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June 19, 2006

UMA Project No. 6029 007 00 (4.6.1.2)

Mr. Hugh Copland, P.Eng., P.Geo.
Government of Yukon - Energy, Mines and Resources
Box 2703 (K-419)
Whitehorse, Yukon
Y1A 2C6

Dear Hugh:

Re: Former Clinton Creek Asbestos Mine – 2005 Engineering Services: Site Inspection and Monitoring Results

A site inspection was completed in May 2005 followed by a survey (completed by others) of the movement monitoring points on the Wolverine Creek tailings pile in September 2005. Observations from the site inspection and a discussion of the movement monitoring results are provided below. The site inspection identified minor maintenance work for the channel stabilization works consistent with previous years. The tailings movement rates are generally similar to or less than those measured from 2003 to 2004. The additional monitoring points installed in 2005 on the south lobe should help to better understand the movement behaviour and consequences of continued movement. These consequences and levels which would trigger further investigations or remedial measures are described in UMA's Long-Term Performance Monitoring report (UMA 2006a)

Based on recommendations from the last monitoring event (UMA 2006), the tailings monitors are scheduled to be surveyed again in 2006 after which further recommendations can be made regarding the frequency of monitoring. No changes to the tailings monitoring program are expected for 2006. Ideally the monitors will be surveyed in the first 2 weeks of September to provide about 12 months between surveys following the protocol provided with the 2005 monitoring request (Appendix C).

1.0 SITE INSPECTION

On May 22, 2005 a site inspection was undertaken by Gil Robinson. P.Eng. of UMA Engineering with assistance from Hugh Copland P.Eng., P.Geo. of the Government of Yukon. The inspection was undertaken after the spring freshet to evaluate the condition of the creek stabilization repairs on Clinton Creek, which were completed the previous summer. While on-site, a photographic record of the rock lined channel on Wolverine Creek was completed and the Wolverine Creek tailings pile was also visited to aid in interpreting the movement monitoring results from 2004.

1.1 Clinton Creek Channel

The purpose of the inspection was to observe the condition of the creek channel stabilization works, which were completed in September 2004 (UMA 2005), and identify maintenance requirements for 2005. Some minor maintenance work has been required in previous years to replace granular fill in some of the baskets, in particular after the post-construction freshet events in 2003 and 2004 Of particular interest for the 2005 inspection was

determining the condition of the transition between the last drop structure and the unstabilized creek channel.The inspection consisted of a visual condition assessment, photograph documentation and taking measurements at two locations across each drop structure. The gabion measurement program was implemented to help determine if the gabions were being impacted by on-going creep movements of the adjacent waste rock pile (UMA 2006). Digital photographs taken during the inspection are provided on the attached Compact Disc.

Due to the flow depth over the gabions at the time of the inspection (approximately 600 mm deep over the drawdown weirs), it was not possible to confirm the extent of the gabion fill material that was washed out of the baskets during the spring freshet event. As illustrated in Photograph 1, taken about 1 month after the site inspection, some gabion fill had been washed out of the baskets forming the floor of Drop Structures 3 and 4, constructed in 2004. Similar material loss occurred in Drop Structures 1 and 2 during the first spring freshet event that passed following each year of construction. The material loss observed in previous years was mitigated by opening the affected baskets and topping them off with 100 to 200 mm diameter gabion fill material. No noticeable material loss has since been observed in the baskets that were topped off.

As illustrated by the white water in Photograph 2, the gabions forming the floor of each step in the structure are subjected to the highest energy and turbulence from the water flowing over the drop structure. The turbulence results in smaller particles being washed out of the baskets along with some re-arrangement of the gabion fill and deformation of the baskets. The production of smaller particle sizes (less than 75mm) was unavoidable due to the stationary screening operation used to process the gabion fill. Some minor channel erosion was evident between Drop Structures 2 & 3 and 3 & 4 where the channel fill is mainly argillite waste rock. As illustrated below the high water line visible on Photograph 3, the finer sized particles have been washed from the surface leaving a veneer of gravel to cobble sized particles. Similar channel erosion was not evident between Drop Structures 1 and 2 where cobbles and boulders were used to line the channel. Given the veneer of larger particles remaining on the slopes and the flat channel grade (approximately 0.1 percent) it is expected that the existing channel armouring between the drop structures is sufficient. In the event that erosion continues, some of the remaining gabion fill could be used for armouring the channel between Drop Structures 2 & 3 and 3 & 4. Horizontal measurements of the four gabion drop structures were taken as recommended in the monitoring plan described in UMA 2006. The results are discussed under the 2005 Monitoring Results section of this letter.

The portion of the Clinton Creek channel most susceptible to erosion is just past the downstream end of the last drop structure (Drop Structure #4) where there is a transition from the stabilized portion of the channel to the existing creek channel. As illustrated on Photograph 4, the channel transition downstream of Drop Structure 4 showed signs of some erosion on the left hand (north) side of the channel and shifting of some of the large boulders. It was anticipated that this might occur and that some maintenance work would be required in 2005 to adjust and infill the armouring after the first spring fresh. Minimal, if any, erosion occurred on the right hand side of the channel (Photograph 5).

In September 2004, tree planting and grass seeding was undertaken at various areas of the former mine site. Of most concern are the willow shoots and small coniferous trees planted in the creek channel between the drop structures, as shown on Photograph 3. The channel has been designed with a very flat gradient of about 0.01 percent to reduce the flow velocity and potential for erosion of the channel between the drop structures (UMA 2003) and therefore does not to be stabilized with vegetation. In addition, the channel was designed to pass a certain creek flow and did not account for hydraulic losses resulting from trees in the channel cross-section. Removal of this vegetation is recommended.

The recommended maintenance work for 2005 is summarized as follows:

Gabion Baskets - open and top off all gabion baskets where there is a void in the basket that is 100mm deep or greater. Top off baskets with 100 to 200 mm diameter gabion fill which is available on site. Re-attach basket lids to the basket frame with stainless steel staples.

Channel transition downstream of Drop Structure 4 – No work is required on the right hand (i.e. waste rock) side of the channel at this time. On the left hand side of the channel, infill voids in the boulders with gabion fill and place additional boulders on the channel slope. Sketches of the proposed maintenance work are provided in Appendix A.

Vegetation - Remove all non-grass vegetation located within the channel cross-section.

1.2 Wolverine Creek – Rock Lined Channel

While on-site for the inspection work of the Clinton Creek channel stabilization works, the condition of the rock lined portion of Wolverine Creek, located just down stream of the south lobe of the tailings pile, was inspected and photographed. Photographs are provided on the attached Compact Disc. In general, the rock lined channel originally constructed in 1978 is functional. Some trees have grown in and around the channel (Photograph 6) and may be affecting the hydraulic capacity although there were no obvious signs that flow had overtopped the banks. No significant channel blockages were identified although there are some signs of sedimentation taking place and some shifting of boulders that form the rock lined wiers (Photograph 6).

There is no immediate maintenance to be undertaken on the rock weirs pending further inspection by UMA in 2006 as part of the recommended long term performance monitoring program (UMA 2006a).

1.3 Wolverine Creek Tailings

The lower portion of the tailings pile was inspected to further evaluate the movement trends from the 2003 and 2004 tailings pile monitoring surveys. It appears that the tailings on the South Lobe may be spreading laterally at the valley bottom and not moving directly east across the valley (UMA 2006). Photograph 7 illustrates how the tailings have mounded up in the bottom of the Wolverine Creek valley (i.e. leading edge of the toe of the south lobe) while a low area remains on the north edge of the lower slope area. Recent monitoring results also suggest that the South Lobe may be moving into the lower area. Based on the monitoring results from 2004 and the observations made during the site visit, It is recommended that 11 new monitoring points (2005-01 to 2005 –11) be established during the 2005 movement monitoring survey. A Memorandum to the Government of Yukon was prepared in August 2005 to providing the details of the 2005 tailings monitoring survey, including the locations for the new monitoring points. A copy of the Memorandum is provided in Appendix B.

2.0 2005 MONITORING RESULTS

The 2005 monitoring program at the former Clinton Creek Mine consisted of measuring the gabion drop structures for signs of lateral displacements and surveying the movement monitors on the tailings pile. An overview of the monitoring plan for this site, including recommendations for 2005, can be found in a previous report (UMA 2006).

2.1 Clinton Creek - Gabion Drop Structure Monitoring

Horizontal measurements of the gabion drop structures were taken during the May 2005 site inspection and are provided in Table C-1 (Appendix C). Each drop structure was measured at the two locations shown on Drawing C-1 and illustrated on the two photographs in Appendix C. Previous (i.e. baseline) readings were only available for Measurement Location #1 on Drop Structures 1 to 3. Where no previous readings were recorded, the May 2005 measurements will serve as baseline readings for future monitoring. At Drop Structures 1 to 3, the distances measured across the drawdown weir were 1 to 12 cm shorter than those taken the previous year. The shorter distances measured may be a result of creep movements of the adjacent waste rock pile, post-construction settlement of the drop structures and/or some minor displacements resulting from the spring freshet event. Long term monitoring, including the installation of additional cross-channel reference points will assist in determining the nature of these movements and their potential impact on the integrity of the channel stabilization works (UMA 2006a).

2.2 Tailings Pile Movement Monitoring

The tailings monitors were surveyed on 17 September 2005 by John Tom Tom and Jean-Louis Salesse of Underhill Geomatics Ltd. in Whitehorse, YK. Thirty-nine existing movement monitors were surveyed using Global Positioning Survey (GPS) referenced to the UTM NAD 83 (Zone 7) co-ordinate system. The monitoring program details, including the locations of eleven new monitor points (2005-01 to 2005-11) on the South Lobe, are provided in Appendix B. The previous monitoring event was completed in September 2004 and the results are discussed in a previous report (UMA,2006). The monitoring results from September 2005 are provided in Appendix D.

The monitor point locations on the tailings pile are shown on Drawing D-1 in Appendix D. The monitors on the North and South lobe of the tailings pile have been grouped according to their location on the slope, that is the upper, mid and lower slope areas (Drawing D-1). 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. For the current monitoring period from September 2004 to September 2005, the direction of movement of each monitoring point is indicated by the vector on Drawing D-1. The measured movement in centimetres for the same time period is shown near the vector. For comparative purposes, the same drawing for the previous monitoring period (2003 to 2004) has also been included in Appendix D (Drawing 3-3 from UMA 2006). Movement rates are summarized as metres per year based on the average rate measured over the previous year. These annual rates can then be compared with annual rates described in previous reports before and after mine closure. The results are summarized in Table 1 below:

Table 1: Range of Annual Movement Rates

SLOPE AREA	NORTH LOBE			SOUTH LOBE		
	1984	2003 to 2004	2004 to 2005	1984	2003 to 2004	2004 to 2005
	(m / yr)	(m / yr)	(m / yr)	(m / yr)	(m / yr)	(m / yr)
Upper	0.4 to 9.0	0.01 to 0.10	0.01 to 0.11	0.5	0.24	0.08 to 0.18
Mid	1.6 to 24.5	0.01 to 0.63	0.02 to 0.53	7	0.4 to 1.0	0.35 to 0.93
Lower	20	0.08 to 0.17	0.06 to 0.18	0.5 to 2.8	0.07 to 0.76	0.05 to 0.66

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2.2.1 South Lobe

The average horizontal movement rates for the south lobe measured for the current monitoring period (September 2004 to September 2005) range from 0.13 to 0.76 m per year (Table D-1, Appendix D). These values are about 0.02 to 0.11 m per year less than those measured during the previous monitoring period (2003_ to 2004). The upper slope is the least active area, consistent with previous monitoring data, with movements rates of 0.08 to 0.18 m/yr.. The mid-slope area is the most active with annual movement rates of ranging from 0.35 to 0.93 m . Movement rates ranging from 0.05 to 0.66 m per year were measured for the lower slope area.

The small movement rates on the upper slope area are not unexpected because the original landslide did not encompass much of this area, which may be due to a slight decrease in the inclination of the underlying valley slope. This feature is visible on some aerial photograph images of the tailings area (UMA 2003). The mid slope is most active and is coincident with the main area of the original landslide which occurred in 1974 (UMA 2003). As mounding of tailings occurs in the valley bottom (i.e. lower slope area), the movement rates in the mid-slope area may continue to decrease as toe support due to mounding increases. It is expected that the variability in movement magnitudes and directions on the lower slope are due to mounding of the tailings in the valley bottom and the non-uniform development of passive resistance.

As illustrated in Photograph 7 taken from the northern edge of the lower slope area, the tailings appear to be moving in the direction of least resistance (i.e. where less tailings have mounded up) or towards the pond between the lobes. The general direction of movement of the tailings is shown on Drawing D-2, which was generated by drawing a smooth fit line along the vectors for Monitors 1084, 1485, 24A, 24B, 24D, SL-3 and 1484. The tailings in the mid slope area have a gentle curve to the north which becomes more pronounced on the lower slope area, where the height of mounded tailings is noticeably less (Photograph 7). Consistent with historical monitoring trends, the tailings in the area of Monitors 25B, SL-1 and SL-2 are generally moving eastwards towards the creek channel. Future monitoring of the additional points added in 2005 should help to interpret the movement behaviour in this area of the tailings.

2.2.2 North Lobe

As shown in Table 1, movement rates for the north lobe are consistently lower than the sloth lobe for the upper, mid and lower slope areas. On average, the annual horizontal movement rates measured for the current monitoring period (September 2004 to September 2005) are within about +/-0.03 m per year of the results from the previous year (Table D-1, Appendix D). The upper slope is the least active area with rates of 0.01 to 0.11 m/yr. The small movements of the upper slope are not unexpected since the original landslide did not encompass much of this area (UMA 2003). In comparing the movement vectors on Drawings D-1 and Drawing 3-3 (UMA 2006), the upper slope monitors moved in an easterly direction over the last monitoring period as compared to a northerly direction in the previous monitoring period. There is no explanation for this other than the main failure scarp is located nearby along the 530 m elevation contour, or about 50 m downslope from Monitors 80-2, 26A and 80-1. Localized sloughing along the head scarp may result in some year to year variation of the movement vectors. The westward movement of Monitor BH-14 (T7) can not be explained but is not of particular concern as it is located well away from the active mass movement of the tailings.

The largest movements on the north lobe (greater than 0.13 m) were measured along the south and east edges of the mid slope area (i.e. all mid-slope monitors except 1085, 500-1 and 650-1). The direction of movement (i.e. easterly / downslope) was consistent with the previous monitoring period. The group of mid-slope monitors just upslope from the 425 m contour moved 0.13 to 0.17 m. On the south edge, Monitors 80-4 and 80-5 moved 0.59

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and 0.4 m, respectively. These two monitors moved about 0.30 m more than the other monitors on the North Lobe. The lower slope area was slightly less active than the mid slope area with movements less than 0.13 m. In general, the lower slope is moving easterly but the southern edge may also be moving south into the pond between the two lobes.

Please contact the undersigned should you have any questions.

Sincerely,

UMA Engineering Ltd.

Gil Robinson, M.Sc., P.Eng.
Geotechnical Engineer
Earth & Water
/dh

Encl.

cc: Ken Skaftfeld

References

UMA Engineering Ltd., 2003. Indian and Northern Affairs Canada, Abandoned Clinton Creek Asbestos Mine, Environmental Liability Report.

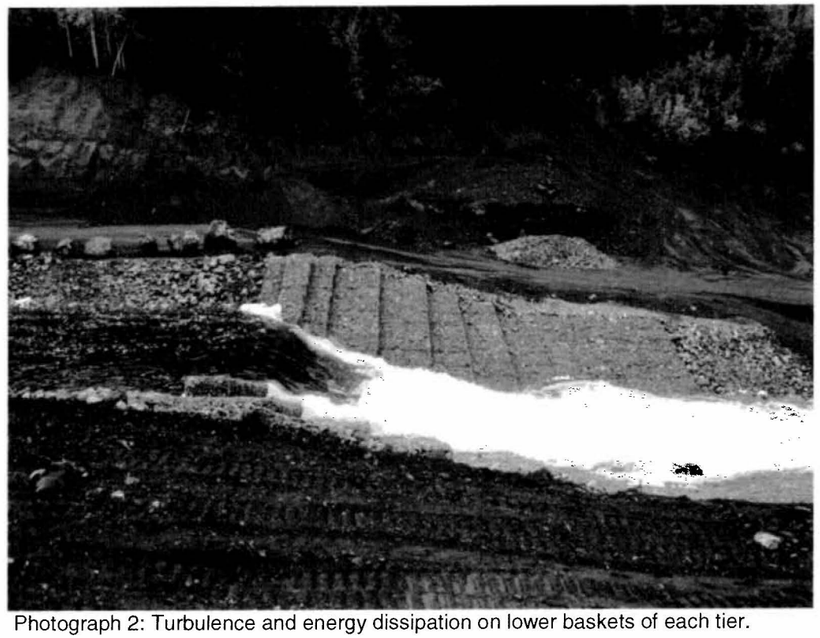
UMA Engineering Ltd., 2005. Government of Yukon, Clinton Creek Channel Stabilization (Stage III) Construction Report – February 2005.

UMA Engineering Ltd., 2006. Government of Yukon, Former Clinton Creek Asbestos Mine – Summary of 2004 Hazard Mitigation Work, Monitoring and a Screening Level Risk Assessment for Airborne Asbestos – March 2006.

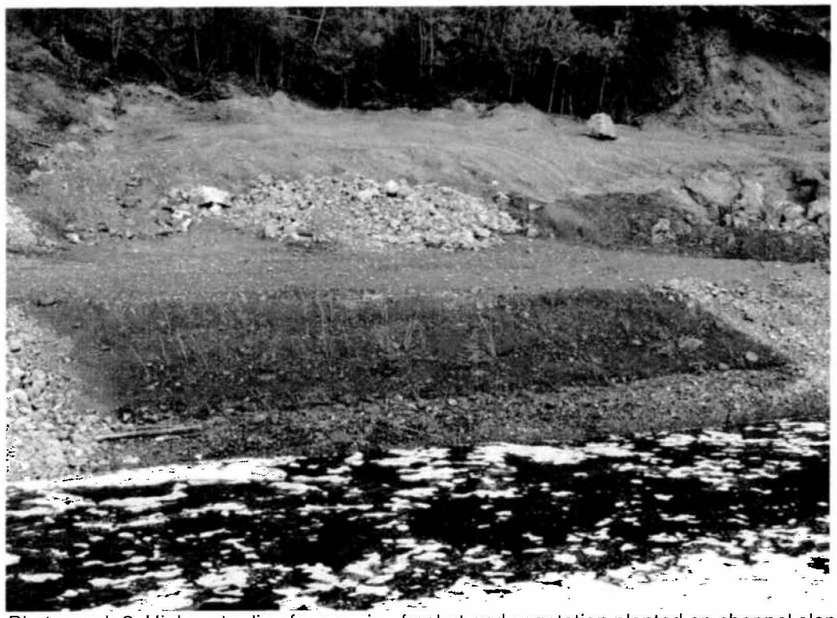
UMA Engineering Ltd., 2006a. Government of Yukon, Former Clinton Creek Asbestos Mine – Long-Term Performance Monitoring Program – June 2006.

Photographs

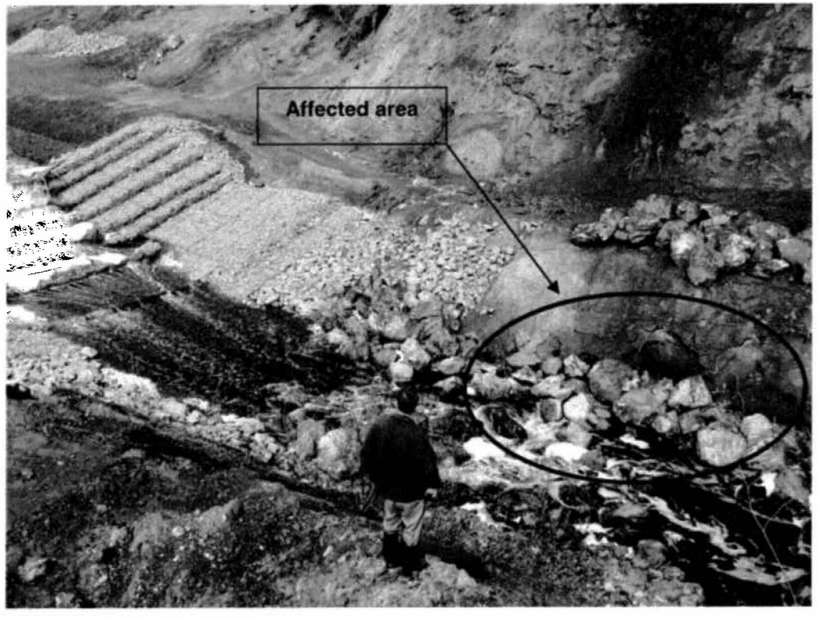
Photograph 1: Erosion of gabion fill from baskets following first spring freshet event



Photograph 2: Turbulence and energy dissipation on lower baskets of each tier.



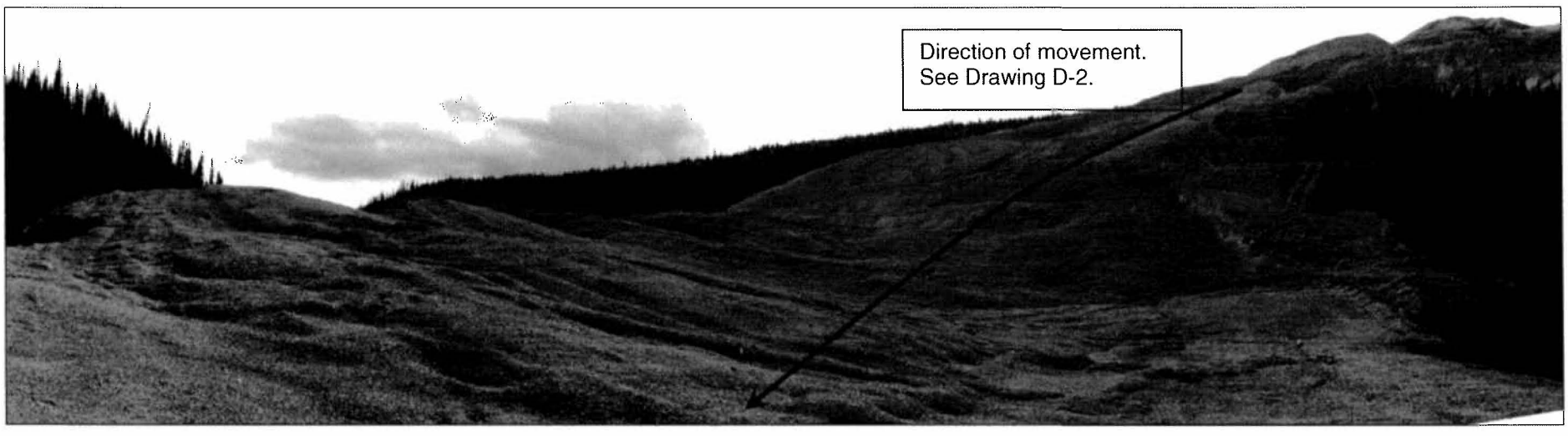
Photograph 3: High water line from spring freshet and vegetation planted on channel slopes.



Photograph 4: Erosion on left hand side of the channel transition downstream of Drop Structure 4.

Photograph 5: Minimal erosion on right hand side of the channel transition downstream of Drop Structure 4.

Photograph 6: Wolverine Creek - Rock lined channel: trees growing in channel and some sedimentation occurring.



Photograph 7: South Lobe of tailings pile taken facing south from the north end of the lower slope near Wolverine Creek.

Appendix A

2005 Maintenance Work

Robinson, Gil

From: Robinson, Gil
Sent: Wednesday, August 03, 2005 10:58 AM
To: Frank.Patch
Cc: hugh.copland@gov.yk.ca
Subject: Clinton Creek: Creek Stabilization_2005 maintenance

Attachments: Creek Stabilization_2005 maintenance.PDF

Creek
bilization_2005 mair

i Frank,

Hugh mentioned last week that Han Construction will soon be mobilizing to do some expected maintenance work on some of the gabion drop structures (top off gabion baskets with 4 to 6 inch diameter rock). When we were on-site in May, Hugh and I talked about a couple of other maintenance items that should be done at the same time.

1) vegetation (trees) planted on the channel slopes between the drop structures should be removed as they restrict flow in the channel, particularly sa the trees start to grow and produce seed for new trees. The channel cross-section was not designed to include hydraulic resistance due to trees so in the event of high flows, there is a chance that the channel won't be able to handle the flow. We recommend that the trees be replanted at least 10 m away from the channel crest to permit access for maintenance when required.

2) some minor work also needs to be done on the left hand side of the channel at the transition downstream of the last drop structure (Drop Structure #4). The work involves placing additional boulders on the channel slope and infilling boulders with gabion fill. This work was expected once the boulders settled in during/after the spring freshet. I have attached some sketches to illustrate the work required.

Please confirm that you received this email and call to discuss if required.

Hope you are keeping well,

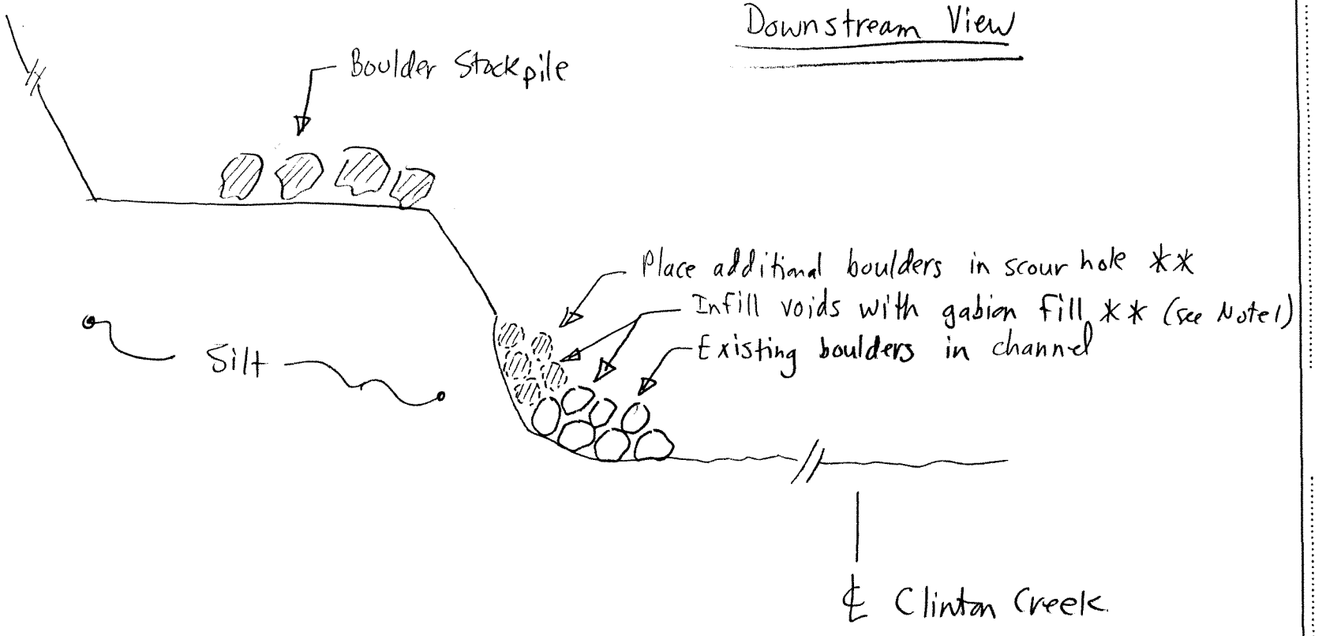
Gil


Stockpile of gabion fill and oversize rock
Infill voids between boulders with gabion fill. Place using machine. Final placement by hand to ensure voids are well filled.
Place additional boulders to fill in scour hole. See attached sketch.

UMA Engineering Ltd.
1479 Buffalo Place, Winnipeg, MB R3T 1L7 Canada

PROJECT NO. 1-16029007001-1
DATE: 2 August 2005 SHEET NO. 1 OF 1
DESIGNED BY: GR CHECKED BY:
CLIENT: Government of Yukon
PROJECT: Clinton Creek Channel Stabilization

Downstream View



Notes) 1) infilling voids should be finished by hand placing rocks into voids to ensure voids are well filled. Placement by machine only will not sufficiently fill voids to minimize scouring of silt behind boulders.

Channel Transition Area Downstream of Drop Structure #4.

CLEARLY IDENTIFY, INITIAL AND DATE ALL REVISED, SUPERSEDED OR VOID CALCULATIONS.

Appendix B

2005 Tailings Monitoring Program

UMA Engineering Ltd.
1479 Buffalo Place
Winnipeg, Manitoba R3T 1L7
T 204.284.0580 F 204.475.3646 www.uma.aecom.com

Memorandum

Date: 8 August 2005
To: Hugh Copland
From: Gil Robinson
Subject: Clinton Creek – 2005 Tailings Survey
Project number: 6029-007-00

Distribution: Frank Patch (GY), Ken Skaftfeld (UMA)

Based on the results of the 2004 tailings pile survey and our site visit in May 2005, we recommend adding eleven monitoring points to the south lobe of the tailings pile. The additional monitoring points are required to understand the movement behaviour and trends of the south lobe of the tailings pile. The results from the 2004 monitoring suggest that the lower slope area of the tailings may be moving in a north easterly direction and not directly east, as first thought.

Once the survey is completed, please have a spreadsheet emailed to us with all the survey information, as illustrated on the attached table from the September 2004 survey. We will update the tailings monitoring spreadsheets and interpret the results once the survey information is received.

Information For Co-ordinating 2005 Tailings Survey:

- In 2004, the survey was co-ordinated through Randy Lee at Underhill Geomatics and the survey was completed by Eldon Pfeiffer. Ideally the same surveyor will go this year. If not, they should talk with Eldon before heading out,
- Monitoring protocol is attached and should be adhered to,
- Site plans showing benchmarks and monitoring locations are attached,
- UTM co-ordinates for benchmarks and monitoring points are attached,
- Approximate UTM co-ordinates for new monitoring points are included with the attached monitoring points,
- A Garmin handheld GPS file has also been provided with the route for monitoring. This route should help to minimize climbing during the survey,
- Two people should be sent for the survey due to remote location and site conditions,
- Vehicle access across Clinton Creek crossings should be confirmed before mobilizing surveyors.

Gil Robinson

Former Clinton Creek Asbestos Mine
Tailings Pile Monitoring Protocol
June 2005

1. Set-up GPS base station near mill site at BM-U1086.

2. Check control points to confirm BM-U1086 is stable (see Table B-1).

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

4. Tailings:
    - Setup RTK base station near crest of tailings pile (U 2834),
    - Face Wolverine Creek when surveying,
    - survey ground level on the side of the pin furthest from the creek.

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine
UMA Job No.: 6029-006-01

TABLE B-1) BENCHMARKS AT FORMER CLINTON CREEK MINE

UTM NAD83 ZONE 7N

Based on 1999 Air Photo Control (U1189 Destroyed)
Set new Control Points U1086 and U1836. Tied 2001 Control Points in stable areas

	Northing (m)	Easting (m)	Elevation (m)	ID
1086	7,147,972.205	513,176.707	590.950	U1086
1182	7,146,634.155	513,637.686	465.460	U1182
1190	7,149,824.696	512,500.926	609.520	U1190
1191	7,147,605.454	513,589.857	528.930	U1191
1192	7,147,564.047	512,278.761	441.290	U1192
1193	7,146,545.113	513,572.457	456.430	U1193
1200	7,147,166.861	513,662.996	375.480	U1200
1836	7,146,656.183	513,597.724	476.540	U1836
2834	7,148,172.722	513,447.467	607.224	U2834
2836	7,146,814.577	513,092.158	478.422	U2836
5698	7,147,458.764	512,825.164	415.050	U5698
5699	7,147,485.368	512,618.332	425.550	U5699
5700	7,147,657.353	512,155.907	481.380	U5700

Local Mine Ground Control Transformed to UTM

Transformation based on U5698,U5699,U5700,U1182 common 2001 and 2003 ties.(U1184 not found)
Used U5698 as base. LDD handles scale to ground and rotation -0°17'15" to grid. Manually scale to metric.
Elevation differences based on U1561 (UTM = 423.803m., LOCAL = 1389.87ft.)

	Northing (m)	Easting (m)	Elevation (m)	ID
228	7,146,650.833	513,454.406	500.740	U228
280	7,146,404.795	513,292.824	501.030	U280
300	7,147,747.252	512,674.428	509.290	HILL
400	7,146,435.213	513,325.619	495.390	SHACK
900	7,147,649.576	513,899.213	489.860	GTRAV
1561	7,148,082.327	514,012.370	423.800	U1561

Survey By: Underhill Geomatics - Whitehorse, YT
Surveyor: John Tom Tom / Jean-Louis Salesse
Datum: NAD83, UTM Zone 7 Coordinates

Monitoring Sept. 23, 2004				
Station	**Northing**	**Easting**	**Elevation**	**Comment**
24	7,148,033.895	513,525.561	549.553	
26	7,148,341.494	513,483.546	575.081	
1083 / NL-2	7,148,354.012	513,936.519	414.078	
1084	7,148,017.993	513,618.378	516.095	
1085	7,148,346.060	513,666.411	488.824	
1484	7,148,149.184	513,961.975	417.949	
1485	7,148,018.022	513,703.459	480.101	
1489	7,148,305.198	513,928.504	413.635	
1491	7,148,376.821	513,868.989	432.316	
1492	7,148,053.727	513,409.949	609.982	
1495	7,148,526.645	513,528.950	529.066	
2834	7,148,172.721	513,447.481	607.227	RTK base for tailings survey
1483	7,148,233.020	513,412.679	608.997	
24-A	7,148,035.439	513,775.702	464.888	
24-B	7,148,045.334	513,833.263	445.888	
24-D	7,148,071.928	513,920.650	422.279	
25-B	7,148,065.753	513,948.634	422.031	
26-A	7,148,339.318	513,540.493	557.740	
350-1A	7,148,298.609	513,822.642	448.002	
350-2A	7,148,300.538	513,873.845	428.576	
350-3A	7,148,312.197	513,899.138	417.275	
500-1	7,148,343.237	513,725.526	474.010	
500-2	7,148,344.367	513,842.258	438.050	
650-1	7,148,408.753	513,701.306	483.907	
650-2	7,148,400.253	513,816.079	439.717	
80-1	7,148,408.034	513,543.064	555.613	
80-2	7,148,290.083	513,549.484	552.632	
80-4	7,148,201.727	513,689.474	501.415	
80-5	7,148,249.423	513,718.768	481.074	
80-7	7,148,344.005	513,890.893	422.399	
80-9	7,147,996.383	513,970.725	411.035	
BH-14 T7	7,148,488.334	513,562.988	530.299	
BH-16 T8 CORD	7,148,048.627	513,761.307	464.593	
BH-16 T8 POST	7,148,048.841	513,761.873	464.910	
NL-1	7,148,365.727	513,942.447	413.164	
NL-2	see 1083			NL-2 and 1083 are the same point
NL-3	7,148,334.731	513,926.880	417.046	
NL-4	7,148,307.194	513,912.986	416.159	
NL-5	7,148,275.174	513,896.964	415.416	
SL-1	7,148,079.086	513,970.461	419.764	
SL-2	7,148,087.009	513,956.878	422.458	
SL-3	7,148,100.541	513,933.163	420.779	
New For 2005 - Approximate Co-ordinates For layout				
NL-Base	7,148,161	513,836		existing point to be tied in
SL-4	7,148,113	513,905		existing point to be tied in
SL-5	7,148,134	513,878		existing point to be tied in
2005-01	7,148,100	513,758		new point for 2005
2005-02	7,148,118	513,817		new point for 2005
2005-03	7,148,108	513,870		new point for 2005
2005-04	7,148,047	513,876		new point for 2005
2005-05	7,148,000	513,782		new point for 2005
2005-06	7,148,000	513,866		new point for 2005
2005-07	7,148,000	513,945		new point for 2005
2005-08	7,148,039	513,971		new point for 2005
2005-09	7,148,124	513,969		new point for 2005
2005-10	7,148,147	513,925		new point for 2005
2005-11	7,148,176	513,942		new point for 2005

510.50 511.00 511.50 512.00 513.00 513.50 514.00 514.50 515.00 515.50 516.00

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

U1190
AIRSTRIP
WOLVERINE CREEK TAILINGS PILE
NORTH LOBE
FORMER MILL SITE
U2834 (RTK BASE)
SOUTH LOBE
U1561 (MINE)
U1086
WOLVERENE CREEK
HILL (MINE)
U5700
U1192
U5699
U5698
U1183
U1191
G-TRAV (MINE)
HUDGEON LAKE
U1200
U1189
CLINTON CREEK WASTE ROCK DUMP
U2836 (RTK BASE)
BEAR CREEK
U228 (MINE)
U1836
U1182
PORCUPINE PIT
U1193
SHACK (MINE)
U280 (MINE)
PORCUPINE CREEK
CLINTON CREEK

0 150 300 m SCALE 1:15000

UTM ZONE 7 NAD83
IMAGE DATE 1999

U5700 BENCHMARK

U228 (MINE) LOCAL MINE BENCHMARKS

UMA | AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
2004 Monitoring

Site Plan
Bench Mark Locations

Drawing B-1

Appendix C

Gabion Drop Structure Monitoring

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Channel Stabilization
Job No.: 6029-007-00
Date: 22-May-05

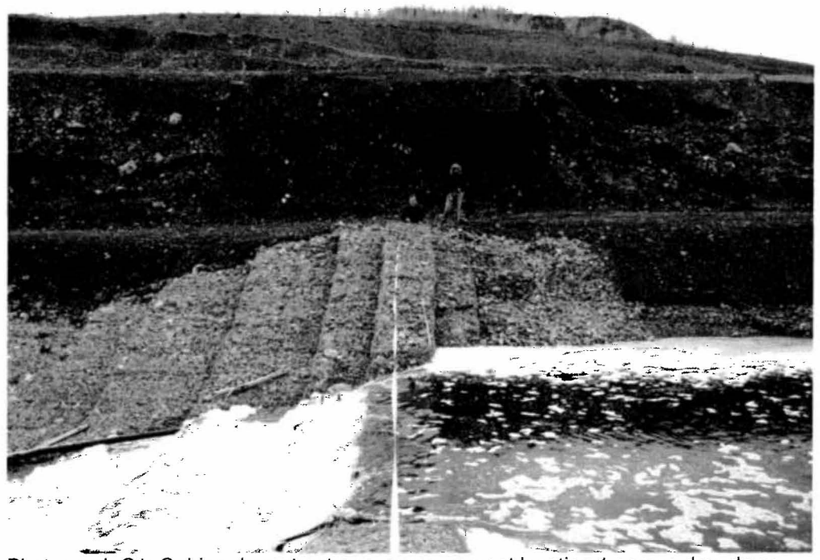
Table C-1) Former Clinton Creek Asbestos Mine - Clinton Creek Drop Structure Monitoring

Measurement Location #1 - Across Drawdown Weir

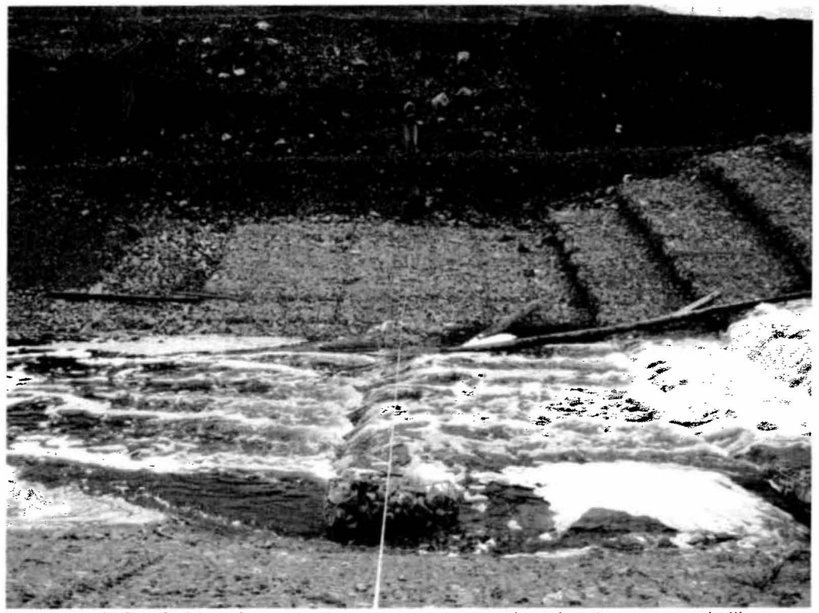
Drop Structure	Horizontal Distance Across Drop Structure (metres)			Comment
	Date	Date:	22-May-05	
	29-Jul-04	measurement	change	
1	19.62	19.57	-0.05	
2	19.49	19.48	-0.01	
3	19.44	19.32	-0.12	
4	n/a	19.61	n/a	baseline

Measurement Location #2 - Across Lower Tier In-Line With End Sill

Drop Structure	Horizontal Distance Across Drop Structure (metres)			Comment
	Date	Date:	22-May-05	
	29-Jul-04	measurement	change	
1	n/a	21.00	n/a	baseline
2	n/a	21.15	n/a	baseline
3	n/a	21.50	n/a	baseline
4	n/a	21.48	n/a	baseline



Photograph C1: Gabion drop structure – measurement location 1 across drawdown weir.



Photograph C2: Gabion drop structure - measurement location 2 across end sill.

Appendix D

Tailings Movement Monitoring

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
UMA Job No.: 6029-005-00 6029-006-00 6029-007-00
Date: 31-Aug-03 Jul / Sep 2004 Sep-05

Table D-1) Wolverine Creek Tailings Pile - Movement Monitoring Summary

		Annual Horizontal Movement Rates (m per year)					
		North Lobe			South Lobe		
Monitoring Period:		1) Aug 03 to Jul 04	2) Sep 04 to Sep 05	rate change	1) Aug 03 to Jul 04	2) Sep 04 to Sep 05	rate change
Upper Slope	average	0.04	0.06	0.02	0.15	0.13	-0.02
	maximum	0.10	0.11	0.01	0.24	0.18	-0.06
	minimum	0.01	0.01	0.00	0.07	0.08	0.01
Mid Slope	average	0.21	0.18	-0.03	0.87	0.76	-0.11
	maximum	0.63	0.53	-0.10	1.02	0.93	-0.09
	minimum	0.01	0.02	0.01	0.43	0.35	-0.08
Lower Slope	average	0.11	0.12	0.01	0.45	0.39	-0.06
	maximum	0.17	0.18	0.01	0.76	0.66	-0.10
	minimum	0.08	0.06	-0.02	0.07	0.05	-0.02

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
UMA Job No.: 6029-005-00 6029-006-00 6029-007-00
Date: 31-Aug-03 Jul / Sep 2004 Sep-05

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)	increment (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						
	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	-0.01	-0.07	-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
26	21-Aug-03	7,148,341.45	513,483.53	575.11	9,275	7,007	2.12	0.44	0.02	-0.95	-0.43	-0.02
	28-Jul-04	7,148,341.48	513,483.55	575.10	9,617	342	2.15	0.03	0.04	-0.96	-0.01	-0.01
	23-Sep-04	7,148,341.49	513,483.55	575.08	9,674	57	2.15	0.00	0.00	-0.97	-0.01	-0.10
	17-Sep-05	7,148,341.47	513,483.57	575.01	10,033	359	2.16	0.01	0.01	-1.05	-0.07	-0.07
80-2	21-Aug-03	7,148,290.05	513,549.41	552.78	7,294	7,007	1.71	0.74	0.04	-0.57	-0.57	-0.03
	28-Jul-04	7,148,290.09	513,549.50	552.65	7,636	342	1.80	0.09	0.10	-0.70	-0.13	-0.14
	23-Sep-04	7,148,290.08	513,549.48	552.63	7,693	57	1.79	-0.01	-0.09	-0.72	-0.02	-0.12
	17-Sep-05	7,148,290.08	513,549.57	552.50	8,052	359	1.87	0.09	0.09	-0.86	-0.14	-0.14
26-A	21-Aug-03	7,148,339.30	513,540.50	557.82	9,275	7,007	2.50	0.72	0.04	-0.83	-0.83	-0.04
	28-Jul-04	7,148,339.32	513,540.52	557.75	9,617	342	2.51	0.01	0.01	-0.90	-0.07	-0.08
	23-Sep-04	7,148,339.32	513,540.49	557.74	9,674	57	2.49	-0.02	-0.15	-0.91	-0.01	-0.06
	17-Sep-05	7,148,339.34	513,540.56	557.65	10,033	359	2.55	0.06	0.06	-1.01	-0.10	-0.10
80-1	21-Aug-03	7,148,407.98	513,543.04	555.71	7,294	7,007	2.07	1.60	0.08	-1.97	-1.97	-0.10
	28-Jul-04	7,148,408.01	513,543.07	555.61	7,636	342	2.09	0.02	0.02	-2.06	-0.10	-0.10
	23-Sep-04	7,148,408.03	513,543.06	555.61	7,693	57	2.08	-0.01	-0.07	-2.06	0.00	0.00
	17-Sep-05	7,148,408.01	513,543.12	555.49	8,052	359	2.14	0.06	0.06	-2.19	-0.12	-0.13
BH-14 (T7)	21-Aug-03	7,148,488.36	513,563.01	530.33	0	0						
	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	0.17	-0.03	0.01	0.08
	17-Sep-05	7,148,488.34	513,562.87	530.24	758	359	0.14	0.11	0.11	-0.09	-0.06	-0.06
1495	21-Aug-03	7,148,526.59	513,528.92	529.06	0	0						
	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	0.01	0.04	0.01	0.01	0.08
	17-Sep-05	7,148,526.65	513,529.00	528.97	758	359	0.10	0.04	0.04	-0.09	-0.10	-0.10

Average	Aug 03 to Jul 04	0.04	0.04	-0.68	-0.06	-0.06
	Jul 04 to Sep 04	0.00	-0.02	-0.68	-0.01	-0.04
	Sep 04 to Sep 05	**0.06**	**0.06**	**-0.77**	**-0.09**	**-0.09**
Maximum	Aug 03 to Jul 04	0.09	0.10	-0.01	-0.01	-0.01
	Jul 04 to Sep 04	0.03	0.17	0.01	0.01	0.08
	Sep 04 to Sep 05	**0.11**	**0.11**	**-0.09**	**-0.04**	**-0.04**
Minimum	Aug 03 to Jul 04	0.01	0.01	-2.06	-0.13	-0.14
	Jul 04 to Sep 04	-0.02	-0.15	-2.06	-0.03	-0.16
	Sep 04 to Sep 05	**0.01**	**0.01**	**-2.19**	**-0.14**	**-0.14**

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	1,496	1,496	0.30	0.30	0.07	-0.42	-0.42	-0.10
	28-Jul-04	7,148,053.72	513,409.97	609.98	1,838	342	0.36	0.06	0.07	-0.50	-0.09	-0.09
	23-Sep-04	7,148,053.73	513,409.95	609.98	1,895	57	0.34	-0.02	-0.14	-0.50	0.00	-0.01
	17-Sep-05	7,148,053.69	513,410.03	609.80	2,254	359	0.42	0.08	0.08	-0.69	-0.18	-0.19
24	21-Aug-03	7,148,033.83	513,525.34	549.69	9,275	7,007	10.88	9.03	0.47	-5.54	-5.54	-0.29
	28-Jul-04	7,148,033.87	513,525.57	549.55	9,617	342	11.10	0.22	0.24	-5.68	-0.14	-0.15
	23-Sep-04	7,148,033.90	513,525.56	549.55	9,674	57	11.09	-0.01	-0.05	-5.67	0.01	0.04
	17-Sep-05	7,148,033.91	513,525.74	549.37	10,033	359	11.27	0.18	0.18	-5.86	-0.19	-0.19

Average	Aug 03 to Jul 04	0.14	0.15	-3.09	-0.11	-0.12
	Jul 04 to Sep 04	-0.01	-0.10	-3.09	0.00	0.01
	Sep 04 to Sep 05	**0.13**	**0.13**	**-3.27**	**-0.19**	**-0.19**
Maximum	Aug 03 to Jul 04	0.22	0.24	-0.50	-0.09	-0.09
	Jul 04 to Sep 04	-0.01	-0.05	-0.50	0.01	0.04
	Sep 04 to Sep 05	**0.18**	**0.18**	**-0.69**	**-0.18**	**-0.19**
Minimum	Aug 03 to Jul 04	0.06	0.07	-5.68	-0.14	-0.15
	Jul 04 to Sep 04	-0.02	-0.14	-5.67	0.00	-0.01
	Sep 04 to Sep 05	**0.08**	**0.08**	**-5.86**	**-0.19**	**-0.19**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
UMA Job No.: 6029-005-00 6029-006-00 6029-007-00
Date: 31-Aug-03 Jul / Sep 2004 Sep-05

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	7,294	7,007	15.93	14.32	0.75	-5.41	-5.41	-0.28
	28-Jul-04	7,148,201.69	513,689.40	501.49	7,636	342	16.52	0.59	0.63	-5.65	-0.24	-0.26
	23-Sep-04	7,148,201.73	513,689.47	501.42	7,693	57	16.60	0.08	0.52	-5.73	-0.07	-0.47
	17-Sep-05	7,148,201.81	513,689.99	501.18	8,052	359	17.12	0.52	0.53	-5.96	-0.24	-0.24
80-5	21-Aug-03	7,148,249.32	513,718.34	481.19	7,294	7,007	21.58	17.47	0.91	-8.31	-8.31	-0.43
	28-Jul-04	7,148,249.41	513,718.73	481.10	7,636	342	21.98	0.40	0.43	-8.40	-0.09	-0.10
	23-Sep-04	7,148,249.42	513,718.77	481.07	7,693	57	22.02	0.04	0.27	-8.43	-0.02	-0.16
	17-Sep-05	7,148,249.49	513,719.16	480.92	8,052	359	22.41	0.39	0.40	-8.59	-0.16	-0.16
1085	21-Aug-03	7,148,346.05	513,666.41	488.88	0	0						
	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	-0.01	-0.09	-0.06	-0.01	-0.09
	17-Sep-05	7,148,346.06	513,666.46	488.72	758	359	0.05	0.04	0.04	-0.16	-0.10	-0.10
500-1	21-Aug-03	7,148,343.22	513,725.53	474.09	9,088	7,007	107.37	43.86	2.28	-46.56	-15.13	-0.79
	28-Jul-04	7,148,343.24	513,725.54	474.02	9,430	342	107.38	0.01	0.01	-46.63	-0.07	-0.07
	23-Sep-04	7,148,343.24	513,725.53	474.01	9,487	57	107.37	-0.01	-0.09	-46.64	-0.01	-0.06
	17-Sep-05	7,148,343.24	513,725.55	473.95	9,846	359	107.39	0.02	0.02	-46.70	-0.06	-0.06
650-1	21-Aug-03	7,148,408.73	513,701.26	483.95	9,088	7,007	83.33	24.10	1.26	-31.32	-11.57	-0.60
	28-Jul-04	7,148,408.75	513,701.33	483.92	9,430	342	83.40	0.06	0.07	-31.35	-0.03	-0.03
	23-Sep-04	7,148,408.75	513,701.31	483.91	9,487	57	83.38	-0.02	-0.12	-31.36	-0.01	-0.07
	17-Sep-05	7,148,408.75	513,701.34	483.87	9,846	359	83.42	0.04	0.04	-31.39	-0.03	-0.03
350-1A	21-Aug-03	7,148,298.59	513,822.46	448.09	9,078	7,007	149.66	72.05	3.75	-52.52	-25.55	-1.33
	28-Jul-04	7,148,298.61	513,822.64	448.01	9,420	342	149.85	0.18	0.20	-52.61	-0.08	-0.09
	23-Sep-04	7,148,298.61	513,822.64	448.00	9,477	57	149.85	0.00	0.00	-52.61	0.00	-0.03
	17-Sep-05	7,148,298.64	513,822.81	447.93	9,836	359	150.01	0.16	0.16	-52.69	-0.07	-0.08
500-2	21-Aug-03	7,148,344.36	513,842.07	438.14	9,078	7,007	159.40	66.97	3.49	-61.43	-26.78	-1.40
	28-Jul-04	7,148,344.36	513,842.27	438.06	9,420	342	159.60	0.20	0.21	-61.51	-0.08	-0.08
	23-Sep-04	7,148,344.37	513,842.26	438.05	9,477	57	159.59	-0.01	-0.07	-61.52	-0.01	-0.08
	17-Sep-05	7,148,344.37	513,842.43	438.00	9,836	359	159.77	0.17	0.18	-61.57	-0.05	-0.05
650-2	21-Aug-03	7,148,400.26	513,815.95	439.87	9,078	7,007	134.07	35.78	1.86	-44.69	-11.93	-0.62
	28-Jul-04	7,148,400.25	513,816.10	439.75	9,420	342	134.21	0.14	0.15	-44.81	-0.12	-0.12
	23-Sep-04	7,148,400.25	513,816.08	439.72	9,477	57	134.19	-0.02	-0.11	-44.84	-0.04	-0.24
	17-Sep-05	7,148,400.24	513,816.21	439.67	9,836	359	134.32	0.13	0.13	-44.89	-0.04	-0.05
350-2A	21-Aug-03	7,148,300.52	513,873.67	428.71	9,070	7,007	163.89	72.97	3.80	-61.41	-29.09	-1.52
	28-Jul-04	7,148,300.53	513,873.83	428.58	9,412	342	164.05	0.16	0.17	-61.54	-0.13	-0.14
	23-Sep-04	7,148,300.54	513,873.85	428.58	9,469	57	164.07	0.01	0.08	-61.55	-0.01	-0.04
	17-Sep-05	7,148,300.52	513,873.98	428.51	9,828	359	164.20	0.14	0.14	-61.61	-0.06	-0.07
1491	21-Aug-03	7,148,376.83	513,868.79	432.49	0	0						
	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	-0.04	-0.17	-0.02	-0.13
	17-Sep-05	7,148,376.85	513,869.15	432.27	758	359	0.36	0.16	0.17	-0.22	-0.05	-0.05

Average	Aug 03 to Jul 04	0.20	0.21	-31.27	-0.10	-0.11
	Jul 04 to Sep 04	0.01	0.04	-31.29	-0.02	-0.14
	Sep 04 to Sep 05	**0.18**	**0.18**	**-31.38**	**-0.09**	**-0.09**
Maximum	Aug 03 to Jul 04	0.59	0.63	-0.04	-0.03	-0.03
	Jul 04 to Sep 04	0.08	0.52	-0.06	0.00	-0.03
	Sep 04 to Sep 05	**0.52**	**0.53**	**-0.16**	**-0.03**	**-0.03**
Minimum	Aug 03 to Jul 04	0.01	0.01	-61.54	-0.24	-0.26
	Jul 04 to Sep 04	-0.02	-0.12	-61.55	-0.07	-0.47
	Sep 04 to Sep 05	**0.02**	**0.02**	**-61.61**	**-0.24**	**-0.24**

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						
	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	0.16	-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
1485	21-Aug-03	7,148,017.91	513,702.37	480.46	0	0						
	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
BH-16 (T8)	21-Aug-03	7,148,048.49	513,760.30	464.94	0	0						
	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
24A	21-Aug-03	7,148,035.28	513,774.68	465.27	9,275	7,007	83.16	61.43	3.20	-21.10	-21.10	-1.10
	28-Jul-04	7,148,035.42	513,775.58	464.94	9,617	342	84.07	0.91	0.97	-21.43	-0.33	-0.35
	23-Sep-04	7,148,035.44	513,775.70	464.89	9,674	57	84.20	0.13	0.81	-21.49	-0.05	-0.34
	17-Sep-05	7,148,035.58	513,776.55	464.66	10,033	359	85.06	0.86	0.88	-21.71	-0.23	-0.23
24B	21-Aug-03	7,148,045.09	513,832.26	446.30	9,275	7,007	81.91	61.11	3.18	-20.06	-20.06	-1.04
	28-Jul-04	7,148,045.31	513,833.13	446.00	9,617	342	82.81	0.90	0.96	-20.36	-0.30	-0.32
	23-Sep-04	7,148,045.33	513,833.26	445.89	9,674	57	82.94	0.13	0.85	-20.47	-0.11	-0.69
	17-Sep-05	7,148,045.55	513,834.05	445.62	10,033	359	83.75	0.81	0.83	-20.74	-0.27	-0.27

Average	Aug 03 to Jul 04	0.81	0.87	-8.50	-0.27	-0.29
	Jul 04 to Sep 04	0.11	0.70	-8.57	-0.06	-0.40
	Sep 04 to Sep 05	**0.75**	**0.76**	**-8.79**	**-0.22**	**-0.23**
Maximum	Aug 03 to Jul 04	0.95	1.02	-0.16	-0.16	-0.17
	Jul 04 to Sep 04	0.14	0.89	-0.16	-0.01	-0.06
	Sep 04 to Sep 05	**0.91**	**0.93**	**-0.24**	**-0.08**	**-0.08**
Minimum	Aug 03 to Jul 04	0.40	0.43	-21.43	-0.33	-0.35
	Jul 04 to Sep 04	0.03	0.16	-21.49	-0.11	-0.69
	Sep 04 to Sep 05	**0.34**	**0.35**	**-21.71**	**-0.29**	**-0.29**

Client: Government of Yukon
Project: Former Clinton Creek Asbestos Mine - Tailings Movement Monitoring
UMA Job No.: 6029-005-00 6029-006-00 6029-007-00
Date: 31-Aug-03 Jul / Sep 2004 Sep-05

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)	increment (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	7,294	7,007	84.36	64.90	3.38	-23.45	-23.45	-1.22
	28-Jul-04	7,148,344.00	513,890.89	422.43	7,636	342	84.52	0.16	0.17	-23.56	-0.11	-0.12
	23-Sep-04	7,148,344.01	513,890.89	422.40	7,693	57	84.52	0.00	0.03	-23.59	-0.03	-0.21
	17-Sep-05	7,148,344.00	513,891.07	422.38	8,052	359	84.70	0.17	0.18	-23.61	-0.02	-0.02
350-3A	21-Aug-03	7,148,312.23	513,899.00	417.39	9,064	7,007	167.16	67.37	3.51	-67.47	-27.66	-1.44
	28-Jul-04	7,148,312.20	513,899.14	417.31	9,406	342	167.30	0.14	0.15	-67.55	-0.08	-0.08
	23-Sep-04	7,148,312.20	513,899.14	417.28	9,463	57	167.29	0.00	-0.02	-67.59	-0.04	-0.25
	17-Sep-05	7,148,312.19	513,899.26	417.28	9,822	359	167.42	0.12	0.12	-67.58	0.00	0.00
1489	21-Aug-03	7,148,305.23	513,928.45	413.70	0	0						
	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
NL-1	28-Jul-04	7,148,365.73	513,942.45	413.19	0	0						
	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	0.13	0.13	-0.03	0.00	-0.01
1083	21-Aug-03	7,148,354.01	513,936.37	414.10	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	33	-309	0.15	0.00	0.00	-0.02	-0.02	0.02
	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
NL-3	28-Jul-04	7,148,334.73	513,926.88	417.07	0	0						
	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	0.10	0.10	0.01	0.03	0.03
NL-4	28-Jul-04	7,148,307.20	513,913.00	416.19	0	0						
	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	0.11	0.11	-0.08	-0.05	-0.05
NL-5	28-Jul-04	7,148,275.21	513,896.96	415.46	0	0						
	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	0.06	0.06	-0.07	-0.03	-0.03

Average	Aug 03 to Jul 04	0.11	0.11	-18.23	-0.05	-0.05
	Jul 04 to Sep 04	0.01	0.05	-11.42	-0.03	-0.17
	Sep 04 to Sep 05	**0.12**	**0.12**	**-11.44**	**-0.02**	**-0.02**
Maximum	Aug 03 to Jul 04	0.16	0.17	0.00	0.00	-0.01
	Jul 04 to Sep 04	0.04	0.26	-0.02	-0.02	0.02
	Sep 04 to Sep 05	**0.17**	**0.18**	**0.01**	**0.03**	**0.03**
Minimum	Aug 03 to Jul 04	0.08	0.08	-67.55	-0.11	-0.12
	Jul 04 to Sep 04	-0.01	-0.09	-67.59	-0.04	-0.26
	Sep 04 to Sep 05	**0.06**	**0.06**	**-67.58**	**-0.05**	**-0.05**

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	9,103	7,007	63.31	50.43	2.63			
	28-Jul-04	7,148,071.88	513,920.59	422.29	9,445	342	63.92	0.60	0.64	-0.10	-0.10	-0.11
	23-Sep-04	7,148,071.93	513,920.65	422.28	9,502	57	63.99	0.07	0.47	-0.11	-0.01	-0.06
	17-Sep-05	7,148,072.22	513,921.17	422.27	9,861	359	64.57	0.58	0.59	-0.12	-0.01	-0.01
25B	21-Aug-03	7,148,065.68	513,948.29	422.02	9,096	7,007	50.24	35.01	1.82	1.18	1.18	0.06
	28-Jul-04	7,148,065.72	513,948.61	422.03	9,438	342	50.56	0.32	0.34	1.19	0.01	0.01
	23-Sep-04	7,148,065.75	513,948.63	422.03	9,495	57	50.59	0.03	0.18	1.19	0.00	-0.01
	17-Sep-05	7,148,065.78	513,948.89	422.10	9,854	359	50.84	0.25	0.26	1.26	0.07	0.07
80-9	21-Aug-03	7,147,996.44	513,970.69	411.11	7,294	7,007	11.83	11.29	0.59	3.07	3.07	0.16
	28-Jul-04	7,147,996.41	513,970.75	411.09	7,636	342	11.89	0.06	0.07	3.05	-0.02	-0.03
	23-Sep-04	7,147,996.38	513,970.73	411.04	7,693	57	11.88	-0.01	-0.04	2.99	-0.05	-0.33
	17-Sep-05	7,147,996.37	513,970.77	411.06	8,052	359	11.93	0.05	0.05	3.02	0.03	0.03
1484	21-Aug-03	7,148,148.49	513,961.52	417.94	0	0						
	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	0.76	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
SL-1	28-Jul-04	7,148,078.88	513,970.45	419.86	0	0						
	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	0.20	0.20	-0.03	0.06	0.06
SL-2	28-Jul-04	7,148,086.80	513,956.84	422.53	0	0						
	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	0.35	0.35	0.08	0.15	0.15
SL-3	28-Jul-04	7,148,100.47	513,933.11	420.80	0	0						
	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

Average	Aug 03 to Jul 04	0.43	0.45	1.04	-0.02	-0.02
	Jul 04 to Sep 04	0.10	0.66	0.56	-0.04	-0.25
	Sep 04 to Sep 05	**0.38**	**0.39**	**0.60**	**0.05**	**0.05**
Maximum	Aug 03 to Jul 04	0.71	0.76	3.05	0.04	0.04
	Jul 04 to Sep 04	0.21	1.38	2.99	0.00	-0.01
	Sep 04 to Sep 05	**0.65**	**0.66**	**3.02**	**0.15**	**0.15**
Minimum	Aug 03 to Jul 04	0.06	0.07	-0.10	-0.10	-0.11
	Jul 04 to Sep 04	-0.01	-0.04	-0.11	-0.09	-0.60
	Sep 04 to Sep 05	**0.05**	**0.05**	**-0.12**	**-0.01**	**-0.02**

B SIZE 11" x 17" (279.4mm x 431.8mm)

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Saved By: jviberg

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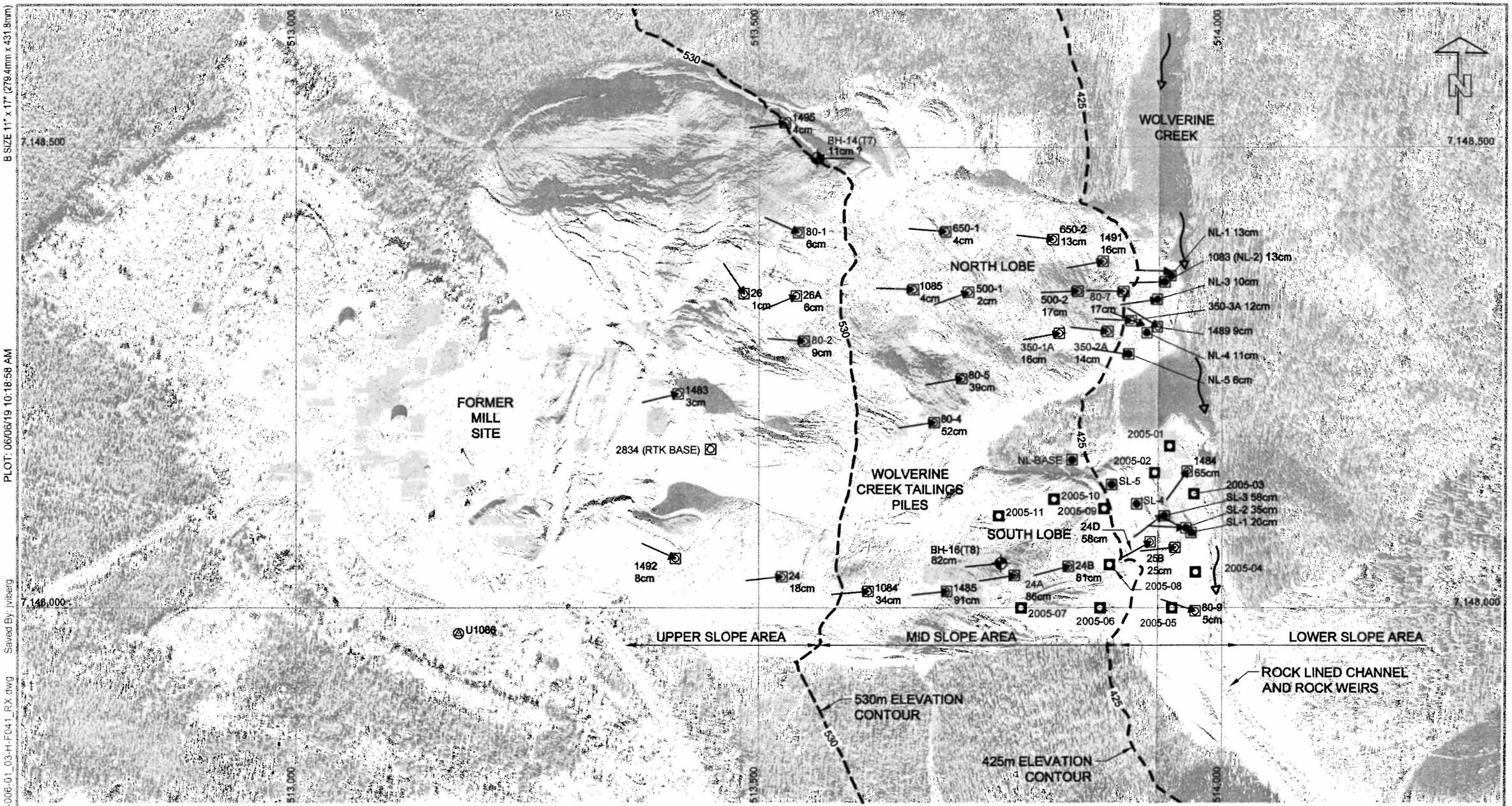

24 — MONITOR LOCATION (ACTIVE)

2005-01 — MONITOR LOCATION (ADDDED IN 2005)

22cm — RECORDED MOVEMENT (SEPT 2004 - SEPT 2005)

→ — MOVEMENT VECTOR (SEPT 2004 - SEPT 2005)

SL/NL-01 — VISUAL ALIGNMENT PIN

BH-14 (T7) — 1978 TEST HOLE LOCATION

0 40 80 120 m

SCALE 1:4000

UTM ZONE 7 NAD83

IMAGE DATE 1999

COMPASS BEARING FROM NL-BASE ALONG PINS NL-1 TO NL-5
DECLINATION: 30°
BEARING: 208°

COMPASS BEARING FROM NL-BASE ALONG PINS SL-1 TO SL-5
DECLINATION: 30°
BEARING: 121°

UMA | AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
2005 Engineering Services

Wolverine Creek Tailings Pile
2005 Movement Monitoring

Drawing - D-1

513,500

514,000

7,148,000

590

530

425

80-2
9cm

80-5
39cm

80-4
52cm

1483
3cm

2834 (RTK BASE)

1492
8cm

24
18cm

1084
34cm

1485
91cm

BH-16(T8)
82cm

24A
86cm

24B
81cm

24D
58cm

25B
25cm

350-1A
16cm

350-2A
14cm

350-3A 12cm

1489-5cm

NL-4 11cm

NL-5 8cm

NL-BASE

2005-01

2005-02

1484
65cm

2005-03

SL-5

SL-4

SL-3 58cm

SL-2 35cm

SL-1 20cm

2005-04

2005-05

80-9
5cm

2005-06

2005-07

2005-08

2005-09

2005-10

2005-11

WOLVERINE CREEK
TAILINGS PILES

SOUTH LOBE

APPARENT DIRECTION
OF MOVEMENT

APPARENT DIRECTION
OF MOVEMENT

UPPER SLOPE AREA

MID-SLOPE AREA

LOWER SLOPE AREA

530m ELEVATION
CONTOUR

425m ELEVATION
CONTOUR

ROCK LINED
CHANNEL AND
ROCK WEIRS

0 20 40 60 m

SCALE 1:2000

UTM ZONE 7 NAD83
IMAGE DATE 1999

24	◎	MONITOR LOCATION (ACTIVE)
2005-01	◘	MONITOR LOCATION (ADDDED IN 2005)
22cm		RECORDED MOVEMENT (SEPT 2004 - SEPT 2005)
	→	MOVEMENT VECTOR (SEPT 2004 - SEPT 2005)
SL/NL-01	◉	VISUAL ALIGNMENT PIN
BH-14 (T7)		1978 TEST HOLE LOCATION

COMPASS BEARING FROM NL-BASE ALONG PINS NL-1 TO NL-5
DECLINATION: 30°
BEARING: 208°

COMPASS BEARING FROM NL-BASE ALONG PINS SL-1 TO SL-5
DECLINATION: 30°
BEARING: 121°

UMA | AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
2005 Engineering Services

Wolverine Creek Tailings Pile Direction of Movement

Drawing - D-2

B SIZE 11" x 17" (279.4mm x 431.8mm)

PLOT: 06-02-17 4:49:46 PM

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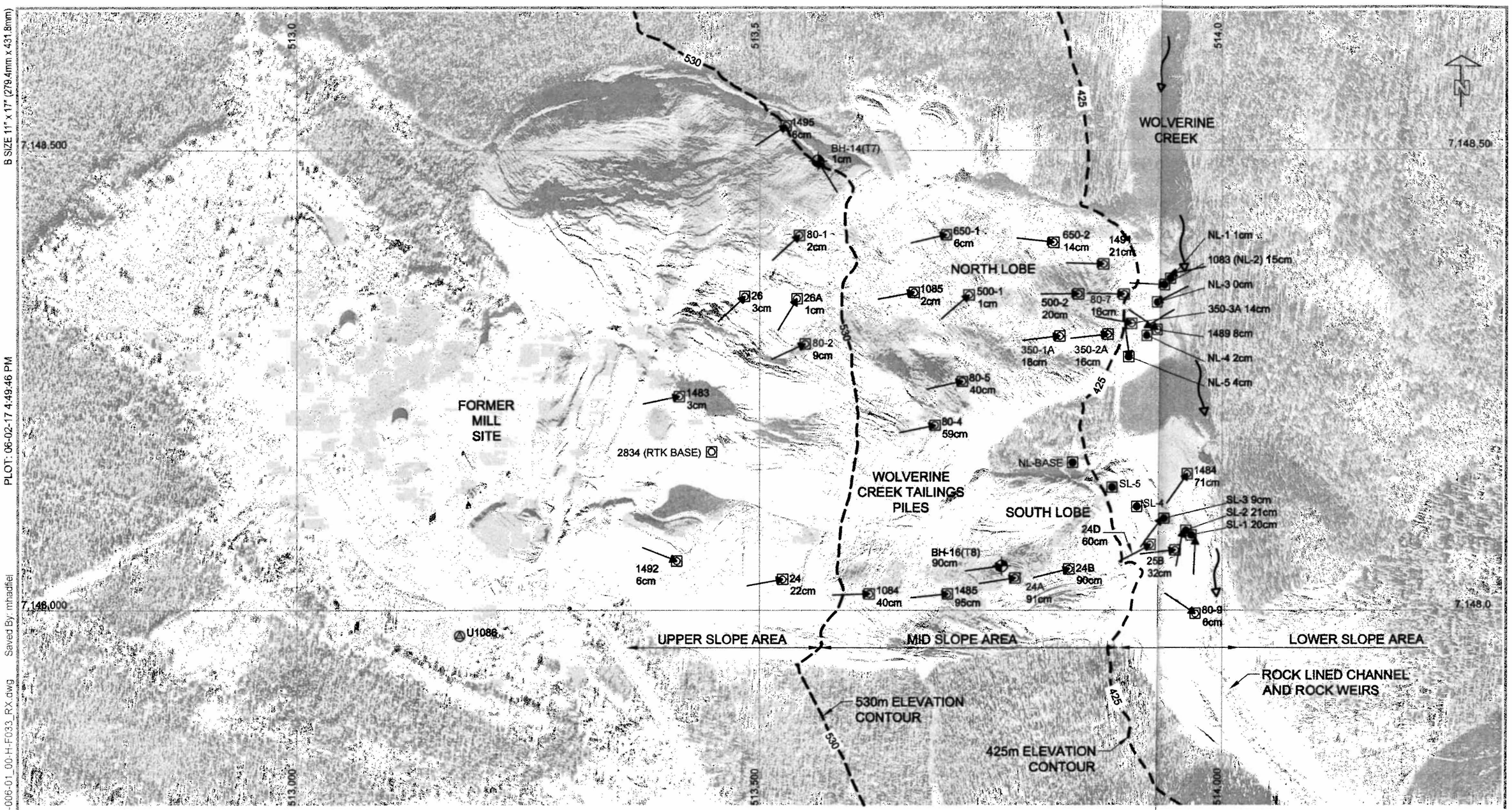

0 40 80 120 m

SCALE 1:4000

UTM ZONE 7 NAD83
IMAGE DATE 1999

24 — MONITOR LOCATION (ACTIVE)

22cm — RECORDED MOVEMENT (AUGUST 2004 - JULY 2004)

SL/NL-01 — VISUAL ALIGNMENT PIN

BH-14 (T7) — 1978 TEST HOLE LOCATION

MOVEMENT VECTOR (AUGUST 2004 - JULY 2004)

COMPASS BEARING FROM NL-BASE ALONG PINS NL-1 TO NL-5
DECLINATION: 30°
BEARING: 208°

COMPASS BEARING FROM NL-BASE ALONG PINS SL-1 TO SL-5
DECLINATION: 30°
BEARING: 121°

UMA | AECOM

Government of Yukon
Former Clinton Creek Asbestos Mine
2004 Monitoring

Wolverine Creek Tailings Pile Movement Monitoring

Drawing 3-3