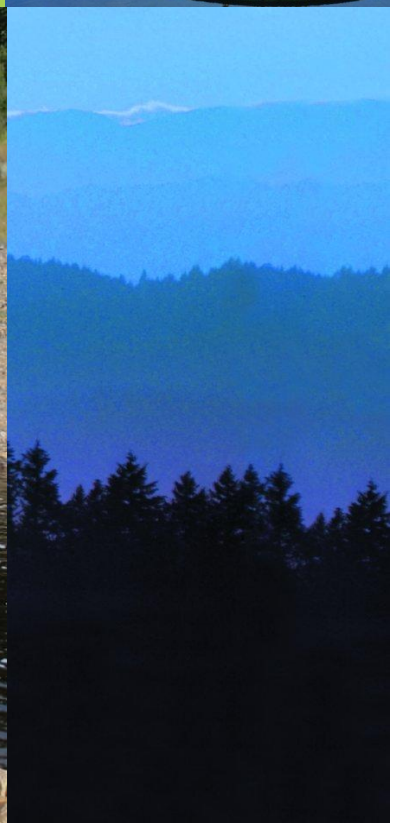
Report

Government of Yukon
Assessment and
Abandoned Mines Branch

Former Clinton Creek Asbestos Mine
Long Term Performance Monitoring,
2012 Revision 2



ASSOCIATED ENGINEERING

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Table of Contents

Sketches

- Sketch 2857-00-SK001 – Site Plan and Bench Mark Locations
- Sketch 2857-00-SK002 – Clinton Creek Waste Rock Dump, Movement Monitoring
- Sketch 2857-00-SK003 – Clinton Creek, Channel Plan
- Sketch 2857-00-SK004 – Drop Structure #1
- Sketch 2857-00-SK005 – Drop Structure #2
- Sketch 2857-00-SK006 – Drop Structure #3
- Sketch 2857-00-SK007 – Drop Structure #4
- Sketch 2857-00-SK008 – Clinton Creek, Channel Profile
- Sketch 2857-00-SK009 – Clinton Creek Channel Profile, Station 0-050 to 0+250
- Sketch 2857-00-SK010 – Clinton Creek Channel Profile, Station 0+250 to 0+550
- Sketch 2857-00-SK011 – Clinton Creek Channel Profile, Station 0+550 to 0+850
- Sketch 2857-00-SK012 – Wolverine Creek Tailings Pile, Movement Monitoring
- Sketch 2857-00-SK013 – Wolverine Creek Tailings Pile, South Lobe Movement
- Sketch 2857-00-SK014 – Wolverine Creek Plan and Profile
- Sketch 2857-00-SK015 – Wolverine Creek Profile
- Sketch 2857-00-SK016 – Clinton Creek Road Tension Crack

1 Introduction

1.1 General

This report provides the results of the 2012 long term performance monitoring at the former **Clinton Creek Asbestos Mine** located approximately 100 km northwest of Dawson City, Yukon. It also includes recommendations for immediate actions and repairs as well as longer term stabilization measures for the mine site area. The purpose of the monitoring program is to track the performance of physical mine site features including the gabion drop structures on Clinton Creek at the outlet of Hudgeon Lake, the Clinton Creek waste rock dump, the Clinton Creek channel, the Wolverine Creek channel, and the Wolverine Creek tailings pile. The monitoring program provides data which is compared with trigger levels and an action plan for maintenance or remedial stabilization work developed to maintain the long term stability of these features (AECOM 2012). It also provides indications of significant ground movements, instabilities and other issues that may require mitigation. The full scope of services for this work is outlined in our letter proposal to Ms. Josée Perron, P.Eng., of the Yukon Government Assessment and Abandoned Mines (AAM) branch, dated July 18, 2012.

1.2 Background

Channel degradation hazards have been previously identified on Clinton Creek near the waste rock dump and on Wolverine Creek near the tailings piles (UMA 2000). The possibility of a sudden breach of channel blockages is of particular concern due to potential risks to human safety, property, and access roads downstream. In areas with significant relief, such as the Clinton Creek valley, flooding from breaches of channel blockages can be especially dangerous. Flooding can occur even in the absence of major precipitation events.

The most immediate concern for a potential breach of channel blockages was considered to be located where Hudgeon Lake outlets into Clinton Creek. Profiles of the creek channel through the waste rock from 1986, 1999 and 2001, showed that progressive channel degradation, including erosion and down-cutting, was occurring along the first 500 m downstream of the outlet. As degradation continued, the toe of the waste rock pile was being undercut and localized slope instabilities were developing. By 2001, conditions had developed to a point where it was feared that an overtopping event or even normal flow could trigger a breach of the waste rock at the Hudgeon Lake outlet. The consequences of a breach and rapid draining of Hudgeon Lake are discussed in UMA's Risk Assessment Report (UMA 2000). To address this concern, channel stabilization works consisting of four gabion drop structures were constructed just downstream of the Hudgeon Lake outlet between 2002 and 2004.

Measures to stabilize the Wolverine Creek tailings piles were also investigated (UMA 2003). The requirement for these remedial measures was based on the premise that the tailings were moving at rates comparable to those observed at mine closure. However, recent surveys indicate that the movements are significantly less than previously assumed and some mounding of the tailings in the valley bottom is also occurring. A better understanding of the behaviour and movements of the tailings piles is necessary to determine the most appropriate strategy to deal with previously identified hazards. A geotechnical investigation and study would be required to gather the information needed. In this regard, implementation of stabilization measures has been deferred until this information is collected. The potential for channel degradation where Wolverine Creek passes over the toe of the tailings is of particular concern. Maintaining the integrity of the rock-lined channel downstream of the tailings, shown in **Photo 1**, is considered essential to reduce the likelihood of mass tailings movements.

Photo 1
Rock-lined Channel

Long term performance monitoring began in 2006 (UMA 2007) and included some follow-up work in 2007. The second biennial performance monitoring event was completed in 2008 (AECOM 2009). Following this, two performance monitoring events were completed in 2010. First, the routine biennial event was completed in July 2010. In August 2010, a significant precipitation event occurred in the Clinton Creek watershed which resulted in some landslides along the mine access road and high flows in the Clinton Creek channel. These high flows caused significant damage to gabion Drop Structure #4 and erosion of the creek channel downstream of the drop structures. A second complete round of performance monitoring was conducted in September 2010 (AECOM 2011a) to capture the effects of this event on the creek and other features of the mine site. Monitoring was continued in 2011 and 2012, to evaluate the longer term impacts of the 2010 precipitation event.

2 Performance Monitoring

2.1 General

The long term performance monitoring work consists of surveying movement monitors located on the gabion drop structures, the Clinton Creek waste rock dump, and the Wolverine Creek Tailings piles. Surveys are completed for channel profiles of Clinton Creek and Wolverine Creek as well as cross sections at the top and bottom of all four gabion drop structures. The horizontal dimension across each drop structure is also measured. Data is then compared to data from previous monitoring events to determine the extent of movement. Analysis of the movements can then be carried out to identify movement trends and the risk of failures.

Underhill Geomatics Ltd. (UGL) from Whitehorse, Yukon completed survey services for this project. The survey was completed on August 6, 2012 by UGL using Global Positioning Survey (GPS) referenced to the UTM NAD 83 (Zone 7) coordinate system. The horizontal accuracy of the GPS survey is within 20 to 30 mm, which is adequate for these purposes and consistent with previous monitoring events. The monitoring instructions and protocol provided to UGL are provided in **Appendix A** along with the resulting survey information provided by UGL.

2.2 Clinton Creek Waste Rock Dump

Monitoring of the waste rock dump was re-instated in 1999. Since then, monitoring events have taken place in June 2001, August 2003, July 2004, July 2006, July 2008, July 2010, September 2010, August 2011 and August 2012. In 2003, the number of movement monitors was expanded from seven to forty-two (UMA 2004). Since then, several monitor points have been lost or destroyed and replaced. For 2012, thirty movement monitors were available for comparison to previous monitoring events and nine new monitors were installed. The following is a list of the available and newly installed movement monitors for the Clinton Creek Waste Rock Dump. The movement monitors that were installed in August 2012 are shown in bold.

UPPER SLOPE MONITORS				
81-1	223	225	1195	1834
MID SLOPE MONITORS				
4	19	20A	21A	22A
68	81-2	224	227	229
1194	1196	1831		
LOWER SLOPE MONITORS				
69	80-13	**991**	**987**	**993**
990	219	**988**	222	226
995	1833	P2	P3	P4
P5	**992**	XS-B	**989**	**994**
1824				

The locations of the waste rock dump movement monitors are shown on Sketch 2857-00-SK002. The monitors have been grouped by their location on the lower, mid, and upper slope. Lower slope monitors have elevations below 420 m, mid-slope monitors have elevations between 420 m and 450 m and upper slope monitors have elevations above 450 m. The Porcupine Pit slope monitors are not included in these categories as they provide data on the east pit wall movements with the exception of Porcupine Pit movement monitors #1493 and #1839, which measure movements to the north of the Pit.

A detailed list of all the waste rock movement monitors is provided in **Tables B-1 to B-4** in **Appendix B**. The tables show the total movement, incremental movement, and annual movement rates for both horizontal and vertical movements. Direction and magnitude for the total movement of each movement monitor from the baseline reading to August 2012 is shown graphically on Sketch 2857-00-SK002. The measured horizontal movement for the current monitoring period from August 2011 to August 2012 is shown beside each monitor point label. The calculated equivalent annual horizontal movement rates are summarized in **Table 2-1** below. The annual horizontal movement rates from August 2011 to August 2012 range from 0.01 to 0.11 m / yr; these rates are similar or slightly higher than the rates calculated in the 2011 monitoring event.

Table 2-1
Summary of Annual Horizontal Movement Rates

Dump Area		Annual Horizontal Movement Rates (m / yr)						Rate Change (m / yr)		
		Monitoring Period								
		July 2004 to July 2006	July 2006 to July 2008	July 2008 to July 2010	July 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012	July 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012
Upper	Avg.	0.02	0.02	0.02	0.20	0.05	0.04	0.18	-0.15	-0.01
(5 monitors)	Max.	0.03	0.03	0.04	0.35	0.07	0.06	0.31	-0.28	-0.01
	Min.	0.01	0.01	0.01	0.07	0.02	0.02	0.06	-0.05	0.00
Mid	Avg.	0.03	0.03	0.02	0.10	0.03	0.04	0.08	-0.07	0.01
(13 monitors)	Max.	0.07	0.05	0.06	0.29	0.06	0.07	0.23	-0.23	0.01
	Min.	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Lower	Avg.	0.02	0.02	0.02	0.16	0.03	0.04	0.14	-0.13	0.01
(12 monitors)	Max.	0.07	0.06	0.08	0.28	0.08	0.11	0.20	-0.20	0.03
(see Note 1)	Min.	0.01	0.00	0.00	0.03	0.00	0.01	0.03	-0.03	0.01

Note 1: Lower Slope Rock Dump Area: Eighteen Monitors active to July 2010. Eight monitors were lost in August 2010 and some were replaced in September 2010 and August 2011. Twelve monitors are available for the 2012 monitoring event – nine monitors were added in 2012 (see **Table 2-2**).

Upper Slope Monitors

There are five monitors located in the upper slope area. The movement vectors and magnitudes shown on Sketch 2857-00-SK002 suggest that this area of the waste rock dump is moving down the valley slope in a northerly direction. The rates of movement for the August 2011 to August 2012 period range from 0.02 to 0.06 m / yr with an average of 0.04 m / yr. These rates are consistent with the rates measured for the last period between September 2010 and August 2011. Compared to the movement rates of the monitoring period before the 2010 flood event (monitoring period 2008-2010), the average annual movement rate has increased by 0.02 m / yr. The ground surface elevation at all monitor locations is decreasing with time. The ground elevation has decreased, on average, by about 0.17 m since 2001. The results are summarized in **Table B-1** of **Appendix B**.

Mid Slope Monitors

There are 13 monitors located in the mid slope area of the waste rock pile, which covers the underlying south valley slope toe and the original valley bottom. The vectors suggest that the waste rock dump in this area is generally moving in a northerly direction across the former valley. However, the three monitors closest to Hudgeon Lake (#0229, 1831, and 22A) continue to move in a north westerly direction towards the lake. This radial spreading has been previously reported and is not unexpected. There are also two monitors in the center of the mid-slope area (Monitors #4 and #68) that do not follow this pattern. Monitor #68 has an overall vector moving in the north westerly direction, but moved in the northerly direction for the current period. Monitor #4 has an overall vector in the southerly direction and continued this trend for the current period. The direction of movement of these two monitors is thought to be influenced by local topography and not representative of the global movement of the mid slope area of the waste rock dump. The ground surface elevation at all monitor locations is decreasing with time. For the current monitoring period one monitor (#1194) increased in elevation by 0.05 m, while the rest decreased by an average of 0.02 m. Since 2001, the ground elevation has decreased by an average total of 0.42 m when all 13 monitor locations are considered.

The movement rates calculated for the August 2011 to August 2012 period are similar or slightly higher than the rates from September 2010 to August 2011. This indicates a return to a more typical movement trend after the significantly higher equivalent annual rates calculated for the period from July 2010 to September 2010. The average movement rate during the period of July 2008 – July 2010 was 0.02 m / yr., while the movement rate for the August 2011 – August 2012 period is 0.04 m / yr. The monitoring results are summarized in **Table B-2** of **Appendix B**.

Lower Slope Monitors

The lower slope area of the waste rock pile is located along the original toe and/or side slope of the original north valley. In July 2010, there were nineteen active monitors located in the lower slope area. This was down from the original twenty as monitor XS-G was destroyed during the creek stabilization work in 2003. An additional eight monitors have been lost since July 2010 due to the effects of the precipitation event that occurred in August 2010 (Monitors not found or lost include: 80-14, 84-1, 217, 218, 220, 228, XS-A, and XS-E). One new monitor (#1824) was added in August 2011. For the current 2012 monitoring event there are a total of 12 monitors available for comparison to at least one previous monitoring period. During the 2012 survey, monitor XS-G and the other eight lost monitors were replaced with new monitors numbered 987 to 995. The lost monitors and corresponding newly installed monitors are summarized in **Table 2-2** below. Movements for the new monitors should be measured during the next monitoring period.

Table 2-2
Summary of Lost and Replaced Monitoring Pins
Clinton Creek Waste Rock Dump

Lost Monitoring Pins	Corresponding Replacement Pins Installed 2012
80-14	991
84-1	987
217	993
218	990
220	988
228	995
XS-A	992
XS-E	989
XS-G	994

The movement rates for the 12 monitors active during the August 2011 to August 2012 period range from 0.01 m / yr up to 0.11 m / yr with an average of 0.04 m / yr. The rate change for this period indicates that rates were similar or slightly higher than the movement rates from the previous survey. This is a return to more typical movement trends after experiencing the significantly higher equivalent annual rates calculated for the period from July 2010 to September 2010. The results are summarized in **Table B-3** of **Appendix B**.

Based on the monitoring results from August 2012, it appears that waste rock in the area south of the stabilized creek channel, near Monitors #1833 and P2, is moving in a northerly direction across the stabilized portion of the creek at rates of about 0.06 to 0.12 m / yr. Monitor #0226 is the exception and is moving in a north easterly direction perpendicular to the adjacent slope and towards Clinton Creek. The remaining monitors east of the stabilized channel section, including monitors 69, P3, 80-13, XS-B, 0219, 0222, P4, and P5, have moved in a variety of directions since 2001. For the current period the monitors east of the stabilized channel are moving at rates of about 0.01 to 0.05 m / yr generally in the northerly direction towards Clinton Creek. Though monitors 222, XS-A, and P4 have moved north in 2012, the overall movement from the start of the monitoring program is in a southern direction. The ground surface elevation at all monitor locations has generally been decreasing with time. The ground elevation has decreased by an average rate of about 0.03 m / yr for the current monitoring period from August 2011 to August 2012.

Open Pit Area Monitors

There are six monitors in the area of the Porcupine Pit. Monitors 1830, 1832, 1837 and 1838 are all located on the east wall of the open pit, #1839 is on the north side of the pit, and #1493 is located near the former crusher building. The four movement monitors on the east wall of the pit do not indicate any signs of significant horizontal or vertical movements. Reports from previous visual inspections indicate that the southwest and southeast corners of the Porcupine Pit are relatively unstable.

The movement data for Monitor #1839 located at the north side of the pit suggest that this monitor is moving down the original valley slope away from the open pit. The monitoring results from 2001 to August 2011 show that this monitor settled about 0.51 m and moved horizontally by 0.07 m. The rates of movement have decreased since September 2010 and are similar to those measured before the August 2010 precipitation event and similar to those measured from September 2010 to August 2011.

The movement data for Monitor #1493, located north of the open pit near the former crusher building, shows that this monitor is moving in a northerly direction at a rates of about 0.10 m / yr or less. The results from 2001 to August 2011 show that this monitor has settled by about 0.36 m and moved horizontally by 0.74 m. The horizontal and vertical movement rates are nearly the same as those measured from September 2010 to August 2011. The monitoring data for the open pit monitors is included in **Table B-4** of **Appendix B**. No data is available for Snowshoe Pit.

Summary

The Clinton Creek waste rock dump continues to undergo creep movements ranging from 0.01 m / yr up to 0.11 m / yr. In general, the movements measured for the period from August 2011 to August 2012 are the same or slightly higher than the previous monitoring period from September 2010 to August 2011. The higher rates of movement measured after the 2010 precipitation event has not been sustained.

The monitoring data suggests that the western area of the waste rock dump nearest to Hudgeon Lake is moving in a westerly direction towards the lake, while the main mass of the waste rock dump is moving generally in a northerly direction across Clinton Creek. East of the stabilized creek channel, the monitors at the top of the south bank of the creek channel have previously moved in a variety of directions, but are generally moving in a northerly direction for the current monitoring period.

With the exception of Monitor U1493, the monitors around the open pit do not appear to be developing any movement trends. Monitor U1493 is moving in a northerly direction at a rate of 0.10 m / yr, but this area of the waste rock dump is not impacting the creek channel at this time.

The waste rock continues to close in on the stabilized section of the creek channel, and it is expected that over time the integrity of the gabion drop structures will be compromised and they may begin to unravel unless stabilization measures for the creek channel and waste rock dump are implemented. As a possible solution, the Hudgeon lake water levels could be drawn down and the gabion structures could be removed to facilitate re-grading of Clinton Creek to a natural channel. Alternatively, the gabion structures can be replaced, or repaired as required in the future to restore their functionality. Currently, there is no access to the lower portion of the stabilized Clinton Creek channel and drop structure # 4 (DS #4). Undercutting and erosion of the waste rock immediately downstream of DS #4 has created safety concerns that will have to be rectified before equipment and workers can safely access the problem areas. This could include moving a significant volume of the waste rock and locally diverting Clinton Creek.

Significant tension cracking and slope erosion is developing along the waste rock pile and Clinton Creek Access Road that is located above the Clinton Creek Channel from approximately 0+340 to 0+410 (stations reference Clinton Creek). As Clinton Creek continues to erode the toe of the waste rock pile in this area, the slope stability of the waste rock will continue to be compromised, which could result in a significant slope failure blocking the Clinton Creek channel. Additional survey of the tension cracks and crest of the slope were completed in August 2012, and is shown in Sketch 2857-00-SK016. Continued monitoring and survey of these cracks is recommended during the regular monitoring program.

Cross-sections of Clinton Creek Channel to the top of the waste rock dump were completed in three locations as part of the 2012 monitoring program. These locations are between drop structure #2 and #3, between drop structure #3 and #4, and downstream of drop structure #4. Two additional cross-sections were completed approximately 250 m and 350 m downstream of drop structure #4. Survey of these cross-sections should be completed as part of future monitoring programs, and the results compared to the 2012 survey.

2.3 Gabion Drop Structures

From 2004 to 2006 drop structure monitoring was limited to two horizontal measurements for each drop structure taken at the weir on the upper level and the end sill on the lower level. Change in the measurements each year indicated the extent of lateral deformation. In 2006, additional survey requirements were added to the long term performance monitoring to provide a more detailed measurement of the deformations (UMA 2006b). These requirements included four movement monitors placed at the four corners of each drop structure and surveying a cross-section at both the top and bottom of each drop structure between each pair of movement monitors.

During 2009, spring freshet the drop structures sustained some damage due to concentrated flows, which were repaired in the fall of 2009 (AECOM 2010). Drop Structure #4 had the worst damage, which required the lower tier to be re-built. The drop structures were not damaged during the 2010 spring freshet. However, an August 2010 precipitation event and the associated high creek flow resulted in the bottom end of Drop Structure 4 being undermined. The extent of the damage to the drop structures could not be fully determined in the fall of 2010 due to the flow level across the drop structures. Unsafe creek flows and weather conditions prevented any repairs from being made in 2010. The repairs completed in 2011 are documented in the construction activity report (AECOM 2011b).

Horizontal Measurements

The horizontal measurement locations were tagged with permanent markers in September 2006 to improve the repeatability of the measurement locations. To May 2011, from 0.19 to 0.60 m of lateral closure of the drop structures has been measured with the largest movements occurring at Drop Structure #3. The average annual rates of movement calculated from the May 2011 measurements range from -0.21 to -0.12 m per year and are two to three times the rates determined from the July 2010 measurements. These rates are similar to the waste rock movement rates for the July 2010 to September 2010 period. The horizontal drop structure measurements were not taken after the August 2010 precipitation event so the calculated rates of movement may not represent the behaviour of the drop structures since September 2010 (AECOM 2011).

Due to water levels and concerns of safely crossing the drop structures at the time of the site inspection, AE staff did not record horizontal measurements of the drop structures in August 2012.

Movement Monitors

In July 2006, sixteen movement monitors numbered #1450 to 1465 were installed by UGL at the four corners of each drop structure. Sketch 2857-00-SK003 shows the overall plan view of the drop structures and movement monitors, while Sketches 2857-00-SK004, SK005, SK006, and SK007 show the cross-section and detail views. Detailed data for each monitor can be found in **Appendix C**.

For the 2012 monitoring event monitors #1453, 1454, and 1461 found disturbed and monitors #1459, 1460, 1462 were found to be lost. These monitors had to be replaced during the August 2012 survey. The new monitor locations cannot be used for an accurate comparison to the locations surveyed in previous monitoring events.

Between August 2011 and August 2012, the horizontal distance between the pairs of movement monitors that were not lost or disturbed decreased on average by 0.11 m. The average annual rate of movement between these pairs of monitors is higher than the results from August 2011 and also slightly higher than the September 2010 results. The average movement rates are also higher when compared to the average waste rock movements. The continued erosion and failure of drop structure #4 could be a possible cause for the higher movement rates of these movement monitors. The results indicate that the total decrease in horizontal distance measured to date ranges from 0.16 to 0.48 m with the largest total movements measured at the bottom end of DS#4, which was undermined following the August 2010 precipitation event. Without addressing the failure of DS #4, we expect movement of the gabion structures will continue.

Surveyed Cross-Sections

Starting in July 2006, two cross-sections were surveyed across each drop structure spanning between each pair of movement monitors as part of the long term performance monitoring program (UMA 2006b). The sections are shown on Sketches 2857-00-SK004 to SK007. The plan view and end view sections provided on the left side of these sketches represent the nominal drop structure geometry with 3H:1V side slopes. The sections shown on right side of the sketches show the surveyed geometry for July 2006, July 2007, July 2008, July 2010, September 2010, August 2011, and August 2012. The cross-sections created from the baseline survey in June 2006 were slightly different than the nominal geometry, suggesting that some deformation had already occurred.

Additional gabion baskets were added at the top of DS#1 in 2007 to address a deficiency in the amount of freeboard. These additional baskets are shown on Sketch 2857-00-SK004. As shown in Section 1, the 2.01 m design flow depth is now contained by the additional gabion baskets at the top of the drop structure. A top of bank survey was completed in 2007 to confirm that at least 0.2 m of freeboard is available above the maximum expected lake level of 411.21 m (UMA 2007). The survey confirmed there is at least 0.2 m of freeboard along both sides of the channel except at one location on the south side of the outlet channel where only 0.13 m of freeboard is available. It is expected that this is a localized area near the top of the channel which is surrounded by higher ground a short distance away.

At the bottom of drop structure #1, a dip in the side slope shown on the right hand side (looking upstream) of Section 2 on Sketch 2857-00-SK004 was caused by flows during the first spring freshet after the structure was completed. Based on the surveyed cross-sections up to 2012, drop structure #1 does not appear to have undergone additional settlement since the baseline survey in 2006.

For drop structures 2, 3, and 4, the most noticeable differences occurred between the July 2010 and September 2010 surveys. The difference from the July 2010 survey is related to the loss of gabion material from the baskets during high flows that occurred in August 2010. Repairs were undertaken in 2011 to repair this damage with the exception of DS#4. It was determined that drop structure # 4 could not be safely accessed to carry out the required repair work, and therefore repairs to the downstream portion of DS#4 were not carried out (AECOM 2011b). The repairs that occurred to Drop Structures 1, 2, and 3 can be found in Emergency Drop Structure Repairs Construction Activity Report – 2011, prepared by AECOM, and are summarized below:

Drop Structure 1

- Filled up partially empty baskets on tiers 1, 2, 3, and 4.
- Filled up floor gabion baskets of tiers 1 and 2.

Drop Structure 2

- Filled empty and partially empty baskets on tiers 1, 2, 3, 4, and 5.
- Installed rip rap on slope and channel bottom downstream of the DS #2 end sill.

Drop Structure 3

- Filled gabion baskets on tiers 1, 2, 3, and 4.
- Installed new end sill.
- Installed three new rows of gabion baskets downstream of end sill.
- Installed 3 m of rip rap downstream of new gabion baskets.

The attached sketches do not reflect the changes and repairs made to the gabion drop structures in 2011. The drawings included in the report titled Emergency Drop Structure Repairs Construction Activity Report – 2011 (AECOM 2011b.) should be reviewed to provide further detail on the gabion drop structures. Survey of the drop structures to capture the changes made in 2011 should be completed as part of the next monitoring survey; the plan and cross-section drawings should then be updated to reflect the repairs.

The differences from August 2011 to August 2012 for drop structures 2, 3, and 4 are relatively minor, except at the downstream end of DS#4. The sections surveyed at the top end of DS #2 and #4, and the bottom end of DS #3 (i.e., Sections 3, 7, and 6 on Sketches 2857-00-SK005, SK007, and SK006, respectively) show only minor changes between August 2011 and August 2012. The sections surveyed at the downstream end of DS #2 and the upstream end of DS #3 (i.e., Sections 4 and 5 on Sketches 2857-00-SK005 and SK006, respectively) show a small amount of deposition has occurred between August 2011 and August 2012. There are significant changes visible at the downstream end of DS#4 shown on the right side of Section 8 on Sketch 2857-00-SK007. The section shows that between August 2011 and August 2012, erosion and undercutting that began after the August 2010 precipitation event has continued to expand. The channel slope has moved approximately 1.5 m laterally, and 0.4 m vertically. The channel is now deeper and much of the slope on the right side is now steeper than the trigger level sideslope of 2H:1V; the approximate slope, based on the 2012 survey, is 1H:1V.

Summary

The horizontal closure measured at the gabion drop structures can be at least partially attributed to continued movements of the waste rock dump. The damage that occurred during the August 2010 precipitation event is reflected in the September 2010, August 2011, and August 2012 drop structure cross-sections. In general, the side slope angle has not been impacted by the movements and is still well below the trigger level slope of 2H:1V. The exception to this is the downstream end of DS#4 where sideslopes have been made steeper than 2H:1V by erosion and undercutting. Some deposition of material has also occurred between the bottom of DS #2 and the top of DS #3. The 2.01 m flow depth is still contained within the channel cross section throughout the stabilized section of Clinton Creek.

In 2011, a repair program was completed to repair the damage to Drop Structures #1 to #3 (AECOM 2011b). No repairs were made to DS#4 due to the extent of damage and erosion at the downstream end and the difficulty in obtaining safe access for men and equipment to make repairs at this location. As documented in the Construction Activity report, three rows of gabion baskets were added to the downstream end of DS #3.

The 2:1 slope trigger level has been exceeded at the downstream end of drop structure #4, as seen in Section 8 on 2857-00-SK007. The bank on the right hand side (looking upstream), has been steepened to approximately 1:1. The exceedence of the 2:1 trigger level at this location is due to the localized erosion and undercutting of the drop structure which was initiated from the 2010 flood event, and is not a result of the lateral deformation of the gabion baskets. The continued undercutting of downstream end of DS #4 can be seen in SK009, which has resulted in the creek profile continuing to migrate upstream. Repair to Drop Structure #4 is not feasible due unsafe access and working conditions at this location.

We recommend that monitoring of DS #4 continue on an annual basis, and that a stabilization plan, such as drawing down the Hudgeon Lake water level and removing the Gabion Structures, be investigated and implemented in order to provide long-term stability to the site.

2.4 Clinton Creek Channel

From 1983 to 2012 the Clinton Creek Channel profile has been surveyed on thirteen different occasions. The channel profiles from all surveys are shown on Sketch 2857-00-SK008. In order to compare conditions before and after channel stabilization works, profiles surveyed in 2001, and earlier are shown as dashed lines in the sketch, while profiles surveyed in 2004, 2006, 2007, 2008, 2010, 2011, and 2012, are shown as solid coloured lines. The 2004 survey has been selected as the baseline to evaluate channel degradation and down cutting. Sketch 2857-00-008 has also been divided into three larger scale sketches (2857-00-SK009, SK010, and SK011) for closer inspection of any changes in the channel profile. Off-set lines are shown on these sketches to indicate the depth of channel degradation that would trigger the action items identified in the Long Term Performance Monitoring Report (UMA 2006b).

The July 2010 surveys shows that there were no significant changes in the creek profile from the 2008 survey and none of the trigger levels were reached. However, the August 2010 event resulted in significant channel erosion and re-alignment of the creek. At the downstream end of DS#4 (Station 0+175 m) the creek bed was eroded to a depth of 5 m reducing to 3.5 m at Station 0+200m and 2 m at Station 0+225 m. Between Stations 0+225 m and 0+320 m the creek profile is about 2 m lower and from Station 0+320 m to 0+390 m the creek profile is about 1 m lower. From Station 0+400 m to 0+600 m the creek profile did not change significantly. Downstream of Station 0+600 m deposition occurred resulting in the creek profile being 0.8 to 1.3 m higher than in July 2010. The re-alignment of the creek channel (Sketch 2857-00-SK003) in 2010 was significant between Stations 0+375 m and 0+450 m where it was shifted about 20 m south into the waste rock pile and also downstream of Station 0+675 m where the creek is now located up to 80 m south of the previous alignment. The impacts of the Clinton Creek alignment on the waste rock and road embankment are discussed in Section 2.2 Clinton Creek Waste Rock Dump. The Clinton Creek profile trigger levels for action were exceeded between Stations 0+175 m and 0+320 m. Between Stations 0+320 m and 0+375m the profile trigger level was reached.

For the period between August 2011 and August 2012, some erosion has occurred between drop structures #1 and #2 and some material has been deposited between drop structures #2 and #3. These changes can also be attributed to some repairs that were completed in 2011 (AECOM 2011). Downstream of the gabion drop structures, some small changes in the Creek alignment occurred in plan view and small amounts of erosion and deposition were measured between the August 2011 and August 2012 creek profile surveys.

Summary

The August 2012 survey shows no significant changes in the creek alignment or profile since the last survey in August 2011, though the channel profile at the downstream end of DS #4 appears to be migrating upstream as undercutting and erosion at the outlet of DS #4 continues. This is likely a result of the failure of drop structure #4 and is consistent with the results summarized in **Section 2.3**, as the channel side slopes have steeped beyond 2:1. As mentioned in **Section 2.3**, we recommend that monitoring of drop structure #4 continue until a long term stabilization plan for the gabion drop structure is implemented. The September 2010 survey results show that the creek alignment and profile were significantly altered during the August 2010 precipitation event and that trigger levels were reached or exceeded on a 200 m length of channel below Drop Structure #4. Creek flows and unsafe working conditions limited the ability of a local Contractor to complete repairs in this area. A decision to address areas that have exceeded trigger levels has been delayed until it is determined if any long term mine closure works are to be contemplated for this site. The exceeded trigger levels need to be addressed and implemented during closure works or other long term stabilization measures.

Continued erosion along the toe of the waste rock dump, downstream of the stabilized creek channel, will continue to compromise the slope stability and increase the potential of a significant slope failure of the waste rock pile blocking the creek channel.

2.5 Wolverine Creek Tailings Piles

Similar to the other areas of the site, two monitoring events were undertaken at the Wolverine Creek tailings piles in 2010. The first took place in July 2010 as part of the biennial monitoring program and the second in September 2010 to evaluate the effects of the August 2010 precipitation event (AECOM 2011a). Performance monitoring was also completed for the period from September 2010 to August 2011. For the current period from August 2011 to August 2012, fifty-two movement monitors were surveyed by UGL and lost monitor 2005-09 was replace with monitor 996 for comparison in future monitoring periods. The monitoring results are provided in **Appendix D** and the locations of the movement monitors are shown on Sketch 2857-00-SK012.

The monitors on the South and North lobes of the tailings piles have been grouped according to their location on the upper, mid and lower slope areas. The monitors on the upper slope are located above elevation 530 m, the mid slope monitors are located between elevation 425 and 530 m and the lower slope monitors are located below elevation 425 m. Baseline surveys were typically completed in 2003, but several additional movement monitors added later use baseline surveys completed in 2004 or 2005. The vectors for each monitoring point on Sketch 2857-00-SK012 indicate the total horizontal movement and direction from the baseline survey to August 2012. The measured horizontal movement for the current monitoring period from August 2011 to August 2012 is listed beside each monitor point label. The measured movements for each monitoring period have been converted to equivalent annual movement rates and are summarized in **Tables 2-3 and 2-4** for the South and North lobes, respectively. A detailed monitoring data showing the movements and annual movement rates for each monitor is provided in **Appendix D, Tables D-1 to D-3**.

The following monitors have been surveyed in 2012, and should be included in future monitoring surveys with the results compared to determine movement rates: TS493, TS494, 1494, BH-16CABLE, BH-14CABLE.

South Lobe

For the current monitoring period from August 2011 to August 2012, the average annual horizontal movement rates for the upper, mid and lower slope areas of the South Lobe are 0.04, 0.30, and 0.20 m / yr, respectively. These rates are generally slightly lower or the same as the rates measure for the period from September 2010 to August 2011. This is the second consecutive period with lower movement trends after the significantly higher equivalent annual rates calculated for the period from July 2010 to September 2010 after the August 2010 precipitation event. Sketch 2857-00-SK013 graphically illustrates the vectors and magnitudes of the movement monitors in a close up view showing just the South Lobe area. The upper slope area has the least movement with annual movement rates of 0.04 and 0.05 m / yr for the two upper slope monitors. The mid and lower slope areas have experienced higher movement rates. The mid-slope area annual movement rates range from 0.02 to 0.45 m / yr and the lower slope area movement rates range from 0.01 to 0.32 m / yr. The calculated annual horizontal movement rates are summarized in

Table 2-3 below, and detailed monitoring data for each South Lobe movement monitor can be found in **Appendix D, Tables D-1 to D-3**.

The ground surface elevation at all of the upper and mid-slope monitors and the majority of lower slope monitors is decreasing with time. Since 2003, the ground elevation has decreased, on average, by about 0.59 m, 1.12 m, and 0.11 m for the upper, mid, and lower slope areas, respectively. The corresponding average annual vertical rates of movement are -0.06, -0.12, and -0.04 m / yr. Measurements from the previous monitoring period from September 2010 to August 2011 showed increasing ground surface elevation for the monitors on the eastern half of the lower slope area. This trend has now been reversed and all lower slope monitors now show decreasing ground surface elevation with time. The only exception is movement monitor 25B, which showed no change in ground elevation over the current monitoring period.

The monitoring data suggests that the upper and mid slope areas are generally moving down slope in an easterly direction and the lower slope area is spreading out to the north, east, and south. The majority of monitors in the mid slope area just above the lower slope are moving in a north easterly direction towards the pond between the two lobes. On the lower slope area, the movement monitors at the north end are moving in a north easterly direction towards the pond, while monitors in the central area are generally moving east across the valley, and monitors at the south end are moving south-easterly direction, down the valley.

The movements of the mid and lower slope areas discussed above are thought to be the result of some mounding of the tailings that has occurred in the middle portion of the lower slope area (AECOM 2012). The mounding has created some passive resistance, which is redirecting the movement of the tailings towards areas of less resistance. The movement monitors are still generally moving in a direction heading down the slope.

The smaller movement rates on the upper slope area are likely due to a flatter underlying valley slope at elevations above 530 m. The upper slope area is also not in the main area impacted by a landslide that occurred in 1974. The flatter valley slope feature is visible on aerial photographs taken before mine site development (UMA 2003). The mid and lower slopes have more movement because these areas are located within the main area of the original 1974 landslide (UMA 2003).

Table 2-3
Summary of Annual Horizontal Movement Rates – South Lobe

WOLVERINE CREEK TAILINGS PILE – SOUTH LOBE										
Slope Area		Annual Horizontal Movement Rates (m/yr)						Rate Change (m/yr)		
		Monitoring Period								
		Sept 2005 to July 2006	July 2006 to July 2008	July 2008 to July 2010	July 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012	Jul 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012
Upper	Avg.	0.10	0.07	0.04	0.11	0.05	0.04	0.07	-0.06	-0.01
(2 monitors)	Max.	0.18	0.09	0.06	0.12	0.05	0.05	0.06	-0.07	0.00
	Min.	0.02	0.05	0.03	0.10	0.04	0.04	0.07	-0.06	0.00
Mid	Avg.	0.59	0.45	0.36	0.53	0.42	0.30	0.17	-0.11	-0.12
(12 monitors)	Max.	0.81	0.62	0.52	0.71	1.11	0.45	0.19	0.40	-0.66
	Min.	0.04	0.03	0.02	0.11	0.02	0.02	0.09	-0.09	0.00
Lower	Avg.	0.35	0.28	0.23	0.36	0.24	0.20	0.13	-0.12	-0.04
(13 monitors)	Max.	0.57	0.44	0.36	0.52	0.38	0.32	0.16	-0.14	-0.06
See Note 1	Min.	0.03	0.02	0.00	0.05	0.01	0.01	0.05	-0.04	0.00

Note 1: Monitor 2005-09 lost in Sept 2010, replaced with monitor 996 in 2012.

North Lobe

The movement rates measured on the North lobe are generally less than those of the South lobe. The average horizontal movement rates for the upper, mid and lower slope areas of the North Lobe for this monitoring period are 0.04, 0.08 and 0.05 m / yr, respectively. These average annual movement rates are slightly higher than the rates measured for the period from September 2010 to August 2011. They are lower than the rates measured in September 2010 following the August 2010 precipitation event. Sketch 2857-00-SK012 illustrates the movement vectors and magnitudes on the North Lobe. The detailed monitoring results can be found in **Appendix D, Tables D-1 to D-3**.

With the exception of Monitors 80-4 and 80-5 in the mid slope area, all of the monitors on the North Lobe have moved at rates ranging from 0.02 to 0.08 m / yr. Monitors 80-4 and 80-5 in the mid slope area are relatively active moving at rates of 0.27 and 0.18 m / yr, respectively. The relatively high rates of movement of monitors 80-4 and 80-5 are attributed to localized slumping of the tailings slope at these locations. The calculated annual horizontal movement rates are summarized in **Table 2-4** below.

The ground surface elevations measured at the monitor locations are all decreasing with time. Since 2003, the average measured ground elevation has decreased by about -0.25 m, -0.41 m, and -0.23 m for the upper, mid, and lower slope areas, respectively. For the current monitoring period the average annual decrease in ground elevations are -0.04, -0.05, and -0.04 m / yr for the upper, mid, and lower slope areas, respectively.

The general direction of movement for the North Lobe is down slope to the east. This is consistent with previous monitoring periods. Monitors NL-4, NL-5 and 1489 on the south side of the lower slope area are moving in a south easterly direction towards the pond where there is less resistance to movement.

Table 2-4
Summary of Annual Horizontal Movement Rates – North Lobe

WOLVERINE CREEK TAILINGS PILE – NORTH LOBE										
Slope Area		Annual Horizontal Movement Rates (m / yr)						Rate Change (m/yr)		
		Monitoring Period								
		Sept 2005 to July 2006	July 2006 to July 2008	July 2008 to July 2010	July 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012	Jul 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012
Upper	Avg.	0.06	0.03	0.03	0.15	0.02	0.04	0.12	-0.13	0.02
(7 monitors)	Max.	0.18	0.05	0.10	0.19	0.05	0.06	0.09	-0.14	0.01
	Min.	0.03	0.02	0.01	0.08	0.01	0.02	0.07	-0.07	0.01
Mid	Avg.	0.13	0.10	0.06	0.33	0.07	0.08	0.27	-0.26	0.01
(10 monitors)	Max.	0.43	0.31	0.21	1.10	0.24	0.25	0.89	-0.86	0.01
	Min.	0.02	0.01	0.00	0.13	0.00	0.02	0.13	-0.13	0.02
Lower	Avg.	0.09	0.07	0.05	0.22	0.03	0.05	0.17	-0.19	0.02
(8 monitors)	Max.	0.13	0.10	0.07	0.27	0.05	0.07	0.20	-0.22	0.02
	Min.	0.05	0.04	0.03	0.14	0.02	0.04	0.11	-0.12	0.02

Summary

The measured movement rates for the South and North Lobes of the Wolverine Creek tailings piles have remained steady. Average annual movement rates for the current monitoring period were generally slightly lower for the South Lobe and slightly higher for the North Lobe when compared to the previous monitoring period from September 2010 to August 2011. There appears to be a return to more typical movement rates after the significantly higher rates that were measured in September 2010 following the August 2010 precipitation event. The tailings continue to move in an easterly downslope direction. Areas located north and south of the pond between the Lobes are generally moving downslope towards the pond. The lower slope of the South Lobe has experienced some mounding in the middle and the tailings are generally continuing downslope to the northeast or southeast around the mounding.

The trigger level for the Wolverine Tailings Pile is describe by UMA Engineering as “the annual movement rates from any one monitoring event (bi-annual frequency) increase by an order of magnitude or, if the annual rates of movement from two consecutive monitoring events (bi-annual frequency) show progressively increasing rates of movement”. Based on the results of the 2012 long term monitoring program, trigger levels for the Wolverine Tailings Piles have not been reached.

2.6 Wolverine Creek Channel

Previous Monitoring Events

The full length of the Wolverine Creek channel in plan and profile from Station 0+000 m to Station 1+500 m is shown on Sketch 2857-00-014. An enlargement of the profile from Station 0+700 to 1+300 can be found on Sketch 2857-00-015. The channel was originally surveyed in 2003 as the baseline survey. Subsequent surveys were completed by UGL in 2006, and beyond to evaluate the extent of channel degradation. However, results from the 2006 survey showed a discrepancy between it and the 2003 baseline survey, in plan and profile, mainly between Station 0+800 and 1+100 m. According to Jean-Louis Salesse of UGL, the 2006 survey and the 2003 baseline survey could not be reconciled without checking some of the control points used for the 2003 survey (AECOM, 2012). No conclusions were made in the 2006 monitoring report and it was recommended that a survey be re-done in 2007. In 2007, the creek channel survey was only partially completed from Station 1+025 to 1+450 m, and no conclusions could be made. Subsequent surveys completed in 2008, July 2010, September 2010, and August 2011 covered from Station 0+700 to 1+450 m.

The 2008 survey results compared well with the 2003 baseline survey in plan view and the profile compared well with the 2003 baseline survey from Stations 0+700 to 0+950 and 1+050 to 1+475 m. Between Station 0+950 and 1+050 m the 2008 survey suggests that the channel filled in by about 0.5 to 1 m. The beaver dam at the upstream end of the south lobe near Station 1+300 m was removed in 2007, which resulted in a local straightening of the channel in plan view. Where the surveyed channel is above the previous baselines, it is implied that depositional processes have raised the channel bottom. Conversely, erosion processes have lowered the channel bottom in other locations.

The July 2010 profile survey results compared well with the baseline and 2008 surveys from 0+700 to 0+960 m. From this point to Station 1+050 m the channel profile was about 0.5 to 1.0 m lower than the 2008 survey but still above the 2003 baseline survey. From Station 1+050 to 1+300 m the July 2010 profile was slightly less than the 2008 profile but not below the baseline. Across the north lobe the profile is lower than the 2008 survey.

The September 2010 survey compared well in plan view with the 2003 baseline, 2008 and July 2010 surveys. In profile the results generally compared well with the July 2010 survey. However, along the downstream half of the rock lined channel, from Station 0+800 to 0+925 m, the creek profile has a distinct 'saw tooth' pattern that was not observed in previous surveys. The valleys of the saw tooth pattern appear to be below the baseline survey and may be scour holes in the creek bed (**Note:** this was visually apparent during a site visit in May 2011 by AECOM (AECOM 2012)). Upstream of Station 1+100 m the September survey was lower than the July survey by as much as 0.5 m in some locations and below the baseline for a 75 m stretch upstream of Station 1+175 m. Across the north lobe the profile was slightly lower than the July survey.

The August 2011 surveyed plan view compared well with the 2003 baseline, 2008, and 2010 surveys upstream of Station 0+950 m. At Stations 0+950 m, 0+875 m, 0+850 m and downstream of Station 0+750 m the creek has shifted slightly from 2010. In profile, the results upstream of Station 0+950 m generally compared well with the September 2010 survey. Downstream of Station 0+950 m, the 2011 creek profile has a similar pattern to the September 2010 survey but it is shifted in the downstream direction. This can be attributed to the change in creek alignment in plan view, which has resulted in variable creek profile lengths. The results of the 2011 survey are hard to compare to determine the extent of any changes in the creek channel but the general slopes and patterns suggest there have only been minor changes since September 2010.

August 2012 Monitoring Event

The August 2012 surveyed creek channel generally compares well with the August 2011 survey in plan view over the entire length of the survey. The August 2012 survey shows some minor differences in the creek alignment and a straightened and shortened creek channel in some sections near Stations 0+700, 0+825, 0+875, 0+975, and 1+150 m. Side channels have also developed near Stations 0+950 and 1+080 m. In profile, the July 2012 survey again generally compares well to the shape of the previous survey in August 2011. However, similar to the observations for the previous monitoring period, the straighter and shorter creek sections have resulted in a shift in the profile to the downstream direction. In total, the August 2012 surveyed creek channel is nearly 40 m shorter than in the August 2011 survey over the entire length of the surveyed section. It is difficult to compare the shifted profiles, but there is a similar pattern to creek channel profiles that suggests that no significant erosion or deposition activity has occurred.

The main area of concern on Wolverine creek is located near Station 1+300 where a beaver dam is holding back water and raising the water level in the pond located just upstream. The water level in the pond has risen by about 0.4 m and water edge has pushed outward by as much as 2.0 m in some areas. The enlarged pond is a contributor to the erosion of the tailings piles and will require mitigation to prevent further degradation and undercutting of the lower North and South Lobe tailings pile slopes.

Based on the survey and visual inspection completed August 2012, trigger levels, as outlined in AECOM 2006b, have not been exceeded, and planning for channel stabilization work is not required at this time. The trigger levels for Wolverine Creek, taken from AECOM 2006b, are listed below:

- **Channel Degradation:** "Planning for channel stabilization works would be initiated based on the results of both visual inspections and the channel profile surveys. In this regard, planning for stabilization works across the tailings piles (i.e., upstream of the rock lined channel) should be considered when 1 m of channel degradation is evident along a measurable section of the channel between stations 1+075 to 1+475 (Drawing 03)."

- **Rock Lined Channel:** "Planning for stabilization within the rock lined channel should be undertaken when the monitoring results and visual observations from site inspections reveal that 0.5 m of channel degradation is evident along a measurable section of the channel between Stations 0+700 to 1+075 (Drawing 03). Planning may also be triggered as a result of visual inspections. These inspections would assess the potential for failures such as isolated attempts by the creek to break out of the existing channel or erosion at the top of bank from surface run-off, which could trigger a natural channel re-alignment."

3 Recommendations

3.1 Monitoring Recommendations

It is recommended that performance monitoring and visual inspections be continued for the gabion structures, Clinton Creek channel, Wolverine Creek Channel, the waste rock dump, and the Wolverine Tailings pile. Results should be compared with previous observations to identify possible trends. The outlet of Hudgeon Lake, and the pond below the Wolverine Tailings pile should be monitored on a regular basis to check for debris accumulation. This could include installation of an automated remote water level monitor to report when lake levels rise due to debris blockage. **Table 3-1** summarizes findings and recommended actions from both the monitoring program and site visit.

Based on previous recommendations (AECOM 2011), the recommended monitoring frequency is listed below:

- Inspection and survey of the Clinton Creek channel should be completed on an annual basis.
- Inspection and survey of the Gabion Drop structures should be completed on an annual basis. This specifically would include monitoring for increased movements in comparison with the waste rock piles to determine any trends.
- Visual inspection of the waste rock dump should be completed on an annual basis.
- Inspection and survey of the tension cracks along the Clinton Creek Access Road should be completed on annual basis.

- Visual inspection of the Hudgeon Lake outlet, and pond at the Wolverine tailings pile should be completed on an annual basis to check for debris accumulation or blockage at these outlets.

The 2012 monitoring results, in general, do not show significant changes to the mine site when compared to the 2011 results. Movement rates of the Clinton Creek Waste Rock Dump, Wolverine Creek Tailings Pile, and Wolverine Creek Channel are consistent with rates observed in 2011 and years prior to the rainfall event, which occurred in 2010. This implies a consistent moving of waste rock and tailings towards the creek. Based on these observations, it is our recommendation that the following be completed on a **biennial basis**:

- Visual Inspection and survey of the rock line channel and weirs on Wolverine Creek.
- Visual Inspection and survey of the Wolverine Creek channel.
- Visual Inspection and survey of the Wolverine Tailings Pile.
- Visual Inspection and survey of the Clinton Creek Waste Rock dump.
- Survey of Cross-section A, B, C, D, and E, from Clinton Creek to the top of the Waste Rock dump.

In summary, the next full round of performance monitoring should be completed in 2014, while the items listed as being completed on an annual basis should be continued in 2013. In addition, the Clinton Creek Channel, Clinton Creek Gabion Drop Structures, outlet of Hudgeon Lake, and outlet of the Pond at the Wolverine Tailings Pile should be visually inspected after any major rainfall or flood event.

3.2 Trigger and Additional Investigation Recommendations

Beyond the requirements for continued monitoring of the site we recommend further investigation and implementation of the trigger levels as follows. In some cases, additional geotechnical investigation is suggested which will serve both to further evaluate current movement rates and to provide current status of site conditions prior to a closure program implementation.

- Trigger level for waste rock monitors should be further investigated and implemented. This would also include the installation of additional monitoring pins adjacent to where Clinton Creek has relocated closer to the waste rock area. The location of these pins should be decided upon in relation with the development of the trigger levels.

- Currently the movement rates of the gabion structures are higher than the waste rock monitors. Additional geotechnical investigation and evaluation should be undertaken to provide a more in-depth discussion on possible causes for differing movement rates between the gabion monitors and waste rock dump monitors.

- Additional geotechnical investigation and evaluation should be undertaken on both the North Lobe and South Lobe to understand the differing rates of movement.

- Additional survey should be undertaken to confirm the freeboard along top of bank near the outlet of the lake as compared to survey data from 2007.

We recommend the development of an overall risk assessment strategy in association with the existing and proposed additional trigger levels. Although trigger levels may be exceeded, a broader view of the overall impact of such an exceedance should be assessed to provide guidance on appropriate action in such an instance. A trigger level implies action is required if reached. In some cases, no action may be required if the risk of potential failure or resultant consequences of such failure may be low and non-detrimental. The development of a risk based trigger level analysis may also provide useful in the development and timing of the overall closure plan.

3.3 Short Term and Long Term Action Recommendations

Results from the 2012 monitoring event, 2012 site visit, and historical long-term mine site monitoring have indicated some potential instability and safety concerns. For higher risk areas, immediate actions are recommended in the 2012 site inspections memo (Associated Engineering, 2012). These immediate actions are listed by site location below:

Short Term

Clinton Creek Access Roads

- Close the road adjacent to the upper portion of Clinton Creek. This section of road exhibits deep tension cracks, and extensive embankment failures. Close both entry points of this section of road with 1.5 m high earth berm and erect signs to restrict foot traffic from entering (see Sketch 2857-00-016).
- Flag shoulder failure locations along the Snowshoe and Porcupine Pit Roads. Erect warning signs with “Hazard Warning – Unstable Shoulders. Keep Clear”.
- Dislodge large boulder that is perched above the main access road.

Clinton Creek and Hudgeon Lake Outflow

- Clinton Creek channel and gabion drop structures to be visually inspected regularly and compared with previous inspections to identify possible trends or significant changes. A long-term stabilization plan should be developed and implemented to reduce the risk of total or incremental failure of the drop structures due to the failure of drop structure no. 4.
- Monitor the outlet of Hudgeon Lake for debris accumulations. An automatic reporting water level monitor could be installed to provide lake levels, which could indicate a debris blockage. Consideration should be given to placing a log boom upstream of the outlet to intercept debris from blocking the Hudgeon Lake outlet.

- Continue monitoring the over-steepened slope and embankment failure along the section of the access road that shows deep tension cracking. A sudden collapse of the waste rock slope (from the access road down to the streambed) could be expected, resulting in blockage of Clinton Creek. Since significant effort would be required to assess and stabilize the slope, it is our recommendation that an overall remediation plan be developed as soon as possible to mitigate the potential safety hazards associated with a creek blockage.

Wolverine Creek and Tailings

- Clear debris and beaver dam at the pond adjacent to the Wolverine South Lobe Tailings pile. Consider placing a log boom in pond to collect floating debris to prevent outlet blockage.

Site Roads

- Install slide hazard and no stopping signs (2 km section) and scale loose rock at slide no. 3 along the wet active area of the access road from Forty Mile Bridge to Wolverine Creek.
- Improve stream crossing on the Wolverine Access Road to enable safe off-road vehicle access.
- Install depth gauge at the Clinton Creek ford and install warning signage in localized areas along road at embankment or shoulder failures.

Open Pits

- Install vehicle barricades or berms and signage to prevent vehicle access to Snowshoe and Porcupine Pits.

Long Term

For longer term stabilization measures it is recommended that additional engineering be completed to enhance the site stability and safety. These tasks include:

Access and Site Roads

- Site survey of the access roads to assess current drainage patterns and develop drainage and grading plan.
- Re-grade access roads to control and direct surface water way from downhill slopes and provide culverts / flumes with erosion protection at the outlets to manage surface water run-off.

Clinton Creek and Hudgeon Lake Outflow

- Environmental assessment to determine the impacts of stabilization measures on Hudgeon Lake, Clinton Creek, Wolverine Creek and any other sensitive areas.
- Geotechnical investigation and assessment of waste rock piles, especially in the vicinity of Clinton Creek and the stabilized channel section.

- Review feasibility of reducing Hudgeon Lake water levels and removing the gabion drop structures. This would require substantial waste rock removal and re-grading of the Clinton Creek Waste Rock Dump to stabilize the slopes adjacent to Clinton Creek.

Wolverine Creek and Tailings Pile

- Develop overall grading and drainage plan to control surface water run-off.
- Geotechnical investigation and assessment of the south and north lobes of the Wolverine Creek Tailings piles.
- Re-grade unconsolidated south lobe tailings as needed following geotechnical assessment.

Table 3-1
Summary of Findings and Recommended Actions

Item	Description	Findings and Risk Assessment		Action Required
2.2a	Clinton Creek Waste Rock Dump	Movements towards the stabilized section of the Creek	High – Long Term	• Continue Monitoring slope for movement and slope degradation. • Complete Geotechnical/Environmental assessments to determine feasibility of long term stabilization measures
		Movements downstream of stabilized channel.	Low – Long Term	• Continue Monitoring slope for movement and slope degradation.
2.2b	Mining Pit Areas	Benches collapsed in spots. Continual minor rock falls from pit walls.	High for personal safety within pit area - Short Term	• Install vehicle barricades or berms to prevent vehicles from entering the pit and notices of safety risk and restrict entry to all but essential personal.
2.2c	Clinton Creek Access Roads	Road adjacent to Clinton Creek.	High - Short Term	• Close off both entrances to lower terrace road. Signage to prevent vehicle or pedestrian access.
		Mine Road access to pit areas	High - Short Term	• Install warning signs along the Hudgeon Lake Road to the pit locations. Flag off areas of shoulder failure.
			High - Short Term	• Scale large boulder or install signs indicating high hazard including no stopping within designated area.

Item	Description	Findings and Risk Assessment		Action Required
2.3a	Gabions Condition and Risk	Creek bed eroded under downstream apron creating a plunge pool. Continued erosion between 2011 and 2012.	Low - Short Term High - Long Term	• Creek channel and Gabion structures should be visually inspected and results recorded and compared with previous observations to identify possible trends. • Geotechnical/Environmental assessments required to determine feasibility of gabion repair / replacement options or removal of gabions, drawing down Hudgeon Lake water level, and re-grading of Creek channel and waste rock dump.
2.3b	Hudgeon Lake Outflow	Debris blocking inflow.	Low - Short Term	• The inlet should be monitored on a regular basis for debris accumulations. • Install log booms upstream of outflow to collect debris
2.4	Clinton Creek Downstream Condition and Risk	Down cutting of the stream bed and toe erosion of the road and adjacent waste rock pile.	Low - Short Term	• Continue Monitoring slope for movement and slope degradation.
2.5a	Wolverine Creek North Lobe Tailings	Stable with little surface erosion or unravelling. Small area at the upper crest which has slumped.	Low - Long Term	• Continue Monitoring slope for movement and slope degradation.
2.5b	Wolverine Creek South Lobe Tailings	Stable with some longitudinal mounds/ridges towards tailings pond.	Low - Long Term	• Continue Monitoring slope for movement and slope degradation.

Item	Description	Findings and Risk Assessment		Action Required
2.5c	Access from Forty Mile Bridge to Wolverine Creek Wolverine Access Road	Slides are located in active wet areas with saturated soils. The stream cannot be crossed by vehicles unless improvements are made to the road.	Moderate - Short Term Low - Long Term	• Sign slide hazard no stopping (2 km section) and scale loose rock and boulders at slide #3. • Improve the stream crossing to enable off-road vehicle access. This action is not an urgent safety item but will provide easier access for monitoring wolverine creek and the inlet debris.
2.6a	Wolverine Creek Inlet	Obstructed with beaver dam and wood debris.	High - Short Term	• Immediate action required to clear debris. Continue to monitor debris accumulations on a regular basis. • Install log booms upstream of inlet to collect debris
2.6b	Wolverine Creek Down Stream	Stream bed appears stable. Refer to inflow clearing.	Low - Long Term	• No action required at this time.

4 References

- UMA Engineering Ltd., 2000. Indian and Northern Affairs Canada, Abandoned Clinton Creek Asbestos Mine, Risk Assessment Report.
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- UMA Engineering Ltd., 2003. Indian and Northern Affairs Canada, Abandoned Clinton Creek Asbestos Mine, Environmental Liability Report.
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- AECOM, 2010. Government of Yukon, Former Clinton Creek Asbestos Mine – Drop Structure Repair Works, Construction Activity Report – 2009.
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- AECOM, 2012. Government of Yukon, Former Clinton Creek Asbestos Mine – Long Term Performance Monitoring - 2011.
- Associated Engineering, 2012. Yukon Government, Inspections at Clinton Creek Mine Site during August 6 to 8, 2012 - Memo.

5 Closing

The services provided by Associated Engineering in preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession practising under similar conditions. No other warranty expressed or implied is made.

Should you have any questions or require additional information, please call **Steven Bartsch, P.Eng., at 867-456-2711**.

Yours truly,

Prepared by:

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Project Engineer

Prepared by:

Ray Korpela
Practice Leader – Resource Transportation

Reviewed by:

18 JAN 2013
PROFESSIONAL ENGINEER
YUKON TERRITORY
GEORGE J. DE RIDDER

George de Ridder, C.Eng., P.Eng., FIStructE
Discipline Leader – Civil Structures

PERMIT TO PRACTICE
ASSOCIATED ENGINEERING (BC) LTD.
SIGNATURE
Date 18-Jan-13
PERMIT NUMBER PP060
Association of Professional Engineers of Yukon

PS/GDR/RK/skn

Sketches

- Sketch 2857-00-SK001 – Site Plan and Bench Mark Locations
- Sketch 2857-00-SK002 – Clinton Creek Waste Rock Dump, Movement Monitoring
- Sketch 2857-00-SK003 – Clinton Creek, Channel Plan
- Sketch 2857-00-SK004 – Drop Structure #1
- Sketch 2857-00-SK005 – Drop Structure #2
- Sketch 2857-00-SK006 – Drop Structure #3
- Sketch 2857-00-SK007 – Drop Structure #4
- Sketch 2857-00-SK008 – Clinton Creek, Channel Profile
- Sketch 2857-00-SK009 – Clinton Creek Channel Profile, Station 0-050 to 0+250
- Sketch 2857-00-SK010 – Clinton Creek Channel Profile, Station 0+250 to 0+550
- Sketch 2857-00-SK011 – Clinton Creek Channel Profile, Station 0+550 to 0+850
- Sketch 2857-00-SK012 – Wolverine Creek Tailings Pile, Movement Monitoring
- Sketch 2857-00-SK013 – Wolverine Creek Tailings Pile, South Lobe Movement
- Sketch 2857-00-SK014 – Wolverine Creek Plan and Profile
- Sketch 2857-00-SK015 – Wolverine Creek Profile
- Sketch 2857-00-SK016 – Clinton Creek Road Tension Crack

511,500
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515,500
516,000

7,149,000
7,148,500
7,148,000
7,147,500
7,147,000
7,146,500

WOLVERINE CREEK
TAILINGS PILE
NORTH
LOBE
SOUTH
LOBE
FORMER
MILL
SITE
TAILINGS PILE
ACCESS ROAD
U2834 (RTK BASE)
U1561 (MINE)
U1086
WOLVERENE
CREEK
HILL (MINE)
CREEK STABILIZATION AREA
INCLUDING: HUDGEON LAKE
OUTLET AND FOUR GABION
DROP STRUCTURES
U5700
U1192
U5699
U5698
U1183
U1191
G-TRAV (MINE)
CLINTON CREEK
2835
U1200
U1189
MINE ACCESS ROAD
HUDGEON LAKE
CLINTON CREEK
WASTE ROCK DUMP
U2836 (RTK BASE)
SNOWSHOE PIT
CLINTON
CREEK
BEAR
CREEK
U228 (MINE)
U1836
U1182
PORCUPINE PIT
U1193
SHACK (MINE)
U280 (MINE)
PORCUPINE
CREEK

N

0 150 300 m
SCALE 1:15000

UTM ZONE 7 NAD83
IMAGE DATE 1999

U5700 BENCHMARK

U228 (MINE) LOCAL MINE BENCHMARKS

Government of Yukon
Clinton Creek Long Term Monitoring
Site Plan and Bench Mark Locations

Dwg. No.: 2857-00-SK001
Date: Oct. 5, 2012

Associated Engineering

CREEK STABILIZATION AREA
(FOUR GABION DROP STRUCTURES)

HUDGEON LAKE

CLINTON CREEK
WASTE ROCK DUMP

CLINTON

CREEK

ENLARGEMENT

0 40 80 m

FORMER
CRUSHER
BUILDING
(DEMOLISHED)

SNOWSHOE
PIT

PORCUPINE PIT
SLOPE MONITORS

PORCUPINE
PIT

CREEK
PIT

±420 CONTOUR

±450 CONTOUR

513,000

513,500

514,000

7,147,000

7,146,500

0 50 100 m

SCALE 1:5000

UTM ZONE 7 NAD83
IMAGE DATE 1999

XS-G MONITOR LOCATION (DESTROYED, NOT FOUND)

0226 MONITOR LOCATION (ACTIVE)

P2 PIEZOMETER LOCATION

22cm INCREMENTAL MOVEMENT (AUG 2011 TO AUGUST 2012)

10cm TOTAL MOVEMENT VECTOR (BASELINE TO AUGUST 2012)

UPPER SLOPE AREA
- ELEVATION >450±

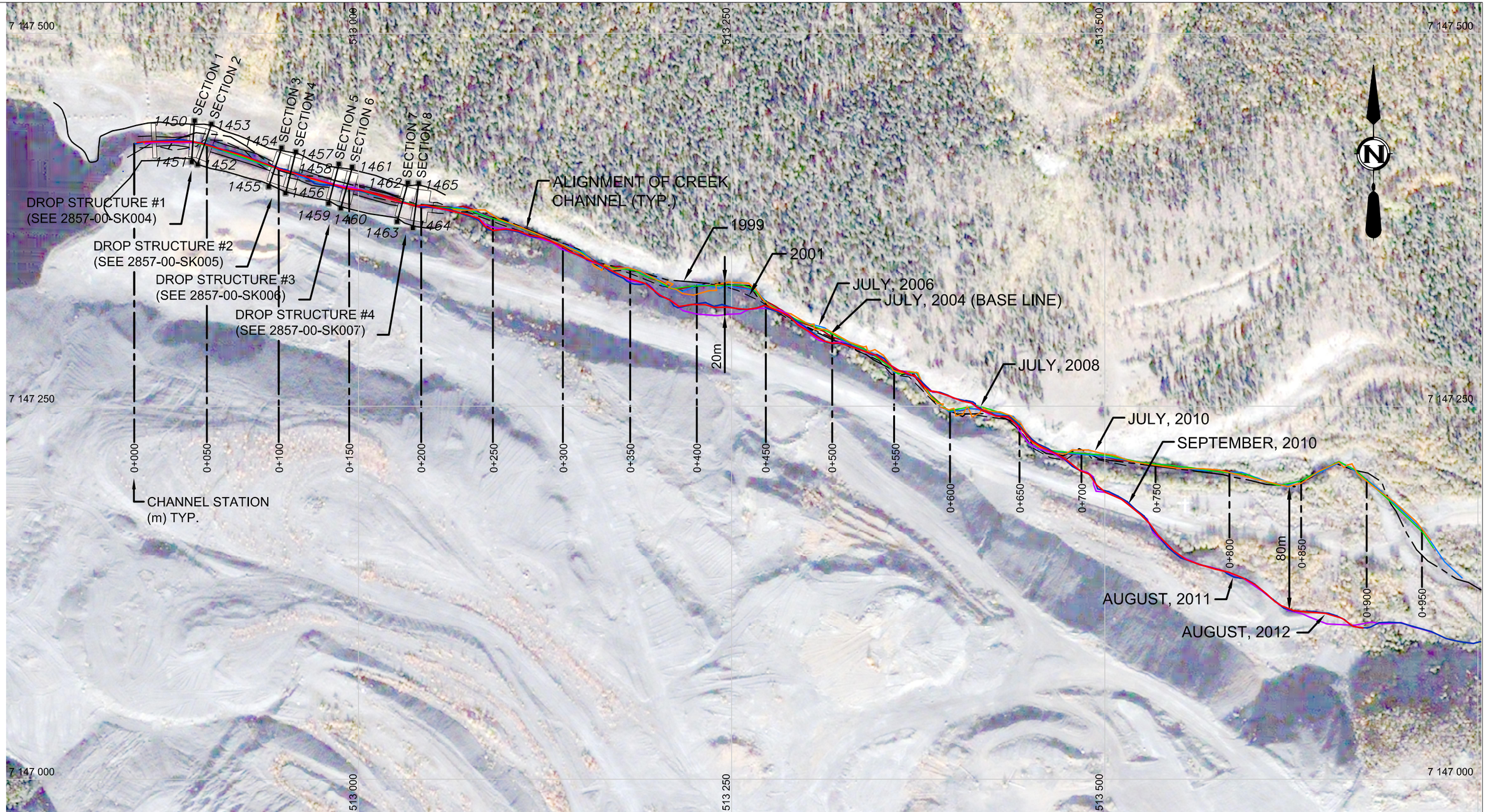
MID SLOPE AREA
- ELEVATION >420± <450±

LOWER SLOPE AREA
- ELEVATION <420±

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Clinton Creek Waste Rock Dump
Movement Monitoring

Dwg. No.: 2857-00-SK002
Date: Oct. 5, 2012

Associated Engineering



PLAN

m
0 25 50
SCALE 1:2500

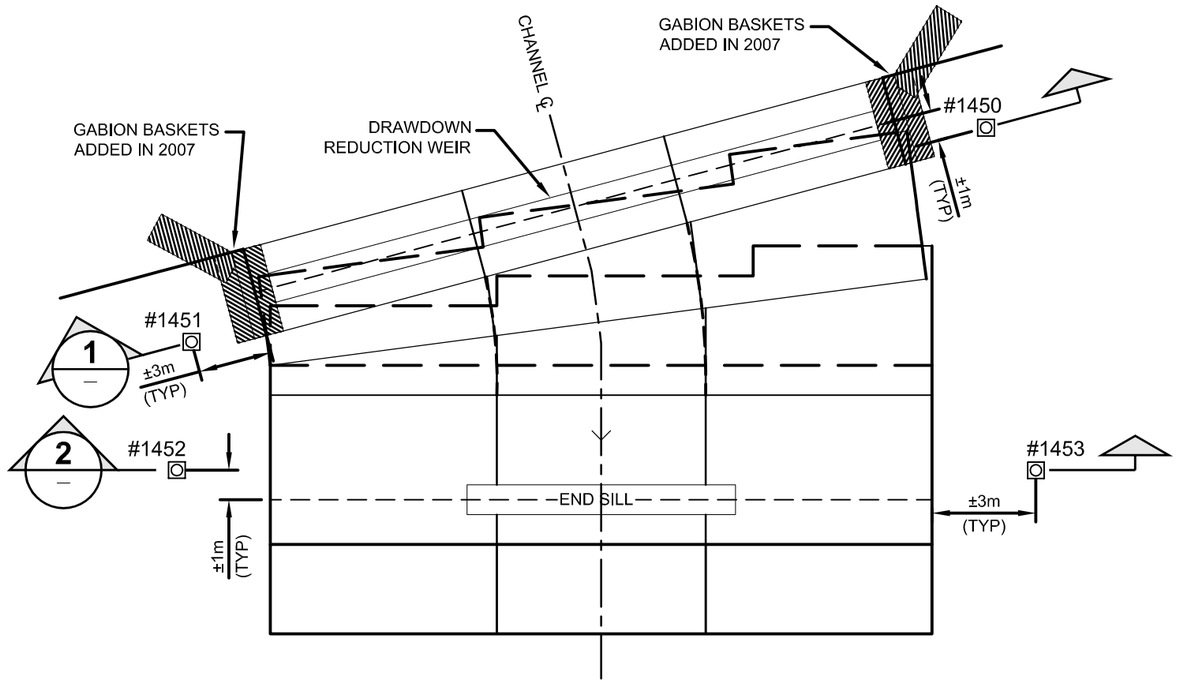
LEGEND

- *1450* CHANNEL CLOSURE MOVEMENT MONITOR (TYP)
- CREEK CENTRELINE 1999
- CREEK CENTRELINE 2001
- CREEK CENTRELINE 2004 (BASELINE FOR LONG TERM MONITORING)
- CREEK CENTRELINE 2006
- CREEK CENTRELINE 2008
- CREEK CENTRELINE JULY 2010
- CREEK CENTRELINE SEPTEMBER 2010
- CREEK CENTRELINE AUGUST 2011
- CREEK CENTRELINE AUGUST 2012

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Clinton Creek Channel Plan

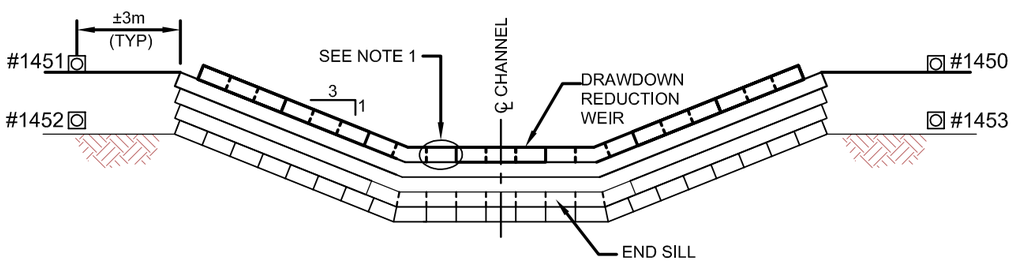
Dwg. No.: 2857-00-SK003
Date: Oct. 5, 2012

Associated Engineering



DROP STRUCTURE PLAN VIEW

0 2 4 m SCALE 1:200



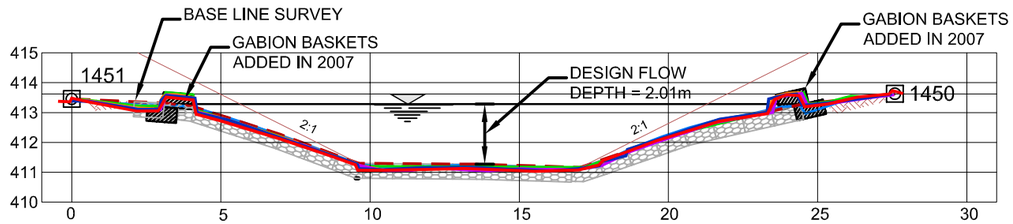
DROP STRUCTURE END VIEW

0 2 4 m SCALE 1:200

▣ CHANNEL CLOSURE MOVEMENT MONITOR (19mm Ø STEEL PIN) INSTALLED DURING 2006 SURVEY.

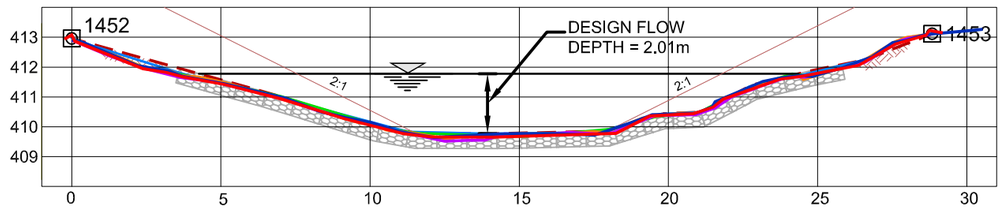
NOTE 1: GABION FILL REMOVED FROM THIS CELL OF THE DRAWDOWN WEIR IN 2007 TO AID IN DRAWING DOWN THE LEVEL IN HUDGEON LAKE DURING LOW FLOW PERIODS.

NOTE 2: REFER TO AECOM's "FORMER CLINTON CREEK ASBESTOS MINE - EMERGENCY DROP STRUCTURE REPAIRS, CONSTRUCTION ACTIVITY REPORT, 2011" FOR 2011 REPAIR DETAILS.



SECTION 1

0 2 4 m SCALE 1:200



SECTION 2

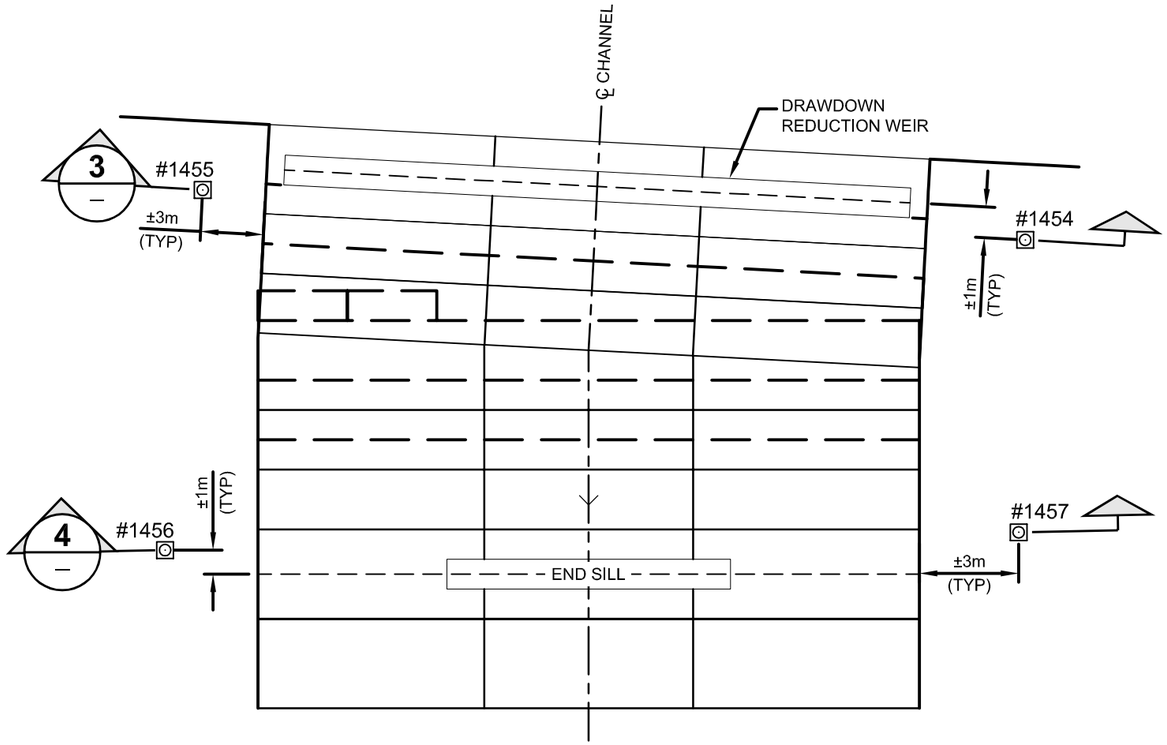
0 2 4 m SCALE 1:200

- BASE LINE SURVEY (2006)
- SURVEY (2007)
- SURVEY (2008)
- SURVEY (JULY 2010)
- SURVEY (SEPTEMBER 2010)
- SURVEY (AUGUST 2011)
- SURVEY (AUGUST 2012)

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Drop Structure #1

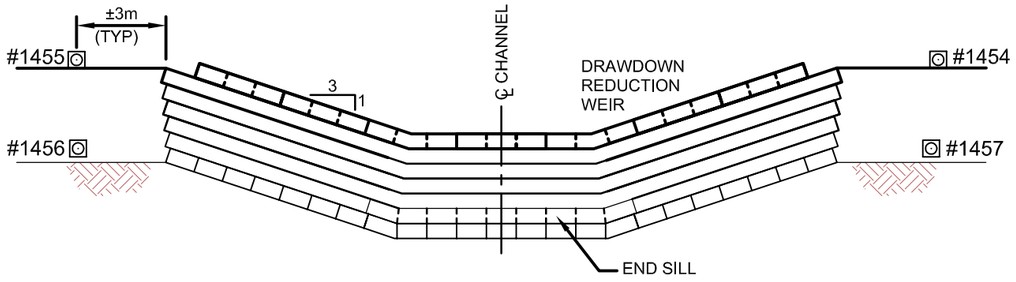
Dwg. No.: 2857-00-SK004
Date: Oct. 5, 2012

Associated Engineering



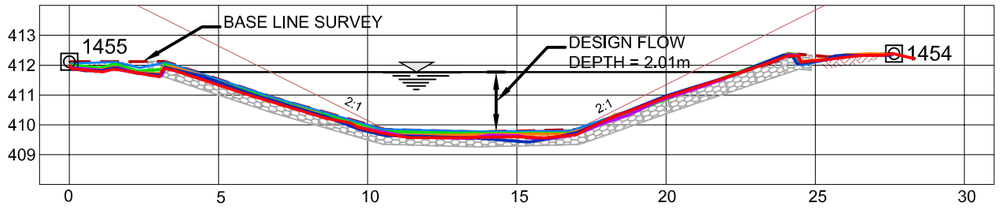
DROP STRUCTURE PLAN VIEW

0 2 4 m SCALE 1:200



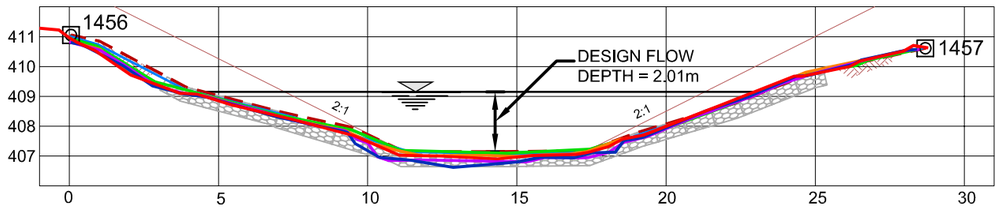
DROP STRUCTURE END VIEW

0 2 4 m SCALE 1:200



SECTION 3

0 2 4 m SCALE 1:200



SECTION 4

0 2 4 m SCALE 1:200

- BASE LINE SURVEY (2006)
- SURVEY (2007)
- SURVEY (2008)
- SURVEY (JULY 2010)
- SURVEY (SEPTEMBER 2010)
- SURVEY (AUGUST 2011)
- SURVEY (AUGUST 2012)

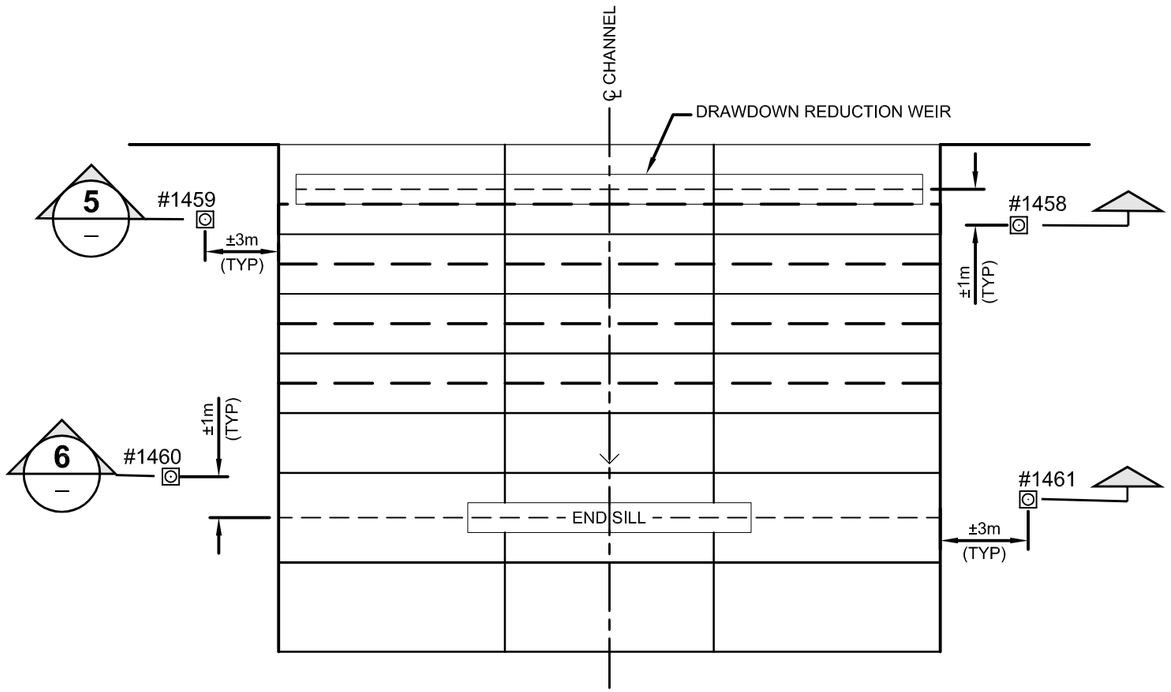
NOTE 1: REFER TO AECOM's "FORMER CLINTON CREEK ASBESTOS MINE - EMERGENCY DROP STRUCTURE REPAIRS, CONSTRUCTION ACTIVITY REPORT, 2011" FOR 2011 REPAIR DETAILS.

▣ CHANNEL CLOSURE MOVEMENT MONITOR (19mm Ø STEEL PIN) INSTALLED DURING 2006 SURVEY.

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Drop Structure #2

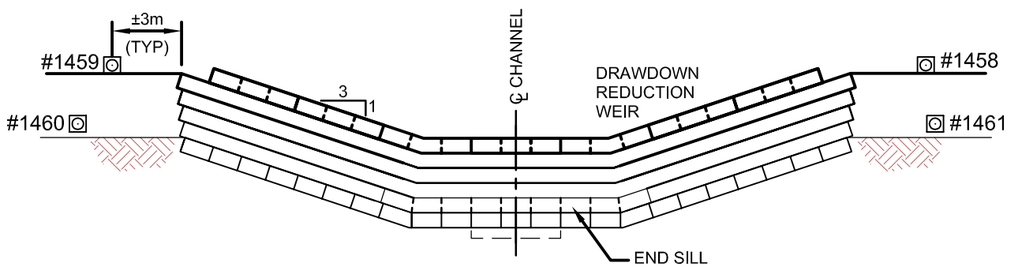
Dwg. No.: 2857-00-SK005
Date: Oct. 5, 2012

Associated Engineering



DROP STRUCTURE PLAN VIEW

0 2 4 m SCALE 1:200

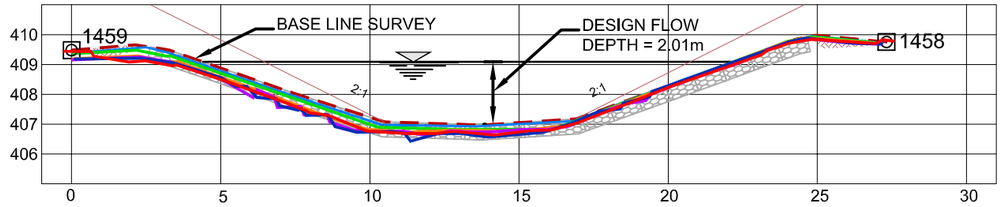


DROP STRUCTURE END VIEW

0 2 4 m SCALE 1:200

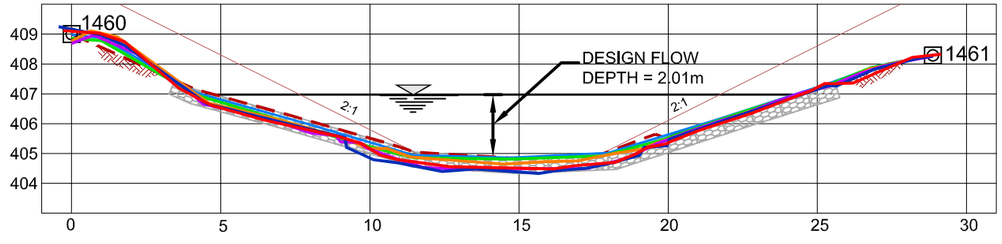
NOTE 1: REFER TO AECOM's "FORMER CLINTON CREEK ASBESTOS MINE - EMERGENCY DROP STRUCTURE REPAIRS, CONSTRUCTION ACTIVITY REPORT, 2011" FOR 2011 REPAIR DETAILS.

⊙ CHANNEL CLOSURE MOVEMENT MONITOR (19mm Ø STEEL PIN) INSTALLED DURING 2006 SURVEY.



SECTION 5

0 2 4 m SCALE 1:200



SECTION 6

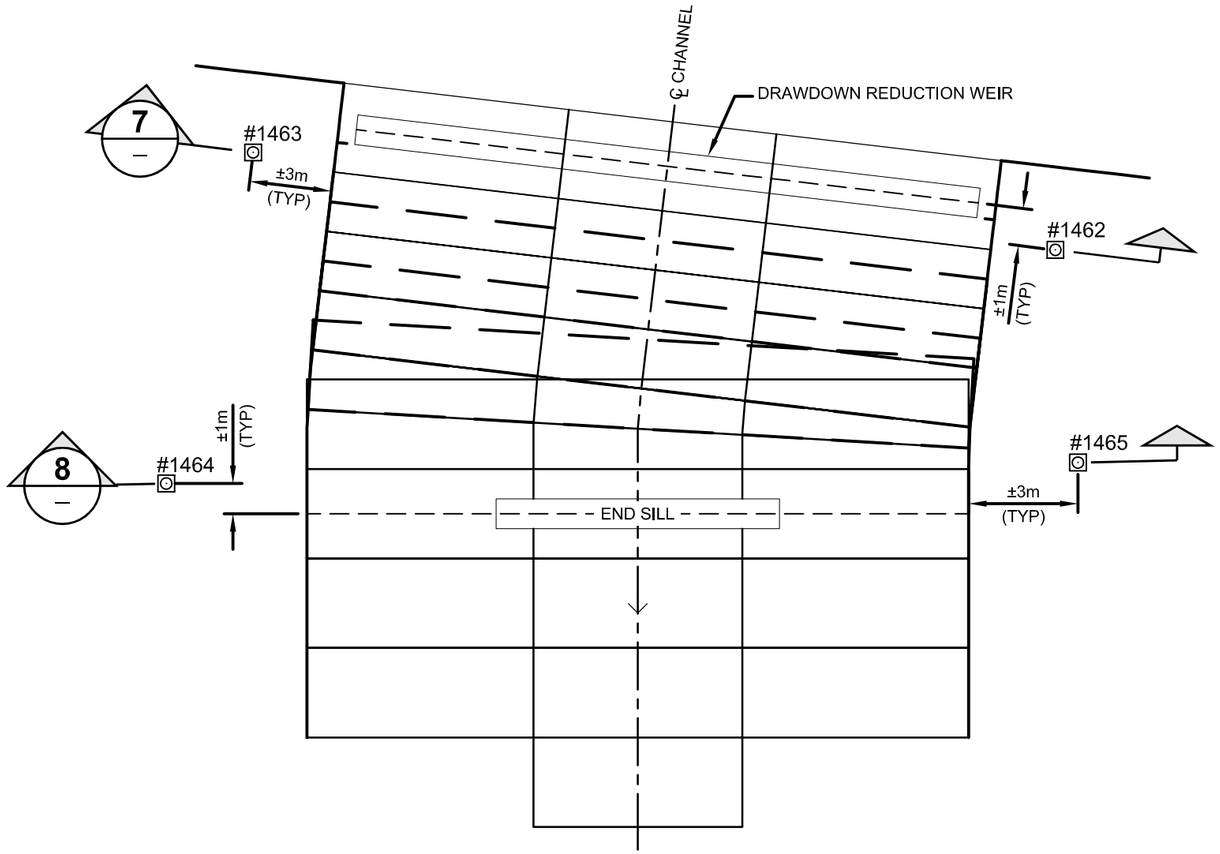
0 2 4 m SCALE 1:200

- BASE LINE SURVEY (2006)
- SURVEY (2007)
- SURVEY (2008)
- SURVEY (JULY 2010)
- SURVEY (SEPTEMBER 2010)
- SURVEY (AUGUST 2011)
- SURVEY (AUGUST 2012)

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Drop Structure #3

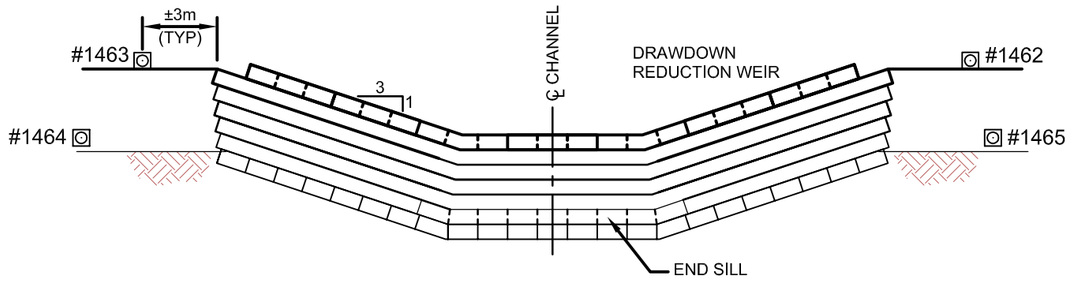
Dwg. No.: 2857-00-SK006
Date: Oct. 5, 2012

Associated Engineering



DROP STRUCTURE PLAN VIEW

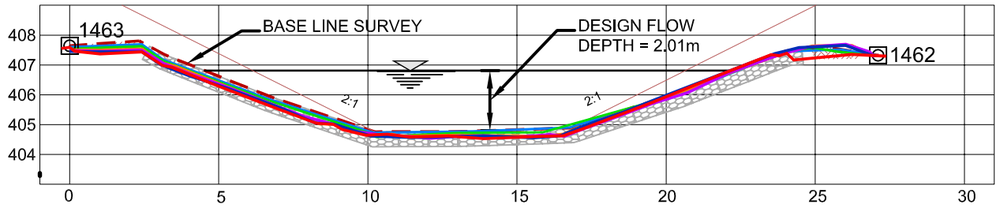
0 2 4 m SCALE 1:200



DROP STRUCTURE END VIEW

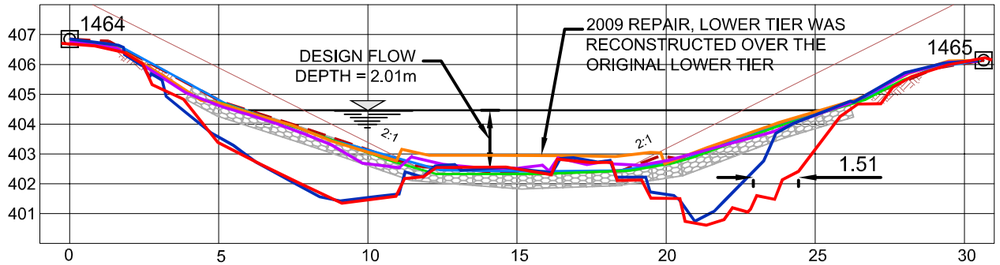
0 2 4 m SCALE 1:200

◎ CHANNEL CLOSURE MOVEMENT MONITOR (19mm Ø STEEL PIN) INSTALLED DURING 2006 SURVEY.



SECTION 7

0 2 4 m SCALE 1:200



SECTION 8

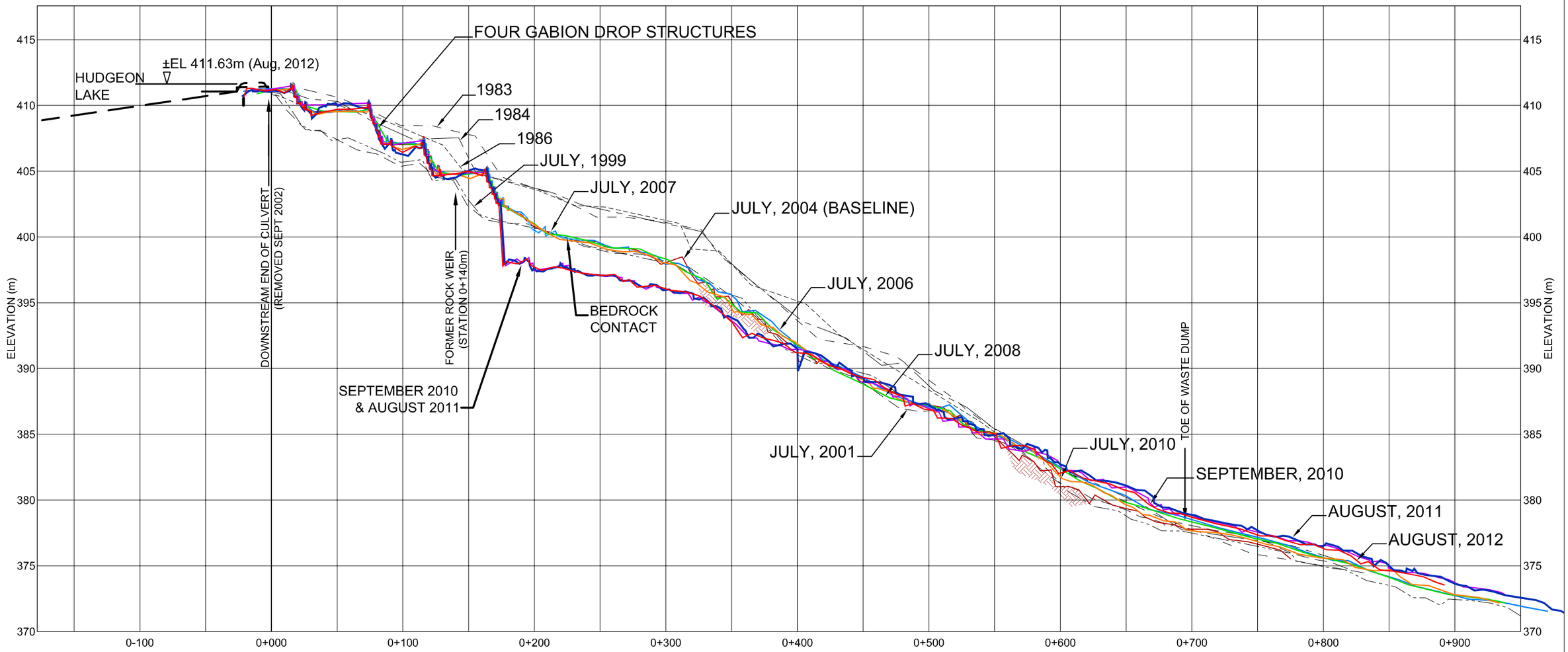
0 2 4 m SCALE 1:200

- BASE LINE SURVEY (2006)
- SURVEY (2007)
- SURVEY (2008)
- SURVEY (JULY 2010)
- SURVEY (SEPTEMBER 2010)
- SURVEY (AUGUST 2011)
- SURVEY (AUGUST 2012)

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Drop Structure #4

Dwg. No.: 2857-00-SK007
Date: Oct. 5, 2012

Associated Engineering



PROFILE

0 30 60 m H=1:3000
0 3 6 V=1:300

STATION	NORTHING	EASTING
0+000	7,147,427	512,863
0+250	7,147,366	513,113
0+500	7,147,272	513,363
0+750	7,147,204	513,613

COORD: UTM ZONE 7W NAD83

LEGEND

- PROFILE 1983
- PROFILE 1984
- PROFILE 1986
- PROFILE 1999
- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006
- PROFILE 2007
- PROFILE 2008
- PROFILE JULY 2010
- PROFILE SEPTEMBER 2010
- PROFILE AUGUST 2011
- PROFILE AUGUST 2012

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Clinton Creek Channel Profile

Dwg. No.: 2857-00-SK008
Date: Oct. 5, 2012

Associated Engineering

STATION (m)

0-050 0+000 0+050 0+100 0+150 0+200 0+250

ELEVATION (m)

415 410 405 400 395

HUDGEON LAKE
±EL 411.63 (Aug, 2012)

DOWNSTREAM END OF CULVERT
(REMOVED SEPT 2002)

DROP STRUCTURE #1

DROP STRUCTURE #2

DROP STRUCTURE #3

DROP STRUCTURE #4

END SILL (0+175m)

CHANNEL TRANSITION

BOULDERS

(0+184m)

(0+195m)

JULY, 2001

JULY, 2004
(BASELINE)

FORMER ROCK WEIR
(STATION 0+140m)

JULY, 2006

JULY, 2008

BEDROCK
CONTACT

TRIGGER LEVEL AT
0.5m OFFSET FROM
BASELINE SURVEY

JULY, 2007

JULY, 2010

STA 0+225

AUGUST 2012

SEPTEMBER, 2010
5m EROSION

AUGUST, 2011

3.5m EROSION
(SEPTEMBER, 2010)

2m
EROSION

TRIGGER LEVEL AT
1.5m OFFSET FROM
BASELINE SURVEY

2.1m EROSION
(SEPTEMBER, 2010)

ENLARGEMENT

410 405 400 395

0+150 0+170 0+180 0+190 0+200

1.2

0 3 6 m SCALE 1:300

STATION 0+150 TO 0+200

PROFILE

0 10 20 H=1:1000

0 1 2 m V=1:100

0-50 to 0+250

LEGEND

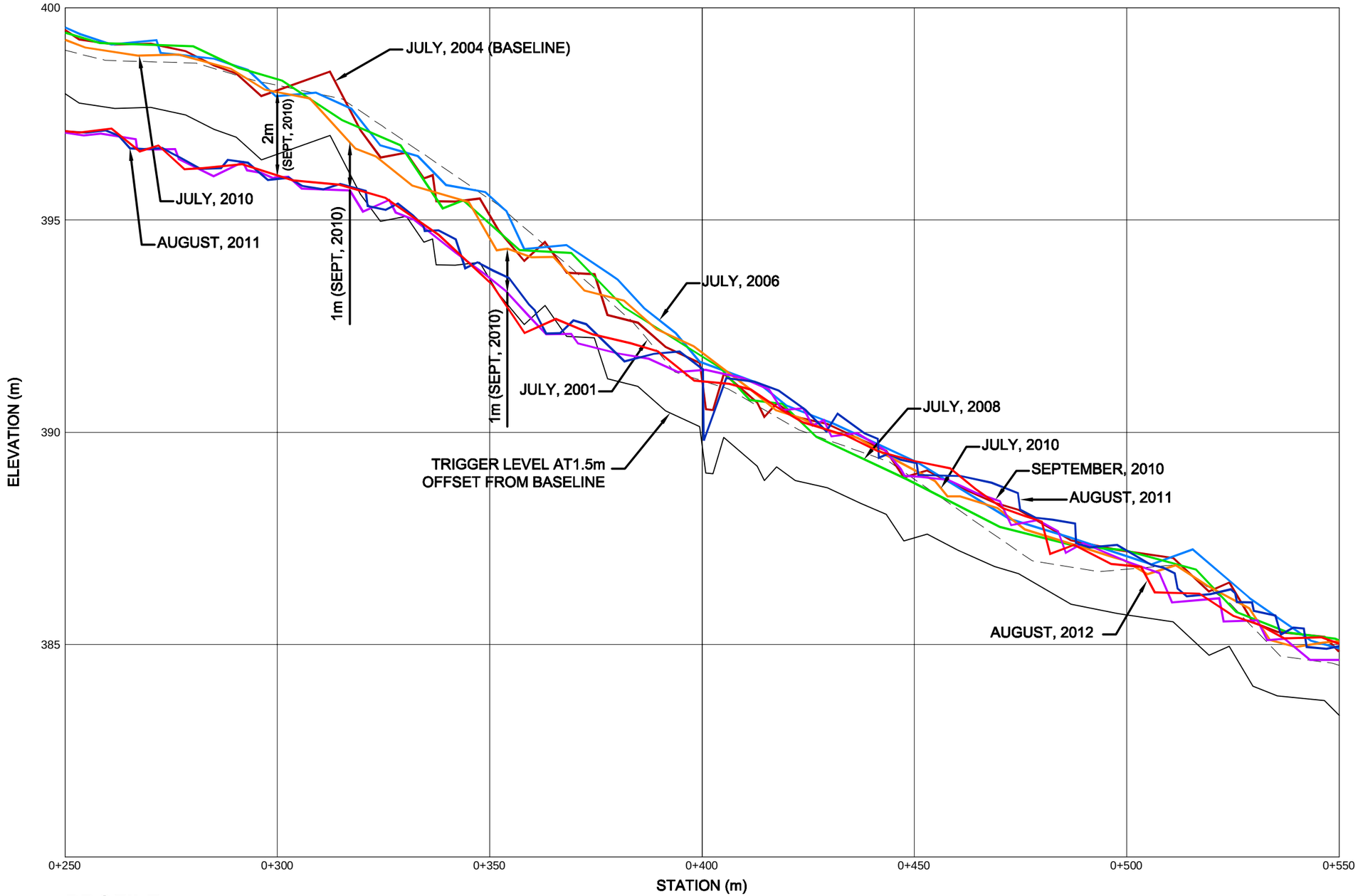
- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006
- PROFILE 2007
- PROFILE 2008
- PROFILE JULY 2010
- PROFILE SEPTEMBER 2010
- PROFILE 2011
- PROFILE 2012

STATION (m)

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Clinton Creek Channel Profile
Station 0-050 to 0+250

Dwg. No.: 2857-00-SK009
Date: Oct. 5, 2012

Associated Engineering



PROFILE

0 10 20 m H=1:1000

0 1 2 V=1:100

0+250 to 0+550

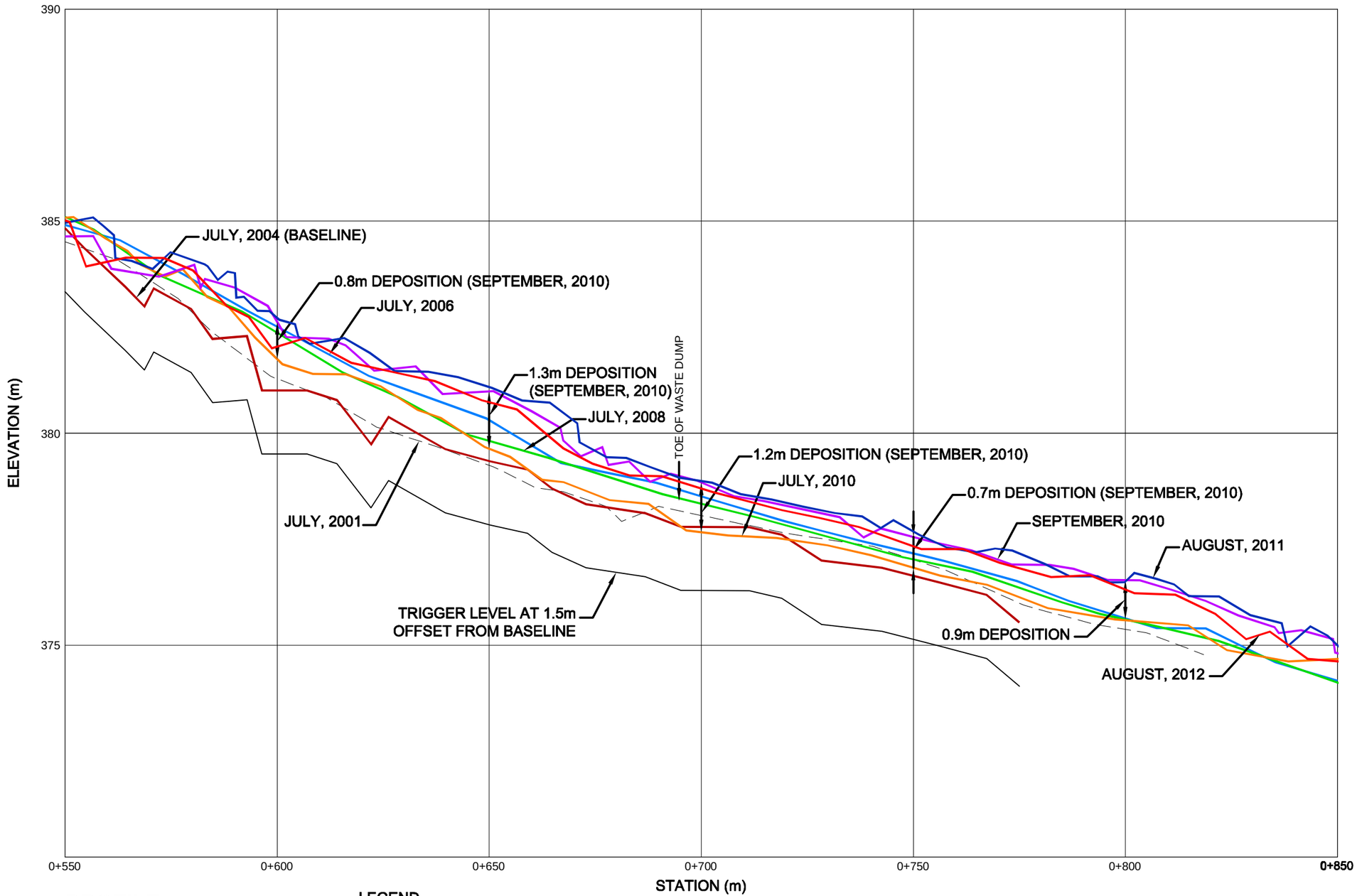
LEGEND

- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006
- PROFILE 2008
- PROFILE JULY 2010
- PROFILE SEPTEMBER 2010
- PROFILE 2011
- PROFILE 2012

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Clinton Creek Channel Profile
Station 0+250 to 0+550

Dwg. No.: 2857-00-SK010
Date: Oct. 5, 2012

Associated Engineering



PROFILE

0 10 20 m H=1:1000

0 1 2 V=1:100

0+550 to 0+850

LEGEND

- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006
- PROFILE 2008
- PROFILE JULY 2010
- PROFILE SEPTEMBER 2010
- PROFILE 2011
- PROFILE 2012

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Clinton Creek Channel Profile
Station 0+550 to 0+850

Dwg. No.: 2857-00-SK011
Date: Oct. 5, 2012

Associated Engineering

513,000
513,500
514,000
7,148,500
7,148,000
530
425
N
WOLVERINE CREEK
NORTH LOBE
SOUTH LOBE
FORMER MILL SITE
WOLVERINE CREEK TAILINGS PILES
1495 4cm
BH-14(T7) 2cm
80-1 4cm
650-1 4cm
650-2 3cm
1491 6cm
80-7 5cm
NL-1 7cm
1083 (NL-2) 6cm
NL-3 6cm
350-3A 5cm
1489 4cm
NL-4 6cm
NL-5 5cm
1085 2cm
500-1 3cm
500-2 6cm
26 4cm
26A 2cm
80-2 6cm
350-1A 6cm
350-2A 6cm
80-5 17cm
80-4 25cm
1483 4cm
2834 (RTK BASE)
NL-BASE 2cm
SL-5 28cm
2005-11 23cm
2005-10 27cm
SL-4 28cm
1484 31cm
1494
TS484
996 0cm
SL-3 31cm
SL-2 24cm
SL-1 19cm
2005-02 29cm
2005-01 32cm
2005-03 32cm
BH-16(T8) 38cm
24A 38cm
25B 12cm
24D 29cm
2005-08 5cm
2005-04 36cm
1492 4cm
24 5cm
1084 6cm
1485 37cm
2005-05 45cm
24B 39cm
2005-06 28cm
2005-07 2cm
80-9 1cm
U1086
UPPER SLOPE AREA
MID SLOPE AREA
LOWER SLOPE AREA
ROCK LINED CHANNEL AND ROCK WEIRS
530m ELEVATION CONTOUR
425m ELEVATION CONTOUR

0 40 80 120 m

SCALE 1:4000

UTM ZONE 7 NAD83
IMAGE DATE 1999

MONITOR LOCATION (DESTROYED, NOT FOUND)

24 MONITOR LOCATION (ACTIVE)

SL/NL-01 VISUAL ALIGNMENT PIN

BH-14 (T7) 1978 TEST HOLE LOCATION

17cm INCREMENTAL MOVEMENT (AUG 2011 TO AUGUST 2012)

100cm TOTAL MOVEMENT VECTOR (BASELINE TO AUGUST 2012)

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Wolverine Creek Tailings Pile Movement Monitoring

Dwg. No.: 2857-00-SK012
Date: Oct. 5, 2012

Associated Engineering

Time: 8:53
Date: 2006/3/24
Lt/Drawing Scale: 1=1.000
AutoCAD File: S:\CAD\AEGRP-2000\BDR\AE-SK-11X17.DWG (GH)

513,500

514,000

7,148,000

530

425

1483
4cm

2834 (RTK BASE)

1492
4cm

80-2
6cm

80-5
17cm

80-4
25cm

24
5cm

1084
6cm

1485
37cm

BH-16(T8)
38cm

24A
38cm

24B
39cm

350-1A
6cm

350-2A
6cm

1489
4cm

NL-4
6cm

NL-5
5cm

NL-BASE
2cm

2005-01
32cm

2005-02
29cm

2005-03
32cm

SL-5
28cm

SL-4
28cm

SL-3
31cm

SL-2
24cm

SL-1
19cm

2005-04
36cm

2005-05
45cm

2005-06
28cm

2005-07
2cm

2005-08
5cm

2005-09

2005-10
27cm

2005-11
23cm

1484
31cm

996
0cm

24D
29cm

25B
12cm

80-9
1cm

WOLVERINE CREEK
TAILINGS PILES

SOUTH LOBE

APPARENT
DIRECTION OF
MOVEMENT
(TYPICAL)

530m ELEVATION
CONTOUR

425m ELEVATION
CONTOUR

UPPER SLOPE AREA

MID SLOPE AREA

LOWER SLOPE AREA

ROCK LINED
CHANNEL AND
ROCK WEIRS

N

0 20 40 m

SCALE 1:2000

UTM ZONE 7 NAD83
IMAGE DATE 1999

XS-G MONITOR LOCATION (DESTROYED, NOT FOUND)

0226 MONITOR LOCATION (ACTIVE)

SL/NL-01 VISUAL ALIGNMENT PIN

P2 PIEZOMETER LOCATION

22cm INCREMENTAL MOVEMENT (AUG 2011 TO AUGUST 2012)

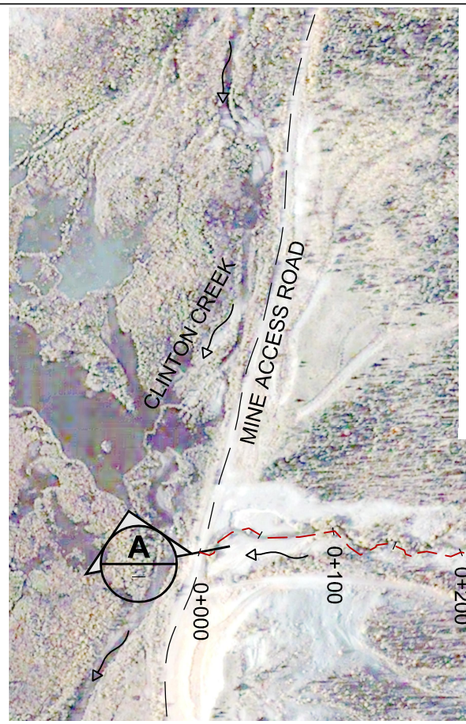
100cm TOTAL MOVEMENT VECTOR (BASELINE TO AUGUST 2012)

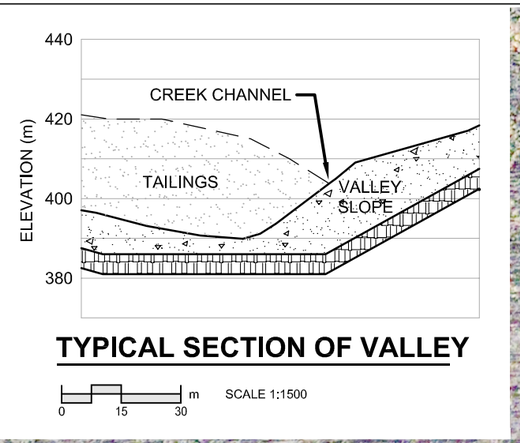
GENERAL MOVEMENT TREND

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Wolverine Creek Tailings Pile
South Lobe Movement

Dwg. No.: 2857-00-SK013
Date: Oct. 5, 2012

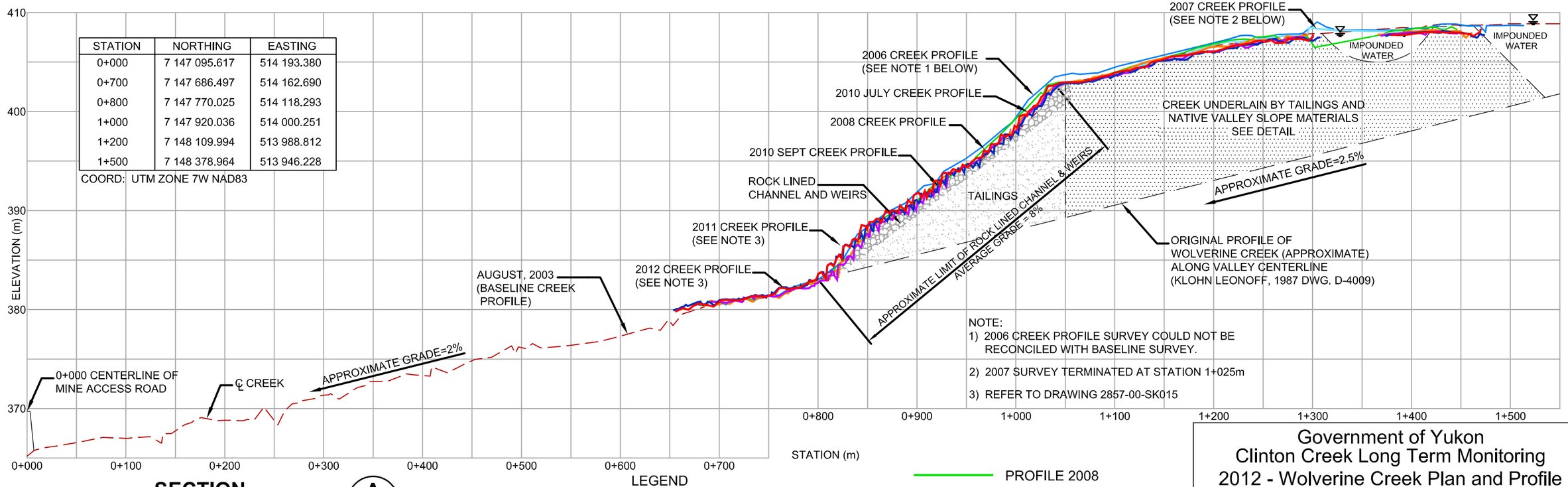
Associated Engineering



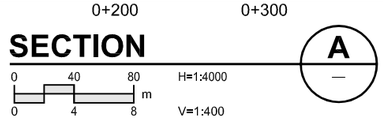


STATION	NORTHING	EASTING
0+000	7 147 095.617	514 193.380
0+700	7 147 686.497	514 162.690
0+800	7 147 770.025	514 118.293
1+000	7 147 920.036	514 000.251
1+200	7 148 109.994	513 988.812
1+500	7 148 378.964	513 946.228

COORD: UTM ZONE 7W NAD83



NOTE:
1) 2006 CREEK PROFILE SURVEY COULD NOT BE RECONCILED WITH BASELINE SURVEY.
2) 2007 SURVEY TERMINATED AT STATION 1+025m
3) REFER TO DRAWING 2857-00-SK015



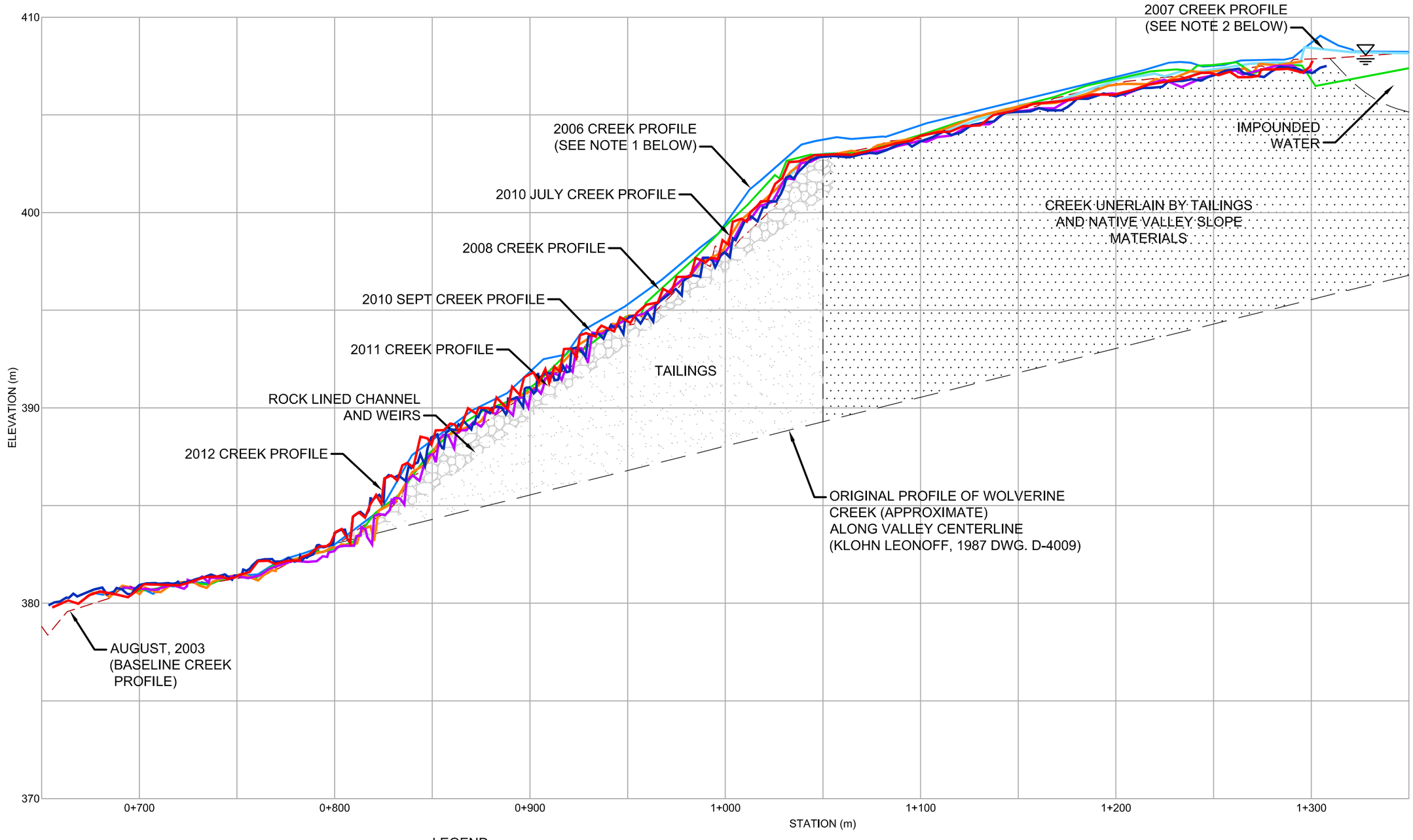
LEGEND

- PROFILE 2003 (BASELINE)
- PROFILE 2006
- PROFILE 2007
- PROFILE 2008
- PROFILE JULY 2010
- PROFILE SEPTEMBER 2010
- PROFILE 2011
- PROFILE 2012

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Wolverine Creek Plan and Profile

Dwg. No.: 2857-00-SK014
Date: Oct. 5, 2012

Associated Engineering



PROFILE

0 25 50 m H=1:2000

0 2.5 5 V=1:200

STATION 0+700 TO 1+350

LEGEND

- PROFILE 2003 (BASELINE)
- PROFILE 2006
- PROFILE 2007
- PROFILE 2008
- PROFILE JULY 2010
- PROFILE SEPTEMBER 2010
- PROFILE 2011
- PROFILE 2012

NOTE:

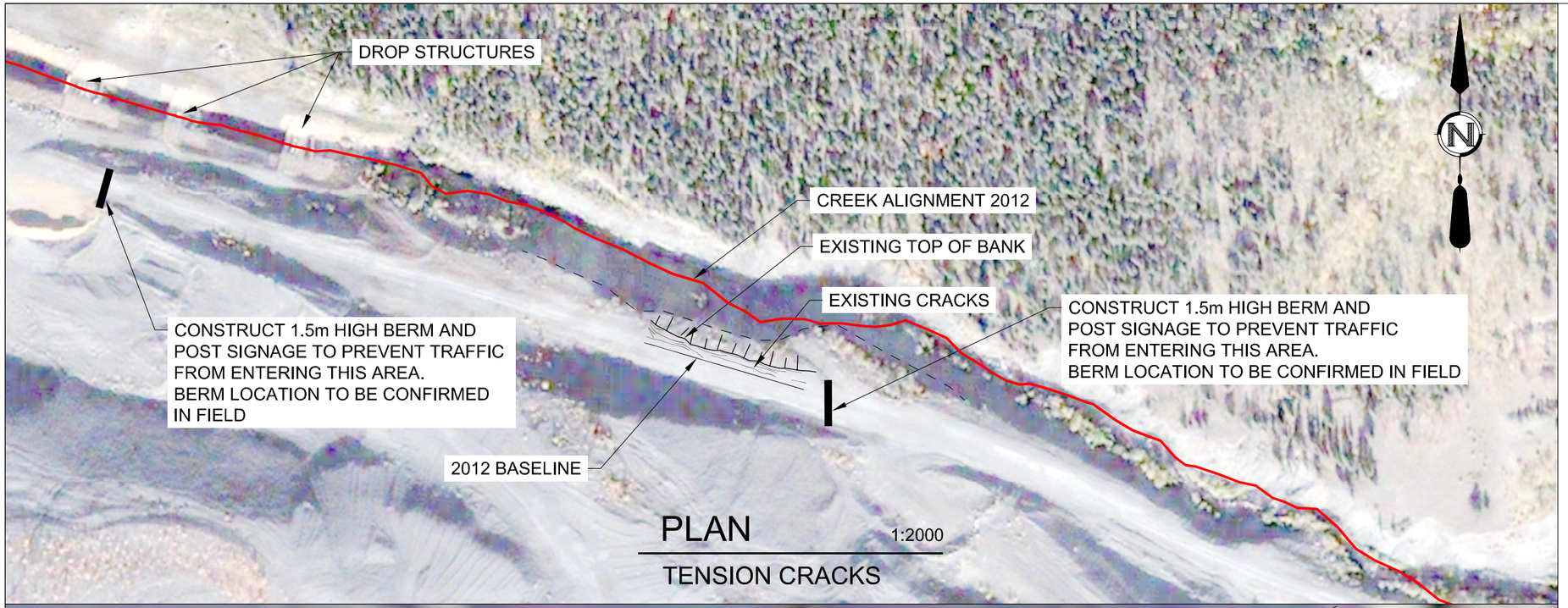
1) 2006 CREEK PROFILE SURVEY COULD NOT BE RECONCILED WITH BASELINE SURVEY.

2) 2007 SURVEY TERMINATED AT STATION 1+025m

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Wolverine Creek Profile

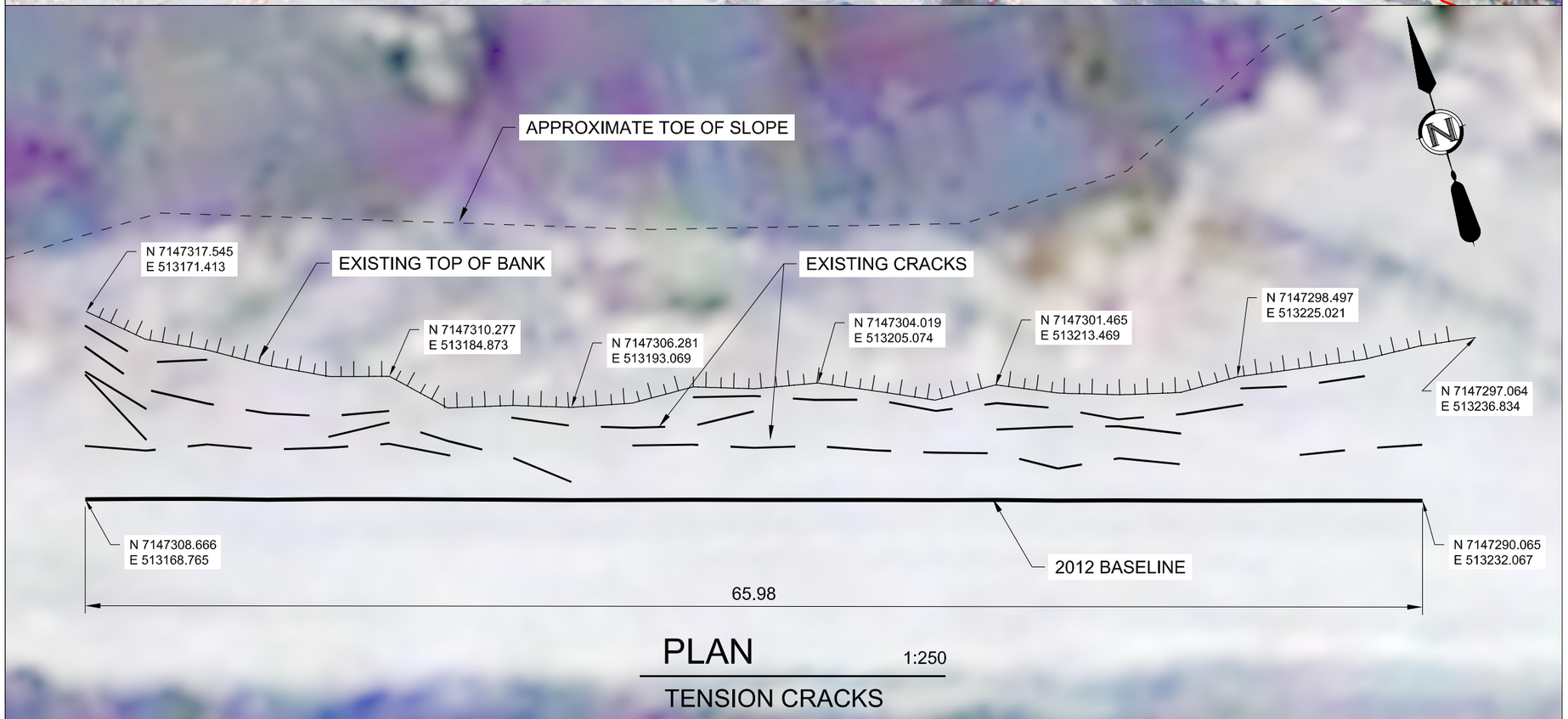
Dwg. No.: 2857-00-SK015
Date: Oct. 9, 2012

Associated Engineering



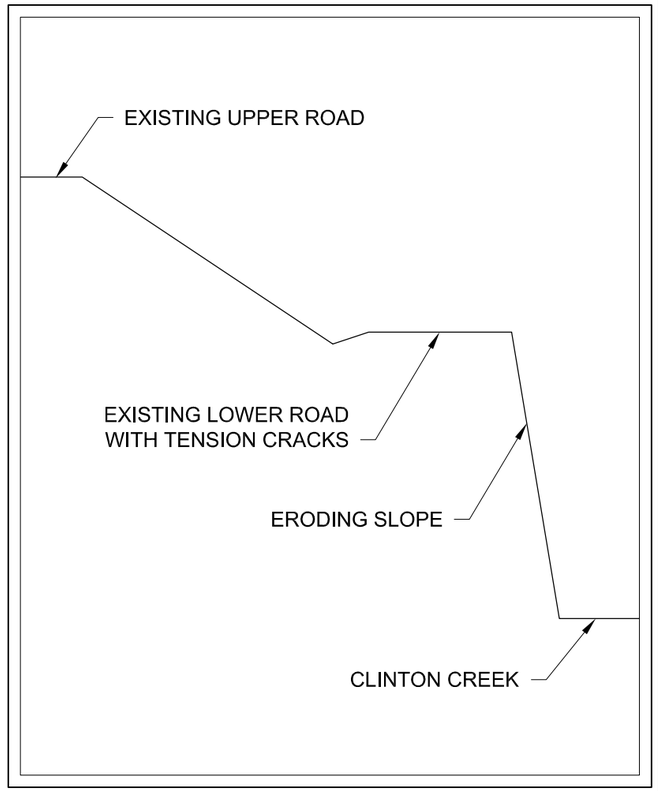
PLAN 1:2000

TENSION CRACKS



PLAN 1:250

TENSION CRACKS



SECTION NTS

TYPICAL ROAD

Government of Yukon
Clinton Creek Long Term Monitoring
Clinton Creek Road Tension Cracks

Dwg. No.: 2857-00-SK016
Date: Oct. 5, 2012

Associated Engineering

Appendix A - Monitoring Instructions and Underhill Geomatics Survey Results

Government of Yukon
Former Clinton Creek Asbestos Mine
2012 Performance Monitoring and Survey Program

Tasks:

1. Set-up GPS base station near Mill Site at BM-U1086.

2. Check control points to confirm BM-U1086 is stable

3. Once control has been verified start survey of movement monitoring points.

4. Waste Rock Pile Movement Monitors:
    - Setup RTK base station on Waste Rock pile at U2836,
    - Face Clinton Creek (CC) when surveying points,
    - **Survey ground level at the base of the pin on the side of the pin furthest from the creek.**
    - Deliverable: spreadsheet with monitor point name, UTM Coords and Elev

5. Porcupine Pit Slope Monitors:
    - Face the open pit when surveying,
    - **Survey ground level at the base of the pin on the side of the pin furthest from the pit.**
    - Deliverable: spreadsheet with monitor point name, UTM Coords and Elev

6. Clinton Creek Channel Stabilization – Drop Structure Monitoring:
    - **Movement Monitor Pins** # 1450 to 1465 located at the four corners of each drop structure
    - Face creek when surveying,
    - **survey ground level at the base of the pin on the side of the pin furthest from the creek.**
        i. Deliverable: spreadsheet with monitor point name, UTM Coords and Elev

    - **Survey cross-sections** #1 to #8 of drop structures along the line between the two sets of movement monitoring pins at each structure. As a minimum, take survey shots on top of the gabions every other basket (1m interval) including top of slope, mid-slope, toe of slope and centerline.
        i. Deliverable: drawing file with plan and sections

7. Clinton Creek Centreline Profile Survey:
    - Establish TBM's (check 2004/2006/2008 survey files for locations),
    - Start at Station 0+00m (see Table below for co-ordinates),
    - Survey from Station 0+000 to 0+800 m
    - Deliverable: drawing file with plan and profile

Clinton Creek Profile Survey: Station Co-ordinates

STATION (m)	NORTHING	EASTING
0+000	7,147,427	512,863
0+250	7,147,366	513,113
0+500	7,147,272	513,363
0+750	7,147,204	513,613
	UTM NAD 83 Zone 7W	

8. Tailings Movement Monitors:
    - Setup RTK base station near crest of tailings pile (U 2834),
    - Face Wolverine Creek when surveying,
    - **Survey ground level at the base of the pin on the side furthest from the creek.**
    - Deliverable: spreadsheet with monitor point name, UTM Coords and Elev

9. Wolverine Creek Centreline Profile Survey (ref: Drawing 7):
    - Establish TBM's if required (check 2003 / 2008 survey for locations),
    - Start at Station 0+700 m (see Table below for co-ordinates),
    - Survey from Station 0+700 to 1+500 m ***(PLEASE NOTE THAT THE STATION NUMBERS INCREASE IN THE UPSTREAM DIRECTION AS SHOWN ON THE ATTACHED DRAWING)***
    - Deliverable: drawing file with plan and profile

Wolverine Creek Profile Survey: Station Co-ordinates

STATION (m)	NORTHING	EASTING
0+000	7,147,095.6	514,193.4
0+700	7,147,686.5	514,162.7
0+800	7,147,770.0	514,118.3
1+000	7,147,920.0	514,000.3
1+200	7,148,110.0	513,988.8
1+500	7,148,379.0	513,946.2
	UTM NAD 83 Zone 7W	

10. Miscellaneous Surveys:

- Complete cross-section surveys at the gabion drop structures at the locations labeled as Sections A, B and C on Drawing 2 of the monitoring protocol package.
- Complete additional cross-sections at D, and E as shown on Drawing 2 of the monitoring protocol.
- Survey the crest of the waste rock pile slope along the Clinton Creek Channel. To avoid walking out to the edge of the waste rock pile slope, a consistent offset from the edge could be used to complete the survey.
- Deliverable: drawing file that can be used by CADD operators to prepare site plans, cross-sections etc.
- Survey of airphoto targets and photo ID's.
- Install new markers 991, 987, 993, 990, 988, 995, 992, 989, 994 to replace lost markers.
- Survey of tension cracking and baseline along Clinton Creek Access Road above the Clinton Creek Channel.

CONTROL AND ROCK WASTE MOVEMENT

CLINTON CREEK LONG TERM PERFORMANCE MONITORING PROGRAM (August 2012)

UTM COORDINATES

NAD 83, Zone 7, 141º West

CONTROL			
	NORTHING	EASTING	OTHOMETRIC HEIGHT
1086	7147972.219	513176.710	590.955
1192	7147563.984	512278.758	441.231
2834	7148172.682	513447.669	606.910
2835	7147272.749	513147.083	432.717
939	7147561.644	512099.139	451.644

Coordinates are NAD 83 UTM grid, derived from a least squares adjustment of GPS observations holding values of stations 1192 and 1086 fixed in 3D.

CLINTON CREEK WASTE ROCK DUMP MOVEMENT MONITORING			
	NORTHING	EASTING	ORTHOMETRIC HEIGHT
2835	7147272.749	513147.083	432.717
68	7147262.121	513142.278	434.071
224	7147241.290	512963.241	444.592
226	7147311.764	513066.580	426.029
229	7147113.628	512718.973	437.230
1195	7147112.063	512899.516	456.394
1196	7147231.443	513066.351	443.695
1831	7147227.620	512766.443	432.446
1833	7147303.023	512921.182	418.424
1834	7146973.818	512893.360	460.964
20-A	7147207.977	513057.208	445.503
21-A	7147228.426	512915.068	446.164
22-A	7147224.674	512841.195	444.501
81-2	7147205.373	513011.599	443.588
BH-10 (P2)	7147354.837	512999.425	415.814
4	7147211.013	513193.620	434.867
19-A	7147126.697	513363.545	428.402
26	not found		
MM80-13	7147299.346	513183.823	413.132
MM81-1	7147034.859	512978.943	455.090
84-1	destroyed		
217	destroyed		
220	destroyed		
223	7146978.247	512942.759	467.053
225	7146918.891	512905.205	475.015
227	7147076.892	513124.809	439.330
228	Not tied under +/- 1m of fill		
1194	7147017.625	513472.473	433.019
1839 F	not found		
BH-9 (P3)	7147309.369	513135.541	414.944
BH-7 (P4)	7147239.441	513347.495	397.167
BH-8 (P5)	7147182.938	513461.403	387.212
XS-B	7147293.706	513274.186	404.286
XS-E	destroyed		
19-B	7147124.412	513365.730	428.521
2836	7146814.712	513092.919	477.532
222	7147265.379	513333.031	399.675
220	destroyed		
219	7147288.622	513273.575	405.589
XS-A	destroyed		
69	7147329.208	513138.523	416.401
1824	7147343.336	513082.316	415.860
BH-4	7146871.287	513025.113	470.979
BH-4CABLE	7146871.327	513025.215	470.960
BH-1	7146863.977	513381.477	422.834
BH-1CABLE	7146863.892	513380.954	422.887
570S?	7146977.651	513497.399	436.582
NO TAG	7146927.556	513026.964	468.878
NO TAG	7146818.487	513088.619	477.658
NO TAG	7146814.028	513201.216	443.204

NO TAG	7147292.158	513274.617	404.567	

2012 NEW MOVEMENT MONITOR				
MM994	7147353.723	513040.008	416.132	Replace XS-G
MM993	7147307.433	513182.312	414.600	Replace 217
MM992	7147304.461	513189.107	413.734	Replace XS-A
MM991	7147266.386	513284.236	403.595	Replace 80-14
MM987	7147177.889	513504.727	380.786	Replace 84-1
MM988	7147208.175	513432.054	388.897	Replace 220
MM989	7147209.022	513433.401	388.668	Replace XS-E
MM990	7147210.996	513440.569	388.355	Replace 218
MM995	7147323.081	512802.482	413.766	

PORCUPINE PIT SLOPE

CLINTON CREEK LONG TERM PERFORMANCE MONITORING PROGRAM (August 2012)

UTM COORDINATES
NAD 83, Zone 7, 141º West

PORCUPINE PIT AREA MOVEMENT MONITORING			
	NORTHING	EASTING	ORTHOMETRIC HEIGHT
1839	7146861.402	513285.135	428.155
U1493	7146802.293	513576.564	452.636
1830	7146523.832	513455.650	471.666
1832	7146537.074	513483.127	473.633
1837	7146502.930	513411.428	470.236
1838	7146491.928	513380.501	468.352

GABION 1 TO 8

CLINTON CREEK LONG TERM PERFORMANCE MONITORING PROGRAM (August 2012)

UTM COORDINATES

NAD 83, Zone 7, 141° West

CROOS SECTION OF GABION 1 TO 8
MOVEMENT MONITORS (#1450 TO 1465)

	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2835	7147272.749	513147.083	432.717	Real Time Kinematic base for Gabion cross sections

GABION 1

	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2000	7147413.416	512888.046	413.375	OG
2001	7147413.800	512888.130	413.360	OG
2002	7147413.863	512888.131	413.483	1451 TOP
2003	7147414.419	512888.153	413.361	GABION
2004	7147416.008	512888.414	413.052	GABION
2005	7147416.740	512888.432	413.054	GABION
2006	7147417.006	512888.443	413.517	GABION
2007	7147417.904	512888.508	413.424	GABION
2008	7147418.011	512888.507	412.945	GABION
2009	7147418.823	512888.563	412.727	GABION
2010	7147420.813	512888.720	412.116	GABION
2011	7147422.449	512888.910	411.563	GABION
2012	7147423.328	512888.924	411.253	GABION
2013	7147423.397	512888.949	411.063	GABION
2014	7147424.175	512889.031	411.066	GABION
2015	7147425.651	512889.078	411.090	GABION
2016	7147426.966	512889.152	411.127	GABION
2017	7147429.347	512889.472	411.035	GABION
2018	7147430.771	512889.523	411.077	GABION
2019	7147431.448	512889.581	411.240	GABION
2020	7147431.580	512889.547	411.388	GABION
2021	7147433.373	512889.619	412.050	GABION
2022	7147435.479	512889.777	412.710	GABION
2023	7147437.090	512889.906	412.968	GABION
2024	7147437.311	512889.832	413.436	GABION
2025	7147437.701	512889.944	413.595	GABION
2026	7147438.108	512889.873	413.566	GABION
2027	7147438.293	512889.933	413.193	GABION
2028	7147439.058	512889.926	413.283	GABION
2029	7147440.070	512890.055	413.522	OG
2030	7147441.112	512890.122	413.617	OG
2031	7147441.577	512890.169	413.634	OG
2032	7147441.216	512890.146	413.739	1450 TOP

GABION 2

	NORTHING	EASTING	ORTHOMETRIC HEIGHT		
2033	7147439.450	512901.610	413.149	OG	
2034	7147438.917	512901.485	413.069	OG	
2035	7147439.024	512901.504	413.225	1453 TOP	Found 1453 disturbed, place new rebar
2036	7147437.932	512901.201	412.769	OG	
2037	7147436.771	512900.785	412.058	OG	
2038	7147434.971	512900.148	411.689	GABION	
2039	7147434.281	512899.913	411.594	GABION	
2040	7147432.487	512899.267	410.924	GABION	
2041	7147432.170	512899.156	410.657	GABION	
2042	7147431.531	512899.000	410.441	GABION	
2043	7147430.140	512898.537	410.363	GABION	
2044	7147429.074	512898.162	409.780	GABION	
2045	7147427.197	512897.664	409.720	GABION	
2046	7147425.125	512897.121	409.652	GABION	
2047	7147423.256	512896.147	409.655	GABION	
2048	7147422.379	512895.801	409.772	GABION	
2049	7147420.476	512895.226	410.272	GABION	
2050	7147418.533	512894.481	410.930	GABION	

2051	7147416.719	512893.829	411.417	GABION
2052	7147415.423	512893.293	411.675	GABION
2053	7147414.912	512893.104	411.824	OG
2054	7147414.171	512892.873	411.944	OG
2055	7147412.043	512892.029	412.867	OG
2056	7147411.727	512891.900	412.935	OG
2057	7147411.947	512891.995	413.078	1452 TOP

GABION 3					
	NORTHING	EASTING	ORTHOMETRIC HEIGHT		
2058	7147397.202	512939.987	411.877	OG	
2059	7147397.107	512939.940	412.012	1455 TOP	
2060	7147398.151	512940.315	411.775	OG	
2061	7147398.532	512940.344	411.869	OG	
2062	7147399.946	512940.905	411.613	GABION	
2063	7147400.012	512940.835	411.822	GABION	
2064	7147400.099	512940.898	411.882	GABION	
2065	7147400.410	512941.013	411.811	GABION	
2066	7147402.691	512941.796	411.016	GABION	
2067	7147405.198	512942.660	410.213	GABION	
2068	7147405.972	512942.914	410.060	GABION	
2069	7147406.215	512942.955	409.907	GABION	
2070	7147407.026	512943.280	409.708	GABION	
2071	7147407.781	512943.625	409.572	GABION	
2072	7147409.466	512944.135	409.566	GABION	
2073	7147411.146	512944.803	409.603	GABION	
2074	7147412.051	512945.107	409.560	GABION	
2075	7147413.106	512945.384	409.666	GABION	
2076	7147413.597	512945.426	409.930	GABION	
2077	7147414.255	512945.667	410.238	GABION	
2078	7147416.026	512946.194	410.946	GABION	
2079	7147417.593	512946.717	411.474	GABION	
2080	7147419.107	512947.197	412.020	GABION	
2081	7147419.895	512947.439	412.321	GABION	
2082	7147420.232	512947.545	412.308	GABION	
2083	7147420.298	512947.548	412.099	GABION	
2084	7147421.092	512947.921	412.186	OG	
2085	7147422.164	512948.281	412.326	OG	
2086	7147422.991	512948.508	412.332	OG	
2087	7147423.940	512948.782	412.207	OG	
2088	7147423.168	512948.559	412.392	1454 TOP	Found 1454 disturbed, place new rebar

GABION 4				
	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2089	7147420.926	512958.017	410.624	OG
2090	7147420.091	512957.932	410.508	OG
2091	7147420.437	512957.960	410.703	1457 TOP
2092	7147418.712	512957.541	410.185	OG
2093	7147418.396	512957.397	410.001	OG
2094	7147416.833	512957.097	409.678	GABION
2095	7147416.566	512957.004	409.678	GABION
2096	7147414.182	512956.406	408.708	GABION
2097	7147411.678	512955.760	407.702	GABION
2098	7147411.002	512955.537	407.560	GABION
2099	7147410.535	512955.465	407.308	GABION
2100	7147409.871	512955.401	407.123	GABION
2101	7147409.493	512955.240	407.048	GABION
2102	7147408.087	512954.960	407.016	GABION
2103	7147406.934	512954.577	406.903	GABION
2104	7147405.108	512954.116	406.996	GABION
2105	7147403.765	512953.774	407.028	GABION
2106	7147402.299	512953.339	407.685	GABION
2107	7147400.264	512952.900	408.233	GABION
2108	7147398.291	512952.416	408.719	GABION
2109	7147397.200	512952.105	409.071	GABION
2110	7147396.772	512952.039	409.102	GABION
2111	7147396.636	512952.057	409.096	GABION
2112	7147395.003	512951.761	409.712	OG
2113	7147393.841	512951.476	410.535	OG
2114	7147393.255	512951.314	410.812	OG
2115	7147392.672	512951.186	411.223	OG
2116	7147391.449	512950.860	411.337	OG
2117	7147393.000	512951.314	410.960	1456 TOP

GABION 5					
	NORTHING	EASTING	ORTHOMETRIC HEIGHT		
2118	7147384.876	512979.915	409.445	OG	
2176	7147386.459	512980.310	409.436	1459A TOP	Found 1459 lost, place new rebar
2119	7147386.549	512980.270	409.277	OG	
2120	7147387.705	512980.505	409.083	OG	
2121	7147388.242	512980.565	409.121	OG	
2122	7147389.121	512980.860	408.957	GABION	
2123	7147389.227	512980.872	408.991	GABION	
2124	7147390.661	512981.347	408.497	GABION	
2125	7147392.575	512981.876	407.786	GABION	
2126	7147393.401	512982.198	407.442	GABION	
2127	7147393.500	512982.240	407.378	GABION	
2128	7147394.073	512982.421	407.299	GABION	
2129	7147394.994	512982.747	406.901	GABION	
2130	7147395.297	512982.837	406.771	GABION	
2131	7147396.577	512983.200	406.689	GABION	
2132	7147397.546	512983.467	406.683	GABION	
2133	7147398.097	512983.573	406.758	GABION	
2134	7147399.463	512983.921	406.635	GABION	
2135	7147400.638	512984.156	406.784	GABION	
2136	7147401.287	512984.332	406.806	GABION	
2137	7147402.082	512984.479	407.013	GABION	
2138	7147403.793	512984.887	407.678	GABION	
2139	7147405.266	512985.200	408.280	GABION	
2140	7147407.228	512985.620	408.976	GABION	
2141	7147408.190	512985.858	409.329	GABION	
2142	7147408.369	512985.876	409.469	GABION	
2143	7147409.115	512986.119	409.722	GABION	
2144	7147409.807	512986.333	409.843	OG	
2145	7147411.864	512986.886	409.698	OG	
2146	7147413.511	512987.182	409.629	OG	
2147	7147412.104	512986.873	409.830	1458 TOP	

GABION 6					
	NORTHING	EASTING	ORTHOMETRIC HEIGHT		
2148	7147410.100	512995.859	408.444	1461 TOP	Found 1461 disturbed, place new rebar
2149	7147411.269	512996.224	408.459	OG	
2150	7147410.297	512995.977	408.327	OG	
2151	7147409.380	512995.687	408.219	OG	
2152	7147407.460	512995.214	407.363	OG	
2153	7147406.870	512995.189	407.340	GABION	
2154	7147406.524	512995.077	407.342	GABION	
2155	7147406.077	512994.911	407.097	GABION	
2156	7147404.184	512994.305	406.343	GABION	
2157	7147402.496	512993.776	405.764	GABION	
2158	7147401.585	512993.515	405.393	GABION	
2159	7147401.473	512993.498	405.328	GABION	
2160	7147400.858	512993.277	405.202	GABION	
2161	7147400.499	512993.254	404.998	GABION	
2162	7147399.779	512993.247	404.704	GABION	
2163	7147398.468	512992.828	404.588	GABION	
2164	7147397.783	512992.646	404.485	GABION	
2165	7147394.405	512991.882	404.559	GABION	
2166	7147392.738	512991.345	404.797	GABION	
2167	7147392.153	512991.308	404.954	GABION	
2168	7147391.664	512990.975	405.323	GABION	
2169	7147390.856	512990.859	405.574	GABION	
2170	7147388.462	512990.144	406.130	GABION	
2171	7147386.734	512989.829	406.617	GABION	
2172	7147385.694	512989.565	407.191	OG	
2173	7147383.950	512989.060	408.747	OG	
2174	7147383.112	512988.917	409.028	OG	
2175	7147381.046	512988.406	409.021	OG	
2177	7147381.546	512988.486	409.150	1460A TOP	Found 1460 lost, place new rebar

GABION 7				
	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2178	7147373.949	513025.988	407.592	1463 TOP
2179	7147372.595	513025.586	407.388	OG
2180	7147374.058	513026.112	407.462	OG
2181	7147374.876	513026.364	407.369	OG
2182	7147376.220	513026.763	407.437	OG
2183	7147376.898	513026.908	406.984	GABION
2184	7147377.199	513027.001	406.921	GABION

2185	7147378.643	513027.366	406.320	GABION	
2186	7147380.268	513027.860	405.663	GABION	
2187	7147381.844	513028.336	405.045	GABION	
2188	7147382.395	513028.491	405.011	GABION	
2189	7147382.677	513028.620	404.838	GABION	
2190	7147383.429	513028.834	404.644	GABION	
2191	7147384.117	513029.032	404.678	GABION	
2192	7147384.855	513029.266	404.585	GABION	
2193	7147386.104	513029.553	404.617	GABION	
2194	7147387.233	513029.856	404.530	GABION	
2195	7147388.939	513030.378	404.601	GABION	
2196	7147389.803	513030.621	404.627	GABION	
2197	7147390.495	513030.726	404.877	GABION	
2198	7147392.727	513031.245	405.748	GABION	
2199	7147395.060	513031.777	406.724	GABION	
2200	7147396.596	513032.180	407.341	GABION	
2201	7147396.871	513032.251	407.310	GABION	
2202	7147397.079	513032.355	407.392	OG	
2203	7147397.312	513032.403	407.166	OG	
2204	7147399.182	513032.931	407.351	OG	
2205	7147401.520	513033.594	407.235	OG	
2206	7147402.926	513034.140	407.142	OG	
2207	7147401.846	513033.694	407.316	1462A TOP	Found 1462 lost, place new rebar

GABION 8				
	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2208	7147399.400	513040.309	406.228	1465 TOP
2209	7147399.829	513040.353	406.079	OG
2210	7147398.207	513039.957	405.984	OG
2211	7147396.987	513039.774	405.591	OG
2212	7147396.370	513039.784	405.227	OG
2213	7147395.987	513039.673	404.686	OG
2214	7147395.266	513039.399	404.671	OG
2215	7147394.674	513039.371	404.258	GABION
2216	7147393.288	513039.195	402.416	GABION
2217	7147392.774	513039.018	402.138	GABION
2218	7147392.526	513038.951	401.481	GABION
2219	7147391.952	513038.765	401.604	GABION
2220	7147391.752	513038.725	401.151	GABION
2221	7147391.658	513038.731	401.054	GABION
2222	7147391.161	513038.599	401.196	GABION
2223	7147390.938	513038.425	400.798	GABION
2224	7147390.408	513038.162	400.611	GABION
2225	7147389.704	513038.043	400.737	GABION
2226	7147389.652	513037.874	401.507	GABION
2227	7147388.691	513037.737	401.520	GABION
2228	7147388.424	513037.896	402.129	GABION
2229	7147387.615	513037.833	402.111	GABION
2230	7147387.426	513037.774	402.720	GABION
2231	7147386.767	513037.587	402.711	GABION
2232	7147385.676	513037.294	402.827	GABION
2233	7147385.486	513037.364	402.305	GABION
2234	7147384.003	513037.017	402.564	GABION
2235	7147381.688	513036.792	402.547	GABION
2236	7147381.252	513036.746	402.238	GABION
2237	7147380.627	513036.644	402.171	GABION
2238	7147380.344	513036.595	401.582	GABION
2239	7147378.557	513036.283	401.348	GABION
2240	7147377.134	513036.066	402.030	GABION
2241	7147375.849	513035.931	402.657	GABION
2242	7147374.433	513035.748	403.388	OG
2243	7147373.355	513036.143	404.833	OG
2244	7147372.311	513036.294	405.323	OG
2245	7147372.005	513036.264	406.014	OG
2246	7147371.371	513036.396	406.407	OG
2247	7147370.407	513036.508	406.625	OG
2248	7147369.153	513036.373	406.715	OG
2249	7147369.543	513036.557	406.792	1464 TOP

CLINTON CREEK CL AND CREST

CLINTON CREEK LONG TERM PERFORMANCE MONITORING PROGRAM (August 2012)

UTM COORDINATES

NAD 83, Zone 7, 141º West

CLINTON CREEK CENTRE LINE

	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2835	7147272.749	513147.083	432.717	RTK base for Clinton Creek CL
3000	7147426.693	512851.350	410.535	CL CK
3001	7147426.903	512853.776	411.287	CL CK
3002	7147427.272	512857.928	411.304	CL CK
3003	7147427.358	512867.316	411.096	CL CK
3004	7147427.357	512875.781	411.215	CL CK
3005	7147427.242	512882.336	410.953	CL CK
3006	7147427.389	512887.698	411.290	CL CK
3007	7147427.382	512887.933	411.586	CL CK
3008	7147427.331	512888.811	411.450	CL CK
3009	7147427.273	512888.931	411.164	CL CK
3010	7147427.171	512889.695	411.027	CL CK
3011	7147427.123	512889.874	410.638	CL CK
3012	7147426.648	512892.007	410.618	CL CK
3013	7147426.596	512892.220	410.147	CL CK
3014	7147426.213	512894.386	410.230	CL CK
3015	7147426.101	512894.606	410.058	CL CK
3016	7147425.941	512895.235	409.827	CL CK
3017	7147425.439	512897.290	409.701	CL CK
3018	7147425.237	512897.557	410.067	CL CK
3019	7147425.176	512898.208	410.052	CL CK
3020	7147425.081	512898.477	409.712	CL CK
3021	7147424.040	512901.973	409.554	CL CK
3022	7147423.909	512902.271	409.245	CL CK
3023	7147421.506	512910.387	409.487	CL CK
3024	7147418.366	512921.671	409.697	CL CK
3025	7147414.472	512931.624	409.708	CL CK
3026	7147410.540	512942.874	409.850	CL CK
3027	7147410.479	512943.069	410.159	CL CK
3028	7147410.156	512943.780	410.024	CL CK
3029	7147410.044	512944.070	409.641	CL CK
3030	7147409.785	512944.672	409.535	CL CK
3031	7147409.664	512944.807	409.160	CL CK
3032	7147409.130	512946.660	408.977	CL CK
3033	7147408.987	512946.750	408.616	CL CK
3034	7147408.503	512948.441	408.616	CL CK
3035	7147408.416	512948.740	408.149	CL CK
3036	7147407.862	512950.387	408.070	CL CK
3037	7147407.773	512950.727	407.594	CL CK
3038	7147407.420	512952.359	407.440	CL CK

3039	7147407.388	512952.548	407.078	CL CK
3040	7147406.475	512956.188	407.036	CL CK
3041	7147405.525	512958.967	407.045	CL CK
3042	7147405.477	512959.164	407.254	CL CK
3043	7147405.294	512959.847	407.345	CL CK
3044	7147405.229	512959.982	406.942	CL CK
3045	7147402.748	512968.373	406.427	CL CK
3046	7147400.338	512976.537	406.854	CL CK
3047	7147398.837	512981.939	406.754	CL CK
3048	7147398.798	512982.122	407.192	CL CK
3049	7147398.634	512983.025	407.089	CL CK
3050	7147398.160	512983.963	406.653	CL CK
3051	7147398.080	512984.132	406.246	CL CK
3052	7147397.744	512985.992	406.071	CL CK
3053	7147397.626	512986.182	405.609	CL CK
3054	7147397.183	512987.829	405.556	CL CK
3055	7147397.138	512987.989	405.163	CL CK
3056	7147396.501	512989.653	405.068	CL CK
3057	7147396.436	512989.813	404.670	CL CK
3058	7147395.831	512992.438	404.657	CL CK
3059	7147395.472	512995.150	404.636	CL CK
3060	7147395.407	512995.377	405.124	CL CK
3061	7147395.289	512996.187	405.098	CL CK
3062	7147395.231	512996.266	404.619	CL CK
3063	7147394.852	513001.060	404.743	CL CK
3064	7147393.341	513006.038	404.777	CL CK
3065	7147390.587	513016.643	405.002	CL CK
3066	7147387.297	513026.935	404.655	CL CK
3067	7147387.021	513028.075	404.966	CL CK
3068	7147386.960	513028.501	405.116	CL CK
3069	7147386.627	513029.220	405.014	CL CK
3070	7147386.517	513029.401	404.628	CL CK
3071	7147386.482	513029.983	404.526	CL CK
3072	7147386.408	513030.151	404.204	CL CK
3073	7147386.058	513031.759	404.120	CL CK
3074	7147385.972	513032.069	403.751	CL CK
3075	7147385.659	513033.698	403.744	CL CK
3076	7147385.499	513034.066	403.242	CL CK
3077	7147385.203	513035.660	403.264	CL CK
3078	7147385.141	513035.850	402.919	CL CK
3079	7147384.825	513036.790	402.791	CL CK
3080	7147384.770	513037.028	402.555	CL CK
3081	7147384.354	513038.928	402.542	CL CK
3082	7147384.612	513042.081	397.792	CL CK
3083	7147384.712	513044.550	398.121	CL CK
3084	7147382.930	513052.774	397.957	CL CK
3085	7147382.070	513056.804	398.155	CL CK
3086	7147381.447	513060.111	398.334	CL CK
3087	7147380.601	513063.260	397.812	CL CK
3088	7147378.945	513070.744	397.455	CL CK
3089	7147375.785	513080.595	397.741	CL CK
3090	7147370.553	513084.776	397.609	CL CK
3091	7147367.660	513090.407	397.410	CL CK
3092	7147368.735	513098.868	397.230	CL CK
3093	7147367.321	513107.563	397.127	CL CK

3094	7147364.591	513114.397	397.062	CL CK
3095	7147363.251	513121.819	397.151	CL CK
3096	7147360.890	513128.017	396.613	CL CK
3097	7147359.063	513131.993	396.756	CL CK
3098	7147356.406	513137.522	396.192	CL CK
3099	7147353.993	513141.196	396.222	CL CK
3100	7147350.001	513149.526	396.318	CL CK
3101	7147345.491	513160.530	395.934	CL CK
3102	7147340.403	513170.264	395.830	CL CK
3103	7147335.894	513180.064	395.521	CL CK
3104	7147332.285	513192.099	394.651	CL CK
3105	7147324.425	513201.865	393.484	CL CK
3106	7147321.013	513208.756	392.339	CL CK
3107	7147316.806	513214.791	392.669	CL CK
3108	7147318.145	513223.298	392.307	CL CK
3109	7147317.986	513232.311	392.098	CL CK
3110	7147316.217	513238.447	391.906	CL CK
3111	7147316.348	513247.036	391.219	CL CK
3112	7147315.251	513255.240	391.144	CL CK
3113	7147314.924	513260.293	391.007	CL CK
3114	7147315.669	513266.347	390.596	CL CK
3115	7147317.484	513272.207	390.237	CL CK
3116	7147310.481	513288.468	389.552	CL CK
3117	7147304.393	513294.374	389.325	CL CK
3118	7147300.050	513301.720	389.150	CL CK
3119	7147296.721	513306.656	388.667	CL CK
3120	7147293.580	513312.174	388.219	CL CK
3121	7147292.155	513317.319	388.023	CL CK
3122	7147292.407	513321.227	387.897	CL CK
3123	7147291.966	513323.146	387.133	CL CK
3124	7147290.391	513328.565	387.347	CL CK
3125	7147287.684	513336.828	386.899	CL CK
3126	7147285.209	513343.486	386.834	CL CK
3127	7147284.305	513346.542	386.230	CL CK
3128	7147278.186	513355.109	386.201	CL CK
3129	7147274.046	513361.951	385.676	CL CK
3130	7147271.813	513367.669	385.463	CL CK
3131	7147263.288	513378.960	385.170	CL CK
3132	7147260.184	513383.110	384.980	CL CK
3133	7147259.658	513386.963	383.928	CL CK
3134	7147256.704	513395.870	384.139	CL CK
3135	7147253.493	513404.221	384.128	CL CK
3136	7147252.045	513410.923	383.836	CL CK
3137	7147247.279	513417.426	382.995	CL CK
3138	7147245.609	513422.282	382.736	CL CK
3139	7147243.302	513427.170	382.002	CL CK
3140	7147242.831	513435.054	382.242	CL CK
3141	7147235.704	513443.202	381.658	CL CK
3142	7147227.096	513450.486	381.408	CL CK
3143	7147222.645	513457.697	381.228	CL CK
3144	7147218.083	513467.766	380.773	CL CK
3145	7147213.741	513474.800	380.557	CL CK
3146	7147206.870	513483.347	379.643	CL CK
3147	7147204.395	513489.722	379.280	CL CK
3148	7147197.106	513494.551	379.004	CL CK

3149	7147192.315	513500.421	378.987	CL CK
3150	7147187.516	513511.437	378.613	CL CK
3151	7147177.276	513524.131	378.183	CL CK
3152	7147171.153	513530.181	378.006	CL CK
3153	7147163.410	513535.850	377.787	CL CK
3154	7147153.060	513546.261	377.267	CL CK
3155	7147147.404	513554.226	377.268	CL CK
3156	7147144.272	513562.310	376.942	CL CK
3157	7147140.826	513573.977	376.602	CL CK
3158	7147138.793	513582.962	376.647	CL CK
3159	7147134.916	513592.682	376.221	CL CK
3160	7147130.201	513601.031	376.189	CL CK
3161	7147124.266	513608.412	375.737	CL CK
3162	7147119.302	513613.724	375.142	CL CK
3163	7147116.278	513618.415	375.318	CL CK
3164	7147112.921	513626.647	374.675	CL CK
3165	7147111.163	513647.888	374.394	CL CK
3166	7147107.805	513659.070	374.162	CL CK
3167	7147102.399	513666.531	373.765	CL CK
3168	7147101.312	513673.457	373.531	CL CK
3169	7147375.675	513086.775	397.956	CL CK 2
3170	7147372.867	513094.134	397.617	CL CK 2
3171	7147313.626	513281.651	389.927	CL CK D
3172	7147300.207	513306.078	388.977	CL CK 2
3173	7147301.970	513309.918	388.399	CL CK 2
3174	7147301.777	513314.443	388.355	CL CK 2
3175	7147297.554	513321.955	387.778	CL CK 2
3176	7147269.899	513373.171	385.149	CL CK D
3177	7147258.945	513379.818	385.213	CL CK 2
3178	7147253.579	513382.264	385.002	CL CK 2
3179	7147246.064	513390.757	384.714	CL CK 2
3180	7147245.384	513391.758	383.808	CL CK 2
3181	7147239.000	513399.554	383.816	CL CK 2
3182	7147232.826	513407.933	383.328	CL CK 2
3183	7147235.150	513413.420	383.355	CL CK 2
3184	7147239.923	513419.637	383.076	CL CK 2
3185	7147241.433	513422.495	382.366	CL CK 2
3186	7147111.938	513637.174	374.589	CL CK/CL RD

CLINTON CREEK CL AND CREST				
TOP OF CREST ALONG CLINTON CREEK				
	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2835	7147272.749	513147.083	432.717	RTK base for Clinton Creek CL
3200	7147375.862	513027.039	407.328	TOP CREST
3201	7147374.098	513028.041	407.142	TOP CREST
3202	7147371.642	513031.278	406.859	TOP CREST
3203	7147371.390	513036.152	406.376	TOP CREST
3204	7147370.113	513041.846	406.307	TOP CREST
3205	7147367.564	513044.342	406.408	TOP CREST
3206	7147366.599	513047.014	406.330	TOP CREST
3207	7147366.306	513052.344	406.630	TOP CREST
3208	7147364.642	513055.141	407.415	TOP CREST
3209	7147360.315	513055.731	410.820	TOP CREST
3210	7147356.926	513058.116	413.524	TOP CREST
3211	7147356.308	513059.327	413.250	TOP CREST
3212	7147354.068	513066.369	413.585	TOP CREST
3213	7147352.515	513071.105	413.827	TOP CREST
3214	7147351.333	513077.708	414.430	TOP CREST
3215	7147351.434	513084.731	414.700	TOP CREST
3216	7147350.385	513086.736	415.681	TOP CREST
3217	7147350.070	513088.433	414.986	TOP CREST
3218	7147349.035	513092.785	415.020	TOP CREST
3219	7147346.811	513099.588	415.177	TOP CREST
3220	7147345.197	513105.804	414.807	TOP CREST
3221	7147346.751	513107.151	413.804	TOP CREST
3222	7147347.479	513111.205	412.789	TOP CREST
3223	7147346.479	513115.791	412.596	TOP CREST
3224	7147342.071	513123.050	414.023	TOP CREST
3225	7147340.097	513123.709	414.540	TOP CREST
3226	7147340.144	513126.044	414.517	TOP CREST
3227	7147339.049	513129.703	414.603	TOP CREST
3228	7147336.613	513133.363	414.910	TOP CREST
3229	7147333.487	513140.590	415.210	TOP CREST
3230	7147327.630	513149.417	415.852	TOP CREST
3231	7147326.357	513153.528	415.838	TOP CREST
3232	7147326.208	513158.892	414.899	TOP CREST
3233	7147320.658	513165.254	415.217	TOP CREST
3234	7147320.213	513166.767	415.174	TOP CREST
3235	7147315.817	513172.954	415.656	TOP CREST
3236	7147312.311	513179.067	415.113	TOP CREST
3237	7147310.026	513185.435	414.485	TOP CREST
3238	7147306.514	513191.646	413.691	TOP CREST
3239	7147305.380	513200.137	412.800	TOP CREST
3240	7147301.369	513213.747	411.033	TOP CREST
3241	7147299.267	513219.230	410.406	TOP CREST
3242	7147298.541	513222.123	410.080	TOP CREST
3243	7147298.456	513222.888	409.987	TOP CREST
3244	7147298.497	513225.021	409.783	TOP CREST
3245	7147298.048	513227.958	409.477	TOP CREST

3246	7147297.564	513231.312	409.135	TOP CREST
3247	7147297.437	513234.043	408.876	TOP CREST
3248	7147297.064	513236.834	408.626	TOP CREST
3249	7147297.108	513244.212	407.785	TOP CREST
3250	7147297.707	513248.309	407.627	TOP CREST
3251	7147295.838	513254.667	407.177	TOP CREST
3252	7147299.314	513261.700	404.951	TOP CREST
3253	7147299.566	513267.805	403.634	TOP CREST
3254	7147300.685	513271.141	402.510	TOP CREST
3255	7147295.778	513275.905	403.290	TOP CREST
3256	7147293.402	513280.263	403.106	TOP CREST
3257	7147293.069	513284.703	402.142	TOP CREST
3258	7147292.019	513289.221	401.666	TOP CREST
3259	7147290.837	513290.991	401.707	TOP CREST
3260	7147287.614	513294.628	401.944	TOP CREST
3261	7147284.652	513301.106	401.557	TOP CREST
3262	7147282.424	513302.079	402.129	TOP CREST
3263	7147281.976	513305.395	401.392	TOP CREST
3264	7147280.634	513308.903	400.998	TOP CREST
3265	7147278.264	513309.684	401.631	TOP CREST
3266	7147277.009	513312.131	401.355	TOP CREST
3267	7147277.153	513315.969	400.265	TOP CREST
3268	7147273.163	513319.706	400.790	TOP CREST
3269	7147271.015	513327.767	399.255	TOP CREST
3270	7147267.887	513336.475	397.935	TOP CREST
3271	7147264.922	513341.905	397.586	TOP CREST
3272	7147262.061	513347.758	397.014	TOP CREST
3273	7147258.630	513355.385	396.680	TOP CREST
3274	7147256.047	513360.385	396.176	TOP CREST
3275	7147252.175	513365.468	396.057	TOP CREST
3276	7147248.063	513369.990	395.491	TOP CREST
3277	7147246.788	513374.037	395.164	TOP CREST
3278	7147245.122	513377.682	394.710	TOP CREST
3279	7147242.770	513377.944	394.670	TOP CREST
3280	7147236.951	513384.729	394.412	TOP CREST
3281	7147229.705	513387.151	393.637	TOP CREST
3282	7147226.628	513389.829	393.276	TOP CREST
3283	7147224.157	513396.997	392.731	TOP CREST
3284	7147222.469	513399.672	392.487	TOP CREST
3285	7147221.263	513404.877	392.148	TOP CREST
3286	7147216.950	513413.260	391.315	TOP CREST
3287	7147213.699	513417.997	390.755	TOP CREST
3288	7147211.910	513420.858	389.749	TOP CREST
3289	7147212.239	513422.352	388.938	TOP CREST
3290	7147211.577	513430.979	387.270	TOP CREST
3291	7147209.355	513431.785	388.771	TOP CREST
3292	7147210.417	513435.559	388.868	TOP CREST
3293	7147211.258	513439.476	388.498	TOP CREST
3294	7147212.543	513441.075	388.375	TOP CREST
3295	7147213.195	513443.632	387.831	TOP CREST
3296	7147219.922	513447.706	382.520	TOP CREST
3297	7147210.932	513448.364	387.159	TOP CREST
3298	7147217.095	513452.334	383.202	TOP CREST
3299	7147208.155	513452.992	386.518	TOP CREST
3300	7147206.799	513457.180	386.027	TOP CREST

3301	7147212.093	513460.220	383.875	TOP CREST
3302	7147201.554	513463.867	385.104	TOP CREST
3303	7147207.667	513466.924	384.321	TOP CREST
3304	7147199.423	513467.735	384.693	TOP CREST
3305	7147204.550	513471.693	384.920	TOP CREST
3306	7147205.337	513472.795	384.440	TOP CREST
3307	7147205.198	513474.610	384.412	TOP CREST
3308	7147203.643	513479.845	383.609	TOP CREST
3309	7147201.629	513480.264	383.551	TOP CREST
3310	7147199.704	513483.111	383.275	TOP CREST
3311	7147197.651	513485.276	383.131	TOP CREST
3312	7147194.590	513488.029	382.821	TOP CREST
3313	7147197.372	513488.187	382.871	TOP CREST
3314	7147190.321	513489.040	382.492	TOP CREST
3315	7147186.027	513491.448	381.963	TOP CREST
3316	7147182.796	513494.643	381.731	TOP CREST
3317	7147179.714	513499.816	381.192	TOP CREST
3318	7147179.145	513505.510	380.657	TOP CREST
3319	7147176.711	513509.554	380.690	TOP CREST
3320	7147174.137	513512.250	380.658	TOP CREST
3321	7147170.189	513512.529	383.419	TOP CREST
3322	7147172.338	513513.027	381.783	TOP CREST
3323	7147167.405	513515.008	384.235	TOP CREST
3324	7147164.124	513517.856	385.392	TOP CREST
3325	7147162.980	513521.633	385.056	TOP CREST
3326	7147160.439	513526.661	384.835	TOP CREST
3327	7147156.873	513530.560	384.902	TOP CREST
3328	7147153.769	513533.214	385.037	TOP CREST
3329	7147151.886	513533.863	385.148	TOP CREST
3330	7147148.724	513536.468	385.072	TOP CREST
3331	7147146.479	513540.605	384.925	TOP CREST
3332	7147142.940	513545.335	384.948	TOP CREST
3333	7147138.806	513547.092	384.896	TOP CREST
3334	7147136.143	513549.768	384.664	TOP CREST
3335	7147133.491	513552.356	384.238	TOP CREST
3336	7147131.123	513559.556	384.487	TOP CREST
3337	7147130.257	513564.102	385.149	TOP CREST
3338	7147129.230	513567.717	384.944	TOP CREST
3339	7147129.083	513573.731	384.776	TOP CREST
3340	7147127.076	513578.665	384.752	TOP CREST
3341	7147127.034	513580.375	384.801	TOP CREST
3342	7147125.068	513583.444	384.984	TOP CREST
3343	7147124.190	513586.669	384.877	TOP CREST
3344	7147123.893	513588.768	385.426	TOP CREST
3345	7147122.105	513591.644	385.574	TOP CREST
3346	7147122.153	513591.886	385.294	TOP CREST
3347	7147122.738	513593.143	384.832	TOP CREST
3348	7147120.375	513596.344	384.734	TOP CREST
3349	7147118.932	513598.478	384.534	TOP CREST
3350	7147117.869	513598.503	384.921	TOP CREST
3351	7147118.039	513598.517	384.705	TOP CREST
3352	7147116.661	513601.256	384.329	TOP CREST
3353	7147115.501	513601.867	384.490	TOP CREST
3354	7147114.822	513603.286	383.990	TOP CREST
3355	7147114.297	513604.708	383.175	TOP CREST

3356	7147114.931	513606.024	381.721	TOP CREST
3357	7147116.279	513608.036	379.375	TOP CREST
3358	7147116.422	513609.446	378.074	TOP CREST
3359	7147116.317	513610.233	378.010	TOP CREST
3360	7147115.007	513611.255	377.937	TOP CREST
3361	7147114.573	513611.757	378.233	TOP CREST
3362	7147112.987	513613.840	377.454	TOP CREST
3363	7147111.079	513615.395	377.161	TOP CREST
3364	7147109.657	513617.295	377.537	TOP CREST
3365	7147106.922	513620.639	377.570	TOP CREST
3366	7147105.688	513624.579	377.153	TOP CREST
3367	7147104.859	513627.326	376.517	TOP CREST

CLINTON CREEK CL AND CREST				
EDGE OF CAT TRAIL				
	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2835	7147272.749	513147.083	432.717	RTK base for Clinton Creek CL
3368	7147216.216	513445.338	382.712	edge of Cat Trail
3369	7147212.959	513450.909	383.251	edge of Cat Trail
3370	7147210.420	513454.311	383.421	edge of Cat Trail
3371	7147207.254	513459.177	383.851	edge of Cat Trail
3372	7147204.041	513462.575	383.875	edge of Cat Trail
3373	7147200.903	513466.238	384.184	edge of Cat Trail
3374	7147200.331	513467.674	384.296	edge of Cat Trail
3375	7147199.901	513468.148	384.447	edge of Cat Trail

WOLVERINE CREET CENTRE LINE

CLINTON CREEK LONG TERM PERFORMANCE MONITORING PROGRAM
(August 2012)

UTM COORDINATES
NAD 83, Zone 7, 141º West

WOLVERINE CREEK CENTRE LINE

	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2834	7148172.682	513447.669	606.910	RTK base for Wolverine Creek CL

WOLVERINE CREEK CENTRE LINE

	NORTHING	EASTING	OTHOMETRIC HEIGHT	
3500	7148631.950	513950.099	409.054	CL CK
3501	7148409.568	513959.093	408.951	CL CK
3502	7148407.660	513958.392	407.512	CL CK
3503	7148395.440	513955.460	408.465	CL CK
3504	7148395.440	513955.460	408.465	CL CR
3505	7148351.613	513957.739	408.371	CL CK
3506	7148350.655	513957.960	408.016	CL CK
3507	7148346.897	513955.174	407.751	CL CK
3508	7148345.761	513953.489	407.643	CL CK
3509	7148343.237	513951.206	407.831	CL CK
3510	7148340.261	513948.532	407.861	CL CK
3511	7148333.343	513945.120	407.971	CL CK
3512	7148325.869	513943.018	407.960	CL CK
3513	7148315.269	513941.546	408.022	CL CK
3514	7148307.834	513943.330	408.016	CL CK
3515	7148300.796	513945.345	408.021	CL CK
3516	7148290.255	513948.661	407.937	CL CK
3517	7148286.235	513950.270	407.802	CL CK
3518	7148277.826	513952.324	407.731	CL CK
3519	7148273.218	513953.194	407.745	CL CK
3520	7148266.561	513953.521	407.740	CL CK
3521	7148205.792	513980.066	407.774	CL CK
3522	7148204.320	513980.615	407.446	CL CK
3523	7148200.939	513982.332	407.172	CL CK
3524	7148194.145	513985.379	407.359	CL CK
3525	7148187.812	513986.787	407.328	CL CK
3526	7148180.747	513985.957	407.324	CL CK
3527	7148179.660	513985.599	407.000	CL CK
3528	7148176.123	513988.012	406.933	CL CK
3529	7148170.620	513991.287	406.927	CL CK
3530	7148166.453	513990.900	407.211	CL CK
3531	7148160.791	513989.499	407.033	CL CK
3532	7148157.136	513991.941	407.155	CL CK
3533	7148152.640	513992.715	407.146	CL CK
3534	7148143.867	513990.587	406.860	CL CK
3535	7148137.542	513987.006	406.732	CL CK
3536	7148126.517	513984.833	406.533	CL CK
3537	7148119.369	513986.813	406.281	CL CK
3538	7148109.740	513987.650	406.027	CL CK
3539	7148099.106	513986.327	406.048	CL CK

3540	7148089.245	513987.762	405.786	CL CK
3541	7148081.571	513987.763	405.690	CL CK
3542	7148068.960	513987.697	405.563	CL CK
3543	7148058.021	513988.014	405.204	CL CK
3544	7148048.184	513988.470	404.989	CL CK
3545	7148041.699	513990.313	404.463	CL CK
3546	7148033.071	513991.187	404.422	CL CK
3547	7148026.478	513991.032	404.147	CL CK
3548	7148020.530	513990.774	404.115	CL CK
3549	7148011.482	513990.355	403.932	CL CK
3550	7148006.468	513990.610	403.679	CL CK
3551	7147998.790	513987.969	403.537	CL CK
3552	7147993.644	513990.327	403.360	CL CK 2
3553	7147991.112	513983.412	403.480	CL CK
3554	7147989.897	513990.420	403.264	CL CK 2
3555	7147984.291	513986.449	403.090	CL CK 2
3556	7147983.374	513982.096	403.257	CL CK
3557	7147979.359	513983.240	402.958	CL CK
3558	7147971.054	513982.348	402.983	CL CK
3559	7147960.518	513980.152	402.935	CL CK
3560	7147952.302	513980.120	402.620	CL CK
3561	7147947.739	513982.062	402.577	CL CK
3562	7147945.076	513984.187	401.760	CL CK
3563	7147942.162	513982.130	401.469	CL CK
3564	7147938.943	513984.492	400.581	CL CK
3565	7147937.416	513987.501	400.570	CL CK
3566	7147936.833	513989.074	400.358	CL CK
3567	7147935.127	513992.290	400.016	CL CK
3568	7147933.932	513993.754	399.530	CL CK
3569	7147931.828	513995.590	399.682	CL CK
3570	7147928.035	513997.804	399.526	CL CK
3571	7147925.967	513998.433	398.347	CL CK
3572	7147923.107	513999.464	398.584	CL CK
3573	7147920.939	514000.132	397.639	CL CK
3574	7147917.632	514002.177	397.676	CL CK
3575	7147916.447	514004.272	397.453	CL CK
3576	7147911.320	514005.471	397.672	CL CK
3577	7147908.826	514006.212	396.719	CL CK
3578	7147906.837	514007.401	396.708	CL CK
3579	7147902.826	514009.933	396.704	CL CK
3580	7147900.256	514011.438	395.870	CL CK
3581	7147896.656	514013.143	396.095	CL CK
3582	7147894.152	514014.109	395.396	CL CK
3583	7147888.743	514016.256	395.283	CL CK
3584	7147883.979	514017.575	394.865	CL CK
3585	7147880.914	514018.886	394.354	CL CK
3586	7147878.118	514023.305	394.642	CL CK 2
3587	7147876.390	514025.792	393.917	CL CK 2
3588	7147876.232	514019.554	394.426	CL CK
3589	7147872.616	514020.032	394.396	CL CK
3590	7147869.895	514024.690	394.204	CL CK 2
3591	7147868.176	514023.991	393.984	CL CK
3592	7147867.241	514024.339	393.644	CL CK
3593	7147863.802	514027.989	393.829	CL CK
3594	7147860.995	514029.200	393.723	CL CK
3595	7147859.294	514029.979	392.568	CL CK

3596	7147856.680	514031.025	393.036	CL CK
3597	7147854.874	514034.031	393.017	CL CK
3598	7147853.435	514035.651	391.864	CL CK
3599	7147851.310	514037.432	392.114	CL CK
3600	7147850.317	514039.876	391.274	CL CK
3601	7147850.004	514037.941	391.984	CL CK
3602	7147849.786	514041.281	391.306	CL CK
3603	7147847.151	514042.063	391.823	CL CK
3604	7147842.807	514044.027	391.562	CL CK
3605	7147840.984	514045.404	390.673	CL CK
3606	7147838.194	514048.005	391.084	CL CK
3607	7147836.449	514049.564	389.943	CL CK
3608	7147832.976	514054.110	390.527	CL CK
3609	7147831.876	514055.736	389.792	CL CK
3610	7147830.484	514057.154	389.992	CL CK
3611	7147826.853	514060.790	390.006	CL CK
3612	7147825.888	514061.643	389.705	CL CK
3613	7147822.407	514063.998	389.979	CL CK
3614	7147821.923	514067.059	389.164	CL CK
3615	7147821.330	514068.408	388.794	CL CK
3616	7147820.064	514070.138	389.142	CL CK
3617	7147817.897	514071.134	389.193	CL CK
3618	7147815.956	514073.688	388.864	CL CK
3619	7147812.590	514076.196	388.847	CL CK
3620	7147811.307	514077.987	388.114	CL CK
3621	7147810.159	514079.586	388.442	CL CK
3622	7147807.689	514082.310	388.529	CL CK
3623	7147804.339	514083.793	386.944	CL CK
3624	7147801.612	514085.256	387.182	CL CK
3625	7147799.182	514085.619	387.062	CL CK
3626	7147797.332	514087.475	386.284	CL CK
3627	7147796.132	514090.284	386.542	CL CK
3628	7147793.598	514092.753	386.390	CL CK
3629	7147792.008	514093.034	385.088	CL CK
3630	7147789.774	514094.501	385.543	CL CK
3631	7147787.144	514096.001	385.042	CL CK
3632	7147785.412	514097.954	384.384	CL CK
3633	7147782.885	514099.964	384.653	CL CK
3634	7147781.733	514102.720	384.431	CL CK
3635	7147780.984	514103.940	383.080	CL CK
3636	7147779.069	514107.858	383.796	CL CK
3637	7147776.617	514109.678	383.650	CL CK
3638	7147774.588	514111.152	383.077	CL CK
3639	7147773.753	514113.024	382.921	CL CK
3640	7147771.568	514116.467	382.899	CL CK
3641	7147768.464	514120.302	382.501	CL CK
3642	7147764.935	514122.246	382.355	CL CK
3643	7147764.190	514122.471	382.192	CL CK
3644	7147758.005	514124.467	382.168	CL CK
3645	7147752.760	514127.842	382.012	CL CK
3646	7147750.052	514129.967	382.177	CL CK
3647	7147747.274	514134.244	382.159	CL CK
3648	7147744.995	514137.974	381.598	CL CK
3649	7147741.774	514142.162	381.448	CL CK
3650	7147739.788	514143.516	381.313	CL CK
3651	7147736.746	514145.835	381.247	CL CK

3652	7147734.091	514147.498	381.378	CL CK
3653	7147728.202	514153.290	381.338	CL CK
3654	7147722.872	514156.158	381.135	CL CK
3655	7147719.975	514158.323	381.012	CL CK
3656	7147717.025	514160.079	380.916	CL CK
3657	7147714.494	514156.400	380.929	CL CK
3658	7147709.742	514154.814	380.946	CL CK
3659	7147701.308	514156.210	380.973	CL CK
3660	7147698.111	514160.698	380.511	CL CK
3661	7147695.607	514161.886	380.304	CL CK
3662	7147689.429	514160.692	380.454	CL CK
3663	7147682.618	514165.100	380.605	CL CK
3664	7147677.863	514167.843	380.402	CL CK
3665	7147672.630	514169.579	379.974	CL CK
3666	7147667.748	514167.800	380.142	CL CK
3667	7147664.554	514165.203	379.959	CL CK
3668	7147661.904	514162.157	379.784	CL CK

WOLVERINE CREEK TAILING PILE

CLINTON CREEK LONG TERM PERFORMANCE MONITORING PROGRAM
(August 2012)

UTM COORDINATES
NAD 83, Zone 7, 141º West

	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2834	7148172.682	513447.669	606.910	RTK base for Wolverine Creek CL

WOLVERINE CREEK TAILING PILE			
24	7148033.982	513526.265	549.110
24-A	7148036.116	513780.201	463.469
24-B	7148046.420	513837.511	444.350
24-D	7148073.596	513923.387	422.115
25-B	7148066.040	513949.899	422.204
26	7148341.526	513483.692	574.914
26-A	7148339.373	513540.629	557.559
80-1	7148408.073	513543.316	555.331
80-7	7148343.963	513891.605	422.197
80-2	7148290.083	513549.884	552.231
80-4	7148202.237	513691.891	500.557
80-5	7148249.745	513720.528	480.624
80-9	7147996.288	513970.811	411.104
350-1A	7148298.717	513823.330	447.737
350-2A	7148300.479	513874.497	428.348
350-3A	7148312.077	513899.718	417.094
TS483	7148020.701	513982.197	412.446
TS484	7148150.783	513982.338	415.489
500-1	7148343.235	513725.619	474.040
500-2	7148344.418	513842.960	437.809
650-1	7148408.756	513701.490	483.751
650-2	7148400.180	513816.520	439.466
1083	7148354.066	513937.113	413.935
1084	7148018.023	513619.579	515.729
1085	7148346.052	513666.576	488.686
1483	7148233.062	513412.773	608.788
1484	7148151.973	513963.955	417.794
1485	7148018.366	513707.981	478.386
1489	7148305.025	513928.744	413.511
1491	7148376.962	513869.820	432.039
1492	7148053.613	513410.279	609.474
1494	7148152.636	513984.556	414.871
1495	7148526.733	513529.158	528.995
62 (2005-01)	7148100.023	513760.924	463.122
63 (2005-02)	7148118.934	513819.550	446.859
64 (2005-03)	7148109.359	513872.816	427.162
66 (2005-04)	7148048.278	513879.128	427.522
61 (2005-05)	7148001.099	513785.522	463.588
65 (2005-06)	7147999.979	513868.360	432.477
68 (2005-07)	7147999.959	513945.394	416.300
67 (2005_08)	7148038.735	513971.441	415.812
(2005-09)FOUND LOST IN CRACKS PLACED Rebar with tag 996			
71 (2005-10)	7148148.354	513927.047	411.792

70 (2005-11)	7148177.999	513943.193	411.969
BH-16	7148049.307	513766.211	463.402
BH-14	7148488.389	513562.906	530.327
NL-3	7148334.730	513927.415	416.977
NL-4	7148306.999	513913.555	415.891
NL-5	7148275.022	513897.385	415.231
NL-1	7148365.727	513943.095	412.936
NL-2	7148354.388	513937.265	413.872
NL BASE	7148154.811	513836.354	431.354
SL-1	7148078.734	513972.432	419.673
SL-2	7148087.537	513959.369	422.741
SL-3	7148102.499	513935.721	420.813
SL-4	7148117.072	513909.675	416.406
SL-5	7148134.911	513878.526	422.039
BH-16 CABLE	7148049.117	513765.695	463.192
TS482	7147742.943	514123.634	389.575
996	7148131.198	513969.098	419.462
BH-14 CABLE	7148488.456	513563.061	530.328

WATER EDGE PONDED AREA

CLINTON CREEK LONG TERM PERFORMANCE MONITORING PROGRAM (August 2012)

UTM COORDINATES

NAD 83, Zone 7, 141º West

	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2834	7148172.682	513447.669	606.910	RTK base for Wolverine Creek CL

WATER PONDED AREA

	NORTHING	EASTING	OTHOMETRIC HEIGHT	
3700	7148634.352	513929.975	409.292	WE
3701	7148630.972	513952.113	409.310	WE
3702	7148627.900	513924.842	409.266	WE
3703	7148624.051	513919.958	409.259	WE
3704	7148618.263	513956.800	409.265	WE
3705	7148616.283	513915.369	409.275	WE
3706	7148608.348	513913.871	409.278	WE
3707	7148606.491	513954.705	409.388	WE
3708	7148599.921	513911.646	409.272	WE
3709	7148596.688	513953.884	409.195	WE
3710	7148590.883	513907.768	409.272	WE
3711	7148588.051	513954.153	409.295	WE
3712	7148582.433	513904.690	409.269	WE
3713	7148579.360	513952.702	409.297	WE
3714	7148576.713	513897.025	409.241	WE
3715	7148571.373	513953.325	409.251	WE
3716	7148569.762	513895.691	409.240	WE
3717	7148563.038	513953.398	409.238	WE
3718	7148559.427	513894.371	409.255	WE
3719	7148555.261	513953.074	409.254	WE
3720	7148549.209	513953.290	409.289	WE
3721	7148544.299	513891.373	409.299	WE
3722	7148541.672	513951.874	409.235	WE
3723	7148535.177	513891.399	409.289	WE
3724	7148530.115	513948.941	409.301	WE
3725	7148527.261	513890.599	409.227	WE
3726	7148521.634	513949.815	409.287	WE
3727	7148519.605	513891.051	409.323	WE
3728	7148513.257	513950.916	409.255	WE
3729	7148511.472	513891.986	409.288	WE
3730	7148506.066	513953.790	409.280	WE
3731	7148503.639	513891.864	409.234	WE
3732	7148500.159	513954.123	409.300	WE
3733	7148494.526	513892.904	409.288	WE
3734	7148492.248	513956.692	409.194	WE
3735	7148487.621	513957.918	409.216	WE
3736	7148484.361	513893.980	409.251	WE
3737	7148480.145	513960.962	409.166	WE
3738	7148475.009	513894.949	409.240	WE
3739	7148472.652	513962.316	409.171	WE
3740	7148464.866	513896.175	409.309	WE
3741	7148462.101	513963.209	409.182	WE
3742	7148454.928	513895.873	409.274	WE
3743	7148450.536	513963.287	409.151	WE
3744	7148442.191	513963.822	409.238	WE
3745	7148442.033	513896.020	409.241	WE
3746	7148438.108	513901.689	409.266	WE

3747	7148435.897	513906.771	409.284	WE
3748	7148435.575	513913.229	409.250	WE
3749	7148433.359	513918.309	409.251	WE
3750	7148432.696	513963.576	409.256	WE
3751	7148431.660	513922.554	409.222	WE
3752	7148430.714	513933.187	409.225	WE
3753	7148430.651	513927.172	409.267	WE
3754	7148429.568	513939.012	409.249	WE
3755	7148424.125	513945.205	409.288	WE
3756	7148422.268	513960.995	408.981	WE
3757	7148421.048	513948.726	409.300	WE
3758	7148414.994	513950.928	409.392	WE
3759	7148414.550	513961.637	409.083	WE
3760	7148413.323	513954.924	409.292	WE
3761	7148411.303	513957.649	409.257	WE
3762	7148411.159	513957.674	409.143	DAM TOP
3763	7148409.583	513958.952	409.272	DAM TOP
3764	7148408.608	513960.096	409.221	DAM TOP
3765	7148408.374	513961.197	409.279	DAM TOP
3766	7148388.675	513956.170	408.434	WE
3767	7148382.892	513945.602	408.448	WE
3768	7148382.229	513957.449	408.434	WE
3769	7148379.335	513947.557	408.418	WE
3770	7148375.060	513949.889	408.460	WE
3771	7148373.381	513958.654	408.443	WE
3772	7148369.715	513951.431	408.452	WE
3773	7148364.958	513959.511	408.472	WE
3774	7148364.596	513951.772	408.438	WE
3775	7148357.792	513959.498	408.459	WE
3776	7148356.702	513954.162	408.490	WE
3777	7148352.493	513955.519	408.429	WE
3778	7148352.284	513955.772	408.458	DAM 2 TOP
3779	7148351.824	513955.830	408.201	WE
3780	7148351.773	513957.386	408.331	DAM 2 TOP
3781	7148351.315	513959.485	408.391	DAM 2 TOP
3782	7148347.690	513954.345	408.341	WE
3783	7148345.787	513950.994	408.231	WE
3784	7148343.398	513948.238	408.243	WE
3785	7148338.832	513945.888	408.251	WE
3786	7148332.805	513943.326	408.219	WE
3787	7148330.222	513942.567	408.183	WE
3788	7148321.333	513941.185	408.179	WE
3789	7148314.612	513940.421	408.138	WE
3790	7148304.363	513941.960	408.150	WE
3791	7148296.338	513944.624	408.075	WE
3792	7148287.659	513947.901	408.069	WE
3793	7148279.761	513949.259	408.047	WE
3794	7148273.396	513939.287	408.010	WE
3795	7148272.100	513933.185	408.054	WE
3796	7148271.931	513950.780	408.065	WE
3797	7148270.775	513972.730	408.070	WE
3798	7148270.619	513968.531	408.060	WE
3799	7148268.351	513963.445	408.090	WE
3800	7148268.348	513950.687	407.998	WE
3801	7148267.356	513975.043	408.045	WE
3802	7148267.114	513924.912	408.024	WE
3803	7148264.580	513962.864	408.071	WE
3804	7148264.168	513917.463	408.110	WE
3805	7148263.080	513957.180	408.084	WE
3806	7148262.332	513958.841	408.079	WE
3807	7148261.283	513912.537	408.010	WE
3808	7148260.535	513978.056	408.045	WE
3809	7148257.232	513907.926	408.086	WE

3810	7148255.114	513902.413	408.084	WE
3811	7148253.478	513901.742	408.076	WE
3812	7148253.097	513980.040	408.056	WE
3813	7148250.710	513897.592	408.087	WE
3814	7148248.012	513892.059	408.099	WE
3815	7148244.674	513980.530	408.068	WE
3816	7148243.800	513886.786	408.003	WE
3817	7148239.534	513885.696	408.018	WE
3818	7148236.735	513982.682	408.064	WE
3819	7148234.437	513884.515	408.065	WE
3820	7148229.404	513982.392	408.059	WE
3821	7148227.166	513883.162	408.126	WE
3822	7148223.065	513883.697	408.069	WE
3823	7148221.968	513984.093	408.090	WE
3824	7148220.274	513883.826	408.082	WE
3825	7148216.912	513951.619	408.045	WE
3826	7148216.801	513948.939	408.019	WE
3827	7148216.021	513941.387	408.005	WE
3828	7148215.965	513945.745	408.009	WE
3829	7148215.833	513982.837	408.089	WE
3830	7148215.067	513883.720	408.079	WE
3831	7148215.021	513939.085	408.044	WE
3832	7148214.384	513956.271	408.010	WE
3833	7148211.853	513967.231	408.044	WE
3834	7148211.463	513966.947	408.052	WE
3835	7148210.511	513983.484	408.065	WE
3836	7148210.149	513970.411	408.052	WE
3837	7148209.943	513962.492	408.021	WE
3838	7148209.892	513973.239	408.030	WE
3839	7148209.659	513966.395	408.008	WE
3840	7148207.625	513933.044	408.049	WE
3841	7148206.353	513983.713	407.975	DAM3TOP
3842	7148205.797	513884.387	408.056	WE
3843	7148205.502	513979.769	408.061	DAM3TOP
3844	7148205.292	513981.711	407.978	DAM3TOP
3845	7148205.188	513975.549	408.063	WE
3846	7148205.152	513976.574	407.977	DAM3TOP
3847	7148205.050	513932.778	408.031	WE
3848	7148201.973	513885.753	408.015	WE
3849	7148201.775	513930.444	408.019	WE
3850	7148199.830	513885.936	408.058	WE
3851	7148197.845	513888.377	408.021	WE
3852	7148197.833	513923.191	408.030	WE
3853	7148197.142	513890.762	408.011	WE
3854	7148196.707	513896.012	408.022	WE
3855	7148195.799	513899.140	408.035	WE
3856	7148195.386	513915.198	408.009	WE
3857	7148195.193	513905.955	407.994	WE
3858	7148194.511	513912.129	407.998	WE

SECTIONS A-B-C-D-E

CLINTON CREEK LONG TERM PERFORMANCE MONITORING

UTM COORDINATES

NAD 83, Zone 7, 141º West

Sections A - B - C - D - E at Gabion drop structure

	NORTHING	EASTING	ORTHOMETRIC HEIGHT	
2835	7147272.749	513147.083	432.717	RTK base for XS

CONTROLS

	Northing	Easting	Elevation	
4132	7147285.473	513282.326	405.193	REBAR
4133	7147254.112	513355.024	397.173	REBAR

Section A

	Northing	Easting	Elevation	
4000	7147440.153	512978.387	413.679	OG
4001	7147436.199	512977.981	412.384	OG
4002	7147433.354	512977.301	411.118	OG
4003	7147430.328	512976.460	410.077	OG
4004	7147429.051	512976.217	409.755	OG
4005	7147425.792	512975.260	409.615	OG
4006	7147421.215	512974.178	409.847	OG
4007	7147418.147	512973.467	409.656	OG
4008	7147415.868	512972.903	409.640	OG
4009	7147413.180	512972.200	409.531	OG
4010	7147412.544	512971.984	409.488	ROCKS
4011	7147411.507	512971.834	409.199	ROCKS
4012	7147409.352	512971.053	408.190	ROCKS
4013	7147407.744	512970.611	407.580	ROCKS
4014	7147407.393	512970.697	407.416	WE
4015	7147407.092	512970.726	407.197	ROCKS
4016	7147406.345	512970.604	407.255	ROCKS
4017	7147405.919	512970.391	406.862	ROCKS
4018	7147405.363	512969.954	406.642	ROCKS
4019	7147396.467	512967.975	407.362	WE
4020	7147394.487	512967.490	408.115	ROCKS
4021	7147390.965	512966.471	409.603	ROCKS
4022	7147389.518	512966.304	410.245	OG
4023	7147385.244	512965.326	410.645	OG
4024	7147384.930	512824.142	411.630	LAKE ELEV
4025	7147382.122	512964.179	413.737	OG
4026	7147381.486	512964.100	413.828	OG
4027	7147381.280	512964.017	413.761	OG
4028	7147379.841	512963.703	412.965	OG
4029	7147378.447	512963.412	412.839	OG
4030	7147370.897	512961.285	412.744	OG
4031	7147369.573	512961.125	412.997	OG
4032	7147367.472	512960.535	414.795	OG
4033	7147367.114	512960.791	415.926	OG
4034	7147365.185	512960.266	415.954	OG
4035	7147364.572	512960.002	416.239	OG
4036	7147362.632	512959.438	417.389	OG
4037	7147361.373	512958.929	418.135	OG
4038	7147360.296	512958.594	418.302	OG
4039	7147354.130	512956.960	418.722	OG
4040	7147347.651	512955.335	419.026	OG
4041	7147338.401	512952.994	419.212	OG

4042	7147337.612	512952.688	419.402	OG
4043	7147335.133	512952.094	419.423	OG
4044	7147331.721	512951.158	420.287	OG
4045	7147329.298	512950.571	421.265	OG
4046	7147328.189	512950.383	421.433	OG
4047	7147322.641	512948.870	421.610	OG
4048	7147321.097	512948.542	421.837	OG
4049	7147316.807	512947.386	422.048	OG
4050	7147316.253	512947.348	422.181	OG
4051	7147315.845	512947.198	422.061	OG
4052	7147314.372	512946.601	422.476	OG
4053	7147307.111	512945.138	421.231	OG
4054	7147298.485	512943.305	421.147	OG
4055	7147284.068	512939.147	428.903	OG
4056	7147272.488	512935.811	434.825	OG
4057	7147262.812	512933.476	438.943	OG
4058	7147258.110	512932.259	440.565	OG
4059	7147256.664	512931.820	440.425	OG

Section B				
	Northing	**Easting**	**Elevation**	
4060	7147414.221	513017.161	409.312	OG
4061	7147410.631	513016.198	407.787	OG
4062	7147404.758	513014.717	407.657	OG
4063	7147403.063	513014.325	407.497	ROCKS
4064	7147400.034	513013.610	406.310	ROCKS
4065	7147397.827	513013.023	405.314	WE
4066	7147395.253	513012.365	404.885	ROCKS
4067	7147387.185	513010.381	405.033	ROCKS
4068	7147385.817	513009.896	405.311	WE
4069	7147382.548	513009.130	406.855	ROCKS
4070	7147379.509	513008.320	408.227	ROCKS
4071	7147375.458	513007.179	408.405	OG
4072	7147368.463	513004.535	415.432	OG
4073	7147364.418	513003.387	415.717	OG
4074	7147361.612	513002.625	416.266	OG
4075	7147353.869	513000.353	416.135	OG
4076	7147352.557	512999.749	415.792	OG
4077	7147350.027	512999.380	418.258	OG
4078	7147347.723	512998.605	419.733	OG
4079	7147344.161	512997.764	422.567	OG
4080	7147332.547	512994.551	422.128	OG
4081	7147321.871	512991.625	423.334	OG
4082	7147304.764	512987.095	423.248	OG
4083	7147297.549	512984.335	423.481	OG
4084	7147295.311	512983.901	424.742	OG
4085	7147290.228	512982.813	423.919	OG
4086	7147286.478	512981.717	422.782	OG
4087	7147273.887	512977.987	430.735	OG
4088	7147263.018	512975.043	436.685	OG
4089	7147256.188	512973.000	440.730	OG
4090	7147251.459	512971.910	441.038	OG

Section C				
	Northing	**Easting**	**Elevation**	
4091	7147402.952	513050.030	409.067	OG
4092	7147398.318	513049.134	406.236	OG
4093	7147397.186	513048.606	402.889	OG
4094	7147394.728	513047.861	401.104	OG

4095	7147391.551	513046.904	399.570	ROCKS
4096	7147389.905	513046.502	398.582	WE
4097	7147389.192	513046.386	398.029	ROCKS
4098	7147388.205	513046.231	398.152	ROCKS
4099	7147387.859	513046.207	397.703	ROCKS
4100	7147385.561	513046.054	397.969	ROCKS
4101	7147382.254	513045.779	398.303	ROCKS
4102	7147378.254	513045.620	398.592	WE
4103	7147376.331	513045.259	399.588	ROCKS
4104	7147372.061	513044.572	403.129	OG
4105	7147368.619	513043.517	406.413	OG
4106	7147367.564	513044.342	406.408	TOP CREST
4107	7147365.039	513043.007	406.652	OG
4108	7147362.009	513042.329	408.783	OG
4109	7147359.491	513041.659	411.253	OG
4110	7147357.762	513041.303	413.405	OG
4111	7147353.972	513040.372	416.102	OG
4112	7147351.828	513039.821	416.500	OG
4113	7147343.647	513038.286	416.628	OG
4114	7147338.473	513037.384	417.733	OG
4115	7147331.766	513035.941	422.937	OG
4116	7147330.832	513035.808	423.053	OG
4117	7147328.435	513035.372	424.684	OG
4118	7147326.761	513034.903	424.211	OG
4119	7147323.631	513034.263	424.470	OG
4120	7147315.354	513032.510	424.425	OG
4121	7147301.707	513030.193	424.479	OG
4122	7147299.286	513029.424	423.718	OG
4123	7147292.184	513027.937	423.678	OG
4124	7147287.518	513027.125	424.656	OG
4125	7147283.497	513026.346	424.655	OG
4126	7147282.366	513026.089	424.109	OG
4127	7147279.440	513025.290	423.992	OG
4128	7147273.396	513024.131	424.923	OG
4129	7147269.119	513023.061	428.253	OG
4130	7147259.580	513021.442	433.056	OG
4131	7147247.517	513018.748	440.246	OG
4132	7147243.720	513018.163	442.202	OG
4133	7147238.896	513017.636	443.091	OG

Section D				
	Northing	**Easting**	**Elevation**	
4134	7147345.818	513292.680	418.591	POPULAR
4135	7147323.961	513284.501	404.562	Tree Line
4136	7147320.170	513281.627	390.398	Rock Wall
4137	7147319.312	513281.644	395.176	Rock Wall
4138	7147319.032	513282.425	397.970	Rock Wall
4139	7147318.379	513284.129	390.191	TOE SLOPE D
4140	7147313.626	513281.651	389.927	CL CK D
4141	7147308.189	513279.476	390.128	TOE SLOPE D
4142	7147296.411	513275.711	403.052	OG
4143	7147295.778	513275.905	403.290	TOP CREST
4144	7147295.557	513275.523	403.488	OG
4145	7147292.863	513274.785	404.394	OG
4146	7147289.919	513274.173	405.259	OG
4147	7147289.033	513273.899	405.693	OG
4148	7147288.599	513273.686	405.610	OG
4149	7147286.513	513273.194	405.633	OG
4150	7147280.073	513271.279	405.211	OG

Section E				
	Northing	**Easting**	**Elevation**	
4151	7147289.597	513384.833	408.912	Popular elevation 0.60 above ground
4152	7147278.086	513378.570	398.799	OG
4153	7147275.167	513376.118	395.573	Rock Wall
4154	7147274.284	513375.581	391.923	Rock Wall
4155	7147273.734	513375.587	385.780	TOE SLOPE E
4156	7147273.724	513375.861	385.874	Rock Wall
4157	7147271.717	513374.490	385.594	Rock Wall
4158	7147269.899	513373.171	385.149	CL CK D
4159	7147266.398	513370.655	386.278	OG D
4160	7147261.588	513368.011	387.182	TOE SLOPE E
4161	7147252.634	513364.977	396.125	OG
4162	7147252.075	513364.702	396.296	OG
4163	7147251.414	513364.365	396.107	OG
4164	7147248.302	513362.833	396.361	OG
4165	7147244.499	513360.898	396.478	OG

LAKE ELEVATION

CLINTON CREEK LONG TERM PERFORMANCE MONITORING PROGRAM (August 2012)

UTM COORDINATES

NAD 83, Zone 7, 141º West

Lake Elevation			
	Northing	**Easting**	**Elevation**
4166	7147384.930	512824.142	411.630

MONITORING CRACKS ROAD

CLINTON CREEK LONG TERM PERFORMANCE MONITORING PROGRAM (August 2012)

UTM COORDINATES
NAD 83, Zone 7, 141º West

Base Line				
	Northing	**Easting**	**Elevation**	
5001	7147308.666	513168.765	415.425	REBAR
5002	7147307.824	513171.713	415.274	NAIL
5003	7147307.000	513174.523	415.090	NAIL
5004	7147306.119	513177.395	414.829	NAIL
5005	7147305.309	513180.266	414.540	NAIL
5006	7147304.458	513183.169	414.237	NAIL
5007	7147303.604	513186.039	413.903	NAIL
5008	7147302.744	513188.920	413.577	NAIL
5009	7147301.880	513191.787	413.269	NAIL
5010	7147301.049	513194.659	412.938	NAIL
5011	7147300.218	513197.540	412.606	NAIL
5012	7147299.371	513200.414	412.264	NAIL
5013	7147298.521	513203.297	411.894	NAIL
5014	7147297.686	513206.156	411.550	NAIL
5015	7147296.824	513209.054	411.168	NAIL
5016	7147295.993	513211.935	410.811	NAIL
5017	7147295.129	513214.795	410.453	NAIL
5018	7147294.296	513217.669	410.110	NAIL
5019	7147293.444	513220.549	409.774	NAIL
5020	7147292.591	513223.431	409.422	NAIL
5021	7147291.755	513226.324	409.056	NAIL
5022	7147290.913	513229.195	408.744	NAIL
5000	7147290.065	513232.067	408.454	REBAR

CRACKS				
	Northing	**Easting**	**Elevation**	
5102	7147311.202	513169.483	415.535	CRACK FRACTION
5103	7147314.582	513170.487	415.586	CRACK 2CM
5104	7147314.712	513170.529	415.571	CRACK FRACTION
5105	7147315.907	513170.859	415.528	CRACK FRACTION
5106	7147316.905	513171.158	415.340	CRACK FRACTION
5107	7147317.545	513171.413	415.237	TOP CRUST
5096	7147310.126	513172.326	415.424	CRACK FRACTION
5097	7147310.630	513172.480	415.446	CRACK FRACTION
5098	7147312.088	513172.908	415.505	CRACK FRACTION
5099	7147313.024	513173.160	415.485	CRACK FRACTION
5100	7147314.312	513173.526	415.482	CRACK FRACTION
5101	7147315.418	513173.828	415.597	TOP CRUST
5092	7147309.577	513175.292	415.271	CRACK FRACTION
5093	7147311.509	513175.869	415.380	CRACK 5CM
5094	7147313.586	513176.469	415.339	CRACK 5CM
5095	7147314.044	513176.611	415.323	TOP CRUST
5089	7147308.489	513178.105	415.009	CRACK FRACTION
5090	7147310.203	513178.596	415.131	CRACK 10CM

5091	7147312.531	513179.155	415.134	TOP CRUST
5085	7147307.735	513180.999	414.739	CRACK FRACTION
5086	7147308.254	513181.142	414.773	CRACK FRACTION
5087	7147309.229	513181.423	414.805	CRACK FRACTION
5088	7147311.084	513182.051	414.873	TOP CRUST
5081	7147307.086	513183.915	414.441	CRACK FRACTION
5082	7147308.100	513184.199	414.465	CRACK FRACTION
5083	7147308.640	513184.381	414.528	CRACK FRACTION
5084	7147310.277	513184.873	414.581	TOP CRUST
5078	7147305.677	513186.652	414.051	CRACK FRACTION
5079	7147306.347	513186.837	414.086	CRACK FRACTION
5080	7147307.966	513187.199	414.229	TOP CRUST
5075	7147304.790	513189.484	413.731	CRACK 4CM
5076	7147306.632	513190.069	413.832	CRACK 13CM
5077	7147307.206	513190.251	413.873	TOP CRUST
5072	7147302.747	513192.022	413.289	CRACK FRACTION
5073	7147305.403	513192.797	413.492	CRACK 24CM
5074	7147306.260	513192.941	413.556	TOP CRUST
5108	7147301.872	513194.914	412.960	RUN OFF
5069	7147303.633	513195.414	413.119	CRACK 3CM
5070	7147304.464	513195.675	413.168	CRACK 8CM
5071	7147305.645	513195.996	413.233	TOP CRUST
5109	7147301.092	513197.754	412.597	RUN OFF
5065	7147302.835	513198.285	412.769	CRACK 8CM
5066	7147303.715	513198.560	412.789	CRACK FRACTION
5067	7147305.076	513198.953	412.886	CRACK 15CM
5068	7147305.565	513199.117	412.891	TOP CRUST
5110	7147300.257	513200.777	412.236	RUN OFF
5060	7147300.795	513200.835	412.310	CRACK 5CM
5061	7147301.833	513201.139	412.391	CRACK 10CM
5062	7147303.568	513201.641	412.503	CRACK 8CM
5063	7147304.295	513201.852	412.537	CRACK 4CM
5064	7147304.625	513201.970	412.515	TOP CRUST
5111	7147299.309	513203.693	411.858	RUN OFF
5057	7147301.083	513204.037	412.017	CRACK 12CM
5058	7147303.259	513204.689	412.136	CRACK 14CM
5059	7147304.019	513205.074	412.127	TOP CRUST
5112	7147298.564	513206.548	411.436	RUN OFF
5054	7147300.034	513206.850	411.647	CRACK 10CM
5055	7147302.438	513207.566	411.766	CRACK 14CM
5056	7147302.839	513207.692	411.784	TOP CRUST
5113	7147297.683	513209.351	411.093	RUN OFF
5051	7147299.075	513209.717	411.230	CRACK FRACTION
5052	7147301.061	513210.271	411.395	CRACK 8CM
5053	7147301.584	513210.377	411.414	TOP CRUST
5114	7147296.826	513212.188	410.742	RUN OFF
5047	7147298.211	513212.569	410.885	CRACK FRACTION
5048	7147299.336	513212.899	410.955	CRACK FRACTION
5049	7147300.585	513213.262	411.045	CRACK 5CM
5050	7147301.465	513213.469	411.056	TOP CRUST
5115	7147296.014	513215.037	410.389	RUN OFF
5043	7147296.643	513215.247	410.498	CRACK FRACTION
5044	7147298.618	513215.830	410.614	CRACK FRACTION
5045	7147299.509	513216.051	410.703	CRACK 7CM

5046	7147300.199	513216.346	410.736	TOP CRUST
5116	7147295.108	513217.927	410.071	RUN OFF
5042	7147296.281	513218.290	410.190	CRACK FRACTION
5041	7147297.795	513218.729	410.272	CRACK 2 CM
5040	7147298.134	513218.789	410.290	CRACK 7CM
5117	7147294.104	513220.773	409.732	RUN OFF
5035	7147295.168	513221.057	409.849	CRACK FRACTION
5036	7147296.592	513221.563	409.965	CRACK FRACTION
5118	7147293.471	513221.832	409.605	RUN OFF
5037	7147297.502	513221.880	410.017	CRACK 8 CM
5121	7147293.272	513222.981	409.465	RUN OFF 2
5119	7147291.763	513223.053	409.316	RUN OFF
5122	7147292.656	513224.011	409.314	RUN OFF 2
5120	7147289.943	513224.251	408.946	RUN OFF
5124	7147292.339	513224.457	409.256	RUN OFF 3
5032	7147297.104	513224.903	409.711	CRACK 2CM
5033	7147297.905	513224.997	409.722	CRACK 4CM
5123	7147289.986	513225.516	408.947	RUN OFF 2
5125	7147291.492	513226.272	409.005	RUN OFF 3
5029	7147293.932	513226.905	409.184	CRACK 1 CM
5030	7147297.229	513227.730	409.446	CRACK 5 CM
5126	7147290.167	513228.940	408.640	RUN OFF 3
5025	7147293.384	513229.861	408.870	CRACK FRACTION
5127	7147288.029	513230.406	408.299	RUN OFF 3
5026	7147295.985	513230.861	409.044	CRACK FRACTION
5027	7147296.765	513231.060	409.094	CRACK FRACTION
5023	7147292.720	513232.825	408.576	CRACK 0.05CM

SLIDE AREA 1 2 3

CLINTON CREEK LONG TERM PERFORMANCE MONITORING

UTM COORDINATES

NAD 83, Zone 7, 141º West

SLIDE AREA					
	NORTHING	EASTING	ORTHOMETRIC HEIGHT		
10005	7146645.496	514792.984	371.352	CLRD	Slide Area 1
10006	7146626.205	514807.131	372.734	CLRD	Slide Area 1
10007	7145614.718	515527.187	348.345	CLRD	Slide Area 2
10008	7145599.926	515536.926	347.832	CLRD	Slide Area 2
10009	7145201.930	516013.958	340.162	CLRD	Slide Area 3
10010	7145188.372	516012.898	340.184	CLRD	Slide Area 3

TARGETS AND PHOTO ID

CLINTON CREEK LONG TERM PERFORMANCE

UTM COORDINATES

NAD 83, Zone 7, 141º West

Table 1			
	NORTHING	EASTING	OTHOMETRIC HEIGHT
TARGET 1	7149422.142	512803.559	604.638
TARGET 2	7148177.097	513006.162	595.361
TARGET 3	7147599.201	512149.574	454.888
TARGET 4	7147365.639	512844.481	414.436
TARGET 5	7147195.637	513042.424	442.770
TARGET 6	7146676.665	513619.907	464.645
TARGET 7	7146936.610	513685.026	410.714
TARGET 8	7147138.824	514177.671	367.382
TARGET ALT 1	7148238.754	513378.839	607.207

Table 2					
	NORTHING	EASTING	OTHOMETRIC HEIGHT		
6027	7148033.168	513213.009	595.045	SEE FN	PH ID 1
6028	7148027.229	513203.797	594.991	SEE FN	PH ID 1
6029	7148040.884	513190.353	594.752	SEE FN	PH ID 1
6026	7148100.263	513147.023	594.902	SEE FN	PH ID 2
6025	7148118.730	513182.757	594.694	SEE FN	PH ID 3
6030	7148068.321	513081.906	595.598	SEE FN	PH ID 4
6031	7148064.675	513081.879	595.012	SEE FN	PH ID 4
6015	7147394.193	512838.307	413.552	SEE FN GRD ELEV	PH ID 5
6014	7147394.717	512838.617	413.892	SEE FN ROCK CENTRE	PH ID 5
6016	7147406.072	512853.375	413.759	SEE FN GRD ELEV	PH ID 6
6017	7147406.640	512854.168	414.793	SEE FN ROCK CENTRE	PH ID 6
6008	7146917.040	513676.492	412.029	SEE FN	PH ID 7
6009	7146918.221	513680.077	411.582	SEE FN	PH ID 7
6010	7146929.567	513673.432	411.278	SEE FN	PH ID 7

Table 3					
	NORTHING	EASTING	OTHOMETRIC HEIGHT		
6043	7147009.645	513439.006	432.843	SEE FN	PH ID 2
6019	7147441.317	512866.564	413.921	SEE FN ROCK COR	PH ID 3
6018	7147455.388	512870.228	414.227	SEE FN	PH ID 3

bridge					
	NORTHING	EASTING	OTHOMETRIC HEIGHT		
6046	7142260.06	519406.98	299.27	SEE FN	CL BRIDGE END
6050	7142250.21	519582.70	301.58	SEE FN	CL BRIDGE END
6047	7142257.41	519456.03	300.04	SEE FN	CL BRIDGE MID
6048	7142255.36	519493.06	300.52	SEE FN	CL BRIDGE MID
6049	7142253.25	519530.08	301.09	SEE FN	CL BRIDGE MID

511,500
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7,149,000
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7,147,500
7,147,000
7,146,500

WOLVERINE CREEK
TAILINGS PILE
NORTH
LOBE
SOUTH
LOBE
FORMER
MILL
SITE
TAILINGS PILE
ACCESS ROAD
U2834 (RTK BASE)
U1561 (MINE)
U1086
WOLVERENE
CREEK
HILL (MINE)
CREEK STABILIZATION AREA
INCLUDING: HUDGEON LAKE
OUTLET AND FOUR GABION
DROP STRUCTURES
U5700
U1192
U5699
U5698
U1183
U1191
G-TRAV (MINE)
CLINTON CREEK
2835
U1200
U1189
MINE ACCESS ROAD
HUDGEON LAKE
CLINTON CREEK
WASTE ROCK DUMP
U2836 (RTK BASE)
SNOWSHOE PIT
CLINTON
CREEK
BEAR
CREEK
U228 (MINE)
U1836
U1182
PORCUPINE PIT
U1193
SHACK (MINE)
U280 (MINE)
PORCUPINE
CREEK

N

0 150 300 m
SCALE 1:15000

UTM ZONE 7 NAD83
IMAGE DATE 1999

U5700 BENCHMARK

U228 (MINE) LOCAL MINE BENCHMARKS

Government of Yukon
Clinton Creek Long Term Monitoring
Site Plan and Bench Mark Locations

Dwg. No.: 2857-00-SK001
Date: Oct. 5, 2012

Associated Engineering

CREEK STABILIZATION AREA
(FOUR GABION DROP STRUCTURES)

HUDGEON LAKE

CLINTON CREEK
WASTE ROCK DUMP

CLINTON CREEK

ENLARGEMENT
0 40 80 m

FORMER
CRUSHER
BUILDING
(DEMOLISHED)

SNOWSHOE
PIT

PORCUPINE PIT
SLOPE MONITORS

PORCUPINE
PIT

CREEK
PIT

±420 CONTOUR

±450 CONTOUR

513,000

513,500

514,000

7,147,000

7,146,500

0 50 100 m

SCALE 1:5000

UTM ZONE 7 NAD83
IMAGE DATE 1999

XS-G MONITOR LOCATION (DESTROYED, NOT FOUND)

0226 MONITOR LOCATION (ACTIVE)

P2 PIEZOMETER LOCATION

22cm INCREMENTAL MOVEMENT (AUG 2011 TO AUGUST 2012)

10cm TOTAL MOVEMENT VECTOR (BASELINE TO AUGUST 2012)

UPPER SLOPE AREA
- ELEVATION >450±

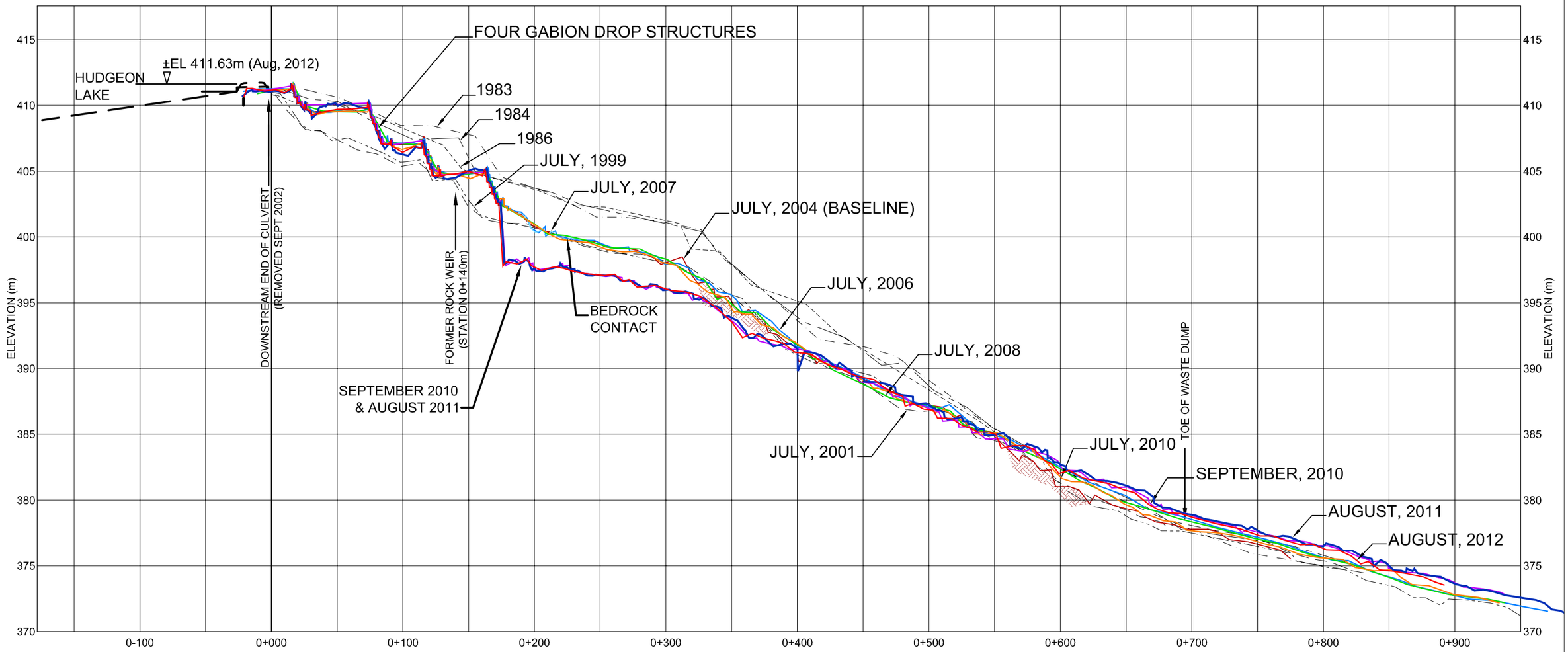
MID SLOPE AREA
- ELEVATION >420± <450±

LOWER SLOPE AREA
- ELEVATION <420±

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Clinton Creek Waste Rock Dump
Movement Monitoring

Dwg. No.: 2857-00-SK002
Date: Oct. 5, 2012

Associated Engineering



PROFILE

0 30 60 m H=1:3000
0 3 6 V=1:300

STATION	NORTHING	EASTING
0+000	7,147,427	512,863
0+250	7,147,366	513,113
0+500	7,147,272	513,363
0+750	7,147,204	513,613

COORD: UTM ZONE 7W NAD83

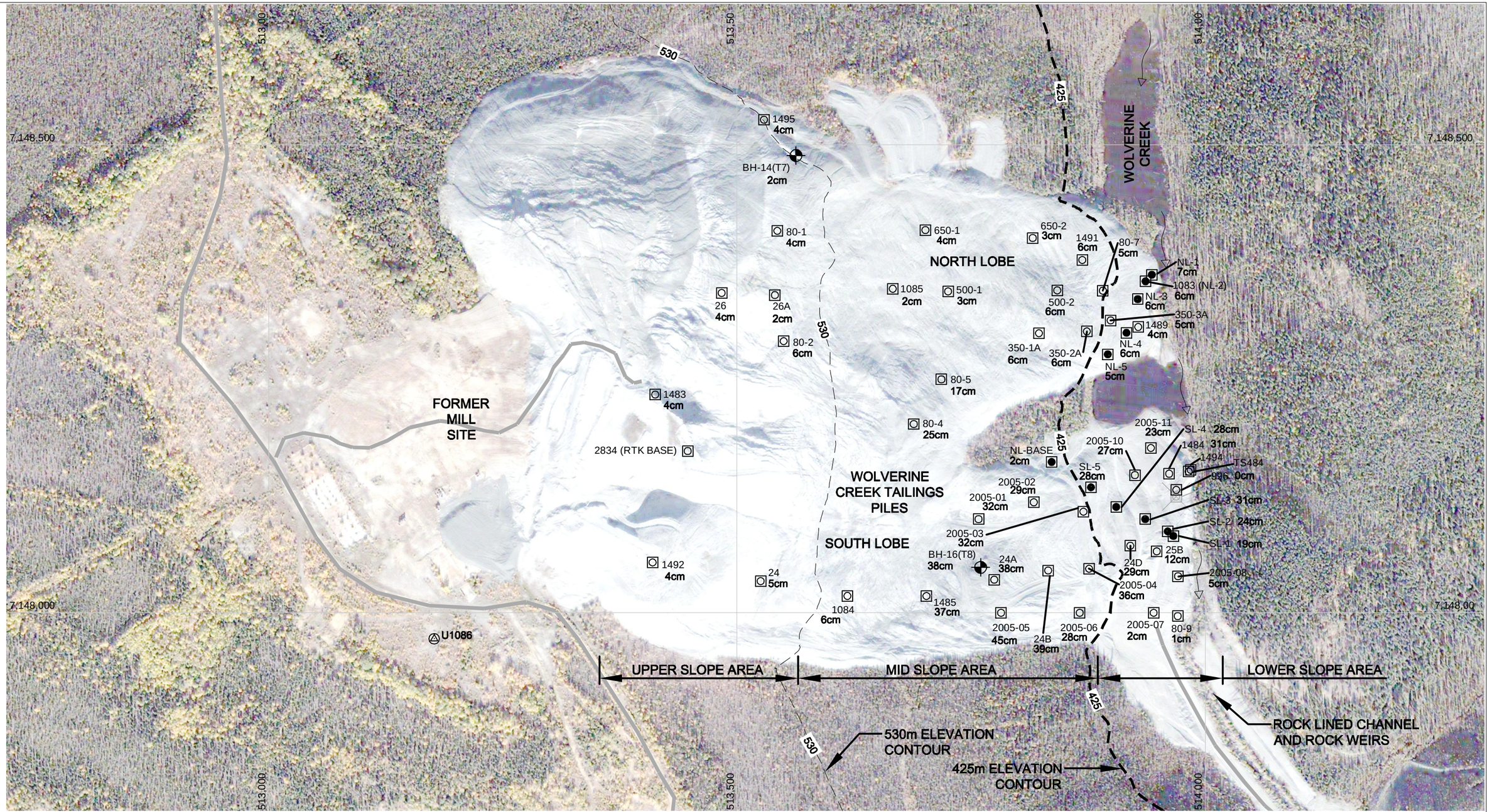
LEGEND

- PROFILE 1983
- PROFILE 1984
- PROFILE 1986
- PROFILE 1999
- PROFILE 2001
- PROFILE 2004 (BASELINE FOR LONG TERM MONITORING)
- PROFILE 2006
- PROFILE 2007
- PROFILE 2008
- PROFILE JULY 2010
- PROFILE SEPTEMBER 2010
- PROFILE AUGUST 2011
- PROFILE AUGUST 2012

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Clinton Creek Channel Profile

Dwg. No.: 2857-00-SK008
Date: Oct. 5, 2012

Associated Engineering



0 40 80 120 m

SCALE 1:4000

UTM ZONE 7 NAD83
IMAGE DATE 1999

MONITOR LOCATION (DESTROYED, NOT FOUND)

24 MONITOR LOCATION (ACTIVE)

SL/NL-01 VISUAL ALIGNMENT PIN

BH-14 (T7) 1978 TEST HOLE LOCATION

17cm INCREMENTAL MOVEMENT (AUG 2011 TO AUGUST 2012)

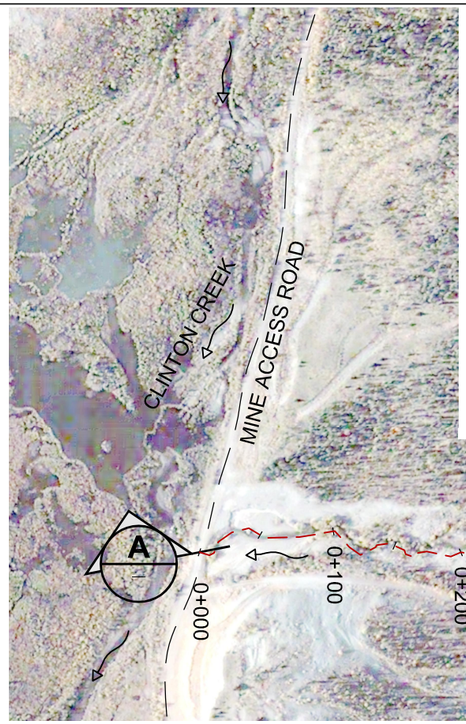
100cm TOTAL MOVEMENT VECTOR (BASELINE TO AUGUST 2012)

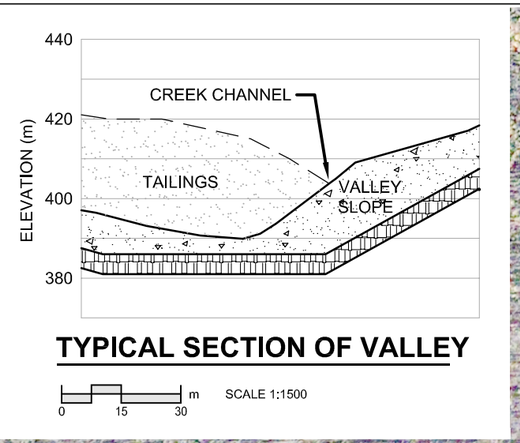
Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Wolverine Creek Tailings Pile Movement Monitoring

Dwg. No.: 2857-00-SK012
Date: Oct. 5, 2012

Associated Engineering

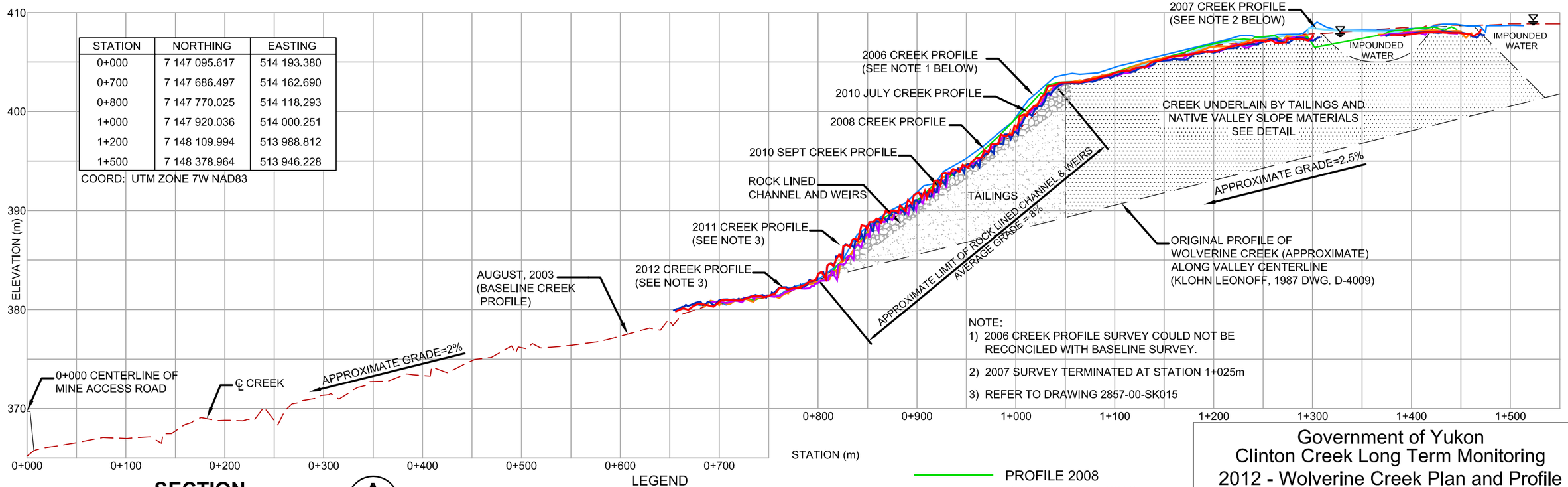
Time: 8:53
Date: 2006/3/24
Lt/Drawing Scale: 1=1,000
AutoCAD File: S:\CAD\AEGRP-2000\BDR\AE-SK-11X17.DWG (GH)



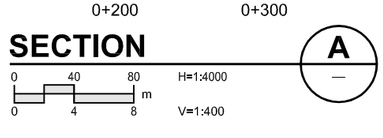


STATION	NORTHING	EASTING
0+000	7 147 095.617	514 193.380
0+700	7 147 686.497	514 162.690
0+800	7 147 770.025	514 118.293
1+000	7 147 920.036	514 000.251
1+200	7 148 109.994	513 988.812
1+500	7 148 378.964	513 946.228

COORD: UTM ZONE 7W NAD83



NOTE:
1) 2006 CREEK PROFILE SURVEY COULD NOT BE RECONCILED WITH BASELINE SURVEY.
2) 2007 SURVEY TERMINATED AT STATION 1+025m
3) REFER TO DRAWING 2857-00-SK015



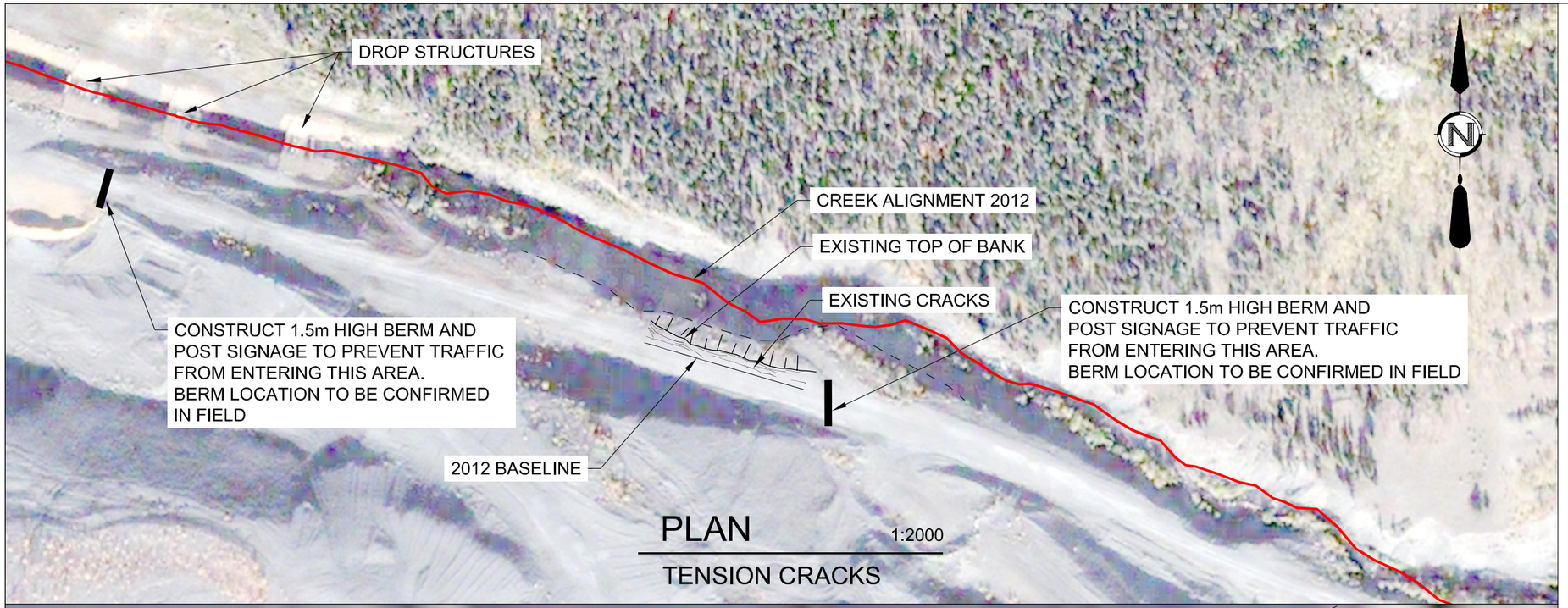
LEGEND

- PROFILE 2003 (BASELINE)
- PROFILE 2006
- PROFILE 2007
- PROFILE 2008
- PROFILE JULY 2010
- PROFILE SEPTEMBER 2010
- PROFILE 2011
- PROFILE 2012

Government of Yukon
Clinton Creek Long Term Monitoring
2012 - Wolverine Creek Plan and Profile

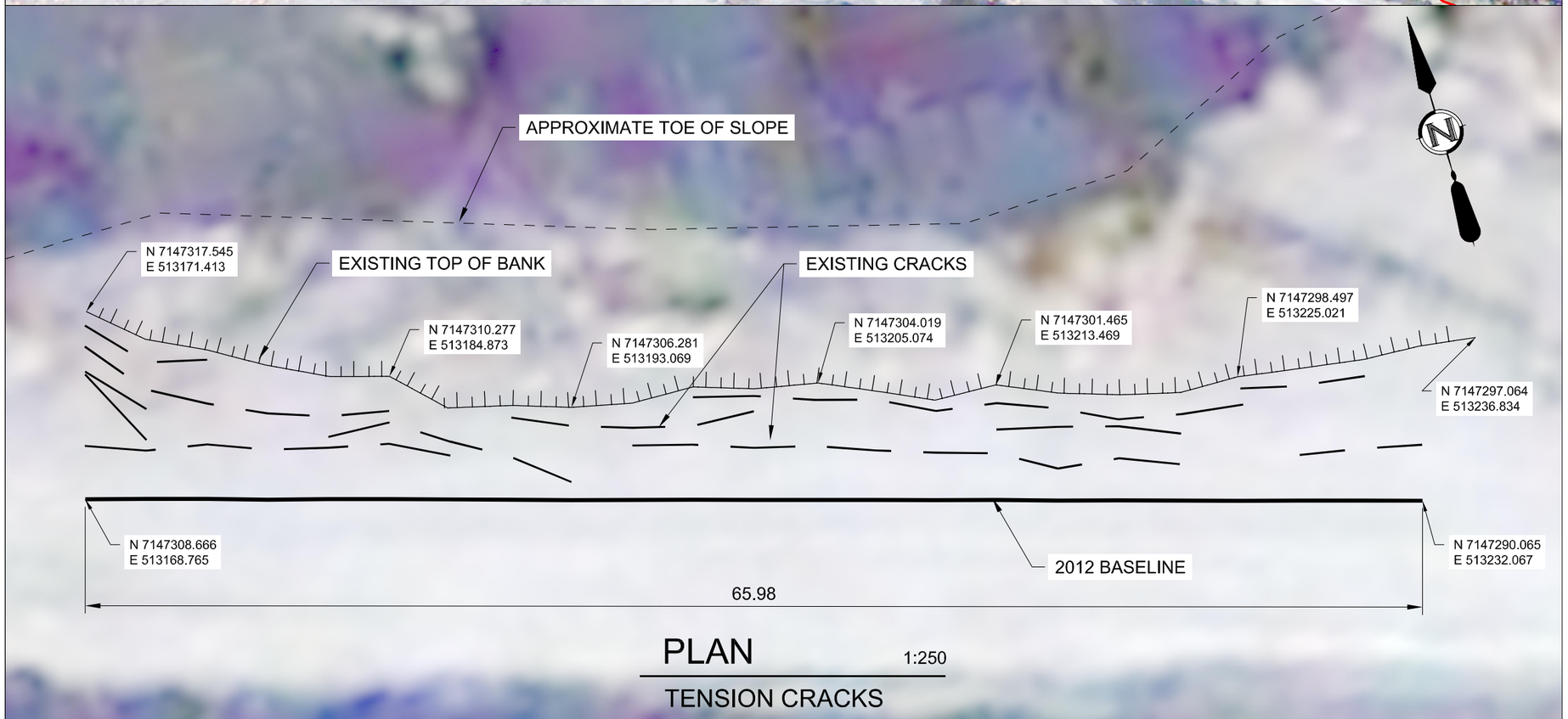
Dwg. No.: 2857-00-SK014
Date: Oct. 5, 2012

Associated Engineering



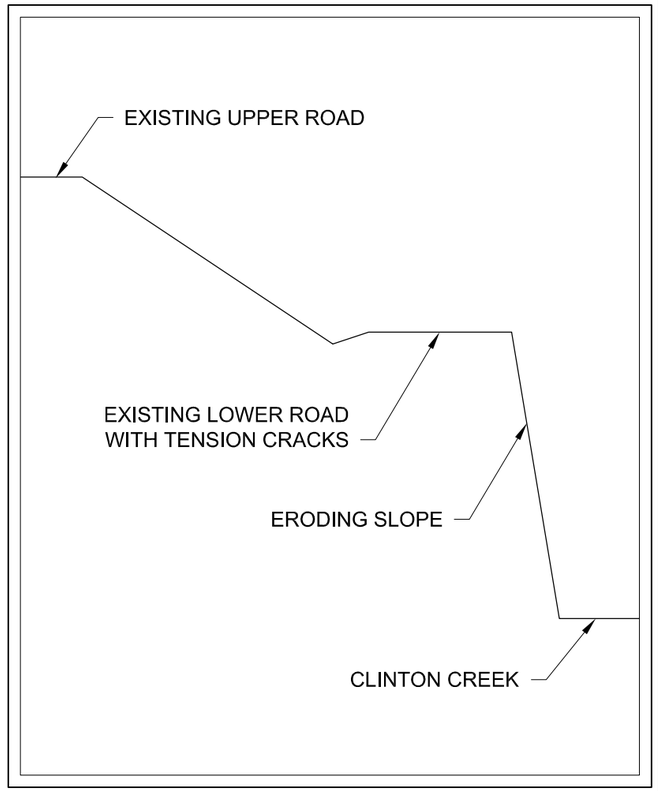
PLAN 1:2000

TENSION CRACKS



PLAN 1:250

TENSION CRACKS



SECTION NTS

TYPICAL ROAD

Government of Yukon
Clinton Creek Long Term Monitoring
Clinton Creek Road Tension Cracks

Dwg. No.: 2857-00-SK016
Date: Oct. 5, 2012

Associated Engineering

Appendix B - Clinton Creek Waste Rock Dump Movement Monitoring Results

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Table B-1) Waste Rock Dump Stability - Upper Slope Summary

Monitor	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
81-1	19-Jun-01	7,147,034.71	512,978.88	455.25	0.00	0.12	0.06	0.00	0.14	0.07
	20-Aug-03	7,147,034.82	512,978.93	455.27	0.12	0.12	0.06	0.02	0.02	0.01
	28-Jul-04	7,147,034.76	512,978.92	455.23	0.07	0.06	0.07	-0.03	-0.04	-0.05
	28-Jul-06	7,147,034.80	512,978.92	455.18	0.10	0.05	0.02	-0.07	-0.04	-0.02
	09-Jul-08	7,147,034.83	512,978.93	455.22	0.13	0.03	0.01	-0.04	0.04	0.02
	20-Jul-10	7,147,034.84	512,978.93	455.17	0.14	0.02	0.01	-0.08	-0.04	-0.02
	25-Sep-10	7,147,034.83	512,978.94	455.17	0.14	0.02	0.08	-0.08	0.00	0.00
	11-Aug-11	7,147,034.86	512,978.99	455.14	0.18	0.06	0.07	-0.11	-0.03	-0.04
	06-Aug-12	7,147,034.86	512,978.94	455.09	0.16	0.05	0.05	-0.16	-0.05	-0.05
223	19-Jun-01	n/a								
	20-Aug-03	7,146,978.05	512,942.74	467.22	0.00			0.00		
	28-Jul-04	7,146,978.08	512,942.73	467.20	0.03	0.03	0.03	-0.02	-0.02	-0.02
	28-Jul-06	7,146,978.12	512,942.73	467.21	0.07	0.04	0.02	-0.01	0.00	0.00
	09-Jul-08	7,146,978.16	512,942.75	467.15	0.11	0.05	0.02	-0.07	-0.05	-0.03
	20-Jul-10	7,146,978.19	512,942.75	467.13	0.14	0.03	0.02	-0.09	-0.02	-0.01
	25-Sep-10	7,146,978.17	512,942.78	467.10	0.12	0.04	0.21	-0.12	-0.03	-0.15
	11-Aug-11	7,146,978.22	512,942.79	467.08	0.17	0.05	0.06	-0.14	-0.02	-0.03
	06-Aug-12	7,146,978.25	512,942.76	467.05	0.20	0.04	0.04	-0.17	-0.03	-0.03
225	19-Jun-01	n/a								
	20-Aug-03	7,146,918.72	512,905.22	475.17	0.00			0.00		
	28-Jul-04	7,146,918.73	512,905.18	475.14	0.04	0.04	0.04	-0.03	-0.03	-0.03
	28-Jul-06	7,146,918.77	512,905.18	475.15	0.07	0.04	0.02	-0.03	0.00	0.00
	09-Jul-08	7,146,918.81	512,905.20	475.10	0.09	0.04	0.02	-0.07	-0.05	-0.03
	20-Jul-10	7,146,918.83	512,905.19	475.07	0.12	0.03	0.02	-0.11	-0.03	-0.01
	25-Sep-10	7,146,918.84	512,905.24	475.06	0.13	0.05	0.27	-0.11	-0.01	-0.04
	11-Aug-11	7,146,918.86	512,905.25	475.03	0.15	0.02	0.03	-0.14	-0.03	-0.03
	06-Aug-12	7,146,918.89	512,905.21	475.02	0.18	0.06	0.06	-0.16	-0.02	-0.02
1195	19-Jun-01	7,147,111.83	512,899.53	456.62	0.00	0.10	0.05	0.00	0.16	0.08
	20-Aug-03	7,147,111.94	512,899.53	456.59	0.11	0.11	0.05	-0.03	-0.03	-0.01
	28-Jul-04	7,147,111.95	512,899.52	456.60	0.12	0.02	0.02	-0.02	0.01	0.01
	28-Jul-06	7,147,111.95	512,899.50	456.56	0.13	0.03	0.01	-0.06	-0.04	-0.02
	04-Jul-07	7,147,112.01	512,899.50	456.54	0.18	0.06	0.06	-0.08	-0.02	-0.03
	09-Jul-08	7,147,112.03	512,899.52	456.51	0.20	0.03	0.03	-0.11	-0.03	-0.03
	20-Jul-10	7,147,112.05	512,899.52	456.48	0.22	0.02	0.01	-0.14	-0.03	-0.02
	25-Sep-10	7,147,112.03	512,899.52	456.43	0.21	0.01	0.07	-0.18	-0.04	-0.23
	11-Aug-11	7,147,112.05	512,899.53	456.41	0.23	0.02	0.02	-0.21	-0.03	-0.03
	06-Aug-12	7,147,112.06	512,899.52	456.39	0.24	0.02	0.02	-0.22	-0.01	-0.01
1834	19-Jun-01	n/a								
	20-Aug-03	7,146,973.62	512,893.43	461.12	0.00			0.00		
	28-Jul-04	7,146,973.64	512,893.38	461.09	0.06	0.06	0.06	-0.03	-0.03	-0.03
	28-Jul-06	7,146,973.69	512,893.36	461.09	0.11	0.06	0.03	-0.03	0.00	0.00
	04-Jul-07	7,146,973.72	512,893.36	461.08	0.13	0.03	0.03	-0.04	-0.01	-0.01
	09-Jul-08	7,146,973.74	512,893.38	461.06	0.13	0.03	0.03	-0.06	-0.01	-0.01
	20-Jul-10	7,146,973.79	512,893.34	461.04	0.20	0.07	0.04	-0.08	-0.02	-0.01
	25-Sep-10	7,146,973.78	512,893.40	461.03	0.16	0.06	0.35	-0.09	-0.01	-0.07
	11-Aug-11	7,146,973.83	512,893.42	461.04	0.22	0.06	0.07	-0.08	0.01	0.01
	06-Aug-12	7,146,973.82	512,893.36	460.96	0.21	0.06	0.06	-0.16	-0.08	-0.08

Average	1999 to 2001	0.00	0.11	0.06	0.00	0.15	0.08
	2001 to 2003	0.05	0.12	0.05	0.00	0.00	0.00
	2003 to 2004	0.06	0.04	0.04	-0.02	-0.02	-0.02
	2004 to 2006	0.09	0.04	0.02	-0.04	-0.02	-0.01
	2006 to 2008	0.13	0.03	0.02	-0.07	-0.02	-0.02
	2008 to 2010	0.16	0.04	0.02	-0.10	-0.03	-0.01
	Jul 2010 to Sep 2010	0.15	0.04	0.20	-0.12	-0.02	-0.10
	Jul 2010 to Aug 2011	0.15	0.06	0.05	-0.12	-0.04	-0.04
	Sept 2010 to 2011	0.19	0.04	0.05	-0.14	-0.02	-0.02
	Aug 2011 to Aug 2012	**0.20**	**0.04**	**0.04**	**-0.17**	**-0.04**	**-0.04**
Maximum	1999 to 2001	0.00	0.12	0.06	0.00	0.16	0.08
	2001 to 2003	0.12	0.12	0.06	0.02	0.02	0.01
	2003 to 2004	0.12	0.06	0.07	-0.02	0.01	0.01
	2004 to 2006	0.13	0.06	0.03	-0.01	0.00	0.00
	2006 to 2008	0.20	0.05	0.03	-0.04	0.04	0.02
	2008 to 2010	0.22	0.07	0.04	-0.08	-0.02	-0.01
	Jul 2010 to Sep 2010	0.21	0.06	0.35	-0.08	0.00	0.00
	Jul 2010 to Aug 2011	0.21	0.09	0.09	-0.08	0.00	0.00
	Sept 2010 to 2011	0.23	0.06	0.07	-0.08	0.01	0.01
	Aug 2011 to Aug 2012	**0.24**	**0.06**	**0.06**	**-0.16**	**-0.01**	**-0.01**
Minimum	1999 to 2001	0.00	0.10	0.05	0.00	0.14	0.07
	2001 to 2003	0.00	0.11	0.05	-0.03	-0.03	-0.01
	2003 to 2004	0.03	0.02	0.02	-0.03	-0.04	-0.05
	2004 to 2006	0.07	0.03	0.01	-0.07	-0.04	-0.02
	2006 to 2008	0.09	0.03	0.01	-0.11	-0.05	-0.03
	2008 to 2010	0.12	0.02	0.01	-0.14	-0.04	-0.02
	Jul 2010 to Sep 2010	0.12	0.01	0.07	-0.18	-0.04	-0.23
	Jul 2010 to Aug 2011	0.12	0.01	0.01	-0.18	-0.07	-0.07
	Sept 2010 to 2011	0.15	0.02	0.02	-0.21	-0.03	-0.04
	Aug 2011 to Aug 2012	**0.16**	**0.02**	**0.02**	**-0.22**	**-0.08**	**-0.08**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Table B-2) Waste Rock Dump Stability - Mid Slope Summary

Monitor	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
4	19-Jun-01	7,147,211.31	513,193.67	435.30	0.00	0.06	0.03	0.00	-0.17	-0.09
	20-Aug-03	7,147,211.28	513,193.64	435.18	0.05	0.05	0.02	-0.12	-0.12	-0.06
	28-Jul-04	7,147,211.22	513,193.64	435.08	0.10	0.06	0.07	-0.22	-0.10	-0.11
	28-Jul-06	7,147,211.16	513,193.61	435.06	0.16	0.07	0.03	-0.24	-0.02	-0.01
	09-Jul-08	7,147,211.10	513,193.62	434.97	0.21	0.06	0.03	-0.33	-0.09	-0.05
	20-Jul-10	7,147,211.05	513,193.59	434.91	0.28	0.06	0.03	-0.39	-0.06	-0.03
	25-Sep-10	7,147,211.04	513,193.60	434.90	0.28	0.02	0.10	-0.40	-0.01	-0.06
	11-Aug-11	7,147,211.02	513,193.60	434.88	0.30	0.02	0.03	-0.42	-0.01	-0.01
	06-Aug-12	7,147,211.01	513,193.62	434.87	0.30	0.02	0.02	-0.43	-0.02	-0.02
19	19-Jun-01	7,147,124.18	513,365.54	430.10	0.00	0.22	0.11	0.00	-0.32	-0.16
	20-Aug-03	7,147,124.35	513,365.64	429.24	0.19	0.19	0.09	-0.86	-0.86	-0.40
	28-Jul-04	7,147,124.36	513,365.70	429.13	0.24	0.06	0.06	-0.97	-0.11	-0.11
	28-Jul-06	not surveyed in 2006								
	09-Jul-08	7,147,124.48	513,365.75	428.78	0.36	0.13	0.03	-1.32	-0.35	-0.09
	20-Jul-10	7,147,124.46	513,365.72	428.66	0.33	0.04	0.02	-1.44	-0.12	-0.06
	25-Sep-10	7,147,124.43	513,365.74	428.64	0.32	0.03	0.18	-1.47	-0.03	-0.14
	11-Aug-11	7,147,124.41	513,365.74	428.58	0.30	0.02	0.02	-1.52	-0.06	-0.07
	06-Aug-12	7,147,124.41	513,365.73	428.52	0.30	0.01	0.01	-1.58	-0.06	-0.06
20A	19-Jun-01	7,147,207.71	513,057.05	445.86	0.00	0.22	0.11	0.00	0.05	0.03
	20-Aug-03	7,147,207.86	513,057.14	445.83	0.17	0.17	0.08	-0.03	-0.03	-0.01
	28-Jul-04	7,147,207.85	513,057.12	445.74	0.15	0.02	0.03	-0.11	-0.09	-0.09
	28-Jul-06	7,147,207.88	513,057.14	445.69	0.19	0.05	0.02	-0.17	-0.05	-0.03
	04-Jul-07	7,147,207.91	513,057.16	445.66	0.22	0.03	0.03	-0.20	-0.03	-0.03
	09-Jul-08	7,147,207.92	513,057.18	445.63	0.25	0.03	0.03	-0.23	-0.03	-0.03
	20-Jul-10	7,147,207.95	513,057.18	445.57	0.27	0.03	0.01	-0.29	-0.06	-0.03
	25-Sep-10	7,147,207.93	513,057.18	445.55	0.25	0.02	0.11	-0.31	-0.02	-0.12
	11-Aug-11	7,147,207.94	513,057.20	445.53	0.27	0.02	0.03	-0.32	-0.02	-0.02
	06-Aug-12	7,147,207.98	513,057.21	445.50	0.31	0.04	0.04	-0.35	-0.03	-0.03
21A	19-Jun-01	7,147,228.14	512,915.05	446.57	0.00	0.20	0.10	0.00	0.05	0.02
	20-Aug-03	7,147,228.20	512,915.15	446.54	0.11	0.11	0.05	-0.03	-0.03	-0.02
	28-Jul-04	7,147,228.18	512,915.11	446.43	0.07	0.04	0.05	-0.14	-0.11	-0.11
	28-Jul-06	7,147,228.26	512,915.11	446.38	0.13	0.08	0.04	-0.19	-0.05	-0.02
	04-Jul-07	7,147,228.30	512,915.11	446.37	0.17	0.12	0.13	-0.21	-0.06	-0.02
	09-Jul-08	7,147,228.31	512,915.12	446.32	0.18	0.05	0.05	-0.25	-0.06	-0.07
	20-Jul-10	7,147,228.36	512,915.09	446.26	0.22	0.02	0.02	-0.31	-0.05	-0.04
	25-Sep-10	7,147,228.34	512,915.10	446.23	0.21	0.02	0.09	-0.35	-0.03	-0.19
	11-Aug-11	7,147,228.38	512,915.08	446.19	0.24	0.04	0.05	-0.38	-0.03	-0.04
	06-Aug-12	7,147,228.43	512,915.07	446.16	0.29	0.05	0.05	-0.41	-0.03	-0.03
22A	19-Jun-01	7,147,224.10	512,841.41	445.02	0.00	0.19	0.10	0.00	-0.03	-0.02
	20-Aug-03	7,147,224.29	512,841.31	444.99	0.22	0.22	0.10	-0.03	-0.03	-0.01
	28-Jul-04	7,147,224.27	512,841.30	444.88	0.21	0.02	0.02	-0.14	-0.11	-0.12
	28-Jul-06	7,147,224.40	512,841.26	444.81	0.33	0.13	0.07	-0.21	-0.07	-0.03
	04-Jul-07	7,147,224.45	512,841.23	444.77	0.39	0.06	0.06	-0.25	-0.04	-0.05
	09-Jul-08	7,147,224.48	512,841.23	444.72	0.42	0.04	0.04	-0.30	-0.05	-0.05
	20-Jul-10	7,147,224.57	512,841.21	444.62	0.51	0.09	0.04	-0.40	-0.09	-0.05
	25-Sep-10	7,147,224.59	512,841.24	444.59	0.52	0.04	0.23	-0.44	-0.04	-0.21
	11-Aug-11	7,147,224.62	512,841.23	444.54	0.55	0.03	0.04	-0.48	-0.05	-0.05
	06-Aug-12	7,147,224.67	512,841.20	444.50	0.61	0.06	0.07	-0.52	-0.04	-0.04
68	19-Jun-01	7,147,261.98	513,142.46	434.49	0.00	0.02	0.01	0.00	-0.15	-0.08
	20-Aug-03	7,147,262.03	513,142.42	434.42	0.07	0.07	0.03	-0.07	-0.07	-0.03
	28-Jul-04	7,147,262.00	513,142.42	434.33	0.05	0.03	0.04	-0.16	-0.09	-0.09
	28-Jul-06	7,147,262.02	513,142.36	434.31	0.11	0.06	0.03	-0.18	-0.02	-0.01
	04-Jul-07	7,147,262.06	513,142.33	434.27	0.15	0.10	0.04	-0.22	-0.06	-0.02
	09-Jul-08	7,147,262.05	513,142.32	434.22	0.17	0.02	0.01	-0.27	-0.05	-0.03
	20-Jul-10	7,147,262.07	513,142.27	434.16	0.22	0.05	0.02	-0.33	-0.06	-0.02
	25-Sep-10	7,147,262.07	513,142.29	434.13	0.20	0.02	0.01	-0.36	-0.03	-0.01
	11-Aug-11	7,147,262.10	513,142.27	434.09	0.22	0.03	0.03	-0.40	-0.03	-0.04
	06-Aug-12	7,147,262.12	513,142.28	434.07	0.24	0.03	0.03	-0.42	-0.02	-0.02
81-2	19-Jun-01	7,147,205.22	513,011.60	443.70	0.00	0.15	0.08	0.00	0.04	0.02
	20-Aug-03	7,147,205.29	513,011.56	443.75	0.07	0.07	0.03	0.05	0.05	0.02
	28-Jul-04	7,147,205.26	513,011.60	443.71	0.03	0.05	0.05	0.01	-0.04	-0.05
	28-Jul-06	7,147,205.28	513,011.59	443.71	0.05	0.02	0.01	0.01	0.00	0.00
	04-Jul-07	7,147,205.31	513,011.58	443.69	0.09	0.03	0.04	-0.01	-0.02	-0.02
	09-Jul-08	7,147,205.32	513,011.59	443.68	0.09	0.02	0.02	-0.02	-0.01	-0.01
	20-Jul-10	7,147,205.32	513,011.61	443.64	0.10	0.01	0.01	-0.06	-0.04	-0.02
	25-Sep-10	7,147,205.33	513,011.60	443.61	0.10	0.00	0.02	-0.09	-0.03	-0.16
	11-Aug-11	7,147,205.34	513,011.60	443.61	0.11	0.01	0.02	-0.09	-0.01	-0.01
	06-Aug-12	7,147,205.37	513,011.60	443.59	0.15	0.03	0.03	-0.11	-0.02	-0.02
224	19-Jun-01	n/a								
	20-Aug-03	7,147,241.09	512,963.33	444.85	0.00			0.00		
	28-Jul-04	7,147,241.12	512,963.29	444.82	0.04	0.04	0.05	-0.03	-0.03	-0.03
	28-Jul-06	7,147,241.17	512,963.29	444.79	0.09	0.05	0.03	-0.06	-0.03	-0.02
	04-Jul-07	7,147,241.19	512,963.25	444.74	0.12	0.04	0.04	-0.11	-0.05	-0.05
	09-Jul-08	7,147,241.21	512,963.27	444.72	0.13	0.03	0.03	-0.13	-0.02	-0.02
	20-Jul-10	7,147,241.22	512,963.26	444.67	0.15	0.02	0.01	-0.18	-0.05	-0.02
	25-Sep-10	7,147,241.23	512,963.26	444.64	0.15	0.01	0.03	-0.21	-0.04	-0.20
	11-Aug-11	7,147,241.24	512,963.26	444.61	0.17	0.02	0.02	-0.24	-0.03	-0.04
	06-Aug-12	7,147,241.29	512,963.24	444.59	0.22	0.05	0.05	-0.26	-0.01	-0.01
227	19-Jun-01	n/a								
	20-Aug-03	7,147,076.84	513,124.78	439.48	0.00			0.00		
	28-Jul-04	7,147,076.78	513,124.77	439.44	0.07	0.07	0.07	-0.04	-0.04	-0.04
	28-Jul-06	7,147,076.82	513,124.77	439.45	0.03	0.04	0.02	-0.03	0.01	0.01
	09-Jul-08	7,147,076.83	513,124.80	439.42	0.02	0.03	0.01	-0.06	-0.03	-0.02
	20-Jul-10	7,147,076.85	513,124.79	439.40	0.02	0.02	0.01	-0.08	-0.02	-0.01
	25-Sep-10	7,147,076.87	513,124.80	439.35	0.04	0.02	0.13	-0.13	-0.06	-0.30
	11-Aug-11	7,147,076.87	513,124.80	439.35	0.03	0.01	0.01	-0.13	0.00	0.00
	06-Aug-12	7,147,076.89	513,124.81	439.33	0.06	0.03	0.03	-0.15	-0.02	-0.02
229	19-Jun-01	n/a								
	20-Aug-03	7,147,113.53	512,719.14	437.43	0.00			0.00		
	28-Jul-04	7,147,113.49	512,719.14	437.37	0.04	0.04	0.05	-0.06	-0.06	-0.06
	28-Jul-06	7,147,113.55	512,719.11	437.39	0.04	0.07	0.04	-0.05	0.02	0.01
	04-Jul-07	7,147,113.52	512,719.04	437.37	0.11	0.08	0.08	-0.06	-0.02	-0.02
	09-Jul-08	7,147,113.56	512,719.06	437.33	0.09	0.04	0.04	-0.10	-0.04	-0.04
	20-Jul-10	7,147,113.60	512,719.03	437.30	0.14	0.05	0.03	-0.13	-0.03	-0.02
	25-Sep-10	7,147,113.60	512,719.02	437.27	0.14	0.01	0.04	-0.16	-0.03	-0.15
	11-Aug-11	7,147,113.61	512,719.02	437.24	0.15	0.01	0.02	-0.19	-0.02	-0.03
	06-Aug-12	7,147,113.63	512,718.97	437.23	0.20	0.05	0.05	-0.20	-0.01	-0.01
1194	19-Jun-01	7,147,017.22	513,472.45	433.19	0.00	0.09	0.05	0.00	-0.18	-0.09
	20-Aug-03	7,147,017.32	513,472.44	433.19	0.10	0.10	0.05	0.00	0.00	0.00
	28-Jul-04	7,147,017.35	513,472.44	433.12	0.13	0.03	0.03	-0.07	-0.07	-0.07
	28-Jul-06	7,147,017.43	513,472.44	433.08	0.21	0.08	0.04	-0.11	-0.04	-0.02
	09-Jul-08	7,147,017.49	513,472.46	433.04	0.27	0.07	0.03	-0.15	-0.04	-0.02
	20-Jul-10	7,147,017.56	513,472.46	433.07	0.34	0.07	0.03	-0.12	0.02	0.01
	25-Sep-10	7,147,017.54	513,472.46	432.96	0.32	0.02	0.10	-0.23	-0.10	-0.56
	11-Aug-11	7,147,017.57	513,472.46	432.97	0.35	0.03	0.03	-0.22	0.00	0.00
	06-Aug-12	7,147,017.63	513,472.47	433.02	0.41	0.06	0.06	-0.17	0.05	0.05
1196	19-Jun-01	7,147,231.16	513,066.14	444.13	0.00	0.17	0.09	0.00	0.03	0.01
	20-Aug-03	7,147,231.23	513,066.18	444.08	0.08	0.08	0.04	-0.05	-0.05	-0.02
	28-Jul-04	7,147,231.26	513,066.20	444.05	0.12	0.04	0.04	-0.08	-0.03	-0.03
	28-Jul-06	7,147,231.28	513,066.23	443.97	0.16	0.04	0.02	-0.17	-0.08	-0.04
	04-Jul-07	7,147,231.35	513,066.26	443.93	0.23	0.07	0.08	-0.20	-0.04	-0.04
	09-Jul-08	7,147,231.36	513,066.28	443.87	0.25	0.02	0.02	-0.26	-0.06	-0.06
	20-Jul-10	7,147,231.40	513,066.31	443.80	0.30	0.05	0.03	-0.33	-0.07	-0.03
	25-Sep-10	7,147,231.39	513,066.32	443.77	0.30	0.01	0.03	-0.36	-0.03	-0.17
	11-Aug-11	7,147,231.42	513,066.33	443.73	0.32	0.02	0.03	-0.40	-0.04	-0.05
	06-Aug-12	7,147,231.44	513,066.35	443.70	0.36	0.04	0.04	-0.44	-0.03	-0.03
1831	19-Jun-01	n/a								
	20-Aug-03	7,147,227.18	512,766.65	432.85	0.00			0.00		
	28-Jul-04	7,147,227.23	512,766.60	432.79	0.07	0.07	0.08	-0.06	-0.06	-0.07
	28-Jul-06	7,147,227.36	512,766.55	432.71	0.20	0.13	0.07	-0.14	-0.07	-0.04
	04-Jul-07	7,147,227.41	512,766.51	432.67	0.27	0.06	0.07	-0.18	-0.04	-0.04
	09-Jul-08	7,147,227.44	512,766.52	432.61	0.29	0.03	0.03	-0.24	-0.06	-0.06
	20-Jul-10	7,147,227.55	512,766.46	432.76	0.41	0.12	0.06	-0.09	0.15	0.07
	25-Sep-10	7,147,227.54	512,766.51	432.50	0.39	0.05	0.29	-0.35	-0.26	-1.41
	11-Aug-11	7,147,227.57	512,766.47	432.47	0.43	0.05	0.06	-0.38	-0.04	-0.04
	06-Aug-12	7,147,227.62	512,766.44	432.45	0.49	0.06	0.06	-0.40	-0.02	-0.02

Average	1999 to 2001	0.00	0.15	0.08	0.00	-0.08	-0.04
	2001 to 2003	0.12	0.12	0.05	-0.13	-0.13	-0.06
	2003 to 2004	0.10	0.04	0.05	-0.16	-0.07	-0.08
	2004 to 2006	0.14	0.07	0.03	-0.13	-0.03	-0.02
	2006 to 2008	0.21	0.04	0.03	-0.28	-0.07	-0.04
	2008 to 2010	0.25	0.05	0.02	-0.32	-0.04	-0.02
	Jul 2010 to Sep 2010	0.25	0.02	0.10	-0.37	-0.05	-0.26
	Jul 2010 to Aug 2011	0.25	0.03	0.03	-0.37	-0.08	-0.08
	Sept 2010 to 2011	0.27	0.02	0.03	-0.40	-0.03	-0.03
	Aug 2011 to Aug 2012	**0.30**	**0.04**	**0.04**	**-0.42**	**-0.02**	**-0.02**
Maximum	1999 to 2001	0.00	0.22	0.11	0.00	0.05	0.03
	2001 to 2003	0.22	0.22	0.10	0.05	0.05	0.02
	2003 to 2004	0.24	0.07	0.08	0.01	-0.03	-0.03
	2004 to 2006	0.33	0.13	0.07	0.01	0.02	0.01
	2006 to 2008	0.42	0.13	0.05	-0.02	-0.01	-0.01
	2008 to 2010	0.51	0.12	0.06	-0.06	0.15	0.07
	Jul 2010 to Sep 2010	0.52	0.05	0.29	-0.09	-0.01	-0.01
	Jul 2010 to Aug 2011	0.52	0.06	0.06	-0.09	-0.02	-0.02
	Sept 2010 to 2011	0.55	0.05	0.06	-0.09	0.00	0.00
	Aug 2011 to Aug 2012	**0.61**	**0.06**	**0.07**	**-0.11**	**0.05**	**0.05**
Minimum	1999 to 2001	0.00	0.02	0.01	0.00	-0.32	-0.16
	2001 to 2003	0.05	0.05	0.02	-0.86	-0.86	-0.40
	2003 to 2004	0.03	0.02	0.02	-0.97	-0.11	-0.12
	2004 to 2006	0.03	0.02	0.01	-0.24	-0.08	-0.04
	2006 to 2008	0.02	0.02	0.01	-1.32	-0.35	-0.09
	2008 to 2010	0.02	0.01	0.01	-1.44	-0.12	-0.06
	Jul 2010 to Sep 2010	0.04	0.00	0.01	-1.47	-0.26	-1.41
	Jul 2010 to Aug 2011	0.04	0.01	0.01	-1.47	-0.29	-0.28
	Sept 2010 to 2011	0.03	0.01	0.01	-1.52	-0.06	-0.07
	Aug 2011 to Aug 2012	**0.06**	**0.01**	**0.01**	**-1.58**	**-0.06**	**-0.06**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Table B-3) Waste Rock Dump Stability - Lower Slope Summary

Monitor	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (metres)	increment (metres)	rate (metres/year)	total (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
	09-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
	06-Aug-12	7,147,329.21	513,138.52	416.40	0.05	0.02	0.02	-0.08	-0.03	-0.03
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
	09-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
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
	09-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	06-Aug-12	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
	09-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	06-Aug-12	7,147,177.89	513,504.73	380.79	0.00	0.00	0.00	0.00	0.00	0.00
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
	09-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	06-Aug-12	7,147,307.43	513,182.31	414.60	0.00	0.00	0.00	0.00	0.00	0.00
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
	09-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	06-Aug-12	7,147,211.00	513,440.57	388.36	0.00	0.00	0.00	0.00	0.00	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
	09-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
	06-Aug-12	7147288.622	513273.575	405.589	0.05	0.03	0.03	0.00	-0.02	-0.02
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
	09-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	06-Aug-12	7,147,208.18	513,432.05	388.90	0.00	0.00	0.00	0.00	0.00	0.00
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
	09-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
	06-Aug-12	7,147,265.38	513,333.03	399.68	0.05	0.05	0.05	0.02	0.02	0.02
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
	04-Jul-07	7,147,311.62	513,066.44	426.32	0.13	0.07	0.07	-0.14	-0.04	-0.04
	09-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
	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
	06-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
	04-Jul-07	7,147,347.15	512,836.70	413.86	0.21	0.04	0.04	-0.09	-0.06	-0.07
	09-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	06-Aug-12	7,147,323.08	512,802.48	413.77	0.00	0.00	0.00	0.00	0.00	0.00
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
	04-Jul-07	7,147,302.84	512,921.20	418.34	0.15	0.07	0.07	0.00	-0.01	-0.01
	09-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
	06-Aug-12	7,147,303.02	512,921.18	418.42	0.33	0.07	0.07	0.08	-0.01	-0.01

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Table B-3) Waste Rock Dump Stability - Lower Slope Summary

Monitor	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
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
	04-Jul-07	7,147,354.63	512,999.38	416.05	0.52	0.13	0.14	-0.09	0.06	0.07
	09-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
	06-Aug-12	7,147,354.84	512,999.43	415.81	0.73	0.11	0.11	-0.32	-0.13	-0.13
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
	09-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
	06-Aug-12	7,147,309.37	513,135.54	414.94	0.08	0.02	0.02	-0.40	-0.05	-0.05
P4	19-Jun-01	7,147,239.53	513,347.49	397.05	0			0		
	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
	09-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
	06-Aug-12	7,147,239.44	513,347.50	397.17	0.09	0.02	0.02	0.11	-0.01	-0.01
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
	09-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
	06-Aug-12	7,147,182.94	513,461.40	387.21	0.14	0.02	0.02	0.35	-0.01	-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						
	09-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	06-Aug-12	7,147,304.46	513,189.11	413.73	0.00	0.00	0.00	0.00	0.00	0.00
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
	09-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
	06-Aug-12	7,147,293.71	513,274.19	404.29	0.06	0.01	0.01	0.01	0.00	0.00
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
	09-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	06-Aug-12	7,147,209.02	513,433.40	388.67	0.00	0.00	0.00	0.00	0.00	0.00
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	06-Aug-12	7,147,353.72	513,040.01	416.13	0.00	0.00	0.00	0.00	0.00	0.00
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
	06-Aug-12	7,147,343.34	513,082.32	415.86	0.10	0.10	0.11	-0.05	-0.05	-0.05

Average	1999 to 2001	0.00	0.14	0.07	0.00	-0.04	-0.02
	2001 to 2003	0.06	0.10	0.04	0.05	0.09	0.03
	2003 to 2004	0.07	0.04	0.04	0.01	-0.04	-0.04
	2004 to 2006	0.09	0.05	0.02	0.05	0.04	0.02
	2006 to 2008	0.11	0.02	0.02	0.04	-0.01	-0.01
	2008 to 2010	0.13	0.04	0.02	0.02	-0.01	-0.01
	Jul 2010 to Sep 2010	0.16	0.03	0.16	-0.01	-0.02	-0.10
	Jul 2010 to Aug 2011	0.15	0.04	0.04	-0.01	-0.04	-0.04
	Sept 2010 to 2011	0.16	0.03	0.03	-0.02	-0.02	-0.02
	Aug 2011 to Aug 2012	**0.17**	**0.04**	**0.04**	**-0.05**	**-0.03**	**-0.03**
Maximum	1999 to 2001	0.00	0.25	0.13	0.00	0.06	0.03
	2001 to 2003	0.25	0.25	0.11	0.35	0.35	0.09
	2003 to 2004	0.30	0.10	0.11	0.34	0.03	0.03
	2004 to 2006	0.39	0.14	0.07	0.38	0.11	0.06
	2006 to 2008	0.46	0.06	0.06	0.37	0.10	0.10
	2008 to 2010	0.59	0.16	0.08	0.38	0.13	0.07
	Jul 2010 to Sep 2010	0.60	0.05	0.28	0.33	0.03	0.16
	Jul 2010 to Aug 2011	0.60	0.08	0.07	0.33	0.05	0.05
	Sept 2010 to 2011	0.63	0.07	0.08	0.36	0.06	0.07
	Aug 2011 to Aug 2012	**0.73**	**0.11**	**0.11**	**0.35**	**0.02**	**0.02**
Minimum	1999 to 2001	0.00	0.05	0.02	0.00	-0.12	-0.06
	2001 to 2003	0.00	0.03	0.01	-0.04	-0.04	-0.02
	2003 to 2004	0.01	0.00	0.00	-0.16	-0.12	-0.13
	2004 to 2006	0.01	0.01	0.01	-0.15	-0.07	-0.04
	2006 to 2008	0.01	0.01	0.00	-0.19	-0.07	-0.07
	2008 to 2010	0.00	0.00	0.00	-0.28	-0.11	-0.05
	Jul 2010 to Sep 2010	0.02	0.01	0.03	-0.32	-0.05	-0.27
	Jul 2010 to Aug 2011	0.00	0.01	0.00	-0.32	-0.12	-0.12
	Sept 2010 to 2011	0.01	0.01	0.00	-0.38	-0.14	-0.16
	Aug 2011 to Aug 2012	**0.05**	**0.01**	**0.01**	**-0.43**	**-0.13**	**-0.13**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Table B-4) Open Pit Area - Summary

Monitor	Date	UTM Coordinates			Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
1493	19-Jun-01	n/a								
	20-Aug-03	7,146,801.56	513,576.66	453.00	0.00			0.00		
	28-Jul-04	7,146,801.65	513,576.65	452.96	0.08	0.08	0.09	-0.04	-0.04	-0.04
	28-Jul-06	7,146,801.85	513,576.60	452.89	0.29	0.21	0.10	-0.11	-0.07	-0.03
	09-Jul-08	7,146,802.00	513,576.60	452.79	0.44	0.15	0.08	-0.21	-0.10	-0.05
	20-Jul-10	7,146,802.12	513,576.56	452.72	0.57	0.13	0.06	-0.28	-0.07	-0.03
	25-Sep-10	7,146,802.12	513,576.55	452.67	0.57	0.00	0.01	-0.33	-0.05	-0.28
	11-Aug-11	7,146,802.22	513,576.52	452.66	0.67	0.11	0.12	-0.34	-0.02	-0.02
	06-Aug-12	7,146,802.29	513,576.56	452.64	0.74	0.09	0.09	-0.36	-0.02	-0.02
1830	19-Jun-01	n/a								
	20-Aug-03	7,146,523.77	513,455.68	471.67	0.00			0.00		
	28-Jul-04	7,146,523.79	513,455.68	471.68	0.02	0.02	0.02	0.01	0.01	0.01
	28-Jul-06	7,146,523.79	513,455.68	471.73	0.02	0.01	0.00	0.06	0.05	0.03
	09-Jul-08	7,146,523.78	513,455.68	471.70	0.02	0.01	0.00	0.03	-0.03	-0.02
	20-Jul-10	7,146,523.80	513,455.68	471.71	0.03	0.02	0.01	0.04	0.01	0.01
	25-Sep-10	7,146,523.81	513,455.69	471.69	0.04	0.01	0.06	0.02	-0.02	-0.12
	11-Aug-11	7,146,523.80	513,455.67	471.69	0.03	0.02	0.02	0.02	0.00	0.00
	06-Aug-12	7,146,523.83	513,455.65	471.67	0.07	0.04	0.04	0.00	-0.02	-0.02
1832	19-Jun-01	n/a								
	20-Aug-03	7,146,537.06	513,483.13	473.62	0.00			0.00		
	28-Jul-04	7,146,537.06	513,483.16	473.58	0.03	0.03	0.03	-0.04	-0.04	-0.05
	28-Jul-06	7,146,537.04	513,483.16	473.68	0.04	0.02	0.01	0.06	0.10	0.05
	09-Jul-08	7,146,537.07	513,483.17	473.65	0.03	0.03	0.02	0.02	-0.04	-0.02
	20-Jul-10	7,146,537.08	513,483.16	473.65	0.03	0.01	0.01	0.03	0.00	0.00
	25-Sep-10	7,146,537.09	513,483.17	473.65	0.05	0.02	0.12	0.03	0.00	0.01
	11-Aug-11	7,146,537.07	513,483.16	473.63	0.03	0.03	0.03	0.01	-0.02	-0.02
	06-Aug-12	7,146,537.07	513,483.13	473.63	0.01	0.04	0.04	0.01	0.00	0.00
1837	19-Jun-01	n/a								
	20-Aug-03	7,146,502.87	513,411.47	470.22	0.00			0.00		
	28-Jul-04	7,146,502.89	513,411.46	470.20	0.02	0.02	0.02	-0.02	-0.02	-0.02
	28-Jul-06	7,146,502.88	513,411.44	470.24	0.02	0.02	0.01	0.02	0.03	0.02
	09-Jul-08	7,146,502.89	513,411.44	470.25	0.03	0.01	0.01	0.03	0.01	0.01
	20-Jul-10	7,146,502.91	513,411.47	470.26	0.04	0.04	0.02	0.04	0.01	0.01
	25-Sep-10	7,146,502.90	513,411.47	470.22	0.03	0.01	0.04	0.00	-0.05	-0.25
	11-Aug-11	7,146,502.90	513,411.46	470.25	0.03	0.01	0.02	0.03	0.03	0.03
	06-Aug-12	7,146,502.93	513,411.43	470.24	0.07	0.04	0.04	0.02	-0.01	-0.01
1838	19-Jun-01	n/a								
	20-Aug-03	7,146,491.91	513,380.52	468.34	0.00			0.00		
	28-Jul-04	7,146,491.89	513,380.52	468.33	0.02	0.02	0.02	-0.01	-0.01	-0.01
	28-Jul-06	7,146,491.87	513,380.53	468.38	0.04	0.02	0.01	0.04	0.05	0.03
	09-Jul-08	7,146,491.89	513,380.52	468.38	0.02	0.01	0.01	0.04	0.00	0.00
	20-Jul-10	7,146,491.89	513,380.53	468.39	0.02	0.01	0.00	0.05	0.00	0.00
	25-Sep-10	7,146,491.88	513,380.53	468.36	0.03	0.01	0.04	0.02	-0.02	-0.13
	11-Aug-11	7,146,491.89	513,380.52	468.37	0.02	0.01	0.01	0.03	0.01	0.01
	06-Aug-12	7,146,491.93	513,380.50	468.35	0.03	0.04	0.05	0.01	-0.02	-0.02
1839	19-Jun-01	n/a								
	20-Aug-03	7,146,861.35	513,285.18	428.66	0.00			0.00		
	28-Jul-04	7,146,861.34	513,285.17	428.61	0.02	0.02	0.02	-0.05	-0.05	-0.05
	28-Jul-06	7,146,861.40	513,285.20	428.60	0.05	0.07	0.03	-0.06	-0.01	-0.01
	09-Jul-08	7,146,861.36	513,285.15	428.39	0.03	0.06	0.03	-0.28	-0.21	-0.11
	20-Jul-10	7,146,861.43	513,285.17	428.32	0.08	0.07	0.04	-0.34	-0.06	-0.03
	25-Sep-10	7,146,861.41	513,285.16	428.29	0.06	0.02	0.11	-0.37	-0.04	-0.20
	11-Aug-11	7,146,861.41	513,285.14	428.23	0.07	0.01	0.02	-0.43	-0.06	-0.07
	06-Aug-12	7,146,861.40	513,285.14	428.16	0.07	0.01	0.01	-0.51	-0.08	-0.08

Average	1999 to 2001	n/a	n/a	n/a	n/a	n/a	n/a
	2001 to 2003	n/a	n/a	n/a	n/a	n/a	n/a
	2003 to 2004	0.03	0.03	0.03	-0.03	-0.03	-0.03
	2004 to 2006	0.08	0.06	0.03	0.00	0.03	0.01
	2006 to 2008	0.10	0.05	0.02	-0.06	-0.06	-0.03
	2008 to 2010	0.13	0.05	0.02	-0.08	-0.02	-0.01
	Jul 2010 to Sep 2010	0.13	0.01	0.06	-0.11	-0.03	-0.16
	Jul 2010 to Aug 2011		0.03	0.03		-0.04	-0.04
	Sept 2010 to Aug 2011	0.14	0.03	0.04	-0.11	-0.01	-0.01
	Aug 2011 to Aug 2012	**0.16**	**0.04**	**0.04**	**-0.14**	**-0.02**	**-0.02**
Maximum	1999 to 2001	n/a	n/a	n/a	n/a	n/a	n/a
	2001 to 2003	n/a	n/a	n/a	n/a	n/a	n/a
	2003 to 2004	0.08	0.08	0.09	0.01	0.01	0.01
	2004 to 2006	0.29	0.21	0.10	0.06	0.10	0.05
	2006 to 2008	0.44	0.15	0.08	0.04	0.01	0.01
	2008 to 2010	0.57	0.13	0.06	0.05	0.01	0.01
	Jul 2010 to Sep 2010	0.57	0.02	0.12	0.03	0.00	0.01
	Jul 2010 to Aug 2011		0.11	0.10		-0.01	-0.01
	Sept 2010 to Aug 2011	0.67	0.11	0.12	0.03	0.03	0.03
	Aug 2011 to Aug 2012	**0.74**	**0.09**	**0.09**	**0.02**	**0.00**	**0.00**
Minimum	1999 to 2001	n/a	n/a	n/a	n/a	n/a	n/a
	2001 to 2003	n/a	n/a	n/a	n/a	n/a	n/a
	2003 to 2004	0.02	0.02	0.02	-0.05	-0.05	-0.05
	2004 to 2006	0.02	0.01	0.00	-0.11	-0.07	-0.03
	2006 to 2008	0.02	0.01	0.00	-0.28	-0.21	-0.11
	2008 to 2010	0.02	0.01	0.00	-0.34	-0.07	-0.03
	Jul 2010 to Sep 2010	0.03	0.00	0.01	-0.37	-0.05	-0.28
	Jul 2010 to Aug 2011		0.01	0.01		-0.09	-0.09
	Sept 2010 to Aug 2011	0.02	0.01	0.01	-0.43	-0.06	-0.07
	Aug 2011 to Aug 2012	**0.01**	**0.01**	**0.01**	**-0.51**	**-0.08**	**-0.08**

Summary of Annual Horizontal Movement Rates

Dump Area		Annual Horizontal Movement Rates (m / yr)						Rate Change (m / yr)		
		Monitoring Period								
		July 2004 to July 2006	July 2006 to July 2008	July 2008 to July 2010	July 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012	July 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012
Upper	Avg.	0.02	0.02	0.02	0.20	0.05	0.04	0.18	-0.15	-0.01
(5 monitors)	Max.	0.03	0.03	0.04	0.35	0.07	0.06	0.31	-0.28	-0.01
	Min.	0.01	0.01	0.01	0.07	0.02	0.02	0.06	-0.05	0.00
Mid	Avg.	0.03	0.03	0.02	0.10	0.03	0.04	0.08	-0.07	0.01
(13 monitors)	Max.	0.07	0.05	0.06	0.29	0.06	0.07	0.23	-0.23	0.01
	Min.	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Lower	Avg.	0.02	0.02	0.02	0.16	0.03	0.04	0.14	-0.13	0.01
(12 monitors)	Max.	0.07	0.06	0.08	0.28	0.08	0.11	0.20	-0.20	0.03
(see Note 1)	Min.	0.01	0.00	0.00	0.03	0.00	0.01	0.03	-0.03	0.01

Note 1: Lower Slope Rock Dump Area: Eighteen Monitors active to July 2010. Eight monitors were lost in August 2010 and some were replaced in September 2010 and August 2011. Twelve monitors are available for the 2012 monitoring event – nine monitors were added in 2012 (see **Table 2-2**).

Appendix C - Gabion Drop Structure Movements

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Former Clinton Creek Asbestos Mine - Clinton Creek Drop Structure Monitoring
Channel Closure Monitor Pins #1450 to #1465 - SUMMARY

Location #1 - Across The Drawdown Weir

Drop Structure	Horizontal Distance Across Drop Structure (metres)							Incremental Change (m)	Calculated Annual Rate of Movement (m/year)				Total Change (m)	Comment
	Date	Date	Date	Date	Date	Date	Date	Aug '11 to Aug '12	Jul 2008	Jul 2010	Sept 2010	Aug 2011		
	28-Jul-06	04-Jul-07	09-Jul-08	20-Jul-10	25-Sep-10	11-Aug-11	06-Aug-12		Jul 2010	Sept 2010	Aug 2011	Aug 2012		
1	27.59	27.56	27.55	27.52	27.52	27.50	27.43	-0.07	-0.01	-0.02	-0.03	-0.07	-0.16	survey tags 1450 & 1451
2	27.62	27.60	27.58	27.55	27.56	27.54	27.45	n/a	-0.01	0.03	-0.02	n/a	n/a	survey tags 1454 & 1455, #1454 replaced in 2012
3	27.28	27.21	27.16	27.05	27.03	27.11	26.47	n/a	-0.06	-0.11	0.10	n/a	n/a	survey tags 1458 & 1459, #1459 replaced in 2012
4	27.09	27.11	27.05	26.97	26.96	26.90	28.94	n/a	-0.04	-0.07	-0.06	n/a	n/a	survey tags 1462 & 1463, #1462 replaced in 2012

Location #2 - Across Lower Tier

Drop Structure	Horizontal Distance Across Drop Structure (metres)							Incremental Change (m)	Calculated Annual Rate of Movement (m/year)				Total Change (m)	Comment
	Date	Date	Date	Date	Date	Date	Date	Aug 11 to Aug 12	Jul 2008	Jul 2010	Sept 2010	Aug 2011		
	28-Jul-06	04-Jul-07	09-Jul-08	20-Jul-10	25-Sep-10	11-Aug-11	06-Aug-12		Jul 2010	Sept 2010	Aug 2011	Aug 2012		
1	28.83	28.76	28.79	28.77	28.77	pin gone	28.70	n/a	-0.01	-0.02	pin gone	n/a	n/a	survey tags 1452 & 1453, #1453 replaced in 2012
2	28.62	28.58	28.54	28.44	28.44	28.36	28.23	-0.13	-0.05	0.01	-0.09	-0.13	-0.39	survey tags 1456 & 1457
3	28.82	28.69	28.64	Not Surveyed	Not Surveyed	pin gone	29.49	n/a	n/a	n/a	pin gone	n/a	n/a	survey tags 1460 & 1461, both replaced in 2012
4	30.57	30.53	30.51	30.43	30.38	30.21	30.09	-0.12	-0.04	-0.30	-0.19	-0.12	-0.48	survey tags 1464 & 1465

Year	Monitored By
2006	Installed by Underhill Geomatics Limited
2007	Underhill Geomatics Limited
2008	Underhill Geomatics Limited
2010	Underhill Geomatics Limited
2011	Underhill Geomatics Limited
2012	Underhill Geomatics Limited

Summary of Avg, Max, and Min Values for Combined Location #1 and #2 results

	Incremental Change (m)	Calculated Annual Rate of Movement (m/year)				Total Change (m)
	Aug 11 to Jul 12	Jul 2008 Jul 2010	Jul 2010 Sept 2010	Sept 2010 Aug 2011	Aug 2011 Aug 2012	
Average (m)	-0.11	-0.03	-0.07	-0.05	-0.11	-0.34
Maximum (m)	-0.07	-0.01	0.03	0.10	-0.07	-0.16
Minimum (m)	-0.13	-0.06	-0.30	-0.19	-0.13	-0.48

Channel Closure Monitor Pins #1450 to #1465

Location #1 - Across The Drawdown Weir

Drop Structure	Incremental Change Summary					
	Jul 06 to Jul 07	Jul 07 to Jul 08	Jul 08 to Jul10	Jul 10 to Sept 10	Sept 10 to Aug 11	Aug 11 to Aug 12
1	-0.03	-0.01	-0.03	0.00	-0.02	-0.07
2	-0.02	-0.02	-0.03	0.01	-0.02	n/a
3	-0.07	-0.05	-0.11	-0.02	0.08	n/a
4	0.02	-0.06	-0.08	-0.01	-0.06	n/a

Location #2 - Across Lower Tier

Drop Structure	Incremental Change Summary					
	Jul 06 to Jul 07	Jul 07 to Jul 08	Jul 08 to Jul10	Jul 10 to Sep 10	Sept 10 to Aug 11	Aug 11 to Aug 12
1	-0.07	0.03	-0.02	0.00	n/a	n/a
2	-0.04	-0.04	-0.10	0.00	-0.08	-0.13
3	-0.13	-0.05	Not Surveyed	Not Surveyed	n/a	n/a
4	-0.04	-0.02	-0.08	-0.06	-0.16	-0.12

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Clinton Creek Channel - Drop Structure Closure Monitoring

Drop Structure #1 - Upper Tier, Waste Rock Side of Channel: Monitor #1450

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,441.30	512,890.12	413.63	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,441.29	512,890.12	413.61	341	341	0.01	0.01	0.01	-0.02	-0.02	-0.02	
09-Jul-08	7,147,441.28	512,890.13	413.62	712	371	0.03	0.02	0.02	-0.02	0.00	0.00	
20-Jul-10	7,147,441.28	512,890.13	413.63	1,453	741	0.03	0.00	0.00	0.00	0.01	0.01	
25-Sep-10	7,147,441.26	512,890.14	413.60	1,520	67	0.05	0.02	0.10	-0.04	-0.03	-0.18	
11-Aug-11	7,147,441.24	512,890.14	413.62	1,840	320	0.07	0.02	0.02	-0.01	0.03	0.03	
06-Aug-12	7147441.216	512890.146	413.739	2201.0	361	0.09	0.02	0.02	0.11	0.11	0.12	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Drop Structure #1 - Upper Tier, Valley Side of Channel: Monitor #1451

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,413.79	512,888.17	413.46	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,413.80	512,888.17	413.42	341	341	0.01	0.01	0.01	-0.04	-0.04	-0.04	
09-Jul-08	7,147,413.79	512,888.17	413.42	712	371	0.01	0.01	0.01	-0.04	0.00	0.00	
20-Jul-10	7,147,413.83	512,888.13	413.41	1,453	741	0.05	0.05	0.03	-0.05	-0.01	-0.01	
25-Sep-10	7,147,413.81	512,888.14	413.40	1,520	67	0.04	0.01	0.08	-0.06	-0.01	-0.08	
11-Aug-11	7,147,413.82	512,888.13	413.38	1,840	320	0.05	0.01	0.01	-0.07	-0.01	-0.01	
06-Aug-12	7,147,413.86	512,888.13	413.48	2,201	361	0.08	0.05	0.05	0.02	0.10	0.10	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Drop Structure #1: Closure of Monitors #1450 and #1451

Monitoring Date	Closure			Time								
	Distance (metres)	total (metres)	incremental (metres)	total (days)	incremental (days)							
28-Jul-06	27.59	0.00		0	0							
04-Jul-07	27.56	-0.02	-0.02	341	341							
09-Jul-08	27.55	-0.03	-0.01	712	371							
20-Jul-10	27.52	-0.06	-0.03	1,453	741							
25-Sep-10	27.52	-0.07	0.00	1,520	67							
11-Aug-11	27.50	-0.09	-0.02	1,840	320							
06-Aug-12	27.43	-0.16	-0.07	2,201	361							

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Clinton Creek Channel - Drop Structure Closure Monitoring

Drop Structure #1 - Lower Tier, Waste Rock Side of Channel: Monitor 1452

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,411.88	512,892.07	412.96	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,411.91	512,892.02	412.99	341	341	0.05	0.05	0.06	0.04	0.04	0.04	
09-Jul-08	7,147,411.90	512,892.04	412.95	712	371	0.04	0.02	0.02	-0.01	-0.04	-0.04	
20-Jul-10	7,147,411.93	512,892.01	412.94	1,453	741	0.08	0.04	0.02	-0.02	-0.02	-0.01	
25-Sep-10	7,147,411.93	512,892.00	412.91	1,520	67	0.08	0.01	0.05	-0.05	-0.03	-0.15	
11-Aug-11	7,147,411.92	512,892.01	412.91	1,840	320	0.07	0.02	0.02	-0.05	0.00	0.00	
06-Aug-12	7,147,411.95	512,892.00	413.08	2,201	361	0.10	0.03	0.03	0.12	0.17	0.17	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Drop Structure #1 - Lower Tier, Valley Side of Channel: Monitor #1453

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,439.11	512,901.52	413.12	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,439.06	512,901.52	413.10	341	341	0.05	0.05	0.06	-0.02	-0.02	-0.02	
09-Jul-08	7,147,439.09	512,901.51	413.11	712	371	0.03	0.03	0.03	-0.01	0.01	0.01	
20-Jul-10	7,147,439.08	512,901.51	413.11	1,453	741	0.03	0.01	0.00	-0.01	0.00	0.00	
25-Sep-10	7,147,439.08	512,901.50	413.09	1,520	67	0.04	0.01	0.04	-0.02	-0.02	-0.09	
11-Aug-11	7,147,440.91	512,901.57	413.26	1,840	320	1.80	1.84	2.09	0.15	0.17	0.19	
06-Aug-12	7,147,439.02	512,901.50	413.23	2,201	361	0.09	7.00	7.08	0.11	-0.04	-0.04	**disturbed**

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Clinton Creek Channel Closure Monitoring Point #1452 and #1453 (Drop Structure #1 - Lower Tier) - Closure

Monitoring Date	Closure			Time								
	Distance (metres)	total (metres)	incremental (metres)	total (days)	incremental (days)							
28-Jul-06	28.83	0.00		0	0							
04-Jul-07	28.76	-0.07	-0.07	341	341							
09-Jul-08	28.79	-0.03	0.03	712	371							
20-Jul-10	28.77	-0.06	-0.02	1,453	741							
25-Sep-10	28.77	-0.06	0.00	1,520	67							
11-Aug-11	30.53	1.70	1.77	1,840	320							
06-Aug-12	28.70	-0.13	-1.83	2,201	361							

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Clinton Creek Channel - Drop Structure Closure Monitoring

Drop Structure #2 - Upper Tier, Valley Side of Channel: Monitor #1454

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,423.24	512,948.59	412.39	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,423.23	512,948.58	412.35	341	341	0.01	0.01	0.02	-0.03	-0.03	-0.03	
09-Jul-08	7,147,423.23	512,948.58	412.36	712	371	0.02	0.01	0.01	-0.03	0.00	0.00	
20-Jul-10	7,147,423.24	512,948.57	412.36	1,453	741	0.02	0.01	0.00	-0.03	0.00	0.00	
25-Sep-10	7,147,423.22	512,948.58	412.34	1,520	67	0.03	0.02	0.13	-0.05	-0.02	-0.11	
11-Aug-11	7,147,423.21	512,948.59	412.33	1,840	320	0.03	0.01	0.01	-0.06	-0.01	-0.01	
06-Aug-12	7,147,423.17	512,948.56	412.39	2,201	361	0.08	0.05	0.05	0.01	0.06	0.07	**disturbed and replaced**

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Drop Structure #2 - Upper Tier, Waste Rock Side of Channel: Monitor #1455

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,397.03	512,939.87	412.12	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,397.03	512,939.88	412.06	341	341	0.01	0.01	0.01	-0.05	-0.05	-0.06	
09-Jul-08	7,147,397.05	512,939.89	412.01	712	371	0.03	0.02	0.02	-0.10	-0.05	-0.05	
20-Jul-10	7,147,397.08	512,939.90	411.93	1,453	741	0.06	0.03	0.02	-0.19	-0.08	-0.04	
25-Sep-10	7,147,397.06	512,939.89	411.92	1,520	67	0.04	0.02	0.11	-0.19	-0.01	-0.05	
11-Aug-11	7,147,397.07	512,939.92	411.90	1,840	320	0.06	0.03	0.03	-0.21	-0.02	-0.02	
06-Aug-12	7,147,397.11	512,939.94	412.01	2,201	361	0.11	0.05	0.05	-0.10	0.11	0.11	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Clinton Creek Channel Closure Monitoring Point #1454 and #1455 (Drop Structure #2 - Upper Tier) - Closure

Monitoring Date	Closure			Time								
	Distance (metres)	total (metres)	incremental (metres)	total (days)	incremental (days)							
28-Jul-06	27.62	0.00		0	0							
04-Jul-07	27.60	-0.02	-0.02	341	341							
09-Jul-08	27.58	-0.04	-0.02	712	371							
20-Jul-10	27.55	-0.07	-0.03	1,453	741							
25-Sep-10	27.56	-0.06	0.01	1,520	67							
11-Aug-11	27.54	-0.08	-0.02	1,840	320							
06-Aug-12	27.45	-0.17	-0.09	2,201	361							

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Clinton Creek Channel - Drop Structure Closure Monitoring

Drop Structure #2 - Lower Tier, Waste Rock Side of Channel: Monitor #1456

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,392.70	512,951.21	411.05	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,392.75	512,951.22	410.99	341	341	0.05	0.05	0.06	-0.07	-0.07	-0.07	
09-Jul-08	7,147,392.77	512,951.25	410.95	712	371	0.08	0.03	0.03	-0.11	-0.04	-0.04	
20-Jul-10	7,147,392.86	512,951.28	410.85	1,453	741	0.18	0.10	0.05	-0.20	-0.10	-0.05	
25-Sep-10	7,147,392.85	512,951.27	410.83	1,520	67	0.16	0.02	0.10	-0.23	-0.02	-0.13	
11-Aug-11	7,147,392.92	512,951.26	410.80	1,840	320	0.23	0.08	0.09	-0.25	-0.03	-0.03	
06-Aug-12	7,147,393.00	512,951.31	410.96	2,201	361	0.32	0.09	0.10	-0.09	0.16	0.16	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Drop Structure #2 - Lower Tier, Valley Side of Channel: Monitor #1457

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,420.50	512,958.00	410.61	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,420.52	512,958.00	410.60	341	341	0.02	0.02	0.02	-0.02	-0.02	-0.02	
09-Jul-08	7,147,420.50	512,958.01	410.59	712	371	0.01	0.02	0.02	-0.02	0.00	0.00	
20-Jul-10	7,147,420.49	512,958.02	410.59	1,453	741	0.02	0.01	0.01	-0.03	-0.01	0.00	
25-Sep-10	7,147,420.48	512,958.00	410.57	1,520	67	0.03	0.02	0.12	-0.04	-0.02	-0.09	
11-Aug-11	7,147,420.47	512,958.01	410.58	1,840	320	0.03	0.01	0.01	-0.04	0.01	0.01	
06-Aug-12	7,147,420.44	512,957.96	410.70	2,201	361	0.08	0.06	0.06	0.09	0.13	0.13	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Clinton Creek Channel Closure Monitoring Point #1454 and #1455 (Drop Structure #2 - Upper Tier) - Closure

Monitoring Date	Closure			Time								
	Distance (metres)	total (metres)	incremental (metres)	total (days)	incremental (days)							
28-Jul-06	28.62	0.00		0	0							
04-Jul-07	28.58	-0.04	-0.04	341	341							
09-Jul-08	28.54	-0.08	-0.04	712	371							
20-Jul-10	28.44	-0.18	-0.11	1,453	741							
25-Sep-10	28.44	-0.18	0.00	1,520	67							
11-Aug-11	28.36	-0.26	-0.08	1,840	320							
06-Aug-12	28.23	-0.39	-0.13	2,201	361							

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Clinton Creek Channel - Drop Structure Closure Monitoring

Drop Structure #3 - Upper Tier, Valley Side of Channel: Monitor #1458

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,412.17	512,986.91	409.75	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,412.17	512,986.90	409.72	341	341	0.02	0.02	0.02	-0.03	-0.03	-0.04	
09-Jul-08	7,147,412.16	512,986.91	409.71	712	371	0.01	0.01	0.01	-0.05	-0.02	-0.01	
20-Jul-10	7,147,412.15	512,986.92	409.70	1,453	741	0.02	0.02	0.01	-0.06	-0.01	0.00	
25-Sep-10	7,147,412.13	512,986.90	409.68	1,520	67	0.04	0.03	0.15	-0.08	-0.02	-0.11	
11-Aug-11	7,147,412.15	512,986.90	409.69	1,840	320	0.02	0.02	0.02	-0.07	0.01	0.01	
06-Aug-12	7,147,412.10	512,986.87	409.83	2,201	361	0.08	0.06	0.06	0.08	0.14	0.15	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Drop Structure #3 - Upper Tier, Waste Rock Side of Channel: Monitor #1459

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,385.79	512,979.99	409.48	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,385.84	512,980.01	409.38	341	341	0.05	0.05	0.06	-0.10	-0.10	-0.10	
09-Jul-08	7,147,385.88	512,980.04	409.36	712	371	0.11	0.05	0.05	-0.12	-0.02	-0.02	
20-Jul-10	7,147,385.98	512,980.09	409.18	1,453	741	0.21	0.11	0.05	-0.30	-0.18	-0.09	
25-Sep-10	7,147,385.97	512,980.11	409.16	1,520	67	0.22	0.02	0.11	-0.32	-0.03	-0.14	
11-Aug-11	7,147,385.92	512,980.04	409.18	1,840	320	0.14	0.08	0.10	-0.30	0.02	0.03	
06-Aug-12	7,147,386.46	512,980.31	409.44	2,201	361	0.74	0.60	0.61	-0.04	0.25	0.26	**lost and replaced**

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Clinton Creek Channel Closure Monitoring Point #1458 and #1459 (Drop Structure #3 - Upper Tier) - Closure

Monitoring Date	Closure			Time								
	Distance (metres)	total (metres)	incremental (metres)	total (days)	incremental (days)							
28-Jul-06	27.28	0.00		0	0							
04-Jul-07	27.21	-0.06	-0.06	341	341							
09-Jul-08	27.16	-0.11	-0.05	712	371							
20-Jul-10	27.05	-0.23	-0.11	1,453	741							
25-Sep-10	27.03	-0.25	-0.02	1,520	67							
11-Aug-11	27.11	-0.16	0.08	1,840	320							
06-Aug-12	26.47	-0.80	-0.64	2,201	361							

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Clinton Creek Channel - Drop Structure Closure Monitoring

Drop Structure #3 - Lower Tier, Waste Rock Side of Channel: Monitor #1460

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,382.48	512,988.03	409.00	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,382.58	512,988.07	408.97	341	341	0.11	0.11	0.12	-0.04	-0.04	-0.04	
09-Jul-08	7,147,382.64	512,988.09	408.86	712	371	0.17	0.06	0.06	-0.14	-0.11	-0.11	
20-Jul-10	NOT SURVEYED											
25-Sep-10	NOT SURVEYED											
11-Aug-11	7,147,381.82	512,988.40	409.25	1,840	1,128	0.76	0.88	0.28	0.25	0.39	0.13	**pin may be missing**
06-Aug-12	7,147,381.55	512,988.49	409.15	2,201	361	1.04	0.29	0.29	0.15	-0.10	-0.10	**lost - replaced**

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Drop Structure #3 - Lower Tier, Valley Side of Channel: Monitor #1461

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,410.21	512,995.90	408.29	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,410.18	512,995.89	408.28	341	341	0.03	0.03	0.03	-0.01	-0.01	-0.01	
09-Jul-08	7,147,410.20	512,995.89	408.25	712	371	0.01	0.02	0.02	-0.04	-0.03	-0.03	
20-Jul-10	7,147,410.18	512,995.88	408.25	1,453	741	0.03	0.02	0.01	-0.04	0.00	0.00	
25-Sep-10	7,147,410.17	512,995.89	408.24	1,520	67	0.03	0.01	0.04	-0.05	-0.01	-0.06	
11-Aug-11	7,147,410.16	512,995.88	408.25	1,840	320	0.05	0.02	0.02	-0.03	0.01	0.02	
06-Aug-12	7,147,410.10	512,995.86	408.44	2,201	361	0.11	0.06	0.06	0.16	0.19	0.19	**disturbed - replaced**

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Clinton Creek Channel Closure Monitoring Point #1460 and #1461 (Drop Structure #3 - Lower Tier) - Closure

Monitoring Date	Closure			Time								
	Distance (metres)	total (metres)	incremental (metres)	total (days)	incremental (days)							
28-Jul-06	28.82	0.00		0	0							
04-Jul-07	28.69	-0.13	-0.13	341	341							
09-Jul-08	28.64	-0.18	-0.04	712	371							
20-Jul-10	Pt. #1460 NOT SURVEYED											
25-Sep-10	Pt. #1460 NOT SURVEYED											
11-Aug-11	29.31	0.49	0.66	1,840	320							
06-Aug-12	29.49	0.67	0.18	2,201	361							

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Clinton Creek Channel - Drop Structure Closure Monitoring

Drop Structure #4 - Upper Tier, Valley Side of Channel: Monitor #1462

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,399.81	513,033.17	407.32	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,399.84	513,033.18	407.31	341	341	0.03	0.03	0.03	-0.02	-0.02	-0.02	
09-Jul-08	7,147,399.81	513,033.15	407.30	712	371	0.02	0.05	0.04	-0.02	-0.01	-0.01	
20-Jul-10	7,147,399.81	513,033.16	407.29	1,453	741	0.01	0.01	0.00	-0.03	-0.01	0.00	
25-Sep-10	7,147,399.80	513,033.15	407.27	1,520	67	0.02	0.01	0.03	-0.05	-0.02	-0.13	
11-Aug-11	7,147,399.80	513,033.16	407.33	1,840	320	0.02	0.01	0.01	0.00	0.06	0.07	
06-Aug-12	7,147,401.85	513,033.69	407.32	2,201	361	2.10	2.11	2.14	-0.01	-0.01	-0.01	**lost and replaced**

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Drop Structure #4 - Upper Tier, Waste Rock Side of Channel: Monitor #1463

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,373.72	513,025.90	407.64	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,373.73	513,025.89	407.60	341	341	0.02	0.02	0.02	-0.05	-0.05	-0.05	
09-Jul-08	7,147,373.74	513,025.94	407.54	712	371	0.04	0.05	0.05	-0.10	-0.06	-0.06	
20-Jul-10	7,147,373.82	513,025.92	407.50	1,453	741	0.11	0.09	0.04	-0.14	-0.04	-0.02	
25-Sep-10	7,147,373.83	513,025.93	407.48	1,520	67	0.11	0.01	0.08	-0.16	-0.02	-0.10	
11-Aug-11	7,147,373.88	513,025.95	407.45	1,840	320	0.17	0.06	0.06	-0.19	-0.03	-0.03	
06-Aug-12	7,147,373.95	513,025.99	407.59	2,201	361	0.25	0.08	0.08	-0.05	0.14	0.14	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Clinton Creek Channel Closure Monitoring Point #1462 and #1463 (Drop Structure #4 - Upper Tier) - Closure

.

Monitoring Date	Closure			Time								
	Distance (metres)	total (metres)	incremental (metres)	total (days)	incremental (days)							
28-Jul-06	27.09	0.00		0	0							
04-Jul-07	27.11	0.02	0.02	341	341							
09-Jul-08	27.05	-0.04	-0.06	712	371							
20-Jul-10	26.97	-0.12	-0.07	1,453	741							
25-Sep-10	26.96	-0.13	-0.01	1,520	67							
11-Aug-11	26.90	-0.19	-0.06	1,840	320							
06-Aug-12	28.94	1.85	2.04	2,201	361							

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
Job No.: 20112857
Date: 06-Aug-12

Clinton Creek Channel - Drop Structure Closure Monitoring

Drop Structure #4 - Lower Tier, Waste Rock Side of Channel: Monitor 1464

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,369.18	513,036.44	406.85	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,369.18	513,036.45	406.83	341	341	0.01	0.01	0.01	-0.02	-0.02	-0.02	
09-Jul-08	7,147,369.20	513,036.47	406.81	712	371	0.05	0.04	0.03	-0.04	-0.02	-0.02	
20-Jul-10	7,147,369.28	513,036.46	406.80	1,453	741	0.11	0.08	0.04	-0.05	-0.01	0.00	
25-Sep-10	7,147,369.32	513,036.49	406.76	1,520	67	0.16	0.05	0.29	-0.09	-0.04	-0.22	
11-Aug-11	7,147,369.46	513,036.55	406.70	1,840	320	0.30	0.15	0.17	-0.15	-0.06	-0.07	
06-Aug-12	7,147,369.54	513,036.56	406.79	2,201	361	0.39	0.09	0.09	-0.06	0.09	0.09	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Drop Structure #4 - Lower Tier, Valley Side of Channel: Monitor #1465

Monitoring Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement			Comments
	Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)	
28-Jul-06	7,147,399.49	513,040.33	406.14	0	0	0	0	0	0	0	0	Underhill Geomatics Ltd.
04-Jul-07	7,147,399.46	513,040.34	406.12	341	341	0.03	0.03	0.04	-0.02	-0.02	-0.02	
09-Jul-08	7,147,399.47	513,040.33	406.13	712	371	0.02	0.01	0.01	-0.01	0.01	0.01	
20-Jul-10	7,147,399.47	513,040.33	406.13	1,453	741	0.03	0.00	0.00	-0.01	0.00	0.00	
25-Sep-10	7,147,399.46	513,040.32	406.10	1,520	67	0.04	0.01	0.07	-0.04	-0.03	-0.16	
11-Aug-11	7,147,399.43	513,040.34	406.13	1,840	320	0.06	0.03	0.03	-0.01	0.03	0.03	
06-Aug-12	7,147,399.40	513,040.31	406.23	2,201	361	0.09	0.04	0.05	0.09	0.10	0.10	

Notes: Originally installed July 28, 2006 by Underhill Surveys.

Clinton Creek Channel Closure Monitoring Point #1464 and #1465 (Drop Structure #4 - Lower Tier) - Closure

.

Monitoring Date	Closure			Time								
	Distance (metres)	total (metres)	incremental (metres)	total (days)	incremental (days)							
28-Jul-06	30.57	0.00		0	0							
04-Jul-07	30.53	-0.04	-0.04	341	341							
09-Jul-08	30.51	-0.06	-0.02	712	371							
20-Jul-10	30.43	-0.13	-0.08	1,453	741							
25-Sep-10	30.38	-0.19	-0.06	1,520	67							
11-Aug-11	30.21	-0.35	-0.16	1,840	320							
06-Aug-12	30.09	-0.47	-0.12	2,201	361							

REPORT

Appendix D - Wolverine Creek Tailings Piles Movement Monitoring Results

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
Project No.: 20112857
Date: 06-Aug-12

Table D1) Tailings Stability - Upper Slopes (Elevation > 530 m)

North Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
1483	21-Aug-03	7,148,233.01	513,412.67	609.08	0	0	0.00			0.00		
	28-Jul-04	7,148,233.01	513,412.69	609.02	342	342	0.03	0.03	0.03	-0.06	-0.06	-0.06
	23-Sep-04	7,148,233.02	513,412.68	609.00	399	57	0.02	0.02	0.10	-0.08	-0.03	-0.16
	17-Sep-05	7,148,233.03	513,412.71	608.96	758	359	0.05	0.03	0.03	-0.12	-0.04	-0.04
	28-Jul-06	7,148,233.06	513,412.70	609.00	1,072	314	0.06	0.03	0.04	-0.08	0.04	0.05
	09-Jul-08	7,148,233.04	513,412.75	608.94	1,784	712	0.08	0.05	0.02	-0.14	-0.06	-0.03
	20-Jul-10	7,148,233.04	513,412.71	608.90	2,525	741	0.06	0.03	0.02	-0.18	-0.04	-0.02
	25-Sep-10	7,148,233.05	513,412.74	608.87	2,592	67	0.08	0.02	0.12	-0.21	-0.02	-0.12
	11-Aug-11	7,148,233.04	513,412.75	608.85	2,912	320	0.09	0.02	0.02	-0.23	-0.02	-0.03
	06-Aug-12	7,148,233.06	513,412.77	608.79	3,273	361	0.12	0.04	0.04	-0.29	-0.06	-0.06
26	21-Aug-03	7,148,341.45	513,483.53	575.11	0	0	0.00			0.00		
	28-Jul-04	7,148,341.48	513,483.55	575.10	342	342	0.04	0.04	0.04	-0.01	-0.01	-0.01
	23-Sep-04	7,148,341.49	513,483.55	575.08	399	57	0.05	0.02	0.10	-0.03	-0.01	-0.10
	17-Sep-05	7,148,341.47	513,483.57	575.01	758	359	0.04	0.04	0.04	-0.10	-0.07	-0.07
	28-Jul-06	7,148,341.50	513,483.58	575.07	1,072	314	0.07	0.04	0.04	-0.04	0.06	0.07
	09-Jul-08	7,148,341.50	513,483.61	575.02	1,784	712	0.10	0.04	0.02	-0.09	-0.05	-0.03
	20-Jul-10	7,148,341.49	513,483.62	575.01	2,525	741	0.10	0.02	0.01	-0.10	-0.01	-0.01
	25-Sep-10	7,148,341.49	513,483.66	574.97	2,592	67	0.14	0.04	0.19	-0.14	-0.04	-0.20
	11-Aug-11	7,148,341.50	513,483.66	574.96	2,912	320	0.14	0.01	0.01	-0.15	-0.01	-0.01
	06-Aug-12	7,148,341.53	513,483.69	574.91	3,273	361	0.18	0.04	0.04	-0.20	-0.05	-0.05
80-2	21-Aug-03	7,148,290.05	513,549.41	552.78	0	0	0.00			0.00		
	28-Jul-04	7,148,290.09	513,549.50	552.65	342	342	0.09	0.09	0.10	-0.13	-0.13	-0.14
	23-Sep-04	7,148,290.08	513,549.48	552.63	399	57	0.08	0.01	0.09	-0.15	-0.02	-0.12
	17-Sep-05	7,148,290.08	513,549.57	552.50	758	359	0.16	0.09	0.09	-0.28	-0.14	-0.14
	28-Jul-06	7,148,290.09	513,549.60	552.54	1,072	314	0.20	0.03	0.04	-0.24	0.05	0.05
	09-Jul-08	7,148,290.08	513,549.69	552.45	1,784	712	0.28	0.09	0.05	-0.33	-0.10	-0.05
	20-Jul-10	7,148,290.09	513,549.75	552.37	2,525	741	0.34	0.06	0.03	-0.41	-0.08	-0.04
	25-Sep-10	7,148,290.08	513,549.78	552.33	2,592	67	0.37	0.03	0.16	-0.45	-0.03	-0.19
	11-Aug-11	7,148,290.09	513,549.83	552.28	2,912	320	0.42	0.05	0.05	-0.50	-0.05	-0.06
	06-Aug-12	7,148,290.08	513,549.88	552.23	3,273	361	0.47	0.06	0.06	-0.55	-0.05	-0.05
26-A	21-Aug-03	7,148,339.30	513,540.50	557.82	0	0	0.00			0.00		
	28-Jul-04	7,148,339.32	513,540.52	557.75	342	342	0.03	0.03	0.03	-0.07	-0.07	-0.08
	23-Sep-04	7,148,339.32	513,540.49	557.74	399	57	0.02	0.02	0.15	-0.08	-0.01	-0.06
	17-Sep-05	7,148,339.34	513,540.56	557.65	758	359	0.07	0.07	0.07	-0.18	-0.10	-0.10
	28-Jul-06	7,148,339.33	513,540.54	557.71	1,072	314	0.05	0.02	0.03	-0.11	0.06	0.07
	09-Jul-08	7,148,339.35	513,540.59	557.67	1,784	712	0.10	0.05	0.03	-0.15	-0.04	-0.02
	20-Jul-10	7,148,339.36	513,540.57	557.61	2,525	741	0.09	0.03	0.02	-0.21	-0.06	-0.03
	25-Sep-10	7,148,339.35	513,540.60	557.60	2,592	67	0.11	0.04	0.19	-0.22	-0.01	-0.04
	11-Aug-11	7,148,339.37	513,540.61	557.59	2,912	320	0.12	0.02	0.02	-0.23	-0.01	-0.01
	06-Aug-12	7,148,339.37	513,540.63	557.56	3,273	361	0.15	0.02	0.02	-0.26	-0.04	-0.04
80-1	21-Aug-03	7,148,407.98	513,543.04	555.71	0	0	0.00			0.00		
	28-Jul-04	7,148,408.01	513,543.07	555.61	342	342	0.04	0.04	0.05	-0.10	-0.10	-0.10
	23-Sep-04	7,148,408.03	513,543.06	555.61	399	57	0.06	0.03	0.16	-0.10	0.00	0.00
	17-Sep-05	7,148,408.01	513,543.12	555.49	758	359	0.09	0.06	0.06	-0.22	-0.12	-0.13
	28-Jul-06	7,148,408.02	513,543.14	555.55	1,072	314	0.11	0.03	0.03	-0.16	0.06	0.07
	09-Jul-08	7,148,408.04	513,543.21	555.48	1,784	712	0.18	0.07	0.04	-0.23	-0.08	-0.04
	20-Jul-10	7,148,408.03	513,543.24	555.43	2,525	741	0.21	0.03	0.01	-0.29	-0.05	-0.03
	25-Sep-10	7,148,408.04	513,543.27	555.40	2,592	67	0.24	0.03	0.17	-0.31	-0.03	-0.15
	11-Aug-11	7,148,408.05	513,543.29	555.37	2,912	320	0.26	0.02	0.02	-0.34	-0.03	-0.03
	06-Aug-12	7,148,408.07	513,543.32	555.33	3,273	361	0.29	0.04	0.04	-0.38	-0.04	-0.04
BH-14 (T7)	21-Aug-03	7,148,488.36	513,563.01	530.33	0	0	0.00			0.00		
	28-Jul-04	7,148,488.36	513,563.01	530.29	342	342	0.01	0.01	0.01	-0.04	-0.04	-0.05
	23-Sep-04	7,148,488.33	513,562.99	530.30	399	57	0.03	0.03	0.22	-0.03	0.01	0.08
	17-Sep-05	7,148,488.34	513,562.87	530.24	758	359	0.14	0.12	0.12	-0.09	-0.06	-0.06
	28-Jul-06	7,148,488.37	513,563.02	530.34	1,072	314	0.02	0.16	0.18	0.01	0.10	0.11
	09-Jul-08	7,148,488.43	513,563.07	530.36	1,784	712	0.10	0.07	0.04	0.03	0.02	0.01
	20-Jul-10	7,148,488.36	513,562.88	530.38	2,525	741	0.14	0.21	0.10	0.05	0.02	0.01
	25-Sep-10	7,148,488.36	513,562.91	530.35	2,592	67	0.11	0.03	0.16	0.02	-0.03	-0.17
	11-Aug-11	7,148,488.37	513,562.90	530.35	2,912	320	0.11	0.01	0.01	0.02	0.00	0.00
	06-Aug-12	7,148,488.39	513,562.91	530.33	3,273	361	0.11	0.02	0.02	0.00	-0.02	-0.02
1495	21-Aug-03	7,148,526.59	513,528.92	529.06	0	0	0.00			0.00		
	28-Jul-04	7,148,526.62	513,528.97	529.05	342	342	0.06	0.06	0.06	-0.01	-0.01	-0.01
	23-Sep-04	7,148,526.65	513,528.95	529.07	399	57	0.06	0.03	0.20	0.01	0.01	0.08
	17-Sep-05	7,148,526.65	513,529.00	528.97	758	359	0.10	0.05	0.05	-0.09	-0.10	-0.10
	28-Jul-06	7,148,526.67	513,529.02	529.06	1,072	314	0.13	0.03	0.03	0.00	0.09	0.11
	09-Jul-08	7,148,526.69	513,529.07	529.04	1,784	712	0.18	0.06	0.03	-0.02	-0.01	-0.01
	20-Jul-10	7,148,526.71	513,529.10	529.06	2,525	741	0.22	0.03	0.02	0.00	0.01	0.01
	25-Sep-10	7,148,526.72	513,529.11	529.03	2,592	67	0.23	0.01	0.08	-0.03	-0.02	-0.14
	11-Aug-11	7,148,526.71	513,529.13	529.01	2,912	320	0.24	0.02	0.02	-0.05	-0.02	-0.02
	06-Aug-12	7,148,526.73	513,529.16	529.00	3,273	361	0.28	0.04	0.04	-0.06	-0.02	-0.02

		Horizontal Movement			Vertical Movement		
		total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
Average	Aug 03 to Jul 04	0.04	0.04	0.04	-0.06	-0.06	-0.06
	Jul 04 to Sep 04	0.05	0.02	0.15	-0.07	-0.01	-0.04
	Sep 04 to Sep 05	0.09	0.06	0.07	-0.16	-0.09	-0.09
	Sep 05 to Jul 06	0.09	0.05	0.06	-0.09	0.07	0.08
	Jul 06 to Jul 08	0.15	0.06	0.03	-0.13	-0.04	-0.02
	Jul 08 to Jul 10	0.17	0.06	0.03	-0.16	-0.03	-0.01
	Jul 10 to Sept 10	0.18	0.03	0.15	-0.19	-0.03	-0.14
	Sept 10 to Aug 11	0.20	0.02	0.02	-0.21	-0.02	-0.02
	Aug 11 to Aug 12	**0.23**	**0.04**	**0.04**	**-0.25**	**-0.04**	**-0.04**
Maximum	Aug 03 to Jul 04	0.09	0.09	0.10	-0.01	-0.01	-0.01
	Jul 04 to Sep 04	0.08	0.03	0.22	0.01	0.01	0.08
	Sep 04 to Sep 05	0.16	0.12	0.12	-0.09	-0.04	-0.04
	Sep 05 to Jul 06	0.20	0.16	0.18	0.01	0.10	0.11
	Jul 06 to Jul 08	0.28	0.09	0.05	0.03	0.02	0.01
	Jul 08 to Jul 10	0.34	0.21	0.10	0.05	0.02	0.01
	Jul 10 to Sept 10	0.37	0.04	0.19	0.02	-0.01	-0.04
	Sept 10 to Aug 11	0.42	0.05	0.05	0.02	0.00	0.00
	Aug 11 to Aug 12	**0.47**	**0.06**	**0.06**	**0.00**	**-0.02**	**-0.02**
Minimum	Aug 03 to Jul 04	0.01	0.01	0.01	-0.13	-0.13	-0.14
	Jul 04 to Sep 04	0.02	0.01	0.09	-0.15	-0.03	-0.16
	Sep 04 to Sep 05	0.04	0.03	0.03	-0.28	-0.14	-0.14
	Sep 05 to Jul 06	0.02	0.02	0.03	-0.24	0.04	0.05
	Jul 06 to Jul 08	0.08	0.04	0.02	-0.33	-0.10	-0.05
	Jul 08 to Jul 10	0.06	0.02	0.01	-0.41	-0.08	-0.04
	Jul 10 to Sept 10	0.08	0.01	0.08	-0.45	-0.04	-0.20
	Sept 10 to Aug 11	0.09	0.01	0.01	-0.50	-0.05	-0.06
	Aug 11 to Aug 12	**0.11**	**0.02**	**0.02**	**-0.55**	**-0.06**	**-0.06**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
Project No.: 20112857
Date: 06-Aug-12

Table D1) Tailings Stability - Upper Slopes (Elevation > 530 m)

South Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
1492	21-Aug-03	7,148,053.74	513,409.91	610.07	0	0	0.00			0.00		
	28-Jul-04	7,148,053.72	513,409.97	609.98	342	342	0.06	0.06	0.07	-0.09	-0.09	-0.09
	23-Sep-04	7,148,053.73	513,409.95	609.98	399	57	0.04	0.02	0.14	-0.09	0.00	-0.01
	17-Sep-05	7,148,053.69	513,410.03	609.80	758	359	0.12	0.08	0.09	-0.27	-0.18	-0.19
	28-Jul-06	7,148,053.68	513,410.04	609.79	1,072	314	0.14	0.02	0.02	-0.28	-0.01	-0.01
	09-Jul-08	7,148,053.66	513,410.14	609.70	1,784	712	0.24	0.10	0.05	-0.38	-0.09	-0.05
	20-Jul-10	7,148,053.64	513,410.20	609.61	2,525	741	0.31	0.07	0.03	-0.46	-0.08	-0.04
	25-Sep-10	7,148,053.62	513,410.21	609.59	2,592	67	0.32	0.02	0.10	-0.48	-0.02	-0.14
	11-Aug-11	7,148,053.61	513,410.24	609.53	2,912	320	0.36	0.04	0.04	-0.54	-0.06	-0.07
	06-Aug-12	7,148,053.61	513,410.28	609.47	3,273	361	0.39	0.04	0.04	-0.60	-0.06	-0.06
24	21-Aug-03	7,148,033.83	513,525.34	549.69	0	0	0.00			0.00		
	28-Jul-04	7,148,033.87	513,525.57	549.55	342	342	0.23	0.23	0.24	-0.14	-0.14	-0.15
	23-Sep-04	7,148,033.90	513,525.56	549.55	399	57	0.23	0.03	0.19	-0.14	0.01	0.04
	17-Sep-05	7,148,033.91	513,525.74	549.37	758	359	0.41	0.18	0.18	-0.33	-0.19	-0.19
	28-Jul-06	7,148,033.92	513,525.89	549.37	1,072	314	0.56	0.15	0.18	-0.32	0.00	0.00
	09-Jul-08	7,148,033.94	513,526.07	549.28	1,784	712	0.73	0.17	0.09	-0.41	-0.09	-0.05
	20-Jul-10	7,148,033.97	513,526.17	549.24	2,525	741	0.84	0.11	0.06	-0.46	-0.04	-0.02
	25-Sep-10	7,148,033.95	513,526.17	549.22	2,592	67	0.84	0.02	0.12	-0.47	-0.02	-0.10
	11-Aug-11	7,148,033.96	513,526.22	549.17	2,912	320	0.89	0.05	0.05	-0.52	-0.04	-0.05
	06-Aug-12	7,148,033.98	513,526.27	549.11	3,273	361	0.94	0.05	0.05	-0.58	-0.06	-0.06

Average	Aug 03 to Jul 04	0.14	0.14	0.15	-0.11	-0.11	-0.12
	Jul 04 to Sep 04	0.13	0.03	0.17	-0.11	0.00	0.01
	Sep 04 to Sep 05	0.26	0.13	0.13	-0.30	-0.19	-0.19
	Sep 05 to Jul 06	0.35	0.09	0.10	-0.30	0.00	0.00
	Jul 06 to Jul 08	0.49	0.14	0.07	-0.39	-0.09	-0.05
	Jul 08 to Jul 10	0.58	0.09	0.04	-0.46	-0.06	-0.03
	Jul 10 to Sept 10	0.58	0.02	0.11	-0.48	-0.02	-0.12
	Sept 10 to Aug 11	0.62	0.04	0.05	-0.53	-0.05	-0.06
	Aug 11 to Aug 12	**0.66**	**0.04**	**0.04**	**-0.59**	**-0.06**	**-0.06**
Maximum	Aug 03 to Jul 04	0.23	0.23	0.24	-0.09	-0.09	-0.09
	Jul 04 to Sep 04	0.23	0.03	0.19	-0.09	0.01	0.04
	Sep 04 to Sep 05	0.41	0.18	0.18	-0.27	-0.18	-0.19
	Sep 05 to Jul 06	0.56	0.15	0.18	-0.28	0.00	0.00
	Jul 06 to Jul 08	0.73	0.17	0.09	-0.38	-0.09	-0.05
	Jul 08 to Jul 10	0.84	0.11	0.06	-0.46	-0.04	-0.02
	Jul 10 to Sept 10	0.84	0.02	0.12	-0.47	-0.02	-0.10
	Sept 10 to Aug 11	0.89	0.05	0.05	-0.52	-0.04	-0.05
	Aug 11 to Aug 12	**0.94**	**0.05**	**0.05**	**-0.58**	**-0.06**	**-0.06**
Minimum	Aug 03 to Jul 04	0.06	0.06	0.07	-0.14	-0.14	-0.15
	Jul 04 to Sep 04	0.04	0.02	0.14	-0.14	0.00	-0.01
	Sep 04 to Sep 05	0.12	0.08	0.09	-0.33	-0.19	-0.19
	Sep 05 to Jul 06	0.14	0.02	0.02	-0.32	-0.01	-0.01
	Jul 06 to Jul 08	0.24	0.10	0.05	-0.41	-0.09	-0.05
	Jul 08 to Jul 10	0.31	0.07	0.03	-0.46	-0.08	-0.04
	Jul 10 to Sept 10	0.32	0.02	0.10	-0.48	-0.02	-0.14
	Sept 10 to Aug 11	0.36	0.04	0.04	-0.54	-0.06	-0.07
	Aug 11 to Aug 12	**0.39**	**0.04**	**0.04**	**-0.60**	**-0.06**	**-0.06**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
UMA Job No.: 20112857
Date: 06-Aug-12

Table D2) Tailings Stability - Mid Slopes (Elevation 425 to 530 m)

North Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
80-4	21-Aug-03	7,148,201.56	513,688.82	501.73	0	0	0.00		0.75	0.00		-0.28
	28-Jul-04	7,148,201.69	513,689.40	501.49	342	342	0.59	0.59	0.63	-0.24	-0.24	-0.26
	23-Sep-04	7,148,201.73	513,689.47	501.42	399	57	0.67	0.09	0.56	-0.31	-0.07	-0.47
	17-Sep-05	7,148,201.81	513,689.99	501.18	758	359	1.19	0.52	0.53	-0.55	-0.24	-0.24
	28-Jul-06	7,148,201.90	513,690.35	501.14	1,072	314	1.56	0.37	0.43	-0.59	-0.04	-0.05
	09-Jul-08	7,148,202.02	513,690.93	500.95	1,784	712	2.16	0.60	0.31	-0.78	-0.19	-0.10
	20-Jul-10	7,148,202.11	513,691.36	500.78	2,525	741	2.59	0.43	0.21	-0.95	-0.17	-0.08
	25-Sep-10	7,148,202.14	513,691.44	500.75	2,592	67	2.68	0.09	0.48	-0.98	-0.04	-0.21
	11-Aug-11	7,148,202.18	513,691.65	500.66	2,912	320	2.89	0.21	0.24	-1.08	-0.09	-0.10
	06-Aug-12	7,148,202.24	513,691.89	500.56	3,273	361	3.15	0.25	0.25	-1.17	-0.10	-0.10
80-5	21-Aug-03	7,148,249.32	513,718.34	481.19	0	0	0.00		0.91	0.00		-0.43
	28-Jul-04	7,148,249.41	513,718.73	481.10	342	342	0.40	0.40	0.43	-0.09	-0.09	-0.10
	23-Sep-04	7,148,249.42	513,718.77	481.07	399	57	0.44	0.04	0.28	-0.12	-0.02	-0.16
	17-Sep-05	7,148,249.49	513,719.16	480.92	758	359	0.84	0.39	0.40	-0.27	-0.16	-0.16
	28-Jul-06	7,148,249.55	513,719.41	480.96	1,072	314	1.09	0.26	0.30	-0.23	0.04	0.05
	09-Jul-08	7,148,249.63	513,719.85	480.86	1,784	712	1.54	0.45	0.23	-0.33	-0.10	-0.05
	20-Jul-10	7,148,249.68	513,720.15	480.77	2,525	741	1.85	0.31	0.15	-0.42	-0.08	-0.04
	25-Sep-10	7,148,249.67	513,720.21	480.72	2,592	67	1.91	0.06	0.33	-0.47	-0.05	-0.29
	11-Aug-11	7,148,249.71	513,720.37	480.69	2,912	320	2.07	0.16	0.18	-0.50	-0.03	-0.04
	06-Aug-12	7,148,249.75	513,720.53	480.62	3,273	361	2.23	0.17	0.17	-0.57	-0.06	-0.06
1085	21-Aug-03	7,148,346.05	513,666.41	488.88	0	0	0.00			0.00		
	28-Jul-04	7,148,346.06	513,666.43	488.84	342	342	0.02	0.02	0.02	-0.04	-0.04	-0.04
	23-Sep-04	7,148,346.06	513,666.41	488.82	399	57	0.01	0.02	0.14	-0.06	-0.01	-0.09
	17-Sep-05	7,148,346.06	513,666.46	488.72	758	359	0.05	0.05	0.05	-0.16	-0.10	-0.10
	28-Jul-06	7,148,346.08	513,666.47	488.82	1,072	314	0.06	0.02	0.02	-0.06	0.09	0.11
	09-Jul-08	7,148,346.05	513,666.51	488.82	1,784	712	0.10	0.05	0.03	-0.06	0.00	0.00
	20-Jul-10	7,148,346.05	513,666.52	488.78	2,525	741	0.10	0.01	0.00	-0.10	-0.04	-0.02
	25-Sep-10	7,148,346.05	513,666.54	488.75	2,592	67	0.13	0.02	0.13	-0.13	-0.03	-0.15
	11-Aug-11	7,148,346.06	513,666.56	488.72	2,912	320	0.15	0.02	0.03	-0.16	-0.03	-0.04
	06-Aug-12	7,148,346.05	513,666.58	488.69	3,273	361	0.17	0.02	0.02	-0.19	-0.03	-0.03
500-1	21-Aug-03	7,148,343.22	513,725.53	474.09	0	0	0.00		2.29	0.00		-0.79
	28-Jul-04	7,148,343.24	513,725.54	474.02	342	342	0.02	0.02	0.02	-0.07	-0.07	-0.07
	23-Sep-04	7,148,343.24	513,725.53	474.01	399	57	0.01	0.01	0.09	-0.08	-0.01	-0.06
	17-Sep-05	7,148,343.24	513,725.55	473.95	758	359	0.03	0.02	0.02	-0.14	-0.06	-0.06
	28-Jul-06	7,148,343.24	513,725.56	474.10	1,072	314	0.04	0.02	0.02	0.01	0.14	0.16
	09-Jul-08	7,148,343.25	513,725.57	474.08	1,784	712	0.05	0.01	0.01	-0.01	-0.01	-0.01
	20-Jul-10	7,148,343.23	513,725.56	474.10	2,525	741	0.04	0.02	0.01	0.01	0.01	0.01
	25-Sep-10	7,148,343.22	513,725.59	474.05	2,592	67	0.06	0.03	0.14	-0.04	-0.04	-0.23
	11-Aug-11	7,148,343.22	513,725.59	474.08	2,912	320	0.07	0.00	0.00	-0.01	0.02	0.03
	06-Aug-12	7,148,343.24	513,725.62	474.04	3,273	361	0.09	0.03	0.03	-0.05	-0.04	-0.04
650-1	21-Aug-03	7,148,408.73	513,701.26	483.95	0	0	0.00		1.31	0.00		-0.60
	28-Jul-04	7,148,408.75	513,701.33	483.92	342	342	0.06	0.06	0.07	-0.03	-0.03	-0.03
	23-Sep-04	7,148,408.75	513,701.31	483.91	399	57	0.05	0.02	0.13	-0.04	-0.01	-0.07
	17-Sep-05	7,148,408.75	513,701.34	483.87	758	359	0.08	0.04	0.04	-0.08	-0.03	-0.03
	28-Jul-06	7,148,408.77	513,701.35	483.89	1,072	314	0.09	0.02	0.03	-0.06	0.02	0.02
	09-Jul-08	7,148,408.75	513,701.39	483.87	1,784	712	0.13	0.05	0.02	-0.08	-0.02	-0.01
	20-Jul-10	7,148,408.75	513,701.40	483.84	2,525	741	0.14	0.02	0.01	-0.12	-0.04	-0.02
	25-Sep-10	7,148,408.75	513,701.44	483.80	2,592	67	0.18	0.04	0.21	-0.15	-0.03	-0.19
	11-Aug-11	7,148,408.74	513,701.46	483.77	2,912	320	0.19	0.01	0.02	-0.18	-0.03	-0.03
	06-Aug-12	7,148,408.76	513,701.49	483.75	3,273	361	0.23	0.04	0.04	-0.20	-0.02	-0.02
350-1A	21-Aug-03	7,148,298.59	513,822.46	448.09	0	0	0.00		3.75	0.00		-1.33
	28-Jul-04	7,148,298.61	513,822.64	448.01	342	342	0.19	0.19	0.20	-0.08	-0.08	-0.09
	23-Sep-04	7,148,298.61	513,822.64	448.00	399	57	0.19	0.00	0.03	-0.09	0.00	-0.03
	17-Sep-05	7,148,298.64	513,822.81	447.93	758	359	0.35	0.17	0.17	-0.16	-0.07	-0.08
	28-Jul-06	7,148,298.65	513,822.90	447.93	1,072	314	0.45	0.10	0.11	-0.16	0.00	0.00
	09-Jul-08	7,148,298.68	513,823.08	447.87	1,784	712	0.62	0.17	0.09	-0.22	-0.06	-0.03
	20-Jul-10	7,148,298.70	513,823.18	447.83	2,525	741	0.73	0.11	0.05	-0.26	-0.05	-0.02
	25-Sep-10	7,148,298.69	513,823.22	447.79	2,592	67	0.77	0.05	0.26	-0.30	-0.03	-0.19
	11-Aug-11	7,148,298.70	513,823.27	447.77	2,912	320	0.82	0.05	0.05	-0.32	-0.02	-0.03
	06-Aug-12	7,148,298.72	513,823.33	447.74	3,273	361	0.88	0.06	0.06	-0.35	-0.03	-0.03
500-2	21-Aug-03	7,148,344.36	513,842.07	438.14	0	0	0.00		3.49	0.00		-1.40
	28-Jul-04	7,148,344.36	513,842.27	438.06	342	342	0.20	0.20	0.21	-0.08	-0.08	-0.08
	23-Sep-04	7,148,344.37	513,842.26	438.05	399	57	0.19	0.02	0.10	-0.09	-0.01	-0.08
	17-Sep-05	7,148,344.37	513,842.43	438.00	758	359	0.36	0.17	0.18	-0.14	-0.05	-0.05
	28-Jul-06	7,148,344.39	513,842.53	438.02	1,072	314	0.46	0.10	0.11	-0.12	0.03	0.03
	09-Jul-08	7,148,344.41	513,842.70	437.96	1,784	712	0.64	0.18	0.09	-0.18	-0.07	-0.03
	20-Jul-10	7,148,344.40	513,842.82	437.91	2,525	741	0.75	0.12	0.06	-0.23	-0.05	-0.02
	25-Sep-10	7,148,344.40	513,842.86	437.87	2,592	67	0.79	0.04	0.22	-0.27	-0.04	-0.21
	11-Aug-11	7,148,344.40	513,842.91	437.87	2,912	320	0.84	0.05	0.05	-0.27	0.00	0.00
	06-Aug-12	7,148,344.42	513,842.96	437.81	3,273	361	0.89	0.06	0.06	-0.33	-0.06	-0.06

North Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
650-2	21-Aug-03	7,148,400.26	513,815.95	439.87	0	0	0.00		2.00	0.00		-0.62
	28-Jul-04	7,148,400.25	513,816.10	439.75	342	342	0.15	0.15	0.16	-0.12	-0.12	-0.12
	23-Sep-04	7,148,400.25	513,816.08	439.72	399	57	0.13	0.02	0.12	-0.15	-0.04	-0.24
	17-Sep-05	7,148,400.24	513,816.21	439.67	758	359	0.26	0.13	0.13	-0.20	-0.04	-0.05
	28-Jul-06	7,148,400.25	513,816.27	439.70	1,072	314	0.32	0.06	0.07	-0.17	0.02	0.03
	09-Jul-08	7,148,400.20	513,816.38	439.64	1,784	712	0.43	0.12	0.06	-0.23	-0.06	-0.03
	20-Jul-10	7,148,400.19	513,816.43	439.58	2,525	741	0.48	0.06	0.03	-0.29	-0.07	-0.03
	25-Sep-10	7,148,400.17	513,816.46	439.53	2,592	67	0.52	0.04	0.20	-0.34	-0.04	-0.23
	11-Aug-11	7,148,400.18	513,816.49	439.54	2,912	320	0.54	0.02	0.03	-0.33	0.00	0.00
	06-Aug-12	7,148,400.18	513,816.52	439.47	3,273	361	0.58	0.03	0.03	-0.40	-0.07	-0.07
350-2A	21-Aug-03	7,148,300.52	513,873.67	428.71	0	0	0.00		3.80	0.00		-1.52
	28-Jul-04	7,148,300.53	513,873.83	428.58	342	342	0.16	0.16	0.17	-0.13	-0.13	-0.14
	23-Sep-04	7,148,300.54	513,873.85	428.58	399	57	0.17	0.01	0.09	-0.13	-0.01	-0.04
	17-Sep-05	7,148,300.52	513,873.98	428.51	758	359	0.31	0.14	0.14	-0.20	-0.06	-0.07
	28-Jul-06	7,148,300.52	513,874.08	428.52	1,072	314	0.41	0.10	0.12	-0.19	0.01	0.01
	09-Jul-08	7,148,300.50	513,874.23	428.47	1,784	712	0.56	0.15	0.08	-0.25	-0.06	-0.03
	20-Jul-10	7,148,300.49	513,874.35	428.42	2,525	741	0.68	0.12	0.06	-0.29	-0.04	-0.02
	25-Sep-10	7,148,300.48	513,874.39	428.38	2,592	67	0.72	0.04	0.23	-0.33	-0.04	-0.23
	11-Aug-11	7,148,300.48	513,874.44	428.37	2,912	320	0.77	0.05	0.05	-0.34	-0.01	-0.01
	06-Aug-12	7,148,300.48	513,874.50	428.35	3,273	361	0.83	0.06	0.06	-0.36	-0.02	-0.02
1491	21-Aug-03	7,148,376.83	513,868.79	432.49	0	0	0.00			0.00		
	28-Jul-04	7,148,376.82	513,869.00	432.34	342	342	0.21	0.21	0.22	-0.15	-0.15	-0.16
	23-Sep-04	7,148,376.82	513,868.99	432.32	399	57	0.20	0.01	0.05	-0.17	-0.02	-0.13
	17-Sep-05	7,148,376.85	513,869.15	432.27	758	359	0.36	0.17	0.17	-0.22	-0.05	-0.05
	28-Jul-06	7,148,376.90	513,869.24	432.34	1,072	314	0.45	0.09	0.11	-0.15	0.07	0.08
	09-Jul-08	7,148,376.96	513,869.39	432.28	1,784	712	0.62	0.17	0.09	-0.21	-0.06	-0.03
	20-Jul-10	7,148,376.92	513,869.51	432.21	2,525	741	0.72	0.12	0.06	-0.29	-0.07	-0.04
	25-Sep-10	7,148,376.94	513,869.71	432.10	2,592	67	0.92	0.20	1.10	-0.39	-0.10	-0.57
	11-Aug-11	7,148,376.96	513,869.76	432.10	2,912	320	0.98	0.06	0.06	-0.39	0.00	0.00
	06-Aug-12	7,148,376.96	513,869.82	432.04	3,273	361	1.04	0.06	0.06	-0.45	-0.06	-0.06

Average	Aug 03 to Jul 04	0.20	0.20	0.21	-0.10	-0.10	-0.11
	Jul 04 to Sep 04	0.21	0.02	0.16	-0.12	-0.02	-0.14
	Sep 04 to Sep 05	0.38	0.18	0.18	-0.21	-0.09	-0.09
	Sep 05 to Jul 06	0.49	0.11	0.13	-0.17	0.04	0.04
	Jul 06 to Jul 08	0.68	0.19	0.10	-0.23	-0.06	-0.03
	Jul 08 to Jul 10	0.81	0.13	0.06	-0.29	-0.06	-0.03
	Jul 10 to Sept 10	0.87	0.06	0.33	-0.34	-0.05	-0.25
	Sept 10 to Aug 11	0.93	0.06	0.07	-0.36	-0.02	-0.02
	Aug 11 to Aug 12	**1.01**	**0.08**	**0.08**	**-0.41**	**-0.05**	**-0.05**
Maximum	Aug 03 to Jul 04	0.59	0.59	0.63	-0.03	-0.03	-0.03
	Jul 04 to Sep 04	0.67	0.09	0.56	-0.04	0.00	-0.03
	Sep 04 to Sep 05	1.19	0.52	0.53	-0.08	-0.03	-0.03
	Sep 05 to Jul 06	1.56	0.37	0.43	0.01	0.14	0.16
	Jul 06 to Jul 08	2.16	0.60	0.31	-0.01	0.00	0.00
	Jul 08 to Jul 10	2.59	0.43	0.21	0.01	0.01	0.01
	Jul 10 to Sept 10	2.68	0.20	1.10	-0.04	-0.03	-0.15
	Sept 10 to Aug 11	2.89	0.21	0.24	-0.01	0.02	0.03
	Aug 11 to Aug 12	**3.15**	**0.25**	**0.25**	**-0.05**	**-0.02**	**-0.02**
Minimum	Aug 03 to Jul 04	0.02	0.02	0.02	-0.24	-0.24	-0.26
	Jul 04 to Sep 04	0.01	0.00	0.03	-0.31	-0.07	-0.47
	Sep 04 to Sep 05	0.03	0.02	0.02	-0.55	-0.24	-0.24
	Sep 05 to Jul 06	0.04	0.02	0.02	-0.59	-0.04	-0.05
	Jul 06 to Jul 08	0.05	0.01	0.01	-0.78	-0.19	-0.10
	Jul 08 to Jul 10	0.04	0.01	0.00	-0.95	-0.17	-0.08
	Jul 10 to Sept 10	0.06	0.02	0.13	-0.98	-0.10	-0.57
	Sept 10 to Aug 11	0.07	0.00	0.00	-1.08	-0.09	-0.10
	Aug 11 to Aug 12	**0.09**	**0.02**	**0.02**	**-1.17**	**-0.10**	**-0.10**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
UMA Job No.: 20112857
Date: 06-Aug-12

Table D2) Tailings Stability - Mid Slopes (Elevation 425 to 530 m)

South Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
1084	21-Aug-03	7,148,017.97	513,617.95	516.26	0	0	0.00			0.00		
	28-Jul-04	7,148,017.98	513,618.35	516.10	342	342	0.40	0.40	0.43	-0.16	-0.16	-0.17
	23-Sep-04	7,148,017.99	513,618.38	516.10	399	57	0.43	0.03	0.18	-0.16	-0.01	-0.06
	17-Sep-05	7,148,018.02	513,618.72	516.02	758	359	0.77	0.34	0.35	-0.24	-0.08	-0.08
	28-Jul-06	7,148,018.00	513,618.94	515.98	1,072	314	0.99	0.22	0.26	-0.28	-0.04	-0.04
	09-Jul-08	7,148,018.01	513,619.24	515.89	1,784	712	1.29	0.30	0.15	-0.37	-0.10	-0.05
	20-Jul-10	7,148,018.02	513,619.42	515.83	2,525	741	1.47	0.18	0.09	-0.43	-0.05	-0.03
	25-Sep-10	7,148,018.01	513,619.44	515.80	2,592	67	1.49	0.03	0.14	-0.46	-0.03	-0.17
	11-Aug-11	7,148,018.00	513,619.52	515.78	2,912	320	1.57	0.08	0.09	-0.48	-0.02	-0.03
	06-Aug-12	7,148,018.02	513,619.58	515.73	3,273	361	1.63	0.06	0.06	-0.53	-0.05	-0.05
1485	21-Aug-03	7,148,017.91	513,702.37	480.46	0	0	0.00			0.00		
	28-Jul-04	7,148,018.00	513,703.32	480.19	342	342	0.95	0.95	1.02	-0.27	-0.27	-0.29
	23-Sep-04	7,148,018.02	513,703.46	480.10	399	57	1.09	0.14	0.89	-0.36	-0.09	-0.56
	17-Sep-05	7,148,018.12	513,704.37	479.82	758	359	2.00	0.91	0.93	-0.64	-0.29	-0.29
	28-Jul-06	7,148,018.16	513,705.01	479.62	1,072	314	2.65	0.65	0.75	-0.84	-0.19	-0.22
	09-Jul-08	7,148,018.25	513,706.15	479.22	1,784	712	3.79	1.14	0.58	-1.24	-0.40	-0.20
	20-Jul-10	7,148,018.30	513,707.09	478.84	2,525	741	4.74	0.95	0.47	-1.62	-0.39	-0.19
	25-Sep-10	7,148,018.30	513,707.21	478.78	2,592	67	4.85	0.12	0.63	-1.68	-0.06	-0.33
	11-Aug-11	7,148,018.33	513,707.61	478.60	2,912	320	5.25	0.40	0.46	-1.86	-0.17	-0.20
	06-Aug-12	7,148,018.37	513,707.98	478.39	3,273	361	5.63	0.37	0.38	-2.07	-0.22	-0.22
BH-16 (T8)	21-Aug-03	7,148,048.49	513,760.30	464.94	0	0	0.00			0.00		
	28-Jul-04	7,148,048.61	513,761.19	464.65	342	342	0.90	0.90	0.96	-0.29	-0.29	-0.31
	23-Sep-04	7,148,048.63	513,761.31	464.59	399	57	1.02	0.12	0.77	-0.35	-0.05	-0.35
	17-Sep-05	7,148,048.72	513,762.13	464.34	758	359	1.84	0.82	0.84	-0.60	-0.25	-0.26
	28-Jul-06	7,148,048.79	513,762.77	464.20	1,072	314	2.49	0.64	0.75	-0.75	-0.14	-0.17
	09-Jul-08	7,148,048.93	513,763.85	463.84	1,784	712	3.58	1.10	0.56	-1.10	-0.36	-0.18
	20-Jul-10	7,148,049.03	513,764.78	463.53	2,525	741	4.52	0.94	0.46	-1.41	-0.31	-0.15
	25-Sep-10	7,148,049.03	513,764.89	463.49	2,592	67	4.63	0.11	0.58	-1.45	-0.04	-0.25
	11-Aug-11	7,148,049.27	513,765.84	463.55	2,912	320	5.59	0.98	1.11	-1.39	0.06	0.07
	06-Aug-12	7,148,049.31	513,766.21	463.40	3,273	361	5.97	0.38	0.38	-1.54	-0.15	-0.15
24A	21-Aug-03	7,148,035.28	513,774.68	465.27	0	0	0.00		3.20	0.00		-1.10
	28-Jul-04	7,148,035.42	513,775.58	464.94	342	342	0.91	0.91	0.97	-0.33	-0.33	-0.35
	23-Sep-04	7,148,035.44	513,775.70	464.89	399	57	1.03	0.13	0.82	-0.38	-0.05	-0.34
	17-Sep-05	7,148,035.58	513,776.55	464.66	758	359	1.90	0.86	0.87	-0.61	-0.23	-0.23
	28-Jul-06	7,148,035.66	513,777.19	464.47	1,072	314	2.54	0.64	0.75	-0.80	-0.19	-0.22
	09-Jul-08	7,148,035.85	513,778.31	464.12	1,784	712	3.67	1.13	0.58	-1.15	-0.35	-0.18
	20-Jul-10	7,148,035.99	513,779.27	463.82	2,525	741	4.64	0.97	0.48	-1.45	-0.30	-0.15
	25-Sep-10	7,148,035.99	513,779.39	463.76	2,592	67	4.76	0.12	0.66	-1.51	-0.06	-0.32
	11-Aug-11	7,148,036.06	513,779.82	463.62	2,912	320	5.20	0.43	0.50	-1.65	-0.14	-0.16
	06-Aug-12	7,148,036.12	513,780.20	463.47	3,273	361	5.58	0.38	0.39	-1.80	-0.15	-0.15
24B	21-Aug-03	7,148,045.09	513,832.26	446.30	0	0	0.00		3.18	0.00		-1.04
	28-Jul-04	7,148,045.31	513,833.13	446.00	342	342	0.90	0.90	0.96	-0.30	-0.30	-0.32
	23-Sep-04	7,148,045.33	513,833.26	445.89	399	57	1.03	0.13	0.85	-0.41	-0.11	-0.69
	17-Sep-05	7,148,045.55	513,834.05	445.62	758	359	1.85	0.82	0.83	-0.68	-0.27	-0.27
	28-Jul-06	7,148,045.69	513,834.66	445.46	1,072	314	2.47	0.62	0.73	-0.84	-0.16	-0.19
	09-Jul-08	7,148,045.97	513,835.72	445.06	1,784	712	3.56	1.09	0.56	-1.24	-0.39	-0.20
	20-Jul-10	7,148,046.19	513,836.62	444.73	2,525	741	4.50	0.93	0.46	-1.57	-0.33	-0.16
	25-Sep-10	7,148,046.23	513,836.74	444.67	2,592	67	4.62	0.12	0.65	-1.63	-0.06	-0.35
	11-Aug-11	7,148,046.31	513,837.14	444.50	2,912	320	5.03	0.41	0.47	-1.80	-0.16	-0.19
	06-Aug-12	7,148,046.42	513,837.51	444.35	3,273	361	5.42	0.39	0.39	-1.95	-0.15	-0.16
NL-Base	17-Sep-05	7,148,154.79	513,836.26	431.47	0	0	0.00			0.00		
	28-Jul-06	7,148,154.78	513,836.23	431.38	314	314	0.03	0.03	0.04	-0.09	-0.09	-0.10
	09-Jul-08	7,148,154.80	513,836.28	431.40	1,026	712	0.02	0.05	0.03	-0.07	0.02	0.01
	20-Jul-10	7,148,154.82	513,836.31	431.41	1,767	741	0.06	0.04	0.02	-0.06	0.01	0.00
	25-Sep-10	7,148,154.81	513,836.32	431.38	1,834	67	0.07	0.02	0.11	-0.09	-0.03	-0.16
	11-Aug-11	7,148,154.81	513,836.34	431.38	2,154	320	0.08	0.01	0.02	-0.09	0.00	0.00
	06-Aug-12	7,148,154.81	513,836.35	431.35	2,515	361	0.10	0.02	0.02	-0.12	-0.02	-0.02
2005-06	17-Sep-05	7,147,999.72	513,865.78	433.29	0	0	0.00			0.00		
	28-Jul-06	7,147,999.74	513,866.22	433.22	314	314	0.44	0.44	0.51	-0.07	-0.07	-0.08
	09-Jul-08	7,147,999.88	513,867.02	432.94	1,026	712	1.25	0.81	0.41	-0.35	-0.28	-0.14
	20-Jul-10	7,147,999.95	513,867.68	432.73	1,767	741	1.91	0.66	0.33	-0.56	-0.21	-0.10
	25-Sep-10	7,147,999.94	513,867.77	432.66	1,834	67	2.00	0.10	0.54	-0.63	-0.07	-0.38
	11-Aug-11	7,147,999.96	513,868.08	432.55	2,154	320	2.31	0.31	0.35	-0.74	-0.11	-0.12
	06-Aug-12	7,147,999.98	513,868.36	432.48	2,515	361	2.59	0.28	0.29	-0.81	-0.08	-0.08
2005-01	17-Sep-05	7,148,100.15	513,757.89	463.73	0	0	0.00			0.00		
	28-Jul-06	7,148,100.13	513,758.45	463.64	314	314	0.56	0.56	0.65	-0.09	-0.09	-0.10
	09-Jul-08	7,148,100.09	513,759.38	463.46	1,026	712	1.49	0.93	0.48	-0.27	-0.18	-0.09
	20-Jul-10	7148100.073	513760.156	463.304	1,767	741	2.26	0.78	0.38	-0.42	-0.15	-0.07
	25-Sep-10	7148100.044	513760.26	463.283	1,834	67	2.37	0.11	0.59	-0.44	-0.02	-0.11
	11-Aug-11	7,148,100.04	513,760.61	463.19	2,154	320	2.71	0.35	0.39	-0.54	-0.09	-0.10
	06-Aug-12	7,148,100.02	513,760.92	463.12	2,515	361	3.03	0.32	0.32	-0.60	-0.07	-0.07

South Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
2005-02	17-Sep-05	7,148,118.21	513,816.95	447.89	0	0	0.00			0.00		
	28-Jul-06	7,148,118.32	513,817.41	447.77	314	314	0.48	0.48	0.56	-0.12	-0.12	-0.14
	09-Jul-08	7,148,118.56	513,818.22	447.45	1,026	712	1.31	0.84	0.43	-0.44	-0.32	-0.17
	20-Jul-10	7,148,118.75	513,818.89	447.17	1,767	741	2.01	0.70	0.35	-0.72	-0.28	-0.14
	25-Sep-10	7,148,118.77	513,818.98	447.11	1,834	67	2.11	0.10	0.52	-0.78	-0.05	-0.29
	11-Aug-11	7,148,118.85	513,819.28	446.99	2,154	320	2.41	0.30	0.35	-0.90	-0.12	-0.14
	06-Aug-12	7,148,118.93	513,819.55	446.86	2,515	361	2.70	0.29	0.29	-1.03	-0.13	-0.13
2005-03	17-Sep-05	7,148,108.16	513,870.12	428.18	0	0	0.00			0.00		
	28-Jul-06	7,148,108.35	513,870.58	428.04	314	314	0.50	0.50	0.58	-0.14	-0.14	-0.16
	09-Jul-08	7,148,108.74	513,871.41	427.72	1,026	712	1.41	0.91	0.47	-0.46	-0.32	-0.16
	20-Jul-10	7,148,109.06	513,872.11	427.45	1,767	741	2.18	0.77	0.38	-0.73	-0.27	-0.13
	25-Sep-10	7,148,109.08	513,872.21	427.40	1,834	67	2.29	0.11	0.58	-0.78	-0.05	-0.27
	11-Aug-11	7,148,109.22	513,872.53	427.29	2,154	320	2.63	0.35	0.40	-0.89	-0.12	-0.13
	06-Aug-12	7,148,109.36	513,872.82	427.16	2,515	361	2.95	0.32	0.32	-1.02	-0.12	-0.13
2005-04	17-Sep-05	7,148,047.07	513,876.04	428.36	0	0	0.00			0.00		
	28-Jul-06	7,148,047.27	513,876.56	428.26	314	314	0.55	0.55	0.64	-0.10	-0.10	-0.12
	09-Jul-08	7,148,047.65	513,877.50	428.02	1,026	712	1.57	1.02	0.52	-0.34	-0.24	-0.13
	20-Jul-10	7,148,047.97	513,878.33	427.81	1,767	741	2.46	0.89	0.44	-0.55	-0.21	-0.10
	25-Sep-10	7,148,048.02	513,878.45	427.73	1,834	67	2.59	0.12	0.68	-0.63	-0.08	-0.45
	11-Aug-11	7,148,048.13	513,878.80	427.63	2,154	320	2.96	0.37	0.42	-0.73	-0.10	-0.11
	06-Aug-12	7,148,048.28	513,879.13	427.52	2,515	361	3.32	0.36	0.36	-0.84	-0.11	-0.11
2005-05	17-Sep-05	7,148,000.57	513,781.55	464.67	0	0	0.00			0.00		
	28-Jul-06	7,148,000.65	513,782.24	464.51	314	314	0.70	0.70	0.81	-0.16	-0.16	-0.19
	09-Jul-08	7,148,000.83	513,783.44	464.19	1,026	712	1.91	1.22	0.62	-0.48	-0.32	-0.16
	20-Jul-10	7,148,000.98	513,784.48	463.91	1,767	741	2.96	1.05	0.52	-0.76	-0.29	-0.14
	25-Sep-10	7,148,000.97	513,784.61	463.86	1,834	67	3.09	0.13	0.71	-0.81	-0.05	-0.28
	11-Aug-11	7,148,001.04	513,785.08	463.72	2,154	320	3.56	0.47	0.54	-0.95	-0.14	-0.16
	06-Aug-12	7,148,001.10	513,785.52	463.59	2,515	361	4.01	0.45	0.45	-1.08	-0.13	-0.13

Average	Aug 03 to Jul 04	0.81	0.81	0.87	-0.27	-0.27	-0.29
	Jul 04 to Sep 04	0.92	0.11	0.70	-0.33	-0.06	-0.40
	Sep 04 to Sep 05	1.67	0.75	0.76	-0.56	-0.22	-0.23
	Sep 05 to Jul 06	1.20	0.50	0.59	-0.36	-0.12	-0.14
	Jul 06 to Jul 08	2.07	0.88	0.45	-0.63	-0.27	-0.14
	Jul 08 to Jul 10	2.81	0.74	0.36	-0.86	-0.23	-0.11
	Jul 10 to Sept 10	2.90	0.10	0.53	-0.91	-0.05	-0.28
	Sept 10 to Aug 11	3.28	0.37	0.42	-1.00	-0.09	-0.11
	Aug 11 to Aug 12	**3.58**	**0.30**	**0.30**	**-1.12**	**-0.11**	**-0.12**
Maximum	Aug 03 to Jul 04	0.95	0.95	1.02	-0.16	-0.16	-0.17
	Jul 04 to Sep 04	1.09	0.14	0.89	-0.16	-0.01	-0.06
	Sep 04 to Sep 05	2.00	0.91	0.93	-0.24	-0.08	-0.08
	Sep 05 to Jul 06	2.65	0.70	0.81	-0.07	-0.04	-0.04
	Jul 06 to Jul 08	3.79	1.22	0.62	-0.07	0.02	0.01
	Jul 08 to Jul 10	4.74	1.05	0.52	-0.06	0.01	0.00
	Jul 10 to Sept 10	4.85	0.13	0.71	-0.09	-0.02	-0.11
	Sept 10 to Aug 11	5.59	0.98	1.11	-0.09	0.06	0.07
	Aug 11 to Aug 12	**5.97**	**0.45**	**0.45**	**-0.12**	**-0.02**	**-0.02**
Minimum	Aug 03 to Jul 04	0.40	0.40	0.43	-0.33	-0.33	-0.35
	Jul 04 to Sep 04	0.43	0.03	0.18	-0.41	-0.11	-0.69
	Sep 04 to Sep 05	0.77	0.34	0.35	-0.68	-0.29	-0.29
	Sep 05 to Jul 06	0.03	0.03	0.04	-0.84	-0.19	-0.22
	Jul 06 to Jul 08	0.02	0.05	0.03	-1.24	-0.40	-0.20
	Jul 08 to Jul 10	0.06	0.04	0.02	-1.62	-0.39	-0.19
	Jul 10 to Sept 10	0.07	0.02	0.11	-1.68	-0.08	-0.45
	Sept 10 to Aug 11	0.08	0.01	0.02	-1.86	-0.17	-0.20
	Aug 11 to Aug 12	**0.10**	**0.02**	**0.02**	**-2.07**	**-0.22**	**-0.22**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
UMA Job No.: 20112857
Date: 06-Aug-12

Table D3) Tailings Stability - Lower Slopes (Elevation <425 m)

North Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	incremental (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
80-7	21-Aug-03	7,148,344.01	513,890.73	422.54	0	0	0.00		3.38	0.00		-1.22
	28-Jul-04	7,148,344.00	513,890.89	422.43	342	342	0.16	0.16	0.17	-0.11	-0.11	-0.12
	23-Sep-04	7,148,344.01	513,890.89	422.40	399	57	0.16	0.01	0.04	-0.14	-0.03	-0.21
	17-Sep-05	7,148,344.00	513,891.07	422.38	758	359	0.34	0.17	0.18	-0.16	-0.02	-0.02
	28-Jul-06	7,148,343.99	513,891.16	422.37	1,072	314	0.43	0.09	0.11	-0.17	-0.01	-0.01
	09-Jul-08	7,148,344.00	513,891.36	422.35	1,784	712	0.63	0.20	0.10	-0.19	-0.03	-0.01
	20-Jul-10	7,148,343.96	513,891.47	422.29	2,525	741	0.74	0.12	0.06	-0.25	-0.06	-0.03
	25-Sep-10	7,148,343.95	513,891.51	422.25	2,592	67	0.78	0.04	0.21	-0.29	-0.03	-0.19
	11-Aug-11	7,148,343.95	513,891.56	422.24	2,912	320	0.83	0.05	0.05	-0.31	-0.02	-0.02
	06-Aug-12	7,148,343.96	513,891.61	422.20	3,273	361	0.88	0.05	0.05	-0.34	-0.04	-0.04
350-3A	21-Aug-03	7,148,312.23	513,899.00	417.39	0	0	0.00		3.51	0.00		-1.44
	28-Jul-04	7,148,312.20	513,899.14	417.31	342	342	0.14	0.14	0.15	-0.08	-0.08	-0.08
	23-Sep-04	7,148,312.20	513,899.14	417.28	399	57	0.14	0.01	0.03	-0.12	-0.04	-0.25
	17-Sep-05	7,148,312.19	513,899.26	417.28	758	359	0.26	0.12	0.12	-0.11	0.00	0.00
	28-Jul-06	7,148,312.16	513,899.34	417.29	1,072	314	0.35	0.09	0.10	-0.10	0.01	0.01
	09-Jul-08	7,148,312.15	513,899.49	417.25	1,784	712	0.50	0.15	0.08	-0.14	-0.04	-0.02
	20-Jul-10	7,148,312.07	513,899.60	417.19	2,525	741	0.62	0.14	0.07	-0.20	-0.06	-0.03
	25-Sep-10	7,148,312.07	513,899.64	417.16	2,592	67	0.66	0.04	0.23	-0.23	-0.04	-0.20
	11-Aug-11	7,148,312.06	513,899.67	417.15	2,912	320	0.69	0.03	0.03	-0.24	-0.01	-0.01
	06-Aug-12	7,148,312.08	513,899.72	417.09	3,273	361	0.73	0.05	0.05	-0.30	-0.06	-0.06
1489	21-Aug-03	7,148,305.23	513,928.45	413.70	0	0	0			0.00		
	28-Jul-04	7,148,305.19	513,928.51	413.66	342	342	0.08	0.08	0.08	-0.04	-0.04	-0.04
	23-Sep-04	7,148,305.20	513,928.50	413.64	399	57	0.06	0.01	0.09	-0.06	-0.03	-0.16
	17-Sep-05	7,148,305.15	513,928.58	413.62	758	359	0.15	0.09	0.09	-0.08	-0.02	-0.02
	28-Jul-06	7,148,305.12	513,928.62	413.62	1,072	314	0.20	0.04	0.05	-0.08	0.00	0.00
	09-Jul-08	7,148,305.09	513,928.68	413.60	1,784	712	0.27	0.07	0.04	-0.10	-0.02	-0.01
	20-Jul-10	7,148,305.03	513,928.67	413.55	2,525	741	0.30	0.06	0.03	-0.15	-0.05	-0.02
	25-Sep-10	7,148,305.03	513,928.69	413.52	2,592	67	0.32	0.03	0.14	-0.18	-0.03	-0.19
	11-Aug-11	7,148,305.02	513,928.71	413.53	2,912	320	0.33	0.02	0.02	-0.17	0.01	0.01
	06-Aug-12	7,148,305.03	513,928.74	413.51	3,273	361	0.36	0.04	0.04	-0.19	-0.02	-0.02
NL-1	28-Jul-04	7,148,365.73	513,942.45	413.19	0	0	0.00			0.00		
	23-Sep-04	7,148,365.73	513,942.45	413.16	57	57	0.01	0.01	0.03	-0.02	-0.02	-0.15
	17-Sep-05	7,148,365.72	513,942.59	413.16	416	359	0.14	0.14	0.14	-0.03	0.00	-0.01
	28-Jul-06	7,148,365.70	513,942.70	413.15	730	314	0.24	0.11	0.13	-0.03	-0.01	-0.01
	09-Jul-08	7,148,365.72	513,942.85	413.10	1,442	712	0.40	0.16	0.08	-0.09	-0.05	-0.03
	20-Jul-10	7,148,365.71	513,942.97	413.05	2,183	741	0.52	0.12	0.06	-0.14	-0.05	-0.03
	25-Sep-10	7,148,365.69	513,943.01	413.00	2,250	67	0.56	0.05	0.27	-0.19	-0.05	-0.29
	11-Aug-11	7,148,365.71	513,943.03	412.99	2,570	320	0.58	0.02	0.02	-0.19	0.00	0.00
	06-Aug-12	7,148,365.73	513,943.10	412.94	2,931	361	0.64	0.07	0.07	-0.25	-0.06	-0.06
1083	21-Aug-03	7,148,354.01	513,936.37	414.10	0	0	0			0		
(NL-2)	28-Jul-04	7,148,354.00	513,936.52	414.10	342	342	0.15	0.15	0.16	0.00	0.00	-0.01
	23-Sep-04	7,148,354.01	513,936.52	414.08	399	57	0.15	0.01	0.09	-0.02	-0.02	-0.11
	17-Sep-05	7,148,354.02	513,936.65	414.05	758	359	0.28	0.13	0.14	-0.05	-0.03	-0.03
	28-Jul-06	7,148,354.03	513,936.74	414.06	1,072	314	0.37	0.09	0.11	-0.04	0.01	0.02
	09-Jul-08	7,148,354.05	513,936.89	414.04	1,784	712	0.52	0.15	0.07	-0.06	-0.02	-0.01
	20-Jul-10	7,148,354.05	513,937.00	414.00	2,525	741	0.63	0.11	0.05	-0.10	-0.04	-0.02
	25-Sep-10	7,148,354.04	513,937.03	413.97	2,592	67	0.66	0.03	0.19	-0.13	-0.03	-0.17
	11-Aug-11	7,148,354.05	513,937.05	413.97	2,912	320	0.68	0.02	0.02	-0.13	0.00	0.00
	06-Aug-12	7,148,354.07	513,937.11	413.94	3,273	361	0.75	0.06	0.07	-0.17	-0.03	-0.03
NL-3	28-Jul-04	7,148,334.73	513,926.88	417.07	0	0	0.00			0.00		
	23-Sep-04	7,148,334.73	513,926.88	417.05	57	57	0.00	0.00	0.03	-0.02	-0.02	-0.13
	17-Sep-05	7,148,334.75	513,926.99	417.08	416	359	0.10	0.11	0.11	0.01	0.03	0.03
	28-Jul-06	7,148,334.75	513,927.08	417.08	730	314	0.20	0.09	0.11	0.02	0.01	0.01
	09-Jul-08	7,148,334.74	513,927.20	417.08	1,442	712	0.32	0.12	0.06	0.01	0.00	0.00
	20-Jul-10	7,148,334.71	513,927.28	417.04	2,183	741	0.40	0.09	0.04	-0.03	-0.04	-0.02
	25-Sep-10	7,148,334.71	513,927.33	417.00	2,250	67	0.44	0.05	0.25	-0.07	-0.04	-0.23
	11-Aug-11	7,148,334.72	513,927.36	417.00	2,570	320	0.48	0.03	0.04	-0.07	0.00	0.00
	06-Aug-12	7,148,334.73	513,927.42	416.98	2,931	361	0.53	0.06	0.06	-0.09	-0.02	-0.02
NL-4	28-Jul-04	7,148,307.20	513,913.00	416.19	0	0	0.00			0.00		
	23-Sep-04	7,148,307.19	513,912.99	416.16	57	57	0.02	0.02	0.13	-0.03	-0.03	-0.20
	17-Sep-05	7,148,307.14	513,913.12	416.11	416	359	0.13	0.14	0.14	-0.08	-0.05	-0.05
	28-Jul-06	7,148,307.12	513,913.19	416.11	730	314	0.21	0.08	0.09	-0.08	0.01	0.01
	09-Jul-08	7,148,307.10	513,913.33	416.07	1,442	712	0.34	0.13	0.07	-0.13	-0.05	-0.02
	20-Jul-10	7,148,307.00	513,913.43	415.98	2,183	741	0.47	0.14	0.07	-0.21	-0.08	-0.04
	25-Sep-10	7,148,307.01	513,913.47	415.94	2,250	67	0.50	0.04	0.21	-0.25	0.05	-0.25
	11-Aug-11	7,148,306.99	513,913.50	415.92	2,570	320	0.54	0.04	0.04	-0.27	-0.01	-0.01
	06-Aug-12	7,148,307.00	513,913.56	415.89	2,931	361	0.59	0.06	0.06	-0.30	-0.03	-0.03
NL-5	28-Jul-04	7,148,275.21	513,896.96	415.46	0	0	0.00			0.00		
	23-Sep-04	7,148,275.17	513,896.96	415.42	57	57	0.04	0.04	0.26	-0.04	-0.04	-0.26
	17-Sep-05	7,148,275.16	513,897.05	415.39	416	359	0.10	0.08	0.08	-0.07	-0.03	-0.03
	28-Jul-06	7,148,275.14	513,897.10	415.41	730	314	0.16	0.06	0.07	-0.04	0.03	0.03
	09-Jul-08	7,148,275.11	513,897.19	415.40	1,442	712	0.26	0.09	0.05	-0.06	-0.02	-0.01
	20-Jul-10	7,148,275.05	513,897.28	415.33	2,183	741	0.36	0.10	0.05	-0.12	-0.06	-0.03
	25-Sep-10	7,148,275.03	513,897.32	415.27	2,250	67	0.41	0.05	0.25	-0.19	-0.06	-0.34
	11-Aug-11	7,148,275.01	513,897.34	415.27	2,570	320	0.43	0.02	0.03	-0.19	0.00	0.00
	06-Aug-12	7,148,275.02	513,897.39	415.23	2,931	361	0.47	0.05	0.05	-0.23	-0.04	-0.04

Average	Aug 03 to Jul 04	0.11	0.11	0.11	-0.05	-0.05	-0.05
	Jul 04 to Sep 04	0.07	0.01	0.09	-0.06	-0.03	-0.19
	Sep 04 to Sep 05	0.19	0.12	0.13	-0.07	-0.02	-0.02
	Sep 05 to Jul 06	0.27	0.08	0.09	-0.07	0.01	0.01
	Jul 06 to Jul 08	0.40	0.14	0.07	-0.09	-0.03	-0.01
	Jul 08 to Jul 10	0.50	0.11	0.05	-0.15	-0.05	-0.03
	Jul 10 to Sept 10	0.54	0.04	0.22	-0.19	-0.04	-0.23
	Sept 10 to Aug 11	0.57	0.03	0.03	-0.20	0.00	0.00
	Aug 11 to Aug 12	**0.62**	**0.05**	**0.05**	**-0.23**	**-0.04**	**-0.04**
Maximum	Aug 03 to Jul 04	0.16	0.16	0.17	0.00	0.00	-0.01
	Jul 04 to Sep 04	0.16	0.04	0.26	-0.02	-0.02	-0.11
	Sep 04 to Sep 05	0.34	0.17	0.18	0.01	0.03	0.03
	Sep 05 to Jul 06	0.43	0.11	0.13	0.02	0.03	0.03
	Jul 06 to Jul 08	0.63	0.20	0.10	0.01	0.00	0.00
	Jul 08 to Jul 10	0.74	0.14	0.07	-0.03	-0.04	-0.02
	Jul 10 to Sept 10	0.78	0.05	0.27	-0.07	-0.03	-0.17
	Sept 10 to Aug 11	0.83	0.05	0.05	-0.07	0.01	0.01
	Aug 11 to Aug 12	**0.88**	**0.07**	**0.07**	**-0.09**	**-0.02**	**-0.02**
Minimum	Aug 03 to Jul 04	0.08	0.08	0.08	-0.11	-0.11	-0.12
	Jul 04 to Sep 04	0.00	0.00	0.03	-0.14	-0.04	-0.26
	Sep 04 to Sep 05	0.10	0.08	0.08	-0.16	-0.05	-0.05
	Sep 05 to Jul 06	0.16	0.04	0.05	-0.17	-0.01	-0.01
	Jul 06 to Jul 08	0.26	0.07	0.04	-0.19	-0.05	-0.03
	Jul 08 to Jul 10	0.30	0.06	0.03	-0.25	-0.08	-0.04
	Jul 10 to Sept 10	0.32	0.03	0.14	-0.29	-0.06	-0.34
	Sept 10 to Aug 11	0.33	0.02	0.02	-0.31	-0.02	-0.02
	Aug 11 to Aug 12	**0.36**	**0.04**	**0.04**	**-0.34**	**-0.06**	**-0.06**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
UMA Job No.: 20112857
Date: 06-Aug-12

Table D3) Tailings Stability - Lower Slopes (Elevation <425 m)

South Lobe

Monitor	Date	UTM Coordinates			Time		Horizontal Movement			Vertical Movement		
		Northing (metres)	Easting (metres)	Elevation (metres)	total (days)	incremental (days)	total (metres)	increment (metres)	rate (metres/year)	total (metres)	incremental (metres)	rate (metres/year)
24D	21-Aug-03	7,148,071.59	513,920.05	422.39	0	0	0.00		2.63	0.00		
	28-Jul-04	7,148,071.88	513,920.59	422.29	342	342	0.61	0.61	0.65	-0.10	-0.10	-0.11
	23-Sep-04	7,148,071.93	513,920.65	422.28	399	57	0.69	0.08	0.51	-0.11	-0.01	-0.06
	17-Sep-05	7,148,072.22	513,921.17	422.27	758	359	1.28	0.59	0.60	-0.12	-0.01	-0.01
	28-Jul-06	7,148,072.45	513,921.53	422.29	1,072	314	1.71	0.43	0.50	-0.10	0.03	0.03
	09-Jul-08	7,148,072.86	513,922.19	422.25	1,784	712	2.49	0.77	0.40	-0.14	-0.04	-0.02
	20-Jul-10	7,148,073.24	513,922.78	422.22	2,525	741	3.18	0.70	0.34	-0.18	-0.04	-0.02
	25-Sep-10	7,148,073.27	513,922.87	422.18	2,592	67	3.28	0.10	0.52	-0.21	-0.04	-0.21
	11-Aug-11	7,148,073.45	513,923.14	422.18	2,912	320	3.61	0.33	0.38	-0.21	0.00	0.00
	06-Aug-12	7,148,073.60	513,923.39	422.12	3,273	361	3.90	0.29	0.29	-0.27	-0.06	-0.06
25B	21-Aug-03	7,148,065.68	513,948.29	422.02	0	0	0.00		1.83	0.00		0.06
	28-Jul-04	7,148,065.72	513,948.61	422.03	342	342	0.32	0.32	0.34	0.01	0.01	0.01
	23-Sep-04	7,148,065.75	513,948.63	422.03	399	57	0.35	0.04	0.26	0.01	0.00	-0.01
	17-Sep-05	7,148,065.78	513,948.89	422.10	758	359	0.60	0.25	0.26	0.08	0.07	0.07
	28-Jul-06	7,148,065.81	513,949.05	422.15	1,072	314	0.76	0.16	0.19	0.13	0.05	0.06
	09-Jul-08	7,148,065.90	513,949.39	422.20	1,784	712	1.11	0.35	0.18	0.18	0.05	0.02
	20-Jul-10	7,148,065.96	513,949.65	422.22	2,525	741	1.38	0.27	0.13	0.20	0.03	0.01
	25-Sep-10	7,148,065.96	513,949.68	422.20	2,592	67	1.42	0.03	0.19	0.18	-0.02	-0.13
	11-Aug-11	7,148,065.99	513,949.79	422.21	2,912	320	1.52	0.11	0.12	0.19	0.01	0.01
	06-Aug-12	7,148,066.04	513,949.90	422.20	3,273	361	1.64	0.12	0.12	0.18	0.00	0.00
80-9	21-Aug-03	7,147,996.44	513,970.69	411.11	0	0	0.00		0.63	0.00		0.16
	28-Jul-04	7,147,996.41	513,970.75	411.09	342	342	0.06	0.06	0.07	-0.02	-0.02	-0.03
	23-Sep-04	7,147,996.38	513,970.73	411.04	399	57	0.07	0.03	0.20	-0.07	-0.05	-0.33
	17-Sep-05	7,147,996.37	513,970.77	411.06	758	359	0.11	0.05	0.05	-0.05	0.03	0.03
	28-Jul-06	7,147,996.36	513,970.80	411.12	1,072	314	0.14	0.03	0.03	0.01	0.06	0.07
	09-Jul-08	7,147,996.33	513,970.82	411.14	1,784	712	0.17	0.03	0.02	0.03	0.02	0.01
	20-Jul-10	7,147,996.32	513,970.82	411.14	2,525	741	0.17	0.01	0.01	0.03	0.00	0.00
	25-Sep-10	7,147,996.31	513,970.82	411.11	2,592	67	0.18	0.01	0.05	0.00	-0.03	-0.16
	11-Aug-11	7,147,996.30	513,970.81	411.14	2,912	320	0.19	0.01	0.02	0.03	0.03	0.03
	06-Aug-12	7,147,996.29	513,970.81	411.10	3,273	361	0.19	0.01	0.01	-0.01	-0.03	-0.03
1484	21-Aug-03	7,148,148.49	513,961.52	417.94	0	0	0.00			0.00		
	28-Jul-04	7,148,149.07	513,961.93	417.98	342	342	0.71	0.71	0.76	0.04	0.04	0.04
	23-Sep-04	7,148,149.18	513,961.98	417.95	399	57	0.83	0.12	0.78	0.01	-0.03	-0.19
	17-Sep-05	7,148,149.71	513,962.36	417.93	758	359	1.49	0.65	0.66	-0.01	-0.01	-0.02
	28-Jul-06	7,148,150.10	513,962.63	417.98	1,072	314	1.96	0.47	0.55	0.04	0.05	0.05
	09-Jul-08	7,148,150.81	513,963.12	417.96	1,784	712	2.82	0.86	0.44	0.02	-0.02	-0.01
	20-Jul-10	7,148,151.41	513,963.53	417.88	2,525	741	3.54	0.72	0.36	-0.06	-0.08	-0.04
	25-Sep-10	7,148,151.47	513,963.59	417.85	2,592	67	3.63	0.09	0.49	-0.09	-0.03	-0.15
	11-Aug-11	7,148,151.72	513,963.77	417.81	2,912	320	3.94	0.31	0.35	-0.13	-0.04	-0.05
	06-Aug-12	7,148,151.97	513,963.96	417.79	3,273	361	4.25	0.31	0.32	-0.15	-0.02	-0.02
SL-1	28-Jul-04	7,148,078.88	513,970.45	419.86	0	0	0.00			0.00		
	23-Sep-04	7,148,079.09	513,970.46	419.76	57	57	0.20	0.20	1.30	-0.09	-0.09	-0.60
	17-Sep-05	7,148,078.87	513,970.86	419.83	416	359	0.40	0.45	0.46	-0.03	0.06	0.06
	28-Jul-06	7,148,078.84	513,971.10	419.84	730	314	0.64	0.24	0.28	-0.02	0.01	0.01
	09-Jul-08	7,148,078.82	513,971.55	419.81	1,442	712	1.10	0.46	0.23	-0.04	-0.02	-0.01
	20-Jul-10	7,148,078.78	513,971.97	419.78	2,183	741	1.52	0.42	0.21	-0.08	-0.03	-0.02
	25-Sep-10	7,148,078.74	513,972.05	419.71	2,250	67	1.61	0.09	0.46	-0.15	-0.07	-0.37
	11-Aug-11	7,148,078.73	513,972.25	419.69	2,570	320	1.80	0.20	0.22	-0.17	-0.03	-0.03
	06-Aug-12	7,148,078.73	513,972.43	419.67	2,931	361	1.98	0.19	0.19	-0.18	-0.01	-0.01
SL-2	28-Jul-04	7,148,086.80	513,956.84	422.53	0	0	0.00			0.00		
	23-Sep-04	7,148,087.01	513,956.88	422.46	57	57	0.21	0.21	1.38	-0.07	-0.07	-0.45
	17-Sep-05	7,148,086.98	513,957.37	422.60	416	359	0.56	0.49	0.50	0.08	0.15	0.15
	28-Jul-06	7,148,087.08	513,957.68	422.65	730	314	0.89	0.33	0.38	0.13	0.05	0.06
	09-Jul-08	7,148,087.23	513,958.26	422.76	1,442	712	1.49	0.60	0.31	0.23	0.10	0.05
	20-Jul-10	7,148,087.39	513,958.80	422.85	2,183	741	2.05	0.56	0.28	0.33	0.10	0.05
	25-Sep-10	7,148,087.37	513,958.88	422.75	2,250	67	2.12	0.09	0.49	0.22	-0.10	-0.57
	11-Aug-11	7,148,087.45	513,959.14	422.76	2,570	320	2.39	0.27	0.31	0.24	0.01	0.02
	06-Aug-12	7,148,087.54	513,959.37	422.74	2,931	361	2.64	0.24	0.25	0.21	-0.02	-0.02
SL-3	28-Jul-04	7,148,100.47	513,933.11	420.80	0	0	0.00			0.00		
	23-Sep-04	7,148,100.54	513,933.16	420.78	57	57	0.09	0.09	0.59	-0.02	-0.02	-0.13
	17-Sep-05	7,148,100.89	513,933.63	420.83	416	359	0.67	0.58	0.59	0.03	0.05	0.05
	28-Jul-06	7,148,101.13	513,933.98	420.86	730	314	1.10	0.43	0.49	0.06	0.03	0.04
	09-Jul-08	7,148,101.63	513,934.59	420.87	1,442	712	1.88	0.79	0.40	0.07	0.01	0.00
	20-Jul-10	7,148,102.06	513,935.14	420.87	2,183	741	2.58	0.70	0.35	0.07	0.00	0.00
	25-Sep-10	7,148,102.11	513,935.22	420.84	2,250	67	2.68	0.09	0.52	0.04	-0.03	-0.15
	11-Aug-11	7,148,102.31	513,935.47	420.85	2,570	320	3.00	0.32	0.36	0.05	0.01	0.01
	06-Aug-12	7,148,102.50	513,935.72	420.81	2,931	361	3.31	0.31	0.32	0.01	-0.04	-0.04
SL-4	17-Sep-05	7,148,115.67	513,907.57	416.88	0	0	0.00			0.00		
	28-Jul-06	7,148,115.91	513,907.91	416.82	314	314	0.42	0.42	0.49	-0.06	-0.06	-0.07
	09-Jul-08	7,148,116.34	513,908.56	416.70	1,026	712	1.19	0.77	0.40	-0.18	-0.12	-0.06
	20-Jul-10	7,148,116.72	513,909.11	416.58	1,767	741	1.86	0.67	0.33	-0.30	-0.12	-0.06
	25-Sep-10	7,148,116.76	513,909.19	416.54	1,834	67	1.95	0.09	0.47	-0.34	-0.04	-0.20
	11-Aug-11	7,148,116.92	513,909.44	416.49	2,154	320	2.25	0.30	0.34	-0.39	-0.05	-0.05
	06-Aug-12	7,148,117.07	513,909.68	416.41	2,515	361	2.53	0.28	0.28	-0.47	-0.09	-0.09
SL-5	17-Sep-05	7,148,133.63	513,876.08	422.91	0	0	0.00			0.00		
	28-Jul-06	7,148,133.86	513,876.52	422.79	314	314	0.49	0.49	0.57	-0.12	-0.12	-0.14
	09-Jul-08	7,148,134.25	513,877.26	422.53	1,026	712	1.34	0.85	0.43	-0.38	-0.26	-0.13
	20-Jul-10	7,148,134.60	513,877.91	422.30	1,767	741	2.07	0.73	0.36	-0.61	-0.24	-0.12
	25-Sep-10	7,148,134.62	513,877.99	422.24	1,834	67	2.15	0.08	0.45	-0.67	-0.06	-0.31
	11-Aug-11	7,148,134.77	513,878.28	422.15	2,154	320	2.48	0.33	0.38	-0.77	-0.10	-0.11
	06-Aug-12	7,148,134.91	513,878.53	422.04	2,515	361	2.76	0.28	0.28	-0.87	-0.11	-0.11
2005-07	17-Sep-05	7,148,000.11	513,945.37	416.35	0	0	0.00			0.00		
	28-Jul-06	7,148,000.07	513,945.39	416.36	314	314	0.04	0.04	0.05	0.01	0.01	0.01
	09-Jul-08	7,147,999.99	513,945.41	416.36	1,026	712	0.12	0.08	0.04	0.01	0.00	0.00
	20-Jul-10	7,147,999.99	513,945.41	416.37	1,767	741	0.12	0.00	0.00	0.02	0.00	0.00
	25-Sep-10	7,147,999.97	513,945.41	416.33	1,834	67	0.14	0.02	0.11	-0.02	-0.03	-0.19
	11-Aug-11	7,147,999.97	513,945.41	416.34	2,154	320	0.15	0.00	0.01	-0.01	0.00	0.01
	06-Aug-12	7,147,999.96	513,945.39	416.30	2,515	361	0.15	0.02	0.02	-0.05	-0.04	-0.04
2005-08	17-Sep-05	7,148,038.85	513,970.98	415.77	0	0	0.00			0.00		
	28-Jul-06	7,148,038.81	513,971.06	415.79	314	314	0.09	0.09	0.10	0.02	0.02	0.02
	09-Jul-08	7,148,038.79	513,971.22	415.84	1,026	712	0.25	0.16	0.08	0.07	0.05	0.03
	20-Jul-10	7,148,038.76	513,971.34	415.89	1,767	741	0.37	0.12	0.06	0.12	0.05	0.02
	25-Sep-10	7,148,038.75	513,971.36	415.83	1,834	67	0.39	0.03	0.15	0.06	-0.07	-0.36
	11-Aug-11	7,148,038.75	513,971.40	415.85	2,154	320	0.43	0.04	0.04	0.08	0.02	0.03
	06-Aug-12	7,148,038.74	513,971.44	415.81	2,515	361	0.48	0.05	0.05	0.04	-0.03	-0.04
2005-09	17-Sep-05	7,148,124.38	513,969.23	420.18	0	0	0.00			0.00		
	28-Jul-06	7,148,124.55	513,969.46	420.28	314	314	0.29	0.29	0.34	0.10	0.10	0.12
	09-Jul-08	7,148,124.87	513,969.90	420.40	1,026	712	0.83	0.54	0.28	0.22	0.12	0.06
	20-Jul-10	7,148,125.15	513,970.34	420.45	1,767	741	1.35	0.52	0.26	0.26	0.05	0.02
	25-Sep-10	NOT FOUND			1,834	67						
	11-Aug-11	NOT FOUND - LOST IN CRACKS			2,154	320						
996 (replace)	06-Aug-12	7,148,131.20	513,969.10	419.46	2,515	361	6.82	6.17	6.24	-0.72	-0.98	-0.99
2005-10	17-Sep-05	7,148,146.69	513,925.39	411.78	0	0	0.00			0.00		
	28-Jul-06	7,148,146.97	513,925.66	411.80	314	314	0.39	0.39	0.45	0.02	0.02	0.02
	09-Jul-08	7,148,147.50	513,926.16	411.83	1,026	712	1.12	0.73	0.37	0.05	0.03	0.02
	20-Jul-10	BURIED			1,767	741						
	25-Sep-10	BURIED			1,834	67						
	11-Aug-11	7,148,148.18	513,926.85	411.817	2,154	320	2.08	0.96	0.31	0.04	-0.01	0.00
	06-Aug-12	7,148,148.35	513,927.05	411.792	2,515	361	2.35	0.27	0.27	0.01	-0.03	-0.03
2005-11	17-Sep-05	7,148,176.10	513,942.17	411.91	0	0	0.00			0.00		
	28-Jul-06	7,148,176.45	513,942.33	411.80	314	314	0.39	0.39	0.45	-0.11	-0.11	-0.13
	09-Jul-08	7,148,177.04	513,942.67	411.99	1,026	712	1.07	0.68	0.35	0.08	0.19	0.10
	20-Jul-10	7,148,177.53	513,942.94	412.00	1,767	741	1.62	0.55	0.27	0.09	0.01	0.01
	25-Sep-10	7,148,177.58	513,942.99	411.97	1,834	67	1.69	0.07	0.37	0.06	-0.03	-0.14
	11-Aug-11	7,148,177.79	513,943.10	411.99	2,154	320	1.93	0.24	0.28	0.08	0.01	0.02
	06-Aug-12	7,148,178.00	513,943.19	411.97	2,515	361	2.16	0.23	0.23	0.06	-0.02	-0.02

Average	Aug 03 to Jul 04	0.43	0.43	0.46	-0.02	-0.02	-0.02
	Jul 04 to Sep 04	0.35	0.11	0.72	-0.05	-0.04	-0.25
	Sep 04 to Sep 05	0.73	0.44	0.45	0.00	0.05	0.05
	Sep 05 to Jul 06	0.66	0.30	0.35	0.01	0.01	0.01
	Jul 06 to Jul 08	1.21	0.55	0.28	0.02	0.01	0.00
	Jul 08 to Jul 10	1.68	0.46	0.23	-0.01	-0.02	-0.01
	Jul 10 to Sept 10	1.77	0.07	0.36	-0.08	-0.04	-0.25
	Sept 10 to Aug 11	1.98	0.26	0.24	-0.08	-0.01	-0.01
	Aug 11 to Aug 12	**2.18**	**0.20**	**0.20**	**-0.11**	**-0.04**	**-0.04**
Maximum	Aug 03 to Jul 04	0.71	0.71	0.76	0.04	0.04	0.04
	Jul 04 to Sep 04	0.83	0.21	1.38	0.01	0.00	-0.01
	Sep 04 to Sep 05	1.49	0.65	0.66	0.08	0.15	0.15
	Sep 05 to Jul 06	1.96	0.49	0.57	0.13	0.10	0.12
	Jul 06 to Jul 08	2.82	0.86	0.44	0.23	0.19	0.10
	Jul 08 to Jul 10	3.54	0.73	0.36	0.33	0.10	0.05
	Jul 10 to Sept 10	3.63	0.10	0.52	0.22	-0.02	-0.13
	Sept 10 to Aug 11	3.94	0.96	0.38	0.24	0.03	0.03
	Aug 11 to Aug 12	**4.25**	**0.31**	**0.32**	**0.21**	**0.00**	**0.00**
Minimum	Aug 03 to Jul 04	0.06	0.06	0.07	-0.10	-0.10	-0.11
	Jul 04 to Sep 04	0.07	0.03	0.20	-0.11	-0.09	-0.60
	Sep 04 to Sep 05	0.11	0.05	0.05	-0.12	-0.01	-0.02
	Sep 05 to Jul 06	0.04	0.03	0.03	-0.12	-0.12	-0.14
	Jul 06 to Jul 08	0.12	0.03	0.02	-0.38	-0.26	-0.13
	Jul 08 to Jul 10	0.12	0.00	0.00	-0.61	-0.24	-0.12
	Jul 10 to Sept 10	0.14	0.01	0.05	-0.67	-0.10	-0.57
	Sept 10 to Aug 11	0.15	0.00	0.01	-0.77	-0.10	-0.11
	Aug 11 to Aug 12	**0.15**	**0.01**	**0.01**	**-0.87**	**-0.11**	**-0.11**

Summary of Annual Horizontal Movement Rates – South Lobe

WOLVERINE CREEK TAILINGS PILE – SOUTH LOBE										
Slope Area		Annual Horizontal Movement Rates (m/yr)						Rate Change (m/yr)		
		Monitoring Period								
		Sept 2005 to July 2006	July 2006 to July 2008	July 2008 to July 2010	July 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012	Jul 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012
Upper	Avg.	0.10	0.07	0.04	0.11	0.05	0.04	0.07	-0.06	-0.01
(2 monitors)	Max.	0.18	0.09	0.06	0.12	0.05	0.05	0.06	-0.07	0.00
	Min.	0.02	0.05	0.03	0.10	0.04	0.04	0.07	-0.06	0.00
Mid	Avg.	0.59	0.45	0.36	0.53	0.42	0.30	0.17	-0.11	-0.12
(12 monitors)	Max.	0.81	0.62	0.52	0.71	1.11	0.45	0.19	0.40	-0.66
	Min.	0.04	0.03	0.02	0.11	0.02	0.02	0.09	-0.09	0.00
Lower	Avg.	0.35	0.28	0.23	0.36	0.24	0.20	0.13	-0.12	-0.04
(13 monitors)	Max.	0.57	0.44	0.36	0.52	0.38	0.32	0.16	-0.14	-0.06
See Note 1	Min.	0.03	0.02	0.00	0.05	0.01	0.01	0.05	-0.04	0.00

Note 1: Monitor 2005-09 lost in Sept 2010, replaced with monitor 996 in 2012.

Summary of Annual Horizontal Movement Rates – North Lobe

WOLVERINE CREEK TAILINGS PILE – NORTH LOBE										
Slope Area		Annual Horizontal Movement Rates (m / yr)						Rate Change (m/yr)		
		Monitoring Period								
		Sept 2005 to July 2006	July 2006 to July 2008	July 2008 to July 2010	July 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012	Jul 2010 to Sept 2010	Sept 2010 to Aug 2011	Aug 2011 to Aug 2012
Upper	Avg.	0.06	0.03	0.03	0.15	0.02	0.04	0.12	-0.13	0.02
(7 monitors)	Max.	0.18	0.05	0.10	0.19	0.05	0.06	0.09	-0.14	0.01
	Min.	0.03	0.02	0.01	0.08	0.01	0.02	0.07	-0.07	0.01
Mid	Avg.	0.13	0.10	0.06	0.33	0.07	0.08	0.27	-0.26	0.01
(10 monitors)	Max.	0.43	0.31	0.21	1.10	0.24	0.25	0.89	-0.86	0.01
	Min.	0.02	0.01	0.00	0.13	0.00	0.02	0.13	-0.13	0.02
Lower	Avg.	0.09	0.07	0.05	0.22	0.03	0.05	0.17	-0.19	0.02
(8 monitors)	Max.	0.13	0.10	0.07	0.27	0.05	0.07	0.20	-0.22	0.02
	Min.	0.05	0.04	0.03	0.14	0.02	0.04	0.11	-0.12	0.02