3		0.499	0.849	4.40	0.633 E	1.19 E
4		0.464	0.864	3.36	0.588 E	1.09 E
5		0.452	0.844	2.21	0.598 E	1.03 E
6		0.446	0.806	1.57	0.61 E	1.28 E
7		0.421	0.771	1.23 E	0.656 E	1.79 E
8		0.41	0.689	0.953 E	0.811 E	1.56 E
9		0.403	0.609	0.765 E	1.14 E	1.29 E
10	3.39	0.386	0.643	0.642 E	1.24 E	
11	3.21	0.358	1.77	0.576 E	1.28 E	
12	3.22	0.322	2.59	0.527 E	1.13 E	
13	4.87	0.296	1.72	0.497 E	1.09 E	
14	4.83	0.293	1.09	0.456 E	1.06 E	
15	3.5	0.284	0.781	0.417 E	0.99 E	
16	3.07	0.279	0.655	0.379 E	0.865 E	
17	2.79	0.285	0.643	0.397 E	0.959 E	
18	2.48	0.276	0.585	0.457 E	1.06 E	
19	2.10	0.271	0.554	0.48 E	0.981 E	
20	1.93	0.269	0.611	0.48 E	0.799 E	
21	1.92	0.262	0.709	0.464 E	0.824 E	
22	2.01	0.243	0.676	0.453 E	0.831 E	
23	2.19	0.23	0.593	0.413 E	0.82 E	
24	2.18	0.227	0.581	0.344 E	0.888 E	
25	3.37	0.22	0.574	0.395 E	1.03 E	
26	3.89	0.228	0.518	0.518 E	1.01 E	
27	2.65	0.239	0.465	0.697 E	1.16 E	
28	1.86	0.275	0.417	1.1 E	1.39 E	
29	1.35	0.30	0.37	0.887 E	1.35 E	
30	1.05	0.331	0.35	0.683 E	1.23 E	
31	0.837		0.485	0.636 E		
Total	**58.697**	**10.233**	**24.579**	**33.716**	**28.165**	**11.67**
Mean	**2.67**	**0.341**	**0.793**	**1.09**	**0.939**	**1.30**
Max.	**4.87**	**0.688**	**2.59**	**4.57**	**1.39**	**1.79**
Min.	**0.837**	**0.220**	**0.350**	**0.344**	**0.550**	**1.03**

Clinton Creek Middle

2013 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		3.476	0.398	0.217	0.388	
2		2.766	0.467	0.188	0.395	
3		2.488	0.461	0.157	0.416	
4		2.188	0.43	0.13	0.448	
5		2.299	0.389	0.112	0.484	
6		2.641	0.384	0.102	0.528	
7		2.176	0.356	0.099	0.504	
8		1.694	0.366	0.093	0.603	
9		1.343	0.375	0.091	2.313	
10		1.158	0.469	0.079	2.422	
11		0.999	0.569	0.074	1.871	
12		0.827	0.55	0.072	1.465	
13		0.674	0.462	0.069	1.239	
14		0.547	0.378	0.102	1.048	
15		0.47	0.315	0.106	0.887	
16		0.426	0.291	0.215	0.746	
17		0.385	0.28	0.276	0.661	
18		0.36	0.323	0.704	0.603	
19		0.321	0.454	1.143	0.654	
20		0.292	0.856	1.254	0.745	
21		0.334	1.023	1.302	0.717	
22		0.943	0.922	1.295	0.674	
23		1.851	0.745	1.086	0.624	
24		1.405	0.598	0.884	0.585	
25		1.077	0.506	0.761	0.577	
26		0.814	0.429	0.627		
27		0.613	0.358	0.547		
28		0.494	0.325	0.472		
29	5.688	0.46	0.288	0.42		
30	4.571	0.433	0.262	0.383		
31	4.181		0.24	0.391		
Total	**14.44**	**35.954**	**14.269**	**13.451**	**21.597**	
Mean	**4.81**	**1.198**	**0.460**	**0.43**	**0.864**	
Max.	**5.688**	**3.476**	**1.023**	**1.302**	**2.422**	
Min.	**4.181**	**0.292**	**0.240**	**0.069**	**0.388**	

Clinton Creek Middle

2014 Daily Discharge in CMS

Day	May	June	July	Aug.	Sept.	Oct.
1		0.297	1.102	0.949	2.008	0.416
2		0.307	1.043	0.889	1.727	0.402
3		0.312	0.919	0.816	1.51	0.394
4		0.296	0.766	0.749	1.305	0.391
5		0.282	0.635	1.015	1.158	0.39
6		0.296	0.536	1.181	1.052	0.389
7		0.289	0.483	1.276	0.96	0.388
8		0.284	0.503	1.603	0.875	0.373
9		0.272	0.572	1.595	0.828	0.353
10		0.264	0.802	1.384	0.78	
11		0.264	0.81	1.171	0.73	
12		0.253	0.732	1.027	0.69	
13		0.24	0.688	0.896	0.669	
14		0.219	0.604	0.803	0.649	
15		0.193	0.547	0.737	0.636	
16		0.169	0.504	0.698	0.615	
17		0.151	0.482	0.647	0.602	
18		0.251	0.458	0.973	0.587	
19		1.887	0.433	1.597	0.569	
20		2.445	0.451	1.738	0.552	
21	0.651	1.774	0.509	1.657	0.55	
22	0.541	1.469	0.507	1.534	0.553	
23	0.428	1.142	0.485	1.412	0.546	
24	0.373	0.889	0.496	1.292	0.533	
25	0.341	2.235	0.614	1.217	0.486	
26	0.327	7.16	1.308	1.246	0.462	
27	0.315	4.624	1.626	1.527	0.441	
28	0.308	2.773	1.575	1.629	0.453	
29	0.303	1.835	1.614	1.575	0.441	
30	0.279	1.322	1.415	1.815	0.431	
31	0.296		1.141	2.208		
Total	**4.162**	**34.194**	**24.36**	**38.856**	**23.398**	**3.496**
Mean	**0.38**	**1.140**	**0.786**	**1.25**	**0.780**	**0.388**
Max.	**0.651**	**7.16**	**1.626**	**2.208**	**2.008**	**0.416**
Min.	**0.279**	**0.151**	**0.433**	**0.647**	**0.431**	**0.353**