ROBERTS BAY AND IDA BAY ABANDONED MINE SITES GEOCHEMICAL ASSESSMENT IN SUPPORT OF SITE REMEDIATION

FINAL REPORT

Submitted to:

Public Works and Government Services Canada

Environmental Services, Northern Contaminated Sites
Edmonton, AB

Submitted by:

AMEC Earth & Environmental
160 Traders Blvd. East, Suite 110
Mississauga, Ontario
L4Z 3K7

WX15131
November, 2006

EXECUTIVE SUMMARY

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC) was retained by Public Works and Government Services Canada (PWGSC) on behalf of the Department of Indian and Northern Affairs Canada (INAC) to undertake a geotechnical and geochemical assessment at the former Roberts Bay and Ida Bay silver mine sites located approximately 68° 10' 45" N and 106° 33' 29" W about 115 kilometers southwest of Cambridge Bay, Nunavut. The purpose of this report is to summarize geochemical data for waste rock, tailings, mine water and vegetation samples collected during site visit in August 2005.

Remaining features at the Roberts Bay mine site include several small waste rock piles, two open and flooded adits, abandoned equipment and debris, several surface ponds, and a small (approximately 1,500 m^3 capacity) tailings pond. The Ida Bay mine site is located about 7 km north of the Roberts Bay site and appears to have been operated as an annex to the Roberts Bay Mine. The prominent features remaining at this abandoned mine site are four small waste rock piles and the open flooded mine adit.

Twenty-two waste rock samples taken from the Roberts Bay site. Only 2 samples had a sulphide-sulphur content in excess of 1.0 wt% (both were less than 2%). Eleven of the samples (50%) contained less than 0.3 wt% sulphide-sulphur, suggesting that these materials are unlikely to contain sufficient sulphide sulphur to become net acid generating. The ratio of Neutralizing Potential (NP) to Acid Generating Potential (AP) for 19 of the samples was greater than 4 (NP/AP > 4), thus meeting the criteria to be classified as non-acid generating. The remaining three samples had NP/AP ratios between 1 and 4 classifying them as having uncertain acid generating potential. All 22 samples had an NP/AP ratio greater than 1 suggesting that none of these samples are likely to be a significant source of net acidity. The mill tailings from the Roberts Bay mine site were net non-acid generating.

Of the four waste rock samples taken from the Ida Bay site, two had sulphide sulphur concentrations less than 0.30 wt% making them unlikely to be net acid generating, while the other two samples contained 0.66 wt% and 0.82 wt% sulphide-sulphur respectively. The NP/AP ratios for these two samples were 3.4 and 2.7, respectively classifying them as having uncertain acid generating potential. While it is unlikely that these samples will become net acid generators additional test work would be required to rule out this potential.

The concentration of major elements in the waste rock and tailings samples reflect the mineral composition of mafic and felsic rocks that dominate the local geology of the area. The concentrations of silver (Ag), arsenic (As), copper (Cu), lead (Pb), zinc (Zn) and selenium (Se) were elevated relative to crustal abundances in waste rock samples from both mine sites and the tailings. Concentrations of antimony (Sb) were elevated in the Roberts Bay waste rock while cadmium (Cd), in all samples, and mercury (Hg) in some samples were elevated in the Ida Bay waste rock. The Ida Bay waste rock also contained higher concentrations of Cu, Pb, and Zn relative to the Roberts Bay waste rock. The concentrations of all other elements measured in the waste rock and tailings samples were similar to or less than average crustal abundances. The concentrations of As, Cu, Pb, Ni, and Zn in the mine water samples were much less than regulated upper limits (MMER, 2003) that would prohibit the discharge of mine water to the environment. The elements As, Cd, Cr, Cu, Pb, Se and Zn exceeded the CCME guidelines for fresh water and in some cases, marine water.

Based on the analytical results, the major findings of this work are as follows:

- The majority of the waste rock at the Roberts Bay mine site is net non-acid generating;
- Three waste rock piles/areas identified on the Roberts Bay mine site had NP:AP ratios between 4.0 and 1.0 indicating that the rock has uncertain acid generating potential based on the results of static testing;
- Approximately 182 m^3 or 6.4% of the total volume of waste rock at the Roberts Bay site falls into the uncertain classification with respect to net acid generating potential;
- The tailings at the Roberts Bay mine site are net non-acid generating;
- The rock represented by two samples from the Ida Bay mine site rock had NP:AP ratios between 4.0 and 1.0 indicating that they have uncertain acid generating potential. This is estimated to represent 758 m^3 or approximately 30% of all waste rock at this site;
- All waste rock and tailing samples at the Roberts Bays and Ida Bay mine sites has paste pH values greater than 7.0 indicating that none of the samples are currently generating net acidity even though they have been exposed to weathering for >30 years;
- The concentrations of Ag, Sb, As, Cu, Pb, Se, and Zn in most waste rock at the Roberts Bay mine site were elevated relative to average background concentrations;
- The total concentration of nickel in the Roberts Bay tailings was elevated relative to average crustal abundance, while concentrations in the waste rock at both mine sites was similar to average crustal (background) abundances;
- The concentration of Cd and Hg were elevated in the Ida Bay waste rock, while concentrations were similar to background crustal abundance at the Roberts Bay site;
- Results from leach solutions indicate that generation of ARD or leaching of metals of interest (As, Co, Cu, Pb, Ni, and Zn) does not appear to be of concern for these waste rock materials;
- The concentration of metals of concern (As, Cu, Pb, Ni, and Zn) in mine water at the Roberts Bay and Ida Bay mine sites are much lower than MMER regulatory values and consequently treatment is not required before discharge to the environment;
- The concentration of most elements measured in the mine water samples were very low and similar to guideline values protective for fresh water aquatic life (CCME, 2003);
- The concentration of As in the Roberts Bay tailings pond and a large pond near the north road leading to Ida Bay was much lower than MMER discharge guidelines but slightly elevated compared to CCME guidelines for both fresh water and marine water;
- The concentration of Se in the north pond at Roberts Bay exceeded CCME guideline values for fresh water;
- The concentration of Zn in the tailings sump sample at the Roberts Bay site was below MMER guidelines for discharge but exceeded CCME guideline values for fresh water;
- Although the Ida Bay waste rock contained elevated concentrations of Cd relative to background, it likely occurs as insoluble suspended particulates and is not expected to elevate concentrations in solution; and
- Vegetation (cottongrass, *Eriophorum sp.*) found in a mature growth stage actively growing on the north edge of the tailings pond did not accumulate higher than normal concentrations of As, Cd, Cu, Pb or Zn in plant dry matter.

TABLE OF CONTENTS

LIST OF FIGURES

PAGE

LIST OF TABLES

PAGE

LIST OF APPENDICES

1.0 INTRODUCTION

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC) was retained by Public Works and Government Services Canada (PWGSC) on behalf of the Department of Indian and Northern Affairs Canada (INAC) to undertake a geotechnical and geochemical assessment of potential acid rock drainage and/or metals leaching concerns from residual waste rock and tailings located at the former Roberts Bay and Ida Bay silver mines in Nunavut. Collectively known as the Roberts Lake property, the site is situated approximately 115 kilometers southwest of Cambridge Bay and is located within the ORO claim region.

During August 2005, a team of engineers, scientists and field technicians from AMEC, EarthTech, EBA Engineering, and UMA Engineering, together with representatives of PWGSC and INAC, visited the Roberts Bay and Ida Bay Mine Sites to investigate site conditions and obtain samples of waste rock, tailings, soil, water and vegetation for analyses in order to prepare the remediation plan for the mine sites. As part of this cooperative investigation AMEC was to conduct geochemical assessment of the waste rock, tailings and mine surface water at the Sites. The objective of the geochemical investigation was to:

- Perform and finalize a detailed assessment of tailings and waste rock geochemistry; and
- Assess mobility of arsenic and other metals from the tailings pond.

Within the context of preparing site remediation plans for the mine sites, this work was conducted in cooperation and in concert with ongoing geotechnical investigations, environmental site assessment and human health risk assessment for the sites.

The purpose of the current document is to summarize the geochemical data collected for the waste rock, tailings, mine water samples and a sample of vegetation collected from the Roberts Bay and Ida Bay abandoned mine sites, focusing on the geochemistry of the waste rock, tailings and mine water. Data and information was shared with and among the Geotechnical Investigation, Environmental Site Assessment, and Human Health Risk Assessment work, which will be provided under separate cover. It is understood that all documents prepared for this work will be used collectively in preparation of remediation plans for both mine sites.

2.0 SITE DESCRIPTION

2.1 Location

Roberts Bay and Ida Bay abandoned silver mines are located approximately 68° 10' 45" N by 106° 33' 29" W about 115 kilometers southwest of Cambridge Bay, Nunavut.

2.2 Background

The Roberts Bay area was first staked by the Roberts Mining Company Ltd. in 1964. Silver was discovered at Roberts Bay in 1965. A silver showing was subsequently discovered and staked at Ida Bay in 1966. Exploration of the Ida Bay and Roberts Bay silver showings was conducted by the Hope Bay Silver Syndicate between 1967 and 1972 where exploration activities included trenching, drilling, mapping, and geophysical surveys. Mining equipment was mobilized to Ida Bay by Hope Bay Mines Ltd. (formerly Hope Bay Mining Co.) in 1973 yielding over 10,000

ounces of high grade silver. The Roberts Bay deposit produced 10 tons of hand sorted ore with highest grades of 4,863 oz/ton (approximately 15%).

In 1974 Hope Bay Mines Ltd. entered into a joint venture with Van Silver Explorations Ltd. and Reako Explorations to upgrade the Roberts Bay mine. A small 50-75 ton/day mill was constructed at the Roberts Bay site and yielded a total of 74,500 ounces of silver until operations ceased in 1975. Further exploration continued at the leases throughout the 1980's and 1990's. In 1997 the Roberts Mining Lease was surrendered and in 1998 the ground was re-staked as the ORO 5 claim. Rescan Environmental Services Ltd. performed a preliminary assessment of the sites for PWGSC in 2003.

2.2.1 Roberts Bay Mine

The Roberts Bay abandoned silver mine is located approximately 1 km north of Roberts Lake. (see Figure 1). A trail leads from the lakeshore of Roberts Lake to the mine site following the crest of a basaltic ridge. The mine site itself is located on and between two basaltic ridges, which run north-south. The site between the ridges occurs on a subtle crest primarily sloping southward and draining between the ridges into Roberts Lake. Parts of the mine site are located north of the crest draining to the north and subsequently westward to Melville Sound. Parts of the mine site on the western basalt ridge may also drain to the west towards Melville Sound. The low areas between the basaltic ridges are underlain with a coarse textured glacial till with permafrost found about 60 cm below surface.

Prominent features remaining at the site are a variety of waste rock piles, two open and flooded adits, infrastructure remains of light framed "temporary" buildings, abandoned equipment and debris, a landfill/dump with a waste rock berm, several surface ponds, drainage ditches and a small tailings pond. Waste rock was used on the mine site to level areas to support infrastructure and to construct berms for the landfill, fuel bladder and tailings pond. The waste rock pads vary in thickness from a thin veneer spread over the surface to greater than 2 m. Some piles of waste rock were several meters high. The tailings pond was small (compared to many other facilities) measuring approximately 25 m across and about 3 m at the highest point equivalent to up to approximately 1,500 m^3 capacity of tailings.

2.2.2 Ida Bay Mine

The Ida Bay mine site is located on the north shore of Ida Bay on the Melville Peninsula adjacent to Melville Sound about 7 km north of the Roberts Bay site. The area is located on a basaltic outcrop with north/south striking ridges. Adjacent to the outcrop are low-lying marshes underlain by coarse textured glacial till. The site slopes towards the southeast with surface drainage directly into the Arctic Ocean (Melville Sound). The rock is dominated by black fine-grained basalt containing small amounts of pyrite in fractures and small thin veins and stringers of quartz and some pink granite (see Figure 2).

The Ida Bay Mine appears to have been operated as an annex to the Roberts Bay Mine with no milling operations performed on-site. Hand picked ore from the Ida Bay Mine was either transported overland to Roberts Bay or shipped off-site for processing. The prominent features remaining at the abandoned mine site are four main piles or areas of waste rock and the open flooded adit.

Figure 1: **Roberts Bay mine site with Roberts Lake in the forefront. Aerial view from the south.**

Figure 2: **Ida Bay mine site. Aerial view from the southeast.**

3.0 SAMPLING AND ANALYSES

3.1 Sample Collection

Sampling of waste rock, tailings, mine water and vegetation was conducted at the Roberts Bay mine site between August 16, and August 21 2005. Sampling at Ida Bay was conducted on August 19, 2005. A description of samples collected from the Roberts Bay and Ida Bay mine sites is provided in Table 1 and Table 2, respectively. The locations of sample site and areas are shown in Figures 3 and 4.

A total of 22 waste rock samples, seven tailings samples, four mine water samples and one vegetation sample were collected from the Roberts Bay site. A total of four waste rock samples and two mine water samples were collected from the Ida Bay site. With the exception of two samples (MYWR-4 and MYWR-5) all waste rock samples were collected as composite samples representing individual units as identified in the field. Samples MYWR-4 and MYWR-5 were collected as discrete samples at the Roberts Bay site.

Samples of the tailings were collected in three inch (76 mm) diameter by 18 inch (460 mm) long steel Shelby tubes driven into the tailings and retrieved by hand. Two samples of tailings were retrieved from outside of the tailings berm, and one sample of tailings was retrieved from inside what is believed to the abandoned delivery pipe for the tailings facility.

A total of six mine water samples of 250 ml each were collected from the two mine sites. Two samples were collected from the Ida Bay Adit. The six samples collected from the Roberts Bay mine site were taken from the adit, a large pond located east of the northern road (map identification number 16), the tailings pond, and a small pit, identified here as the tailings sump, excavated at the toe of the containment berm on the southwest side of the tailings pond to collect seepage. The sump was excavated and water was allowed to collect in the hole for a period of about 24 hours. A very limited amount (approximately 20 ml) of water was collected from this tailings sump. Each sample was collected from the respective sites and retained at ambient temperature (approximately 10^{o}C). The pH and temperature of all water samples was determined in the field within 8 hours of sample collection using a small hand-held meter calibrated immediately before-hand with pH 4.01 and pH 7.00 buffers. Samples were acidified in the field with a few drops of HCl and refrigerated (4^{o}C) prior to shipping. As part of AMEC's quality control protocols, a travel blank was treated similarly and also submitted for analyses.

One sample of vegetation, identified as a cottongrass species; (*Eriophorum sp.*) in mature growth stage was collected from a 1 m area on the north edge of tailings pond. At the time of sampling the vegetation was actively growing using the tailings as a rooting medium.

Table 1: Description of Samples collected from Roberts Bay mine site.

Sample	Location[1]	Site/Sample Description
Waste Rock		
OP-E	1	Ore pad -west half
OP-W	2	Ore pad - east half
EM	3	Explosives area including the access road
FB-S	4	Fuel bladder berm south half
FB-N	5	Fuel bladder berm north half
MYWR-1	6	Mine yard Waste rock pile #1 (south end)
MYWR-2	7	Mine yard waste rock pile #2 (north east)
MYWR-3	8	Mine Yard waste rock pile #3 (north west)
MYWR-4	9	Mine yard waste rock west facing slope discrete sample
MYWR-5	10	Mine yard waste rock south facing slope discrete sample
MYWR-6	11	Mine yard waste rock plateau area east of the three mine yard waste rock piles.
MYWR-7	12	Mine yard waste rock from flat area north of the three mine yard waste rock piles and west of machine shop
NWRP-1	13	North waste rock pile #1 (east side)
NWRP-2	14	North waste rock pile #2 (middle of the 3)
NWRP-3	15	North waste rock pile #3 (actually a berm west to fine ore pad
IBARO-1	16	Incomplete road leading north towards Ida Bay
FOP-1	17	Fine ore pad
LYWR-1	18	Mill yard area (north of the mill infrastructure)
WHWR-1	19	Waste rock berm north of tailings pond and west of the hopper
SOWR-1	20	Waste Rock berm south of tailings pond (retention berm)
DWR-1	21	Waste rock around the dump
TPWRB-1	22	Ramp of waste rock to Adit #2 (on the eastern basalt ridge)
Tailings Samples		
RBTP-04	T1	North edge of tailings pond (next to surface water)
RBTP-05	T2	West edge of tailings pond (next to surface water)
RBTP-06	T3	South east side of pond adjacent to mill feeder
RBTP-07S	T4	South east side of pond – surface
RBTP-08U	T5	South west edge tailings berm – upslope
RBTP-08L	T6	South west edge tailings berm – downslope
RBTP-09P	T7	Tailings remaining in the delivery pipe
Mine Water Samples		
Roberts Bay Adit	W3	Roberts Bay Adit Water Sample
Roberts Bay Tailing Pond	W4	Roberts Bay Tailings Pond Water sample
Roberts Bay North Pond	W5	Roberts Bay North Pond Water sample
Roberts Bay Tailings Sump	W6	Roberts Bay Tailings Sump Sample
Vegetation		
RBTP-10V	V1	Cottongrass vegetation growing in tailings pond along the north edge

Note: [1] Sample locations indicated on Figure 3.

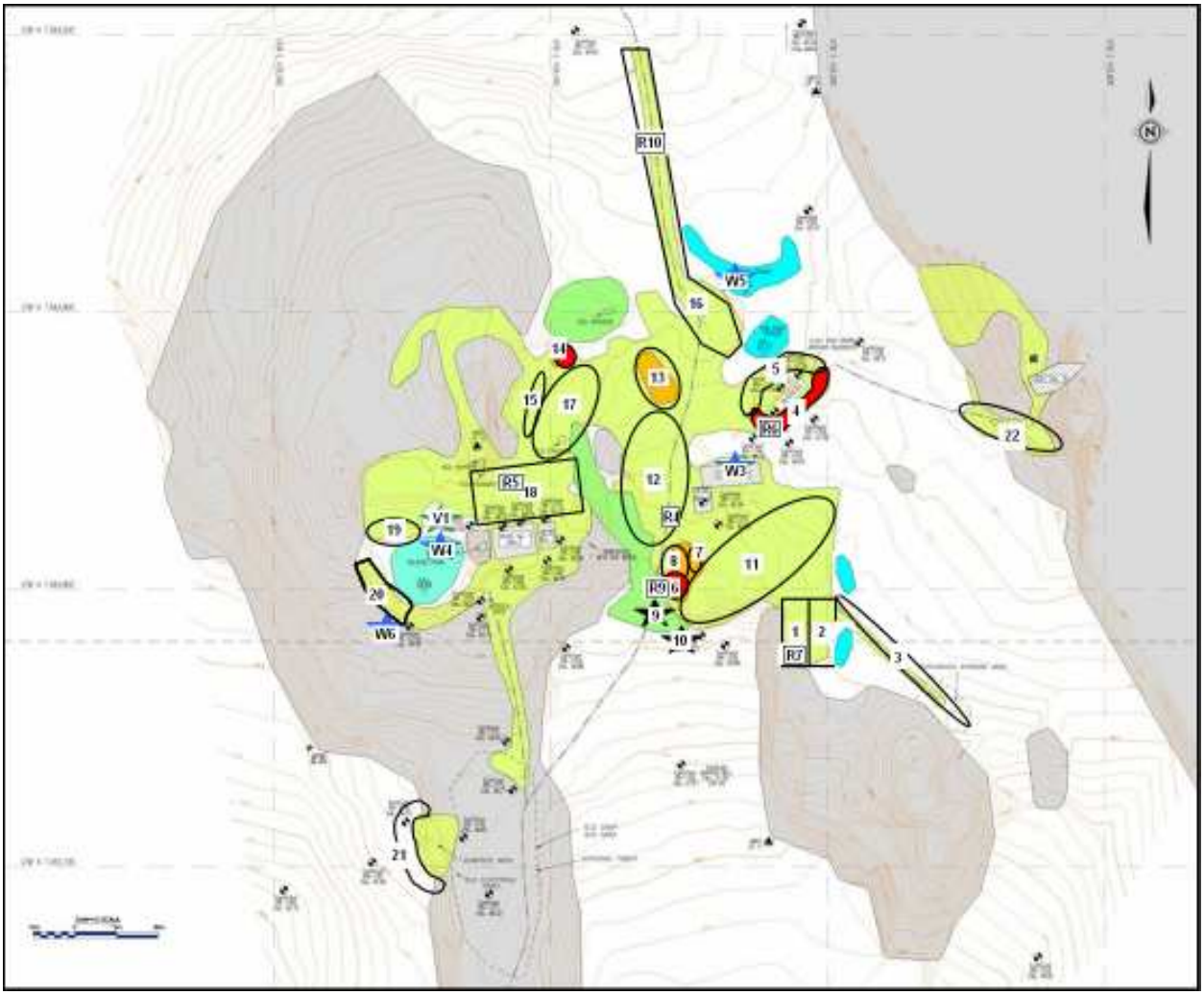

Figure 3: Sketch indicating the approximate location of sample sites at the Roberts Bay mine site.
Sample points prefixed with R indicate approximate locations of Rescan (2003) samples. Areas in red indicate possible acid generating waste rock.

Table 2: Description of samples collected from Ida Bay mine site.

Sample	Location[1]	Site/Sample Description
Waste Rock		
IBWR-1	A	Waste Rock pile #1 east side of mine site
IBWR-2	B	Waste Rock Pile #2 immediately east of the adit
IBWR-3	C	Waste Rock Area #3 along shore line
IBWR-4	D	Waste Rock Pile #4 northwest of the adit
Mine Water Samples		
Ida Bay Adit #1	W1	Ida Bay Adit Water Sample #1
Ida Bay Adit #2	W2	Ida Bay Adit Water Sample #2

Note: [1] Sample locations indicated on Figure 4.

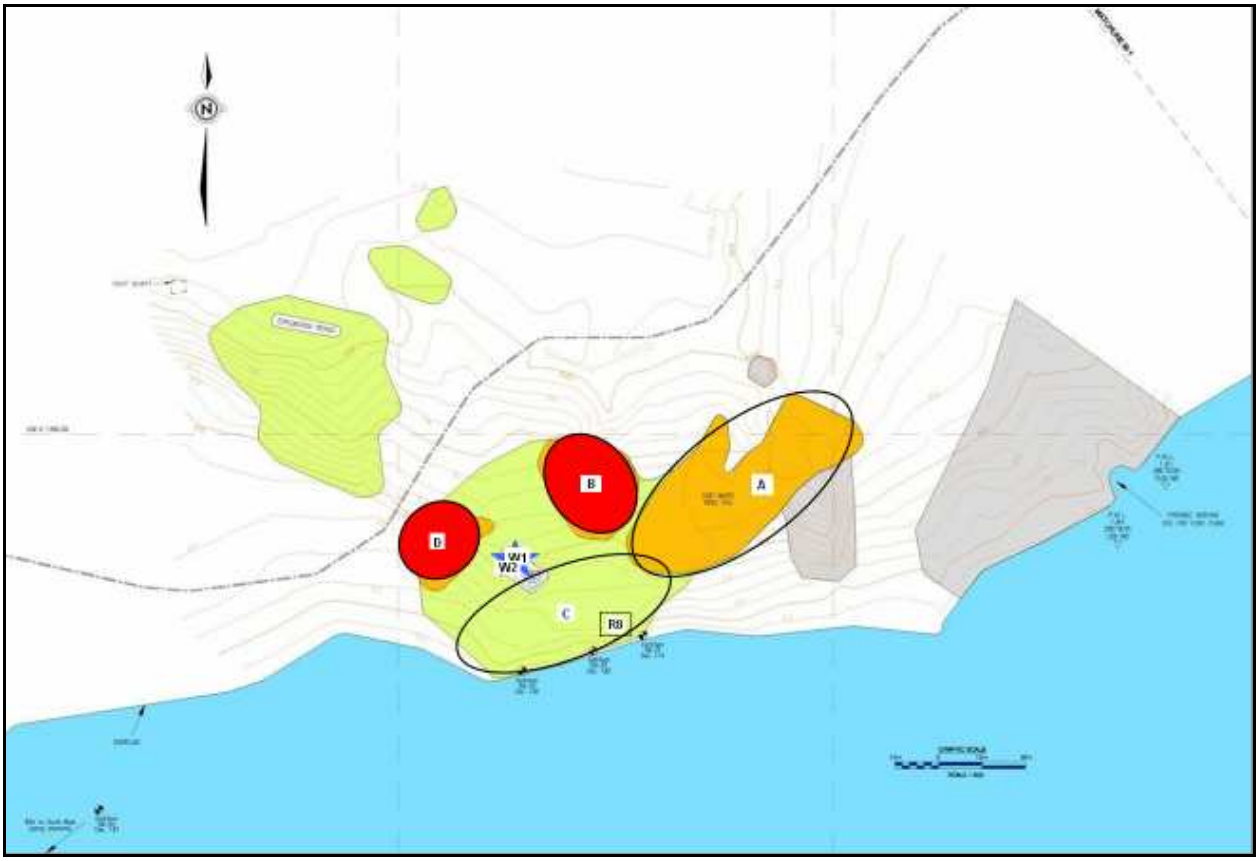

Figure 4: Sketch indicating the approximate location of sample sites at the Ida Bay mine site.
Sample point R8 indicates the approximate location of the Rescan (2003) sample. Areas in red indicate possible acid generating waste rock.

3.2 Analyses

Waste rock and tailings samples were submitted for the following analyses. All waste rock and tailings samples were subjected to conventional acid base accounting (ABA) analyses using the modified Sobek method.

The concentration of total metals was determined by strong acid digestion followed by ICP-MS analyses on a total of 10 selected samples including six samples of waste rock and two samples of tailings from the Roberts Bay mine site, and two waste rock samples from the Ida Bay mine site.

The BC MEM (BC Ministry of Energy and Mines) shake flask extraction test was conducted on a total of eight selected samples including five waste rock samples and one tailings sample from the Roberts Bay site and two waste rock samples from the Ida Bay mine site.

Based on the analytical values from the static testing at total of ten waste rock samples were selected for kinetic testing. Five samples of waste rock were subjected to humidity cell testing and five samples were selected for leaching column testing.

Mine water samples were submitted for analyses of total metals by ICP-MS. The volume of the sample collected from the sump was extremely limited. The sample was filtered using a 0.45 um filter prior to analyses and diluted 10X to obtain sufficient volume for analyses. Consequently values for MDL (minimum detection limits) for this sample were one order of magnitude higher compared to the other samples.

The sample of cottongrass (*Eriophorum sp.*) collected adjacent to the Roberts Bay tailings pond was submitted to determine the metal content of the plant dry matter. The sample was dried to constant mass and the residue digested in strong acid and analyzed for content of metals by ICP-MS.

Certificates of analyses are provided in Appendix A.

4.0 RESULTS

4.1 Acid Base Accounting (ABA)

A summary of ABA results for waste rock from the Roberts Bay and Ida Bay mine sites is provided in Table 3. The ABA results for the tailings samples collected from the Roberts Bay mine site are given in Table 4. Values for neutralization potential (NP) vs. acidification potential (AP) for all samples along with preliminary data reported by Rescan (2003) are plotted in Figure 5.

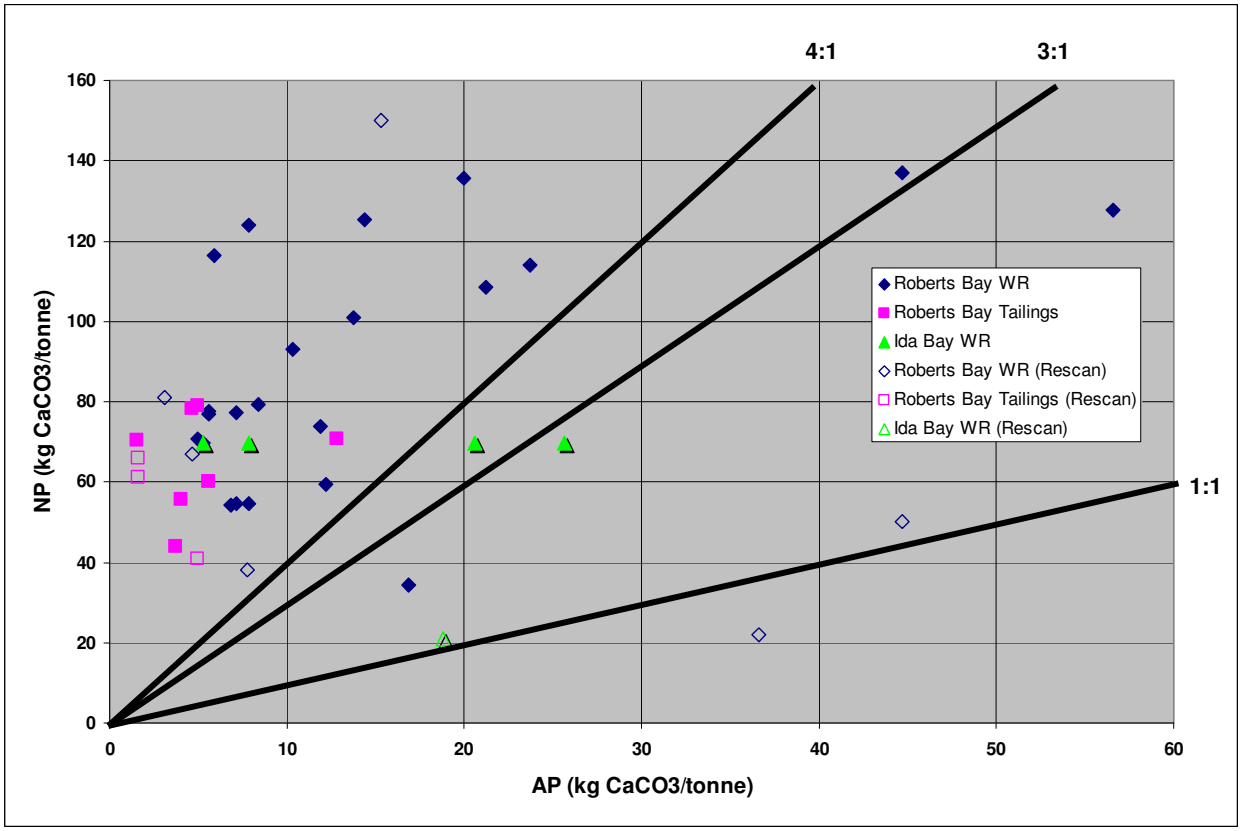

Figure 5: Plot of NP vs. AP for all waste rock and tailings samples from Roberts Bay and Ida Bay mine sites.
Open symbols indicated values reported by Rescan (2003.)

4.1.1 Waste Rock

The results for the ABA tests for waste rock were interpreted by comparison with guidelines from two sources: (1) Indian and Northern Affairs Canada (INAC; 1993) and (2) what are commonly referred to as the BC guidelines (Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia - Price, 1997). Both guidelines are referenced here for completeness. The BC guidelines are typically applied in the Province of British Colombia and are slightly more conservative compared to

other guidelines. Lines representing NP:AP ratios of 1:1, 3:1, and 4:1 are shown in Figure 5. Both guidelines indicate that waste rock with NP:AP ratios of less than or equal to 1:1 are potentially acid generating. Waste rock with NP:AP ratios greater than 4:1 in the case of the BC Guidelines and 3:1 in the case of the INAC guidelines is considered to by non-acid generating. The higher value in the case of the BC guidelines reflects a slightly higher factor of safety. Waste rock with an NP:AP ratio between the aforementioned low and high values (1:1 and 3:1 or 4:1) are considered to be uncertain with respect to acid generating potential.

4.1.1.1 Roberts Bay Mine Site

Waste rock samples were collected from the Roberts Bay mine site by a stratified sampling process to represent a total of 19 separate waste rock units (i.e. piles, areas, berms, etc.). Each waste rock unit for the Roberts Bay site is described in Table 1 and identified in Figure 3.

The content of sulphur occurring as sulphide in the Roberts Bay waste rock samples was less than 2.0% with only two samples (FB-S and NWRP-3) containing >1.0% sulphide-S. Eleven of the 22 samples (50%) contained less than 0.3% sulphur as sulphide indicating that waste rock represented by these samples does not likely contain sufficient sulphide-S to generate net acidity based on the BC guidelines (Price, 1997).

The NP:AP ratios for all waste rock at the Roberts Bay mine site were greater than 1:1 with only 3 of the 19 samples falling within the uncertain range. Sample FB-S (south half of the fuel bladder berm) contained the highest concentration of sulphide-S (1.81%) and had a NP:AP ratio of 2.3. Sample MYWR-1 (representing a small waste rock pile in the mine yard) contained 0.54% sulphide-S and had a NP:AP ratio of 2.0. Sample NWRP-2 (a waste rock pile at the north end of the site) contained 1.43% sulphide-S and had a NP:AP ratio of 3.1. The location for these waste rock units are identified in red on Figure 3. These results agree with those reported by Rescan (2003).

The volumes of waste rock at the Roberts Bay and the Ida Bay mine sites were estimated based on data collected during AMEC's site survey. Values are summarized in Appendix B. Based on the ABA results and the volume of waste rock at the Roberts Bay site associated with the three samples which may be acid generating, the volume of waste rock that may be net acid generating was approximately 182 m^3 or 6.4% of the total volume of waste rock at the Roberts Bay site.

The paste pH values for all the samples were well above 7.0 indicating that none of the samples are currently generating net acidity even though they have been exposed to atmospheric weathering for >30 years.

4.1.1.2 Ida Bay Mine Site

Waste rock samples were collected from the Ida Bay mine site represented 4 waste rock piles. Each waste rock pile is described in Table 2. Locations are identified in Figure 4.

The content of sulphur occurring as sulphide in the four Ida Bay waste rock samples was less than 1.0% with two of the piles represented by samples IBWR-1 and IBWR-3 containing less than 0.3% sulphur as sulphide. The two waste rock piles located furthest from the shore, represented by samples IBWR-2 and IBWR-4 contained 0.66% and 0.82% sulphide-S, respectively (Figure 4). The NP:AP ratios for the two waste rock samples containing >0.3% sulphide-S were 3.4 and 2.7, respectively indicating that the ability of these materials to

generate acidity was uncertain. The location for these waste rock units are identified in red on Figure 4. The paste pH values for all four waste rock samples from Ida Bay were >8.0 indicating that none of the samples are currently generating net acidity even though they have been exposed to weathering for more than three decades.

The location of the single grab sample from Ida Bay reported by Rescan (2003) corresponded to the location of IBWR-3 which was located near the shore. The results reported by Rescan (2003) indicated that the waste rock in this area was close to being acid generating (NP:AP = 1.1) while the results of the current study indicated that this material was non-acid generating. This apparent difference in results is interpreted as the difference in results between a grab sample (Rescan, 2003) and a composite sample.

Based on the ABA results and estimates for volume of waste rock at the Ida Bay mine site (Appendix B) associated with the samples which may be acid generating. The volume of waste rock at the Ida Bay site that may be acid generating was approximately 758 m^3 or 30% of the total volume of waste rock at the Ida Bay site.

4.1.2 Tailings

All tailings samples collected from the Roberts Bay mine site contained less than 0.3% sulphide-S with the exception of sample RBTP-09P. All tailings samples had NP:AP values >4.0 indicating that the tailings are non-acid generating. All samples had paste pH values >7.0. Sample RBTP-09P was unique in that it was collected from inside a 3 inch diameter pipe found at the site. The pipe is believed to be the delivery system for the tailings to the tailings pond and the material found in it could well represent the last tailings produced by the mill. The pipe also served to protect the inner tailings from weathering and comparison of the characteristics of this sample with the other tailings samples provides insight into the amount of weathering and leaching the tailings have undergone.

The content of sulphide-S and total sulphur in protected Sample RBTP-09P was 0.4% or nearly four times the content of sulphide-S in the other tailings samples (Table 4). The neutralization potential for all tailings samples was similar. The higher sulphide content of the protected sample indicates that sulphide oxidation has occurred within the tailings after delivery to the pond but that the neutralization potential of the tailings was sufficient to neutralize the acid. Consequently the tailings are net non-acid generating.

4.2 Content of Total Metals

The total concentration of major elements and elements of environmental interest in waste rock and tailings samples from the Roberts Bay and Ida Bay mine sites are shown in Table 5A. The total concentration of other elements in the same samples is shown in Table 5B. Values for average concentrations found in crustal rocks are provided for comparison. Elevated concentrations (≥10X background) of a given element within rock samples provided a method of screening to identify elements of potential environmental concern.

The concentration of major elements in the waste rock and tailings samples reflect the mineral composition of mafic and felsic rocks that dominate the local geology of the area.

The concentration of silver (Ag), arsenic (As), copper (Cu), Lead (Pb), zinc (Zn) and selenium (Se) in waste rock samples from both mine sites and the tailings were elevated relative to crustal abundances. Concentrations of antimony (Sb) was elevated in the Roberts Bay waste rock while cadmium (Cd), in all samples, and mercury (Hg) in some samples were elevated in the Ida bay waste rock. The Ida bay waste rock also contained higher concentrations of Cu, Pb, and Zn relative to the Roberts Bay waste rock. The concentration of nickel (Ni) was elevated in sample RBTP-09P (protected tailings sample) compared to background and the weathered tailings. The concentrations of all other elements measured in the waste rock and tailings samples (Table 5B) were similar to or less than average crustal abundances.

4.3 Shake Flask Tests

Results for the BC MEM shake flask extraction tests are present in Table 6. The test provides an index for the solubility and release of elements during the weathering of rock and/or tailings. The concentration of elements in the solutions extracted from the waste rock and tailings samples were compared to CCME guidelines (Canadian Council of Ministers of Environment - CCME, 2003) for fresh water and marine waters to be protective of aquatic life. It should be noted that all measured concentrations from this testing were within the Metal Mining Effluent Regulation (MMER) concentrations for discharge established under the Fisheries Act. Only the concentrations of arsenic, copper and nickel (one sample) exceeded the CCME guidelines. The largest exceedances where for the non-weathered tailings sample (sample RBTP-09P) and thus not expected to influence the environment. Values for As and Cu only slightly exceeded the CCME guidelines and it is expected that the potential for leaching can be effectively controlled through implementation of the selected remediation options.

4.4 Humidity Cell and Leach Column Tests

Based on previous geochemical analyses, ten samples of waste rock from the Roberts and Ida Bay sites were selected for humidity cell (five samples) and leaching column analyses (five samples), as listed in Table 7.

A summary of analytical data from the five humidity cells and five leach columns are given in Tables 8 and 9, respectively. A total of 7 to 9 leach samples were collected from each humidity cell and leach column during a period of 10 to 12 weeks. Samples were submitted for analysis on a weekly basis for the first four weeks, then biweekly for the remaining 6 to 8 weeks. Samples were analyzed for conductivity (E.C.), and concentration of mercury (Hg) for the first four weeks. All samples submitted for analyses during the 10 to 12 week period were analyzed of pH, acidity, alkalinity, concentration of sulphate and metals (Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, P, K, Se, Se, Ag, Na, Sr, Te, Tl, Th, Sn, Ti, U, V, Zn and Zr).

The pH values for all leach solutions from the humidity cells and leach columns were typically between 7.5 and 8.5 with alkalinity values higher than acidity values. The concentration of sulfate in all samples was less than 100 mg/L. The concentration of Sb, Be, Bi, B, Cd, Cr, Co, Fe, Hg, Ni, P, Se, Ag, Te, Tl, Th, Sn, Ti, V, and Zr were very close to or below detection limits for ICP-MS instrumentation. The concentration of elements of concern (As, Co, Cu, Pb, Ni, and Zn) in the humidity cell and leaching column leachates were far less than MMER values for discharge of these elements to the environment. The concentration of Al in initial leachate increments exceeded the CCME guideline of 0.100 mg/L in fresh water for protection of aquatic life, however, concentrations decreased to below 0.100 mg/L within the 10 week leaching

period. The concentration of Mo in all leachates was less than the CCME guideline of 0.073 mg/l in fresh water for protection of aquatic life. The concentrations of other elements measured in the leachates are not currently regulated by either MMER regulations or CCME guidelines. Based on these results, the generation of ARD or leaching of metals does not appear to be of concern for these waste rock materials.

4.5 Mine Water

The concentration of metals found in samples of mine water collected from the adits at the two mine sites and the tailings pond at the Roberts Bay mine site are summarized in Table 10. The measured concentrations of As, Cu, Pb, Ni, and Zn are much lower than the regulated discharge limits (MMER, 2003) that would prohibit the discharge of mine water to the environment. The pH values for the samples were also with the range (pH 6.0-9.5) allowed by the MMER regulations for discharge.

The concentration of most elements measured in the mine water samples were very similar to documented guideline values for fresh water required to maintain aquatic life (CCME, 2003) with the following exceptions. The elements As, Cd, Cr, Cu, Pb, Se and Zn exceeded the CCME guidelines for fresh water. The concentration of Cd in one of two duplicate samples from the Ida Bay adit exceeded CCME guidelines for marine water.

The concentration of Cr found within the mine water samples was inconsistent with other analytical findings. The concentration of total Cr in all mine water samples exceeded the CCME guideline for Cr as hexavalent chromium (Cr(VI) = 1.0 ug/L), but not as trivalent Cr (Cr(III) = 8.9). The concentration of total Cr in all waste rock samples was consistently less that background concentrations (see Table 5A) and Cr was not detected (MDL < 0.001 mg/L) in shake flask test extracts (see Table 6). Chromium was also not detected in previous studies of the site. Consequently the slightly elevated concentrations of Cr in the mine water samples are suspect, as the source of Cr in the water samples is unclear. A possible source may be related to preservatives in the wooden support structures used to construct the adits or possibly associated with paint or plastic used at the sites.

4.5.1 Tailings Pond and Sump

The concentrations of arsenic, copper and lead in the tailings pond water and the tailings pond sump were well below MMER guidelines for discharge standards but exceeded CCME guidelines for fresh water (Table 10). The concentration of As in the tailings pond and the sump exceeded the CCME guidelines for As (5.0 ug/L) by 3 to 5 times. The concentration of Cu in the tailings pond exceeded the upper CCME guideline of 4 ug/L and the concentration of Pb exceeded the upper limit of 7 ug/L. The concentration of Zn in the tailings sump was 221 ug/L, which was one order of magnitude higher than all other mine water samples and the CCME guidelines.

It should be noted here that the quality of mine water in general rarely compares with CCME guidelines which only apply within receiving waters. It is generally accepted that mine discharge undergoes dilution and elements are attenuated by contact with natural soils and sediments. This process is apparent as indicated by the low concentrations of metals and elements of interest in the water at the mouth of the stream downstream of the Roberts Bay mine site compared to concentrations in the mine water samples.

4.5.2 Roberts Bay Adit

The concentrations of all metals of concern (As, Cu, Pb, Ni, and Zn) in the water from the Roberts Bay adit were well below MMER guidelines for discharge standards (Table 10). The concentrations of cadmium and copper in water from the Roberts Bay adit exceeded the CCME guidelines for fresh water. The concentration of Cd was 0.7 ug/L compared to the CCME guideline of 0.017 ug/L and the concentration of Cu was 11.5 ug/L compared to the upper guideline of 4 ug/L for copper in fresh water.

4.5.3 Roberts Bay - North Pond

The north pond on the Roberts Bay mine site was located east of the unfinished waste rock road leading to Ida Bay. The concentrations of all metals of concern (As, Cu, Pb, Ni, and Zn) in the water from the sample were well below MMER guidelines for discharge standards. The concentration of As in the north pond was exceeded the CCME fresh water guidelines by four times and the concentration of Se exceeded the CCME guidelines by more than five times. The chemistry of this pond may have been influenced by its close proximity to the waste rock in the road however the concentrations of As and Se in the shake flask extracts for the road waste rock sample (IBARO-1) were at or below detection limits (Table 6). The concentrations of all other elements were similar or less than the CCME fresh water guideline values.

4.5.4 Ida Bay Adit

The concentrations of all metals of concern (As, Cu, Pb, Ni, and Zn) in the water from the Ida Bay adit were far less than MMER guidelines limits for discharge. The concentration of copper in water from the Ida Bay adit averaged 5.6 ug/L which slightly exceeded the upper CCME guideline limit of 4 ug/L. The concentration of lead (3 and 4.8 ug/L) in the adit water was within the range of 1 to 7 ug/L but exceeded the lower limits of the guideline. The guideline for lead is dependent on the hardness of the water which is expected to be on the order of 120-180 mg/L as $CaCO_3$ assuming the hardness is similar to other nearby water sources. Under these assumptions the concentration of Pb is expected to be similar to or less than the CCME guideline.

The concentration of Cd in one of the duplicate adit water samples was <0.1 ug/L while the other was 2.5 ug/L. The sample containing 2.5 ug/L total Cd exceeded CCME guidelines for both fresh water and marine water. The difference in concentrations between the duplicate samples was attributed to the presence of a small amount of particulate matter in the one sample. The concentration of aluminium in the same duplicate was also elevated relative to the other sample supporting the present of the particulate material in the sample. The total concentration of Cd in all waste rock samples from the Ida Bay mine site was elevated (Table 5A) relative to background yet the concentration of Cd in the shake flask extracts (Table 6) was less than detection limits (MDL <0.0002 ug/L). Consequently, although one sample of mine water contained elevated concentrations of Cd the value was attributed to the presence of suspended particulate in the samples. Consequently Cd is not expected to be soluble and thus not present in a bioavailabile form.

4.6 Vegetation

The concentration of metals in dry matter for a sample of cottongrass (*Eriophorum sp.*) at a mature growth stage found on the north edge of the Roberts Bay tailings pond is summarized in Table 11. The concentration of As, Cd, Cu, Pb, and Zn reported in tall cottongrass (Stoltz and

Greger, 2002) and ranges in concentrations reported in grasses to provide normal growth and to produce phytotoxic effects are provided for comparison. The concentrations of many elements measured in the cottongrass sample were in the excessive range or on the high end of the sufficient range compared to the data ranges for grasses reported by Kabata-Pendias and Pendias (1984). However the concentrations of As, Cd, Cu, Pb and Zn were less than the values reported for tall cottongrass. Based on this data it would appear the cottongrass species actively growing in the Roberts Bay tailings are able to accumulate and tolerate higher concentrations of these metals compared to most grasses, and able to derive sufficient nutrients from the tailings to thrive (see Figure 6).

Figure 6: Cottongrass (*Eriophorum sp.*) growing on the north side of the Roberts Bay tailings pond.

Table 3: ABA Results for Waste Rock Samples from Roberts Bay and Ida Bay Mine Sites.

Sample	Map Location	Paste pH	Total Sulphur (%)	Sulphate-S (%)	Sulphide-S[1] (%)	$CaCO_3$ Equiv. (kg $CaCO_3$/tonne)	AP[2] (kg $CaCO_3$/tonne)	NP (kg $CaCO_3$/tonne)	NNP (kg $CaCO_3$/tonne)	NP/AP
Roberts Bay										
OP-E	1	8.2	0.39	<0.01	0.39	63.0	12.2	59.5	47.3	4.9
OP-W	2	8.4	0.28	0.01	0.27	138	8.4	79.2	70.8	9.4
EM	3	8.2	0.46	<0.01	0.46	75.5	14.4	125	111	8.7
FB-S	4	8.0	1.81	<0.01	1.81	145	56.6	128	71.1	2.3
FB-N	5	8.2	0.44	<0.01	0.44	115	13.8	101	87.1	7.3
MYWR-1	6	8.2	0.54	<0.01	0.54	34.5	16.9	34.2	17.3	2.0
MYWR-2	7	8.3	0.22	<0.01	0.22	53.4	6.9	54.2	47.3	7.9
MYWR-3	8	8.3	0.25	<0.01	0.25	58.4	7.8	54.4	46.6	7.0
MYWR-4	9	8.4	0.19	<0.01	0.19	104	5.9	116	111	19.6
MYWR-5	10	8.2	0.64	<0.01	0.64	157	20.0	136	116	6.8
MYWR-6	11	8.2	0.33	<0.01	0.33	103	10.3	93.2	82.9	9.0
MYWR-7	12	8.4	0.38	<0.01	0.38	80.0	11.9	73.7	61.8	6.2
NWRP-1	13	8.4	0.18	<0.01	0.18	85.0	5.6	76.9	71.3	13.7
NWRP-2	14	8.1	1.43	<0.01	1.43	162	44.7	137	92.4	3.1
NWRP-3	15	8.2	0.23	<0.01	0.23	85.0	7.2	77.3	70.2	10.8
IBARO-1	16	8.5	0.16	<0.01	0.16	71.8	5.0	70.9	65.9	14.2
FOP-1	17	7.9	0.68	<0.01	0.68	114	21.3	108	87.2	5.1
LYWR-1	18	7.4	0.23	<0.01	0.23	53.0	7.2	54.4	47.2	7.6
WHWR-1	19	8.4	0.18	<0.01	0.18	83.4	5.6	77.7	72.0	13.8
SOWR-1	20	8.1	0.77	0.01	0.76	126	23.7	114	90.2	4.8
DWR-1	21	8.2	0.25	<0.01	0.25	144	7.8	124	116	15.9
TPWRB-1	22	8.3	0.17	<0.01	0.17	74.3	5.3	69.8	64.4	13.1
Rescan Data[3]										
RB WR	R4	8.0	0.10	0.01	0.08	80	3.1	81	77.9	26.1
RB WR	R5	8.4	0.49	0.01	0.37	100	15.3	150	135	9.8
RB WR	R6	7.3	1.43	<0.01	1.18	50	44.7	50	5.3	1.1
RB WR	R7	8.4	0.25	0.14	0.17	35	7.8	38	30.2	4.9
RB WR	R9	8.2	1.17	<0.01	0.95	14	36.6	22	-14.6	0.6
RB WR	R10	8.3	0.15	0.01	0.12	65	4.7	67	62.3	14.3
Ida Bay										
IBWR-1	A	8.6	0.17	<0.01	0.17	35.2	5.3	69.8	64.4	13.1
IBWR-2	B	8.2	0.66	<0.01	0.66	54.5	20.6	69.8	49.1	3.4
IBWR-3	C	8.6	0.25	<0.01	0.25	26.1	7.8	69.8	61.9	8.9
IBWR-4	D	8.1	0.82	<0.01	0.82	62.7	25.6	69.8	44.1	2.7
Rescan Data[3]										
Ida WR	R8	8.1	0.60	0.02	0.44	10	18.8	21	2.2	1.1

[1] Based on difference between total sulphur and sulphate-sulphur
[2] Maximum Potential Acidity based on sulphide-sulphur, NP method used: Modified ABA Method (Lawrence, 1989)
[3] Rescan Environmental Services Ltd. (Rescan) 2003. Page 4-4, Table 4.2-1

Table 4: ABA Results for Tailings Samples from the Robert's Bay Mine Site.

Sample	Map Location	Paste pH	Total Sulphur (%)	Sulphate-S (%)	Sulphide-S[1] (%)	$CaCO_3$ Equiv. (kg $CaCO_3$/tonne)	AP[2] (kg $CaCO_3$/tonne)	NP (kg $CaCO_3$/tonne)	NNP (kg $CaCO_3$/tonne)	NP/AP
Detection Limits		*0.1*	*0.02*	*0.01*						
RBTP-04	T1	7.6	0.17	0.01	0.16	79.3	5.0	78.8	73.8	15.8
RBTP-05	T2	7.9	0.19	0.01	0.18	62.5	5.6	60.3	54.6	10.7
RBTP-06	T3	8.2	0.05	<0.01	0.05	74.1	1.6	70.4	68.8	45.0
RBTP-07S	T4	7.6	0.15	<0.01	0.15	78.4	4.7	78.2	73.5	16.7
RBTP-08U	T5	7.7	0.14	0.01	0.13	55.2	4.0	55.7	51.7	13.8
RBTP-08L	T6	7.8	0.12	<0.01	0.12	53.6	3.8	44.1	40.3	11.7
RBTP-09P	T7	8.0	0.42	0.01	0.41	45.7	12.8	70.9	58.1	5.5
Rescan Data[3]										
RB Tailings	R1	7.2	0.16	0.12	0.12	53	5.0	41	36.0	8.2
RB Tailings	R2	8.2	0.05	0.03	0.04	64	1.6	66	64.4	41.3
RB Tailings	R3	7.4	0.05	0.03	0.04	44	1.6	61	59.4	38.1

[1] Based on difference between total sulphur and sulphate-sulphur
[2] Maximum Potential Acidity based on sulphide-sulphur, NP method used: Modified ABA Method (Lawrence, 1989)
[3] Rescan Environmental Services Ltd. (Rescan) 2003. Page 4-4, Table 4.2-1

Table 5A: Total concentration (mg/kg) of selected elements in samples of waste rock and tailings from the Roberts Bay and Ida Bay mine sites.

Sample	Map Location	Elements of Interest (mg/kg = ppm)																Major and Minor Elements (%)									
		Ag	Sb	As	Cd	Cu	Pb	Zn	B	Mo	Cr	Co	V	Ni	Sn	Se	Hg	Al	Fe	Ca	Mg	Na	K	P	Ti	S	Mn
Roberts Bay Waste Rock																											
OP-E	1	5.51	0.34	6.4	0.35	113	101	161	9	3.27	84.1	27.2	104	49.2	0.4	0.6	0.016	2.24	4.79	2.04	2.4	0.033	0.07	0.052	0.065	0.39	0.098
FB-S	4	1.56	0.38	40.3	0.04	711	7.45	34.5	3	3.55	46.7	33.3	56	20.5	0.1	0.6	0.006	1.20	4.59	3.01	2.02	0.008	0.06	0.064	0.009	1.72	0.114
FB-N	5	2.39	0.43	12.2	0.12	148	39.1	82.3	7	5.17	61.8	28.0	95	39.6	0.2	0.5	<0.005	2.31	5.21	3.06	2.52	0.019	0.07	0.077	0.029	0.49	0.111
MYWR-1	6	3.48	0.25	39.5	0.02	1435	13.6	64.8	5	14.0	50.9	42.7	51	23.4	0.5	1.0	0.015	2.75	4.75	0.92	2.92	0.027	0.04	0.076	0.013	0.45	0.058
MYWR-3	8	0.19	0.13	3.0	0.03	103	23.1	65.4	7	3.69	39.1	20.0	80	18.9	0.5	0.5	<0.005	2.46	5.07	1.66	2.43	0.025	0.08	0.101	0.039	0.21	0.073
MYWR-5	10	1.61	0.97	25.2	0.05	344	41.1	58.7	6	2.87	88.7	35.1	127	51.9	0.1	0.7	0.007	2.84	6.34	3.49	3.55	0.014	0.06	0.053	0.016	0.58	0.142
NWRP-2	14	0.66	0.92	29.7	0.17	150	154	108	6	3.12	81.2	41.9	154	52.0	0.2	1.8	<0.005	2.87	7.17	3.84	3.27	0.017	0.07	0.059	0.015	1.23	0.149
LYWR-1	18	36.9	1.72	13.5	0.43	131	328	181	11	2.84	73.2	25.0	98	49.9	0.4	0.3	0.064	2.30	5.02	2.19	1.91	0.039	0.08	0.066	0.083	0.16	0.097
SOWR-1	20	15.6	0.97	17.0	0.39	1568	178	183	7	1.90	67.3	37.9	103	47.6	0.2	0.6	0.021	2.20	5.26	3.47	2.53	0.016	0.08	0.072	0.036	0.63	0.122
DWR-1	21	0.29	0.27	11.1	0.05	120	11.7	75.2	9	13.4	75.8	32.4	132	50.2	0.2	0.4	<0.005	3.02	6.54	3.57	3.59	0.012	0.07	0.066	0.018	0.26	0.126
Roberts Bay Tailings																											
RBTP-04	T1	5.94	3.95	105	1.06	89.2	401	402	13	1.17	135	30.3	149	148.6	0.6	0.2	0.016	2.74	5.01	3.58	2.52	0.067	0.09	0.040	0.110	0.08	0.144
RBTP-05	T2	2.80	3.77	128	2.82	145	1030	846	10	1.15	96.1	25.2	104	176.7	0.4	0.4	0.007	1.80	3.40	2.62	1.80	0.031	0.05	0.031	0.069	0.11	0.132
RBTP-06	T3	8.11	1.25	61.8	0.16	56.0	79.2	99.4	11	0.77	65.8	20.6	95	116.4	0.3	0.1	0.023	1.97	3.67	3.02	1.86	0.019	0.05	0.057	0.071	0.01	0.092
RBTP-07S	T4	9.54	2.46	69.2	1.33	94.5	464	483	13	0.94	155	32.7	173	132.8	0.8	0.4	0.029	3.08	5.79	3.93	2.85	0.075	0.11	0.044	0.130	0.09	0.152
RBTP-08U	T5	1.91	2.40	47.6	1.00	101	394	362	11	0.74	86.2	21.9	105	104	0.3	0.2	0.013	1.91	3.65	2.45	1.94	0.028	0.05	0.042	0.073	0.08	0.105
RBTP-08L	T6	2.00	2.45	50.3	0.80	96.9	396	326	9	0.71	75.2	19.2	98	95.1	0.3	0.2	0.006	1.78	3.43	2.18	1.83	0.025	0.04	0.038	0.067	0.05	0.096
RBTP-09P	T7	18.6	146	3300	0.72	90.7	306	252	10	1.31	95.4	229	88	2898	0.4	0.1	0.099	1.69	3.42	1.97	1.69	0.028	0.05	0.041	0.040	0.10	0.080
Ida Bay Waste Rock																											
IBWR-1	A	6.95	0.09	1.2	3.74	323	809.7	1190	7	3.47	43.1	21.2	75	38.2	0.6	0.3	0.009	1.74	4.69	1.71	1.64	0.055	0.08	0.059	0.086	0.24	0.067
IBWR-2	B	63.9	0.16	12.2	4.45	279	806.1	1570	13	2.72	33.6	22.8	114	19.2	0.4	0.8	0.255	1.58	4.93	2.45	1.21	0.069	0.06	0.075	0.068	0.59	0.088
IBWR-3	C	1.42	<.02	0.90	1.29	71.6	257.2	528	7	2.43	32.8	18	81	6.7	0.3	0.3	<0.005	1.48	4.21	1.53	1.12	0.097	0.05	0.077	0.076	0.19	0.060
IBWR-4	D	>100	0.59	38.8	21.3	652	8660	6590	12	4.94	39.1	26.8	134	33.9	0.6	1.4	1.98	1.61	4.88	2.86	1.18	0.066	0.08	0.081	0.068	0.76	0.117
Background[1]		0.07	0.2	1.8	0.2	55	12.5	70	10	1.5	100	25	950	75	2.0	0.05	0.080	8.16	5.3	3.86	2.19	2.62	2.39	0.105	0.570	0.026	0.014

Notes:
[1] Average Crustal Abundance, (Bowen, 1979)

Table 5B: Total concentrations (mg/kg) of other elements in samples of waste rock and tailings from the Roberts Bay and Ida Bay mine sites.

Sample	Map Location	Other Elements (mg/kg = ppm)																									
		Au	Ba	Be	Bi	Ce	Cs	Ga	Ge	Hf	In	La	Li	Nb	Pd	Pt	Rb	Re	Sc	Sr	Ta	Te	Th	Tl	U	Y	W	Zr
Roberts Bay Waste Rock																												
OP-E	1	0.0098	204	0.3	0.18	16.3	0.3	9.6	0.1	0.1	0.04	7.2	68.4	0.05	<0.01	0.003	3.4	0.003	9.6	15.4	<0.05	0.03	0.9	0.03	0.3	11.23	<0.1	2.9
FB-S	4	0.0433	14.3	0.1	3.44	6.8	0.14	4.3	<.1	0.11	0.06	2.9	26.5	0.03	<0.01	<0.002	1.9	0.011	7.3	18.1	<0.05	0.93	0.4	0.02	2.9	6.37	<0.1	3.4
FB-N	5	0.0048	169	0.3	0.58	14	0.29	8.8	<.1	0.11	0.05	6.4	69.9	0.02	<0.01	0.004	2.6	0.008	10.3	24.2	<0.05	0.07	0.8	0.02	0.7	9.1	<0.1	3.2
MYWR-1	6	0.0062	18.2	0.6	98.53	22.7	0.17	15	0.1	0.15	0.14	9.1	93.5	0.05	<0.01	<0.002	1.5	0.007	8.3	5.9	<0.05	0.06	1.4	0.02	5.3	17.06	<0.1	5.8
MYWR-3	8	0.0041	227	0.5	0.27	22.9	0.27	11.5	0.1	0.12	0.05	8.9	64.1	0.07	<0.01	<0.002	2.7	0.014	9.6	11.5	<0.05	0.04	1.2	0.02	1.5	15.07	<0.1	3.4
MYWR-5	10	0.267	22.3	0.2	0.91	8.1	0.23	9.7	0.1	0.06	0.05	3.5	90.3	0.07	<0.01	0.006	2	0.005	14.5	16.8	<0.05	0.14	0.5	<0.02	0.9	6.97	<0.1	1.9
NWRP-2	14	0.015	35.0	0.3	0.43	12.6	0.33	10.1	0.1	0.08	0.05	5.7	105.8	0.04	0.012	0.005	2.5	0.008	16	27.4	<0.05	0.07	0.4	0.02	0.5	9.4	<0.1	3.1
LYWR-1	18	0.0075	355	0.2	0.41	15.8	0.45	9.6	0.1	0.14	0.04	7.2	52.4	0.05	<0.01	0.003	3.8	0.005	10.7	31.4	<0.05	0.02	0.8	0.02	0.4	7.53	<0.1	4.5
SOWR-1	20	0.425	170	0.2	1.95	18.1	0.65	7.5	0.1	0.16	0.07	8.8	62.5	0.02	<0.01	0.004	3.1	0.002	9.1	43.6	<0.05	0.43	0.6	0.03	0.7	7.36	<0.1	6.9
DWR-1	21	0.0023	35.8	0.4	0.58	12	0.28	11	0.1	0.07	0.06	5.2	87.9	0.03	<0.01	0.004	2.4	0.040	14.9	25.2	<0.05	0.03	0.5	<0.02	1.2	9.64	<0.1	2.3
Roberts Bay Tailings																												
RBTP-04	T1	0.0018	1450	0.4	0.16	13.6	0.33	8.7	0.1	0.13	0.04	6.9	74.1	0.03	0.013	0.007	4.2	0.005	12.8	49.8	<0.05	0.03	0.5	0.02	0.5	10.81	0.2	3.4
RBTP-05	T2	0.0008	606	0.2	0.17	11	0.26	5.9	0.1	0.09	0.03	5.4	59	0.02	<0.01	0.006	2.6	0.005	10.3	26	<0.05	0.02	0.2	0.02	0.3	9.22	<0.1	2
RBTP-06	T3	0.0012	482	0.2	0.07	13.2	0.45	7.2	0.1	0.11	0.02	6.5	55.3	0.04	<0.01	0..005	2.3	0.003	7.9	29.9	<0.05	<.02	0.6	<0.02	0.3	6.62	0.1	3.4
RBTP-07S	T4	0.0017	1420	0.5	0.16	14.5	0.38	10.5	0.1	0.15	0.04	7.8	78.3	0.03	<0.01	0.008	5.1	0.005	14.1	54.6	<0.05	0.04	0.5	0.03	0.8	11.89	0.2	4.5
RBTP-08U	T5	0.0013	734	0.2	0.1	11.8	0.28	6.2	0.1	0.09	0.02	5.9	57.2	0.09	<0.01	0.006	2.6	0.002	8.5	28.9	<0.05	0.02	0.4	0.02	0.4	7.91	0.2	2.4
RBTP-08L	T6	0.0011	510	0.2	0.07	10.8	0.27	5.8	0.1	0.07	0.03	5.6	54.4	0.04	<0.01	0.004	2.2	0.001	8.0	23.7	<0.05	<.02	0.4	0.02	0.2	7.16	0.1	2.2
RBTP-09P	T7	0.0006	460	0.2	0.19	10.8	0.28	5.5	0.1	0.1	0.02	5.4	46.5	0.02	<0.01	0.004	2	<0.001	6.5	27	<0.05	0.02	0.4	0.02	0.7	5.24	2.6	2.6
Ida Bay Waste Rock																												
IBWR-1	A	0.0107	53.5	0.3	0.07	18.4	0.37	8.8	0.1	0.08	0.06	8.6	30.7	0.07	<0.01	0.002	3	0.002	7.1	10.3	<0.05	0.14	1.0	0.03	0.1	14.57	<0.1	1.9
IBWR-2	B	0.0054	11.2	0.4	0.1	17.9	0.39	8.2	0.1	0.07	0.05	8.8	27.4	0.02	<0.01	<0.002	2.5	0.005	8.9	7.1	<0.05	0.1	0.6	0.06	0.1	15.42	<0.1	1.3
IBWR-3	C	0.0028	10.5	0.3	0.04	17.1	0.26	7.2	0.1	0.11	0.04	8.4	20.2	0.02	<0.01	<0.002	1.6	0.001	7.5	5.1	<0.05	0.04	0.9	0.03	0.1	11.99	<0.1	2
IBWR-4	D	0.0017	18.4	0.4	0.1	20.3	0.38	9.3	0.1	0.07	0.1	9.9	33.9	0.02	<0.01	<0.002	2.9	0.007	10.6	7.9	<0.05	0.19	0.7	0.08	0.1	17.14	<0.1	1.4
Background[1]		0.0002	425	2.8	0.17	60	3	15	1.5	3	0.1	30	20	20			90		22	375	2		9.6	0.45	2.7	33	1.5	165

Notes:
[1] Average Crustal Abundance, (Bowen, 1979)

Table 6: Concentration of elements in extracts from BC-MEM shake flask tests for selected samples.

Parameter	Units	Method	Detection Limit	OP-E	MYWR-2	FOP-1	WHWR-1	DWR-1	RBTP-09P	IBARO-1	IBWR-1	IBWR-3	Roberts L. Bkg[1]	CCME[2] (Fresh Water)	CCME[2] (Marine)
Map Location				1	7	17	19	21	T7	16	A	C			
pH	units	meter		8.8	9.0	8.8	8.85	8.84	8.54	9.1	9.15	9.28	6.9	6.5-9.0	7.0-8.7
EC	dS/m	meter		0.127	0.125	0.157	0.113	0.169	0.276	0.117	0.119	0.109	0.353		
Dissolved Metals															
Al	mg/L	ICP-MS	0.005	0.52	0.6	0.41	0.56	0.42	0.04	0.6	0.5	0.73	0.07	0.100	
Sb	mg/L	ICP-MS	0.001	0.002	0.003	0.005	0.003	0.002	2.33	0.002	0.001	< 0.001	0.0005		
As	mg/L	ICP-MS	0.001	0.006	0.011	0.016	0.002	0.002	15.7	0.001	0.006	0.002	<0.0004	0.005	0.0125
Ba	mg/L	ICP-MS	0.001	0.26	0.22	0.25	0.3	0.035	0.073	0.3	0.015	0.004	0.025		
Be	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0034		
Bi	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.0005		
B	mg/L	ICP-MS	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	<0.00005		
Cd	mg/L	ICP-MS	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	<0.0001	0.000017	0.00012
Ca	mg/L	ICP-MS	0.05	9.81	8.86	14.8	8.92	12.7	33.8	7.14	7.94	7.68			
Cr	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.0004	0.0089/0.056[3]	0.001/0.0015[3]
Co	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.0001		
Cu	mg/L	ICP-MS	0.001	< 0.001	< 0.001	0.003	< 0.001	< 0.001	0.003	< 0.001	< 0.001	< 0.001	0.0016	0.002	
Fe	mg/L	ICP-MS	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		0.3	
Pb	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.0001	0.001	
Li	mg/L	ICP-MS	0.001	0.004	0.002	0.007	0.002	0.005	0.005	0.001	0.002	0.002			
Mg	mg/L	ICP-MS	0.05	2.62	2.23	4.18	2.74	5.48	1.44	2.07	2.46	1.49			
Mn	mg/L	ICP-MS	0.001	0.002	0.001	0.002	< 0.001	0.001	0.004	< 0.001	< 0.001	0.002			
Mo	mg/L	ICP-MS	0.0005	0.0093	0.012	0.037	0.031	0.031	0.019	0.0015	0.0071	0.0029	0.0003	0.073	
Ni	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.087	< 0.001	< 0.001	< 0.001	0.0004	0.025	
PO_4	mg/L	ICP-MS	0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15			
K	mg/L	ICP-MS	0.1	5.0	5.6	4.0	4.3	6.8	7.2	2.5	3.7	2.3			
Se	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.0004	0.001	
SiO_2	mg/L	ICP-MS	0.25	4.0	4.2	3.2	3.0	3.3	5.8	3.8	4.4	4.9			
Ag	mg/L	ICP-MS	0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	<0.0002	0.0001	
Na	mg/L	ICP-MS	0.05	4.68	5.22	2.93	2.94	3.9	14.1	8.11	6.11	6.94			
Sr	mg/L	ICP-MS	0.001	0.038	0.04	0.037	0.047	0.035	0.058	0.054	0.015	0.01	0.0504		
Te	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001			
Tl	mg/L	ICP-MS	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.00005		
Th	mg/L	ICP-MS	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005			
Sn	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.0002		
Ti	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0005		
U	mg/L	ICP-MS	0.0005	< 0.0005	0.0008	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0001		
V	mg/L	ICP-MS	0.001	0.003	0.003	0.001	0.001	0.001	0.006	0.003	0.003	0.005	0.0005		
Zn	mg/L	ICP-MS	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.002	0.03	
Zr	mg/L	ICP-MS	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01			

Notes:
[1] Roberts Lake background, data courtesy of Earthtech Inc.
[2] Canadian Council of Ministers of the Environment (CCME) 2003.
[3] Values are for trivalent chromium (Cr(III)) and hexavalent chromium (Cr(VI)

Table 7: Waste rock samples selected for humidity cell and leaching column analyses.

Location	Humidity Cell Samples		Leach Column Samples
Roberts Bay	FB-S		MYWR-4 + MYWR-5 (50:50 Blend of 2 samples)
	MYWR-1		IBARO-1
	NWRP-2		MYWR-6
Ida Bay	IBWR-2		IBWR-1
	IBWR-4		IBWR-3

Table 8: Roberts Bay and Ida Bay Mines – Results of humidity cell tests.

HC # 1, Sample ID FB-S

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Hg ug/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Te mg/L	Tl mg/L	Th mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	605	7.91	120	15	< 1	18	0.100	-0.001	-0.001	0.007	-0.001	-0.001	-0.05	-0.0002	8.97	-0.001	-0.001	0.014	-0.05	-0.001	0.002	2.81	0.009	-0.02	0.0036	0.001	-0.15	3.1	-0.001	0.4	-0.00025	5.78	0.028	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0011	-0.001	-0.005	-0.01
16-Mar-06	2	500	385	7.60	168	39	2	15	0.089	0.001	-0.001	0.008	-0.001	-0.001	0.07	-0.0002	12.40	-0.001	-0.001	0.013	-0.05	-0.001	0.003	4.76	0.015	-0.02	0.0081	-0.001	-0.15	2.6	-0.001	0.6	-0.00025	5.10	0.032	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0087	-0.001	-0.005	-0.01
23-Mar-06	3	500	390	7.65	121	30	< 1	15	0.083	-0.001	0.001	0.007	-0.001	-0.001	-0.05	-0.0002	10.50	-0.001	-0.001	0.009	-0.05	-0.001	0.003	4.09	0.012	-0.02	0.0061	-0.001	-0.15	2.1	-0.001	0.5	-0.00025	2.90	0.024	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0077	-0.001	0.006	-0.01
30-Mar-06	4	500	400	8.11	83	25	< 1	13	0.086	-0.001	0.001	0.005	-0.001	-0.001	-0.05	-0.0002	7.79	-0.001	-0.001	0.011	-0.05	-0.001	0.003	3.50	0.009	-0.02	0.0044	-0.001	-0.15	1.5	-0.001	0.3	-0.00025	1.62	0.017	-0.001	0.0002	-0.0005	-0.001	-0.001	0.0088	-0.001	-0.005	-0.01
06-Apr-06	5	500	400																																									
13-Apr-06	6	500	425	7.82		45	2	14	0.051	-0.001	-0.001	0.007	-0.001	-0.001	-0.05	-0.0002	15.10	-0.001	-0.001	0.004	-0.05	-0.001	0.002	4.70	0.016		0.0036	-0.001	-0.15	1.4	-0.001	0.5	-0.00025	1.08	0.029	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.014	-0.001	0.007	-0.01
20-Apr-06	7	500	430																																								
27-Apr-06	8	500	430	8.13		43	< 1	14	0.041	-0.001	-0.001	0.005	-0.001	-0.001	-0.05	-0.0002	13.6	-0.001	-0.001	0.003	0.08	-0.001	0.002	4.45	0.01		0.0026	-0.001	-0.15	1.0	-0.001	0.4	-0.00025	0.49	0.021	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.012	-0.001	-0.005	-0.01
04-May-06	9	500	440																																								
11-May-06	10	500	425	7.72		39	1	12	0.028	-0.001	-0.001	0.006	-0.001	-0.001	-0.05	-0.0002	13.8	-0.001	-0.001	0.002	-0.05	-0.001	0.002	4.11	0.007		0.003	-0.001	-0.15	0.9	-0.001	0.5	-0.00025	0.33	0.021	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.012	-0.001	-0.005	-0.01

HC # 2, Sample ID MYWR-1

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Hg ug/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Te mg/L	Tl mg/L	Th mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	595	7.73	97	17	1	15	0.130	0.001	0.024	0.009	-0.001	-0.001	-0.05	-0.0002	7.20	-0.001	-0.001	0.009	-0.05	-0.001	0.004	2.30	0.005	-0.02	0.034	0.002	-0.15	1.7	0.001	0.50	-0.00025	5.69	0.017	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
16-Mar-06	2	500	500	7.94	203	48	1	20	0.099	0.003	0.038	0.016	-0.001	-0.001	0.06	-0.0002	14.50	-0.001	0.002	0.017	-0.05	-0.001	0.01	6.35	0.026	-0.02	0.066	-0.001	-0.15	2.3	0.002	1.10	-0.00025	5.85	0.031	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0058	-0.001	-0.005	-0.01
23-Mar-06	3	500	480	7.54	130	34	1	17	0.093	0.003	0.045	0.01	-0.001	-0.001	-0.05	-0.0002	11.60	-0.001	0.001	0.009	-0.05	-0.001	0.008	4.58	0.021	-0.02	0.047	-0.001	-0.15	1.6	0.002	0.80	-0.00025	2.92	0.021	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0030	-0.001	-0.005	-0.01
30-Mar-06	4	500	475	7.55	100	27	2	16	0.110	0.002	0.045	0.008	-0.001	-0.001	-0.05	-0.0002	9.50	-0.001	-0.001	0.009	-0.05	-0.001	0.008	3.69	0.017	-0.02	0.041	-0.001	-0.15	1.2	0.001	0.70	-0.00025	1.85	0.017	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0024	-0.001	-0.005	-0.01
06-Apr-06	5	500	465																																									
13-Apr-06	6	500	490	7.58		19	2	16	0.075	0.003	0.051	0.008	-0.001	-0.001	-0.05	-0.0002	9.15	-0.001	0.001	0.004	-0.05	-0.001	0.006	2.76	0.019		0.035	-0.001	-0.15	1.0	0.002	1.00	-0.00025	1.09	0.016	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0025	-0.001	-0.005	-0.01
20-Apr-06	7	500	480																																								
27-Apr-06	8	500	490	7.66		21	1	15	0.055	0.002	0.042	0.009	-0.001	-0.001	-0.05	-0.0002	8.69	-0.001	-0.001	0.003	-0.05	-0.001	0.006	2.84	0.019		0.027	-0.001	-0.15	0.8	-0.001	0.80	-0.00025	0.63	0.013	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0024	-0.001	-0.005	-0.01
04-May-06	9	500	490																																								
11-May-06	10	500	480	7.62		20	1	14	0.050	0.002	0.039	0.009	-0.001	-0.001	-0.05	-0.0002	8.99	-0.001	-0.001	0.003	-0.05	-0.001	0.005	2.64	0.012		0.026	-0.001	-0.15	0.7	-0.001	0.9	-0.00025	0.46	0.013	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0029	-0.001	-0.005	-0.01
18-May-06	11	500	470																																								
25-May-06	12	500	500	7.50		20	1	14	0.058	0.002	0.037	0.008	-0.001	-0.001	-0.05	-0.0002	9.46	-0.001	-0.001	0.002	-0.05	-0.001	0.005	2.71	0.012		0.023	-0.001	-0.15	0.6	0.001	0.7	-0.00025	0.32	0.012	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0027	-0.001	-0.005	-0.01
01-Jun-06	13	500	495																																								
08-Jun-06	14	500	485	7.65		18	1	14	0.062	0.001	0.032	0.008	-0.001	-0.001	-0.05	-0.0002	8.49	-0.001	-0.001	0.003	-0.05	-0.001	0.004	2.41	0.008		0.023	-0.001	-0.15	0.5	0.001	0.8	-0.00025	0.2	0.011	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0027	-0.001	-0.005	-0.01

HC # 3, Sample ID NWRP-2

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Hg ug/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Te mg/L	Tl mg/L	Th mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	600	8.16	312	82	< 1	20	0.079	0.002	0.003	0.012	-0.001	-0.001	0.09	-0.0002	22.40	-0.001	-0.001	0.007	-0.05	-0.001	0.009	5.60	0.009	-0.02	0.0048	0.002	-0.15	7.9	-0.001	0.5	-0.00025	17.1	0.120	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
16-Mar-06	2	500	420	8.23	283	72	< 1	20	0.096	0.002	0.005	0.01	-0.001	-0.001	0.14	-0.0002	18.80	-0.001	-0.001	0.010	-0.05	-0.001	0.01	6.89	0.013	-0.02	0.0082	-0.001	-0.15	6.7	-0.001	0.8	-0.00025	11.5	0.110	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0008	-0.001	-0.005	-0.01
23-Mar-06	3	500	405	8.57	161	43	#N/A	19	0.120	0.002	0.005	0.007	-0.001	-0.001	0.11	-0.0002	11.70	-0.001	-0.001	0.006	-0.05	-0.001	0.007	4.72	0.01	-0.02	0.0075	-0.001	-0.15	4.6	-0.001	0.6	-0.00025	6.74	0.062	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
30-Mar-06	4	500	415	8.30	117	29	#N/A	21	0.150	0.002	0.004	0.010	-0.001	-0.001	0.11	-0.0002	8.94	-0.001	-0.001	0.005	-0.05	-0.001	0.006	3.72	0.007	-0.02	0.0061	-0.001	-0.15	3.8	-0.001	0.5	-0.00025	4.54	0.049	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
06-Apr-06	5	500	400																																								
13-Apr-06	6	500	430	7.80		15	1	22	0.110	0.002	0.005	0.008	-0.001	-0.001	0.08	-0.0002	8.00	-0.001	-0.001	0.002	-0.05	-0.001	0.005	2.72	0.009		0.0055	-0.001	-0.15	2.8	-0.001	0.7	-0.00025	2.33	0.040	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
20-Apr-06	7	500	410																																								
27-Apr-06	8	500	410	7.85		12	1	20	0.100	0.001	0.004	0.006	-0.001	-0.001	0.05	-0.0002	6.53	-0.001	-0.001	0.002	-0.05	-0.001	0.004	2.49	0.009		0.0032	-0.001	-0.15	1.8	-0.001	0.5	-0.00025	1.11	0.029	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
04-May-06	9	500	415																																								
11-May-06	10	500	430	8.83		18	#N/A	20	0.071	0.001	0.004	0.009	-0.001	-0.001	0.05	-0.0002	8.23	-0.001	-0.001	0.001	-0.05	-0.001	0.005	3.16	0.008		0.004	-0.001	-0.15	2	-0.001	0.6	-0.00025	0.93	0.041	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01

HC # 4, Sample ID IBWR-2

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Hg ug/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Te mg/L	Tl mg/L	Th mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	615	8.43	122	26	#N/A	16	0.130	-0.001	-0.001	0.003	-0.001	-0.001	-0.05	-0.0002	11.20	-0.001	-0.001	0.005	-0.05	0.003	0.002	1.09	0.013	-0.02	0.0041	0.002	-0.15	2.0	-0.001	0.50	-0.00025	7.26	0.021	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
16-Mar-06	2	500	475	8.07	137	29	1	21	0.096	-0.001	-0.001	0.003	-0.001	-0.001	0.09	-0.0002	10.70	-0.001	-0.001	0.010	-0.05	0.006	0.004	1.60	0.026	-0.02	0.0047	-0.001	-0.15	2.4	-0.001	1.00	-0.00025	7.97	0.023	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
23-Mar-06	3	500	465	7.65	125	16	1	20	0.120	-0.001	-0.001	0.002	-0.001	-0.001	-0.05	-0.0002	8.46	-0.001	-0.001	0.006	-0.05	0.006	0.003	1.23	0.024	-0.02	0.0037	-0.001	-0.15	2.0	-0.001	0.90	-0.00025	4.69	0.017	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
30-Mar-06	4	500	435	7.84	120	13	4	17	0.110	-0.001	-0.001	0.002	-0.001	-0.001	-0.05	-0.0002	8.28	-0.001	-0.001	0.003	-0.05	0.006	0.003	1.09	0.025	-0.02	0.003	-0.001	-0.15	2.0	-0.001	0.95	-0.00025	2.75	0.022	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
06-Apr-06	5	500	440																																								
13-Apr-06	6	500	470	8.10		9	1	19	0.084	-0.001	-0.001	0.002	-0.001	-0.001	-0.05	-0.0002	8.04	-0.001	-0.001	0.002	-0.05	0.006	0.002	0.95	0.022		0.0026	-0.001	-0.15	1.5	-0.001	1.00	-0.00025	1.76	0.015	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
20-Apr-06	7	500	480																																								
27-Apr-06	8	500	475	7.73		8	1	18	0.067	-0.001	-0.001	0.001	-0.001	-0.001	-0.05	-0.0002	6.98	-0.001	-0.001	0.001	-0.05	0.005	0.002	0.8	0.02		0.0017	-0.001	-0.15	1.1	-0.001	0.8	-0.00025	0.95	0.011	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
04-May-06	9	500	445																																								
11-May-06	10	500	490	8.72		9	#N/A	18	0.056	-0.001	-0.001	0.002	-0.001	-0.001	-0.05	-0.0002	7.88	-0.001	-0.001	0.001	-0.05	0.005	0.002	0.83	0.016		0.0019	-0.001	-0.15	1.2	-0.001	0.9	-0.00025	0.75	0.013	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01

HC # 5, Sample ID IBWR-4

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Hg ug/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Te mg/L	Tl mg/L	Th mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	605	8.15	164	42	< 1	16	0.072	-0.001	0.001	0.008	-0.001	-0.001	-0.05	0.0003	17.4	-0.001	-0.001	0.006	-0.05	0.046	0.004	1.68	0.025	-0.02	0.0044	0.001	-0.15	2.3	-0.001	0.5	-0.00025	6.32	0.067	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.007	-0.01
16-Mar-06	2	500	500	8.29	201	50	< 1	20	0.048	-0.001	0.003	0.011	-0.001	-0.001	0.11	0.0006	18.8	-0.001	-0.001	0.01	-0.05	0.059	0.007	3.02	0.062	-0.02	0.0050	0.002	-0.15	3.1	-0.001	1.0	-0.00025	9.27	0.089	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.018	-0.01
23-Mar-06	3	500	490	7.80	117	27	1	19	0.053	-0.001	0.002	0.008	-0.001	-0.001	0.05	0.0004	12.6	-0.001	-0.001	0.005	-0.05	0.057	0.005	1.82	0.041	-0.02	0.0044	-0.001	-0.15	2.2	-0.001	1.0	-0.00025	4.29	0.063	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.011	-0.01
30-Mar-06	4	500	465	7.42	88	23	< 1	17	0.061	-0.001	0.001	0.006	-0.001	-0.001	-0.05	0.0003	10.3	-0.001	-0.001	0.004	-0.05	0.059	0.004	1.48	0.032	-0.02	0.0036	-0.001	-0.15	1.8	-0.001	0.8	-0.00025	2.69	0.06	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.007	-0.01
06-Apr-06	5	500	460																																								
13-Apr-06	6	500	500	7.99		17	1	18	0.030	-0.001	0.001	0.006	-0.001	-0.001	-0.05	0.0004	10.4	-0.001	-0.001	0.002	-0.05	0.049	0.003	1.08	0.039		0.0032	-0.001	-0.15	1.4	-0.001	1.0	-0.00025	1.27	0.061	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.013	-0.01
20-Apr-06	7	500	465																																								
27-Apr-06	8	500	440	7.58		14	1	15	0.026	-0.001	-0.001	0.004	-0.001	-0.001	-0.05	0.0003	8.4	-0.001	-0.001	0.001	-0.05	0.034	0.002	0.81	0.029		0.0022	-0.001	-0.15	1	-0.001	0.7	-0.00025	0.74	0.044	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.014	-0.01
04-May-06	9	500	495																																								
11-May-06	10	500	505	7.80		16	1	16	0.012	-0.001	-0.001	0.007	-0.001	-0.001	-0.05	0.0004	10.4	-0.001	-0.001	0.001	-0.05	0.05	0.002	0.89	0.045		0.0026	-0.001	-0.15	1.1	-0.001	0.9	-0.00025	0.62	0.07	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.016	-0.01
18-May-06	11	500	495																																								
25-May-06	12	500	500	8.10		16	1	16	0.026	-0.001	0.001	0.005	-0.001	-0.001	-0.05	0.0004	10.8	-0.001	-0.001	-0.001	-0.05	0.056	0.002	0.81	0.037		0.0028	-0.001	-0.15	1.0	-0.001	0.7	-0.00025	0.43	0.068	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.016	-0.01
01-Jun-06	13	500	495																																								

Note: Negative numbers indicate values less than detection limit

Table 9: Roberts Bay and Ida Bay Mines – Results of leaching column tests.

Roberts Bay and Ida Bay Mines - Leaching Columns

Column # 1, Sample ID MYWR-4 + MYWR-5 (50:50)

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al (mg/L)	Sb (mg/L)	As (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	B (mg/L)	Cd (mg/L)	Ca (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)	Pb (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Hg (mg/L)	Mo (mg/L)	Ni (mg/L)	P (mg/L)	K (mg/L)	Se (mg/L)	Si (mg/L)	Ag (mg/L)	Na (mg/L)	Sr (mg/L)	Te (mg/L)	Tl (mg/L)	Th (mg/L)	Sn (mg/L)	Ti (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Zr (mg/L)
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	625	8.24	461	82	< 1	97	0.130	0.005	0.009	0.035	-0.001	-0.001	0.32	-0.0002	31.10	-0.001	-0.001	0.011	-0.05	-0.001	0.014	20.60	0.011	-0.02	0.123	0.002	-0.15	11.4	0.001	2.3	-0.00025	38.90	0.082	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0170	0.001	-0.005	-0.01
16-Mar-06	2	500	475	8.26	221	19	< 1	75	0.150	0.005	0.010	0.023	-0.001	-0.001	0.16	-0.0002	16.50	-0.001	-0.001	0.004	-0.05	-0.001	0.009	9.55	0.007	-0.02	0.058	-0.001	-0.15	4.6	0.002	2.5	-0.00025	9.07	0.042	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0061	0.002	-0.005	-0.01
23-Mar-06	3	500	420	8.28	271	35	< 1	87	0.097	0.006	0.011	0.028	-0.001	-0.001	0.25	-0.0002	20.00	-0.001	-0.001	0.005	-0.05	-0.001	0.011	11.70	0.006	-0.02	0.057	-0.001	-0.15	4.9	0.001	2.8	-0.00025	11.80	0.052	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0150	0.002	-0.005	-0.01
30-Mar-06	4	500	405	8.08	340	83	1	70	0.090	0.004	0.009	0.031	-0.001	-0.001	0.21	-0.0002	27.70	-0.001	-0.001	0.004	-0.05	-0.001	0.013	15.30	0.005	-0.02	0.047	-0.001	-0.15	4.4	-0.001	2.5	-0.00025	8.79	0.069	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0500	-0.001	-0.005	-0.01
06-Apr-06	5	500	475																																									
13-Apr-06	6	500	455	8.23		76	<1	77	0.062	0.005	0.010	0.036	-0.001	-0.001	0.23	-0.0002	33.00	-0.001	-0.001	0.003	-0.05	-0.001	0.011	13.30	0.004		0.047	-0.001	-0.15	3.9	-0.001	2.8	-0.00025	5.98	0.074	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0600	0.002	-0.005	-0.01
20-Apr-06	7	500	470																																								
27-Apr-06	8	500	465	8.24		39	<1	70	0.065	0.003	0.01	0.023	-0.001	-0.001	0.15	-0.0002	23.2	-0.001	-0.001	0.002	-0.05	-0.001	0.008	9.27	0.002		0.023	-0.001	-0.15	2.7	-0.001	2.4	-0.00025	3.19	0.045	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.026	0.001	-0.005	-0.01
04-May-06	9	500	470																																								
11-May-06	10	500	450	8.20		65	<1	63	0.042	0.003	0.008	0.032	-0.001	-0.001	0.18	-0.0002	30.5	-0.001	-0.001	0.001	-0.05	-0.001	0.008	10.4	0.002		0.03	-0.001	-0.15	2.8	-0.001	2.4	-0.00025	3.3	0.061	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.051	0.001	-0.005	-0.01

Column # 2, Sample ID IBARO-1

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al (mg/L)	Sb (mg/L)	As (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	B (mg/L)	Cd (mg/L)	Ca (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)	Pb (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Hg (mg/L)	Mo (mg/L)	Ni (mg/L)	P (mg/L)	K (mg/L)	Se (mg/L)	Si (mg/L)	Ag (mg/L)	Na (mg/L)	Sr (mg/L)	Te (mg/L)	Tl (mg/L)	Th (mg/L)	Sn (mg/L)	Ti (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Zr (mg/L)
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	640	8.13	409	29	1	54	0.170	0.011	0.002	0.110	-0.001	-0.001	0.20	-0.0002	23.30	-0.001	-0.001	0.004	-0.05	-0.001	0.01	10.20	0.024	-0.02	0.0063	0.002	-0.15	10.7	-0.001	2.5	-0.00025	33.5	0.200	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0012	0.001	-0.005	-0.01
16-Mar-06	2	500	445	7.89	144	15	2	43	0.270	0.013	0.002	0.180	-0.001	-0.001	0.16	-0.0002	12.10	-0.001	-0.001	0.002	-0.05	-0.001	0.005	4.19	0.013	-0.02	0.0037	-0.001	-0.15	3.8	-0.001	2.5	-0.00025	6.64	0.120	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0011	0.003	-0.005	-0.01
23-Mar-06	3	500	420	8.08	186	18	< 1	63	0.160	0.017	0.002	0.140	-0.001	-0.001	0.40	-0.0002	15.60	-0.001	-0.001	0.004	-0.05	-0.001	0.008	5.94	0.018	-0.02	0.0047	-0.001	-0.15	4.2	0.001	3.0	-0.00025	9.77	0.150	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0026	0.003	-0.005	-0.01
30-Mar-06	4	500	455	8.32	132	15	#N/A	52	0.180	0.008	0.002	0.100	-0.001	-0.001	0.50	-0.0002	12.50	-0.001	-0.001	0.003	-0.05	-0.001	0.007	4.67	0.012	-0.02	0.0037	-0.001	-0.15	3.2	-0.001	3.2	-0.00025	7.08	0.120	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0032	0.003	-0.005	-0.01
06-Apr-06	5	500	490																																								
13-Apr-06	6	500	415	8.22		14	< 1	58	0.120	0.010	0.003	0.160	-0.001	-0.001	0.49	-0.0002	15.10	-0.001	-0.001	0.002	-0.05	-0.001	0.006	4.28	0.011		0.0039	-0.001	-0.15	2.9	0.001	3.8	-0.00025	5.73	0.150	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0065	0.004	0.007	-0.01
20-Apr-06	7	500	475																																								
27-Apr-06	8	500	450	8.23		10	<1	55	0.120	0.005	0.003	0.210	-0.001	-0.001	0.34	-0.0002	13.70	-0.001	-0.001	0.002	-0.05	-0.001	0.005	3.57	0.007		0.0019	-0.001	-0.15	2.0	-0.001	3.6	-0.00025	3.54	0.120	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0091	0.004	-0.005	-0.01
04-May-06	9	500	445																																								
11-May-06	10	500	420	8.17		13	<1	51	0.089	0.005	0.003	0.19	-0.001	-0.001	0.57	-0.0002	15.7	-0.001	-0.001	-0.001	-0.05	-0.001	0.005	3.49	0.004		0.0046	-0.001	-0.15	2.1	-0.001	4	-0.00025	4.92	0.14	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.015	0.004	-0.005	-0.01

Column # 3, Sample ID MYWR-6

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al (mg/L)	Sb (mg/L)	As (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	B (mg/L)	Cd (mg/L)	Ca (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)	Pb (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Hg (mg/L)	Mo (mg/L)	Ni (mg/L)	P (mg/L)	K (mg/L)	Se (mg/L)	Si (mg/L)	Ag (mg/L)	Na (mg/L)	Sr (mg/L)	Te (mg/L)	Tl (mg/L)	Th (mg/L)	Sn (mg/L)	Ti (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Zr (mg/L)
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	635	8.18	334	49	2	94	0.130	0.011	0.018	0.059	-0.001	-0.001	0.16	-0.0002	30.6	-0.001	-0.001	0.009	-0.05	-0.001	0.006	8.60	0.018	-0.02	0.0092	0.003	-0.15	6.7	-0.001	2.4	-0.00025	14.2	0.057	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0014	-0.001	-0.005	-0.01
16-Mar-06	2	500	485	8.25	209	17	< 1	71	0.140	0.009	0.017	0.084	-0.001	-0.001	0.09	-0.0002	21.8	-0.001	-0.001	0.003	-0.05	-0.001	0.006	6.10	0.017	-0.02	0.0035	0.001	-0.15	3.4	-0.001	2.6	-0.00025	2.95	0.056	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0013	0.001	-0.005	-0.01
23-Mar-06	3	500	440	8.34	295	44	#N/A	97	0.086	0.011	0.018	0.110	-0.001	-0.001	0.33	-0.0002	32.9	-0.001	-0.001	0.004	-0.05	-0.001	0.007	9.96	0.015	-0.02	0.0053	0.002	-0.15	4.0	-0.001	3.1	-0.00025	5.71	0.079	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0026	0.001	-0.005	-0.01
30-Mar-06	4	500	470	7.97	325	88	1	69	0.094	0.006	0.013	0.055	-0.001	-0.001	0.35	-0.0002	38.4	-0.001	-0.001	0.003	-0.05	-0.001	0.008	11.10	0.008	-0.02	0.0050	0.002	-0.15	3.2	-0.001	2.7	-0.00025	4.64	0.074	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0032	-0.001	-0.005	-0.01
06-Apr-06	5	500	430																																								
13-Apr-06	6	500	440	8.27		71	< 1	75	0.066	0.007	0.015	0.064	-0.001	-0.001	0.31	-0.0002	40.6	-0.001	-0.001	0.002	-0.05	-0.001	0.006	8.76	0.002		0.0057	0.002	-0.15	2.7	-0.001	2.9	-0.00025	3.54	0.072	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0031	0.001	-0.005	-0.01
20-Apr-06	7	500	465																																								
27-Apr-06	8	500	485	8.29		43	< 1	82	0.061	0.005	0.013	0.110	-0.001	-0.001	0.18	-0.0002	31.9	-0.001	-0.001	0.002	-0.05	-0.001	0.005	7.39	-0.001		0.0040	0.001	-0.15	2.0	-0.001	2.7	-0.00025	2.05	0.069	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0024	-0.001	-0.005	-0.01
04-May-06	9	500	450																																								
11-May-06	10	500	475	8.22		64	<1	71	0.045	0.006	0.011	0.091	-0.001	-0.001	0.35	-0.0002	38	-0.001	-0.001	0.001	-0.05	-0.001	0.005	7.84	0.002		0.0054	0.001	-0.15	2	-0.001	2.6	-0.00025	3.16	0.072	-0.001	-0.0001	-0.0005	-0.001	-0.001	0.0031	-0.001	-0.005	-0.01

Column #4, Sample ID IBWR-1

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al (mg/L)	Sb (mg/L)	As (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	B (mg/L)	Cd (mg/L)	Ca (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)	Pb (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Hg (mg/L)	Mo (mg/L)	Ni (mg/L)	P (mg/L)	K (mg/L)	Se (mg/L)	Si (mg/L)	Ag (mg/L)	Na (mg/L)	Sr (mg/L)	Te (mg/L)	Tl (mg/L)	Th (mg/L)	Sn (mg/L)	Ti (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Zr (mg/L)
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	660	8.13	236	22	1	71	0.220	0.006	0.001	0.007	-0.001	-0.001	0.24	-0.0002	8.77	0.001	-0.001	0.005	-0.05	-0.001	0.006	2.38	0.028	-0.02	0.0066	-0.001	-0.15	3.8	-0.001	2.7	-0.00025	29.40	0.053	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.003	-0.005	-0.01
16-Mar-06	2	500	465	8.00	151	10	2	50	0.210	0.006	0.001	0.012	-0.001	-0.001	0.24	-0.0002	11.10	-0.001	-0.001	0.002	-0.05	-0.001	0.005	2.48	0.052	-0.02	0.0041	-0.001	-0.15	2.6	-0.001	3.1	-0.00025	11.70	0.110	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.003	-0.005	-0.01
23-Mar-06	3	500	460	8.21	186	20	< 1	68	0.120	0.008	0.002	0.019	-0.001	-0.001	0.53	-0.0002	15.40	0.001	-0.001	0.003	-0.05	0.001	0.006	3.91	0.074	-0.02	0.0056	-0.001	-0.15	3.3	-0.001	3.8	-0.00025	15.70	0.160	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.002	-0.005	-0.01
30-Mar-06	4	500	445	8.13	141	22	< 1	44	0.190	0.003	0.001	0.010	-0.001	-0.001	0.47	-0.0002	12.60	-0.001	-0.001	0.003	-0.05	0.001	0.005	3.20	0.039	-0.02	0.0045	-0.001	-0.15	2.4	-0.001	3.0	-0.00025	9.55	0.120	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.002	-0.005	-0.01
06-Apr-06	5	500	430																																								
13-Apr-06	6	500	460	8.08		24	1	54	0.100	0.004	0.001	0.017	-0.001	-0.001	0.54	-0.0002	17.00	-0.001	-0.001	0.002	-0.05	0.001	0.004	3.15	0.041		0.0051	-0.001	-0.15	2.5	-0.001	3.8	-0.00025	7.62	0.170	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.002	-0.005	-0.01
20-Apr-06	7	500	475																																								
27-Apr-06	8	500	475	8.16		27	1	54	0.100	0.003	0.001	0.018	-0.001	-0.001	0.41	-0.0002	16.10	-0.001	-0.001	0.002	-0.05	-0.001	0.004	2.82	0.005		0.0032	-0.001	-0.15	2.3	-0.001	3.7	-0.00025	5.36	0.140	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.001	-0.005	-0.01
04-May-06	9	500	465																																								
11-May-06	10	500	440	8.10		27	1	47	0.076	0.003	0.001	0.023	-0.001	-0.001	0.61	-0.0002	20.2	-0.001	-0.001	0.001	-0.05	-0.001	0.004	2.83	0.005		0.0042	-0.001	-0.15	2.3	-0.001	3.9	-0.00025	5.9	0.17	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.002	-0.005	-0.01

Column #5, Sample ID IBWR-3

Date	Accum. Weeks	Volume (ml) Input	Volume (ml) Output	pH	Cond. (umhos/cm)	Sulphate (mg/L)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	Al (mg/L)	Sb (mg/L)	As (mg/L)	Ba (mg/L)	Be (mg/L)	Bi (mg/L)	B (mg/L)	Cd (mg/L)	Ca (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)	Pb (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Hg (mg/L)	Mo (mg/L)	Ni (mg/L)	P (mg/L)	K (mg/L)	Se (mg/L)	Si (mg/L)	Ag (mg/L)	Na (mg/L)	Sr (mg/L)	Te (mg/L)	Tl (mg/L)	Th (mg/L)	Sn (mg/L)	Ti (mg/L)	U (mg/L)	V (mg/L)	Zn (mg/L)	Zr (mg/L)
DL		5	5	0.01	1	1	1	1	0.005	0.001	0.001	0.001	0.001	0.001	0.05	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001	0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001	0.001	0.0001	0.0005	0.001	0.001	0.0005	0.001	0.005	0.01
09-Mar-06	1	750	670	8.06	191	19	1	48	0.200	0.007	0.002	0.007	-0.001	-0.001	0.24	-0.0002	9.83	-0.001	-0.001	0.005	-0.05	-0.001	0.006	2.78	0.009	-0.02	0.0099	0.001	-0.15	3.5	-0.001	3.0	0.00040	20.60	0.037	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.005	-0.005	-0.01
16-Mar-06	2	500	455	8.00	140	17	1	41	0.250	0.006	0.002	0.012	-0.001	-0.001	0.20	-0.0002	11.4	-0.001	-0.001	0.003	-0.05	-0.001	0.005	2.71	0.016	-0.02	0.0056	-0.001	-0.15	2.5	-0.001	3.2	-0.00025	7.69	0.047	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.004	-0.005	-0.01
23-Mar-06	3	500	440	8.22	224	34	< 1	59	0.120	0.007	0.002	0.021	-0.001	-0.001	0.55	-0.0002	19.8	-0.001	-0.001	0.003	-0.05	0.001	0.008	5.29	0.046	-0.02	0.0075	-0.001	-0.15	3.6	-0.001	3.9	-0.00025	11.60	0.080	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.002	-0.005	-0.01
30-Mar-06	4	500	415	7.97	177	41	2	41	0.150	0.002	-0.001	0.013	-0.001	-0.001	0.60	-0.0002	18.4	-0.001	-0.001	0.002	-0.05	0.003	0.008	4.55	0.031	-0.02	0.0058	-0.001	-0.15	2.7	-0.001	3.2	-0.00025	7.93	0.067	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
06-Apr-06	5	500	475																																								
13-Apr-06	6	500	440	8.02		39	1	49	0.084	0.003	0.001	0.016	-0.001	-0.001	0.59	-0.0002	21.2	-0.001	-0.001	0.001	-0.05	0.005	0.007	3.67	0.041		0.0061	-0.001	-0.15	2.5	-0.001	4.1	-0.00025	6.12	0.072	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.001	-0.005	-0.01
20-Apr-06	7	500	460																																								
27-Apr-06	8	500	495	8.05		17	1	47	0.076	0.002	0.001	0.015	-0.001	-0.001	0.41	-0.0002	18.7	-0.001	-0.001	0.002	-0.05	0.005	0.005	3	0.033		0.0049	-0.001	-0.15	2.1	-0.001	4.0	-0.00025	4.09	0.057	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	-0.005	-0.01
04-May-06	9	500	485																																								
11-May-06	10	500	400	8.15		55	1	47	0.032	0.002	-0.001	0.023	-0.001	-0.001	0.78	-0.0002	29.1	-0.001	-0.001	0.001	-0.05	0.007	0.006	3.71	0.039		0.0078	-0.001	-0.15	2.5	-0.001	4.5	-0.00025	6.52	0.084	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.013	-0.01
18-May-06	11	500	480																																								
25-May-06	12	500	475	8.12		27	1	47	0.056	0.001	0.001	0.014	-0.001	-0.001	0.38	-0.0002	22.5	-0.001	-0.001	0.001	-0.05	0.005	0.004	2.34	0.015		0.0046	-0.001	-0.15	1.8	-0.001	3.8	-0.00025	3.45	0.054	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	-0.001	0.008	-0.01
01-Jun-06	13	500	450																																								
08-Jun-06	14	500	470	8.11		9	1	31	0.097	-0.001	0.001	0.006	-0.001	-0.001	0.27	-0.0002	11.1	-0.001	-0.001	0.001	-0.05	0.005	0.002	1.01	0.005		0.0013	-0.001	-0.15	1.2	-0.001	3.4	-0.00025	2.62	0.025	-0.001	-0.0001	-0.0005	-0.001	-0.001	-0.0005	0.001	0.041	-0.01

Note: Negative numbers indicate values less than detection limit

Table 10: Concentration of metals in mine water samples from Roberts Bay and Ida Bay Mine Sites, collected August, 2005

Analytical Parameter	Units	MDL	Ida Bay			Roberts Bay				Traveler (Blank)	Stream[1] Mouth	Roberts[1] Lake (Bkg)	MMER[2]	CCME[3] Fresh Water	CCME[3] Marine	Reference Method
			Adit 1	Adit 1 (Dup)	Adit 2	Adit	North Pond	Tailings Pond	Tailings Sump							
Aluminum	µg/L (ppb)	5	< 5	< 5	24	< 5	< 5	136	< 50	< 5	220	500		5-100		APHA 3030E/3125B
Antimony	µg/L (ppb)	0.1	0.7	0.8	< 0.1	47.7	0.2	5.6	10.9	< 0.1	0.5	0.5				APHA 3030E/3125B
Arsenic	µg/L (ppb)	0.4	2.5	2.5	2.5	3.7	19.6	28.2	15.5	< 0.4	0.5	0.6	500	5.0	12.5	APHA 3030E/3125B
Barium	µg/L (ppb)	5	15	15	16	32	156	75	230	< 5	20.4	9.5				APHA 3030E/3125B
Beryllium	µg/L (ppb)	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 50.0	< 0.5	<1.0	<1.0				APHA 3030E/3125B
Boron	µg/L (ppb)	10	34	34	34	33	13	38	< 100	< 10	30	30				APHA 3030E/3125B
Cadmium	µg/L (ppb)	0.1	< 0.1	< 0.1	2.5	0.7	< 0.1	< 0.1	< 1.0	< 0.1	<0.2	<0.2		0.017	0.12	APHA 3030E/3125B
Calcium	mg/L (ppm)	0.20	39.9	40.6	41.1	50.7	238	56.6	110	< 0.20	22.4	6.3				APHA 3030E/3120
Chromium	µg/L (ppb)	0.9	2.1	2.3	2.6	4.6	6.7	4.7	< 9.0	0.9	<0.8	<0.8		1.0 Cr(VI) 8.9 Cr(III)	1.5 Cr(VI) 56 Cr(III)	APHA 3030E/3125B
Cobalt	µg/L (ppb)	0.1	0.1	0.1	0.3	0.2	0.4	0.3	2.1	< 0.1	<0.2	<0.2				APHA 3030E/3125B
Copper	µg/L (ppb)	1.0	5.1	5.2	6.1	11.5	1.4	8.7	122	< 1.0	4	3	300	2-4		APHA 3030E/3125B
Iron	mg/L (ppm)	0.01	0.05	0.05	0.08	0.12	0.46	0.26	0.26	< 0.01	0.210	0.063		300		APHA 3030E/3120
Lead	µg/L (ppb)	0.1	3	3	4.8	0.3	< 0.1	7.7	7.8	< 0.1	<0.1	0.1	200	1-7		APHA 3030E/3125B
Magnesium	mg/L (ppm)	0.50	31.1	31.7	32	19.2	127	15.6	22.3	< 0.50	11.,6	8.8				APHA 3030E/3120
Manganese	mg/L (ppm)	0.002	0.015	0.015	0.043	0.037	0.139	0.011	0.238	< 0.002	14	0.001				APHA 3030E/3120
Mercury (Total)	µg/L (ppb)	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				0.026	0.016	APHA 3112
Molybdenum	µg/L (ppb)	0.5	0.8	0.8	0.8	1.7	< 0.5	21.6	23.4	< 0.5	0.4	0.2		73		APHA 3030E/3125B
Nickel	µg/L (ppb)	0.6	2.1	2.6	2.9	3.1	12.4	7.2	17.8	< 0.6	1.7	0.9	500	25-150		APHA 3030E/3125B
Phosphorus	µg/L (ppb)	50	< 50	< 50	< 50	< 50	72	< 50	< 500	< 50						APHA 3030E/3125B
Potassium	mg/L (ppm)	0.5	5	5.2	5.2	3.7	12.2	4.3	13	< 0.5	2200	2300				APHA 3030E/3120
Selenium	µg/L (ppb)	0.8	< 0.8	< 0.8	< 0.8	< 0.8	5.5	< 0.8	< 8.0	< 0.8	0.8	1.1		1.0		APHA 3030E/3125B
Silicon	mg/L (ppm)	0.01	0.98	0.99	1.02	1.33	1.23	0.99	1.72	< 0.01						APHA 3030E/3120
Silver	µg/L (ppb)	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 2.0	< 0.2	<0.2	<0.2		0.1		APHA 3030E/3125B
Sodium	mg/L (ppm)	0.5	65.2	66.9	67.2	20.8	574	12.5	27.4	< 0.5	40	44				APHA 3030E/3120
Sulphur	mg/L (ppm)	0.1	11.2	11.4	11.4	6.8	9.5	20.3	88.2	< 0.1						APHA 3030E/3120
Thallium	µg/L (ppb)	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	<0.4	<0.1				APHA 3030E/3125B
Uranium	µg/L (ppb)	0.05	2.7	2.74	2.87	3.78	0.21	6.6	< 0.50	< 0.05	0.3	<0.1				APHA 3030E/3125B
Vanadium	µg/L (ppb)	0.1	0.8	0.8	1	1.4	1.6	1.8	2	0.2	0.4	0.8				APHA 3030E/3125B
Zinc	µg/L (ppb)	2	17	16	24	9	4	9	221	< 2	<4	<4	500	30		APHA 3030E/3125B
pH	units	0.1	7.7	7.7	7.5	7.2	7.8	8.1	na	na	7.7	6.9	6.0-9.5	6.5-9.0	7.0-8.7	

Notes:

[1] Data for mouth of the stream into Roberts Lake and Roberts Lake (Background) courtesy of EarthTech

[2] Metal Mining Effluent Regulations (MMER) 2002, Schedule 4.

[3] Canadian Council of Ministers of the Environment (CCME) 2003.

Table 11: Concentration of elements in dry matter for cottongrass (*Eriophorum sp.*) growing on the north edge of the Roberts Bay tailings pond.

Element	MDL (mg/kg)	RBTP-10V (mg/kg)	RBTP-10V Duplicate (mg/kg)	Tall Cottongrass[1] (mg/kg)	Sufficient[2] Normal Range (mg/kg)	Excessive[2] Toxic Range (mg/kg)	Method
Aluminum	1.0	122	218				EPA 3050B/6020
Arsenic	0.05	3.11	3.87	4.3	1-1.7	5-20	EPA 3050B/6020
Barium	1.0	55.2	73.8			500	EPA 3050B/6020
Cadmium	0.01	0.18	0.2	0.52	0.05-0.2	5-30	EPA 3050B/6020
Calcium	5	6390	12000				EPA 3050/6010
Chromium	0.05	6.99	7.3		0.1-0.5	5-30	EPA 3050B/6020
Cobalt	0.05	0.36	0.53		0.02-1.0	15-30	EPA 3050B/6020
Copper	0.01	9.62	7.73	20.9	5-30	20-100	EPA 3050B/6020
Iron	5	371	555				EPA 3050/6010
Lead	0.10	9.32	11.3	24.7	5-10	30-300	EPA 3050B/6020
Magnesium	1	862	1970				EPA 3050/6010
Manganese	0.10	298	496		20-300	300-500	EPA 3050/6010
Mercury	n/a	0.328	0.112			1-3	EPA 3050/6010
Molybdenum	0.2	6.1	4.5		0.2-1.0	10-50	EPA 3050B/6020
Nickel	0.10	4.13	5.62		0.1-5.0	10-100	EPA 3050B/6020
Phosphorus	n/a	1440	1510				EPA 3050B/6020
Potassium	1	12100	16000				EPA 3050/6010
Selenium	0.10	< 0.10	< 0.10		0.01-2.0	5-30	EPA 3050B/6020
Sodium	1	205	347				EPA 3050/6010
Thallium	0.05	< 0.05	< 0.05			20	EPA 3050B/6020
Vanadium	0.05	2.56	0.73		0.2-1.5	5-10	EPA 3050B/6020
Zinc	0.5	120	129	211	27-150	100-400	EPA 3050B/6020

Notes:
[1]Stoltz, and Greger, 2002,
[2]Kabata-Pendias, and Pendias, 1984

5.0 SUMMARY OF FINDINGS

Based on the analytical results presented above, the major findings of this work are as follows:

- The majority of the residual waste rock at the Roberts Bay mine site is net non-acid generating;
- Three waste rock piles/areas identified on the Roberts Bay mine site (represented by samples FB-S, MYWR-1 and NWRP-2) had NP:AP ratios between 4.0 and 1.0 indicating that the rock has uncertain acid generating potential based on the static testing conducted to date;
- The volume of waste rock that falls into the uncertain net acid generating classification at the Roberts Bay site was estimated as approximately 182 m^3 or 6.4% of the total volume of waste rock.
- The tailings at the Roberts Bay mine site are net non-acid generating;
- Two of four samples of waste rock from the Ida Bay mine site had NP:AP ratios between 4.0 and 1.0 indicating that they have uncertain acid generating potential based on the static testing conducted to date. The rock represented by these two samples is estimated at 758 m^3 or approximately 30% of the waste rock at the Ida Bay mine site;
- All waste rock and tailing samples at the Roberts Bays and Ida Bay mine sites has paste pH values greater than 7.0 indicating that none of the samples are currently generating net acidity even though they have been exposed to weathering for >30 years;
- The concentrations of Ag, Sb, As, Cu, Pb, Se, and Zn in most waste rock at the Roberts Bay mine site were elevated relative to average background concentrations;
- The total concentration of nickel in the Roberts Bay tailings was elevated relative to average crustal abundance, while concentrations in the waste rock was similar to background at both mine sites;
- The concentration of Cd and Hg were elevated in the Ida Bay waste rock, while concentrations were similar to background crustal abundance at the Roberts Bay site;
- The concentration of sulfate in all in leach solutions was less than 100 mg/L and the concentration of metals of concern (As, Co, Cu, Pb, Ni, and Zn) in leach solutions were much lower than MMER regulatory values for discharge of these elements to the environment;
- The concentration of metals of concern (As, Cu, Pb, Ni, and Zn) in mine water at the Roberts Bay and Ida Bay mine sites are much lower than MMER regulatory values and consequently treatment is not required before discharge to the environment;
- The concentration of most elements measured in the mine water samples were very low and similar to guideline values protective for fresh water aquatic life (CCME, 2003);
- The concentration of As in the Roberts Bay tailings pond and a large pond near the north road leading to Ida Bay was much lower than MMER discharge guidelines but slightly elevated compared to CCME guidelines for both fresh water and marine water;
- The concentration of Se in the north pond at Roberts Bay exceeded CCME guideline values for fresh water;
- The concentration of Zn in the tailings sump sample at the Roberts Bay site was below MMER guidelines for discharge but exceeded CCME guideline values for fresh water;

- Although the Ida Bay waste rock contained elevated concentrations of Cd relative to background, it likely occurs as insoluble suspended particulates and is not expected to elevate concentrations in solution; and
- Vegetation (cottongrass, *Eriophorum sp.*) found in a mature growth stage actively growing on the north edge of the tailings pond did not accumulate higher than normal concentrations of As, Cd, Cu, Pb or Zn in plant dry matter.

6.0 CLOSURE

The findings and recommendations presented in this report were based on the results of field and laboratory investigations, combined with an interpretation of test results from previous reports. If conditions are encountered that appear to be different from those shown and described in this report, or if the assumptions stated herein are not in keeping with the proposed project, this office should be notified in order that the recommendations can be reviewed and adjusted, if necessary. Soil conditions, by their nature, can be highly variable across a site. The placement or removal of fill material and other prior construction activities on a site can contribute to the variability, especially near surface. A contingency should always be included in any construction budget to allow for the possibility of variation in soil conditions, which may result in modification of the design and construction procedures. This report was prepared exclusively for Public Works and Government Services Canada and their agents, for the proposed remediation project as described in the report. The data and recommendations provided herein should not be used for any other purpose, or by any other parties, without review and advice from qualified engineering personnel. The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering principles and practice. No other warranty, expressed or implied, is given.

This report was prepared by Dr. Jim Warren, P.Geo. The site survey and preparation of map sheets was completed by Mr. Brent Campbell of AMEC Land Surveys Limited. Senior review was provided by Mr. Larry Connell. If you have any questions or comments regarding this work, please do not hesitate to contact the undersigned or Dr. Caius Priscu.

AMEC Earth & Environmental
a division of AMEC Americas Limited

C. James Warren, Ph.D. P.Ag. P.Geo. (ON)
Senior Geochemist
Mississauga, Ontario

Caius Priscu, Ph.D. P.Eng. (MB)
Senior Geotechnical Engineer and
Project Manager
Winnipeg, Manitoba

Reviewed by:

Larry Connell, P.Eng. (BC, YK, ON)
Senior Mining Environmental Consultant
Burnaby, British Columbia

7.0 REFERENCES

Bowen, H.J.M 1979. Environmental Chemistry of the Elements, Academic Press, London.

Canadian Council of Ministers of the Environment (CCME) 2003. Canadian Environmental Quality Guidelines. Summary Table, December, 2003.

Indian and Northern Affairs Canada (INAC) 1993. Guidelines for Acid Rock Drainage Prediction in the North. Indian and Northern Affairs Canada QS-8480-000-EF-A1.

Kabata-Pendias, A. Pendias, H. 1984. Trace elements in soils and plants. CRC Press, Baco Raton, Florida.

Metal Mining Effluent Regulations (MMER) 2002, Schedule 4, Authorized Limits of Deleterious Substances. Canada Gazette Part II, Vol. 136, No. 13. Pg.1428. SOR/DORS.2002-222.

Price, W.A. 1997. DRAFT Guidelines and recommended methods for the prediction of metal leaching and acid rock drainage at minesites in British Colombia. British Colombia Ministry of Employment and Investment, Energy and Minerals Division.

Rescan Environmental Services Ltd. (Rescan) 2003. Preliminary Assessment of Roberts Bay and Ida Bay Abandoned Mine Sites, Nunavut, Canada. Report prepared for Public Works and Government Services Canada, September 2003.

Stoltz, E. and Greger, M. 2002, Cottongrass effects on trace elements in submersed mine tailings. J. Environ. Qual. 31:1477-1483.

APPENDIX A

Certificates of Analyses

T: 604-224-4331 | F: 604-224-0540 | info@vizonscitec.com | www.vizonscitec.com
Vizon SciTec Inc. | 3650 Wesbrook Mall | Vancouver, BC | Canada V6S 2L2

VIZON SCITEC

Table 1: ABA Results for Robert's Bay Samples Received September 2005

Sample	Paste pH	CO2 (Wt.%)	CaCO3 Equiv. (Kg $CaCO_3$/T)	Total Sulphur (Wt.%)	Sulphate Sulphur (Wt.%)	Sulphide Sulphur* (Wt.%)	Max. Potential Acidity** (Kg $CaCO_3$/T)	Neutralization Potential (Kg $CaCO_3$/T)	Net Neutralization Potential (Kg $CaCO_3$/T)	Fizz
OP-E	8.2	2.77	63.0	0.39	<0.01	0.39	12.2	59.5	47.3	moderate
OP-W	8.4	6.09	138.4	0.28	0.01	0.27	8.4	**79.2**	70.8	moderate
EM	8.2	3.32	75.5	0.46	<0.01	0.46	14.4	125.4	111.0	moderate
FB-S	8.0	6.38	145.0	1.81	<0.01	1.81	56.6	**127.7**	71.1	moderate
FB-N	8.2	5.06	115.0	0.44	<0.01	0.44	13.8	100.9	87.1	moderate
MYWR-1	8.2	1.52	34.5	0.54	<0.01	0.54	16.9	34.2	17.3	none
MYWR-2	8.3	2.35	53.4	0.22	<0.01	0.22	6.9	54.2	47.3	moderate
MYWR-3	8.3	2.57	58.4	0.25	<0.01	0.25	7.8	54.4	46.6	moderate
MYWR-4	8.4	4.58	104.1	0.19	<0.01	0.19	5.9	116.5	110.6	moderate
MYWR-5	8.2	6.92	157.3	0.64	<0.01	0.64	20.0	**135.7**	115.7	moderate
MYWR-6	8.2	4.55	103.4	0.33	<0.01	0.33	10.3	93.2	82.9	moderate
MYWR-7	8.4	3.52	80.0	0.38	<0.01	0.38	11.9	73.7	61.8	moderate
NWRP-1	8.4	3.74	85.0	0.18	<0.01	0.18	5.6	76.9	71.3	none
NWRP-2	8.1	7.11	161.6	1.43	<0.01	1.43	44.7	137.1	92.4	moderate
NWRP-3	8.2	3.74	85.0	0.23	<0.01	0.23	7.2	77.3	70.2	none
IBARO-1	8.5	3.16	71.8	0.16	<0.01	0.16	5.0	70.9	65.9	moderate
FOP-1	7.9	5.02	114.1	0.68	<0.01	0.68	21.3	108.5	87.2	moderate
LYWR-1	7.4	2.33	53.0	0.23	<0.01	0.23	7.2	54.4	47.2	moderate
WHWR-1	8.4	3.67	83.4	0.18	<0.01	0.18	5.6	77.7	72.0	moderate
SOWR-1	8.1	5.54	125.9	0.77	0.01	0.76	23.7	113.9	90.2	moderate
DWR-1	8.2	6.34	144.1	0.25	<0.01	0.25	7.8	124.0	116.1	moderate
RBTP-04	7.6	3.49	79.3	0.17	0.01	0.16	5.0	78.8	73.8	moderate
RBTP-05	7.9	2.75	62.5	0.19	0.01	0.18	5.6	60.3	54.6	moderate
RBTP-06	8.2	3.26	74.1	0.05	<0.01	0.05	1.6	70.4	68.8	moderate
RBTP-07S	7.6	3.45	78.4	0.15	<0.01	0.15	4.7	78.2	73.5	moderate
RBTP-08U	7.7	2.43	55.2	0.14	0.01	0.13	4.0	55.7	51.7	moderate
RBTP-08L	7.8	2.36	53.6	0.12	<0.01	0.12	3.8	44.1	40.3	moderate
RBTP-09P	8.0	2.01	45.7	0.42	0.01	0.41	12.8	70.9	58.1	moderate
TPWRB-1	8.3	3.27	74.3	0.17	<0.01	0.17	5.3	69.8	64.4	moderate
IBWR-1	8.6	1.55	35.2	0.17	<0.01	0.17	5.3	69.8	64.4	moderate
IBWR-2	8.2	2.4	54.5	0.66	<0.01	0.66	20.6	69.8	49.1	moderate
IBWR-3	8.6	1.15	26.1	0.25	<0.01	0.25	7.8	69.8	61.9	moderate
IBWR-4	8.1	2.76	62.7	0.82	<0.01	0.82	25.6	69.8	44.1	moderate
Detection Limits	*0.1*	*0.01*		*0.02*	*0.01*					
Number	7160	7460	Calculation	7400	7410	Calculation	Calculation	7150	Calculation	7150

*Based on difference between total sulphur and sulphate-sulphur

**Based on sulphide-sulphur

NP method used: Modified ABA Method (Lawrence, 1989)

Tim O'Hearn, Lab Supervisor

Dec 6/05
Date

T: 604-224-4331 | F: 604-224-0540 | info@vizonscitec.com | www.vizonscitec.com
Vizon SciTec Inc. | 3650 Wesbrook Mall | Vancouver, BC | Canada V6S 2L2

VIZON SCITEC

Table 2a: QA/QC for NP Determination

Sample	Neutralisation Potential (kgCaCO3/Tonne)	Neutralisation Potential (kgCaCO3/Tonne)
Duplicates - NP		
MYWR-6	93.2	91.9
RBTP-04	78.8	77.4
IBWR-2	57.7	58.0
NBM-1 Reference (NP = 42)	42.0	41.3

Table 2b: QA/QC for Sulphur Speciation

Sample	Sulphur (Wt.%)	Sulphur (Wt.%)
Total Sulphur		
MYWR-5	0.64	0.60
SOWR-1	0.77	0.83
IBWR-1	0.82	0.84
Standard S.11% (0.11%)	0.11	0.12
Std. CSB (5.3% S)	5.36	5.36
Sulphate-sulphur		
MYWR-5	<0.01	<0.01
SOWR-1	0.01	0.01
IBWR-1	<0.01	<0.01
Vizon Ref. (0.27% SO4-S)	0.29	-

Table 2c: QA/QC for CO2 Determination

Sample	CO2 (Wt.%)	CO2 (Wt.%)
MYWR-5	6.92	6.88
SOWR-1	5.54	5.57
IBWR-1	2.76	2.83
Std. CSB (1.50% CO2)	1.49	1.49

Tim O'Hearn, Lab Supervisor

Dec 6/05
Date

T: 604-224-4331 | F: 604-224-0540 | info@vizonscitec.com | www.vizonscitec.com
Vizon SciTec Inc. | 3650 Wesbrook Mall | Vancouver, BC | Canada V6S 2L2

VIZON SCITEC

Table 3: Trace Metals by Aqua Regia Digestion for Robert's Bay Samples Received September, 2005

Sample	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm
OP-E	3.27	113	101	161	5505	49.2	27.2	982	4.79	6.4	0.3	9.8	0.9	15.4	0.35	0.34	0.18	104	2.04	0.05	7.2	84.1	2.4	204	0.07	9
FB-S	3.55	711	7.45	34.5	1564	20.5	33.3	1142	4.59	40.3	2.9	433	0.4	18.1	0.04	0.38	3.44	56	3.01	0.06	2.9	46.7	2.02	14.3	0.01	3
FB-N	5.17	148	39.1	82.3	2389	39.6	28	1108	5.21	12.2	0.7	48	0.8	24.2	0.12	0.43	0.58	95	3.06	0.08	6.4	61.8	2.52	169	0.03	7
MYWR-1	14	1435	13.6	64.8	3484	23.4	42.7	583	4.75	39.5	5.3	6.2	1.4	5.9	0.02	0.25	98.5	51	0.92	0.08	9.1	50.9	2.92	18.2	0.01	5
MYWR-3	3.69	103	23.1	65.4	192	18.9	20	730	5.07	3	1.5	4.1	1.2	11.5	0.03	0.13	0.27	80	1.66	0.1	8.9	39.1	2.43	227	0.04	7
MYWR-5	2.87	344	41.1	58.7	1608	51.9	35.1	1424	6.34	25.2	0.9	2666	0.5	16.8	0.05	0.97	0.91	127	3.49	0.05	3.5	88.7	3.55	22.3	0.02	6
NWRP-2	3.12	150	154	108	656	52	41.9	1491	7.17	29.7	0.5	15	0.4	27.4	0.17	0.92	0.43	154	3.84	0.06	5.7	81.2	3.27	35	0.02	6
LYWR-1	2.84	131	328	181	36901	49.9	25	973	5.02	13.5	0.4	7.5	0.8	31.4	0.43	1.72	0.41	98	2.19	0.07	7.2	73.2	1.91	355	0.08	11
SOWR-1	1.9	1568	178	183	15646	47.6	37.9	1215	5.26	17	0.7	425	0.6	43.6	0.39	0.97	1.95	103	3.47	0.07	8.8	67.3	2.53	170	0.04	7
DWR-1	13.4	120	11.7	75.2	290	50.2	32.4	1257	6.54	11.1	1.2	23	0.5	25.2	0.05	0.27	0.58	132	3.57	0.07	5.2	75.8	3.59	35.8	0.02	9
RBTP-04	1.17	89.2	401	402	5942	149	30.3	1445	5.01	105	0.5	1.8	0.5	49.8	1.06	3.95	0.16	149	3.58	0.04	6.9	135	2.52	1453	0.11	13
RBTP-05	1.15	145	1026	846	2799	177	25.2	1325	3.4	128	0.3	0.8	0.2	26	2.82	3.77	0.17	104	2.62	0.03	5.4	96.1	1.8	606	0.07	10
RBTP-06	0.77	56	79.2	99.4	8105	116	20.6	922	3.67	61.8	0.3	1.2	0.6	29.9	0.16	1.25	0.07	95	3.02	0.06	6.5	65.8	1.86	482	0.07	11
RBTP-07S	0.94	94.5	464	483	9537	133	32.7	1522	5.79	69.2	0.8	1.7	0.5	54.6	1.33	2.46	0.16	173	3.93	0.04	7.8	155	2.85	1417	0.13	13
RBTP-08U	0.74	100	394	362	1911	104	21.9	1051	3.65	47.6	0.4	1.3	0.4	28.9	1	2.4	0.1	105	2.45	0.04	5.9	86.2	1.94	734	0.07	11
RBTP-08L	0.71	96.9	396	326	2001	95.1	19.2	975	3.43	50.3	0.2	1.1	0.4	23.7	0.8	2.45	0.07	98	2.18	0.04	5.6	75.2	1.83	510	0.07	9
RBTP-09P	1.31	90.7	306	253	18589	2898	229	805	3.42	3305	0.7	0.6	0.4	27	0.72	146	0.19	88	1.97	0.04	5.4	95.4	1.69	460	0.04	10
IBWR-1	3.47	323	810	1194	6950	38.2	21.2	668	4.69	1.2	0.1	10.7	1	10.3	3.74	0.09	0.07	75	1.71	0.06	8.6	43.1	1.64	53.5	0.09	7
IBWR-2	2.72	279	806	1568	63919	19.2	22.8	878	4.93	12.2	0.1	5.4	0.6	7.1	4.45	0.16	0.1	114	2.45	0.08	8.8	33.6	1.21	11.2	0.07	13
IBWR-3	2.43	71.6	257	528	1420	6.7	18	602	4.21	0.9	0.1	2.8	0.9	5.1	1.29	<.02	0.04	81	1.53	0.08	8.4	32.8	1.12	10.5	0.08	7
IBWR-4	4.94	652	8664	6588	>100000	33.9	26.8	1167	4.88	38.8	0.1	1.7	0.7	7.9	21.3	0.59	0.1	134	2.86	0.08	9.9	39.1	1.18	18.4	0.07	12
QA/QC																										
RE DWR-1	14.3	124	12	69	279	53.1	35.8	1272	6.57	12	1.2	8	0.5	25.4	0.04	0.28	0.61	135	3.62	0.07	5.7	81.1	3.59	36	0.02	8
Percent Difference	-7.0	-3.4	-2.7	8.2	3.8	-5.8	-10.5	-1.2	-0.5	-8.1	0.0	65.2	0.0	-0.8	20.0	-3.7	-5.2	-2.3	-1.4	-3.0	-9.6	-7.0	0.0	-0.6	-11.1	11.1
RE IBWR-4	4.64	669	8887	6695	>100000	36.6	26.5	1175	4.91	39.9	0.1	1.6	0.7	8.2	21.8	0.61	0.1	135	2.89	0.08	10.3	37.8	1.19	19.5	0.07	13
Percent Difference	6.1	-2.7	-2.6	-1.6	-	-8.0	1.1	-0.7	-0.6	-2.8	0.0	5.9	0.0	-3.8	-2.4	-3.4	0.0	-0.7	-1.0	1.2	-4.0	3.3	-0.8	-6.0	1.5	-8.3
STANDARD DS6	11.4	121	28.8	141	293	24.7	10.2	701	2.79	19.1	6.4	46	3	39.6	6	3.46	4.9	56	0.85	0.08	13	191	0.57	140	0.07	16
True Value Std DS6	11.7	122	29	141	271	24.8	10.8	704	2.8	21.5	6.48	46.3	3	39.6	5.98	3.42	5.02	56	0.85	0.08	14.2	191	0.57	167	0.08	16.1
Percent Difference	-2.6	-0.5	-0.5	0.0	8.1	-0.4	-5.6	-0.4	-0.2	-11.2	-1.2	-0.6	0.0	0.0	0.3	1.2	-2.4	0.0	0.2	-1.3	-8.5	-0.1	0.0	-16.5	-8.6	-0.6
Method	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1
Detection Limits	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.1	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0	1	1	0.01	1	0	1

Tim O'Hearn, Lab Supervisor

DEC 6/05
Date

T: 604-224-4331 | F: 604-224-0540 | info@vizonscitec.com | www.vizonscitec.com
Vizon SciTec Inc. | 3650 Wesbrook Mall | Vancouver, BC | Canada V6S 2L2

VIZON SCITEC

Table 3: Trace Metals by Aqua Regia Digestion for Robert's Bay Samples Received September, 2005

Sample	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	Cs ppm	Ge ppm	Hf ppm	Nb ppm	Rb ppm	Sn ppm	Ta ppm	Zr ppm	Y ppm	Ce ppm	In ppm	Re ppb	Be ppm	Li ppm	Pd ppb	Pt ppb
OP-E	2.24	0.03	0.07	<.1	9.6	0.03	0.39	16	0.6	0.03	9.6	0.3	0.1	0.1	0.05	3.4	0.4	<.05	2.9	11.2	16.3	0.04	3	0.3	68.4	<10	3
FB-S	1.20	0.01	0.06	<.1	7.3	0.02	1.72	6	0.6	0.93	4.3	0.14	<.1	0.11	0.03	1.9	0.1	<.05	3.4	6.37	6.8	0.06	11	0.1	26.5	<10	<2
FB-N	2.31	0.02	0.07	<.1	10.3	0.02	0.49	<5	0.5	0.07	8.8	0.29	<.1	0.11	0.02	2.6	0.2	<.05	3.2	9.1	14	0.05	8	0.3	69.9	<10	4
MYWR-1	2.75	0.03	0.04	<.1	8.3	0.02	0.45	15	1	0.06	15	0.17	0.1	0.15	0.05	1.5	0.5	<.05	5.8	17.1	22.7	0.14	7	0.6	93.5	<10	<2
MYWR-3	2.46	0.03	0.08	<.1	9.6	0.02	0.21	<5	0.5	0.04	11.5	0.27	0.1	0.12	0.07	2.7	0.5	<.05	3.4	15.1	22.9	0.05	14	0.5	64.1	<10	<2
MYWR-5	2.84	0.01	0.06	<.1	14.5	<.02	0.58	7	0.7	0.14	9.7	0.23	0.1	0.06	0.07	2	0.1	<.05	1.9	6.97	8.1	0.05	5	0.2	90.3	<10	6
NWRP-2	2.87	0.02	0.07	<.1	16	0.02	1.23	<5	1.8	0.07	10.1	0.33	0.1	0.08	0.04	2.5	0.2	<.05	3.1	9.4	12.6	0.05	8	0.3	106	12	5
LYWR-1	2.30	0.04	0.08	<.1	10.7	0.02	0.16	64	0.3	0.02	9.6	0.45	0.1	0.14	0.05	3.8	0.4	<.05	4.5	7.53	15.8	0.04	5	0.2	52.4	<10	3
SOWR-1	2.20	0.02	0.08	<.1	9.1	0.03	0.63	21	0.6	0.43	7.5	0.65	0.1	0.16	0.02	3.1	0.2	<.05	6.9	7.36	18.1	0.07	2	0.2	62.5	<10	4
DWR-1	3.02	0.01	0.07	<.1	14.9	<.02	0.26	<5	0.4	0.03	11	0.28	0.1	0.07	0.03	2.4	0.2	<.05	2.3	9.64	12	0.06	40	0.4	87.9	<10	4
RBTP-04	2.74	0.07	0.09	0.2	12.8	0.02	0.08	16	0.2	0.03	8.7	0.33	0.1	0.13	0.03	4.2	0.6	<.05	3.4	10.8	13.6	0.04	5	0.4	74.1	13	7
RBTP-05	1.80	0.03	0.05	<.1	10.3	0.02	0.11	7	0.4	0.02	5.9	0.26	0.1	0.09	0.02	2.6	0.4	<.05	2	9.22	11	0.03	5	0.2	59	<10	6
RBTP-06	1.97	0.02	0.05	0.1	7.9	<.02	0.01	23	0.1	<.02	7.2	0.45	0.1	0.11	0.04	2.3	0.3	<.05	3.4	6.62	13.2	0.02	3	0.2	55.3	<10	5
RBTP-07S	3.08	0.08	0.11	0.2	14.1	0.03	0.09	29	0.4	0.04	10.5	0.38	0.1	0.15	0.03	5.1	0.8	<.05	4.5	11.9	14.5	0.04	5	0.5	78.3	<10	8
RBTP-08U	1.91	0.03	0.05	0.2	8.5	0.02	0.08	13	0.2	0.02	6.2	0.28	0.1	0.09	0.09	2.6	0.3	<.05	2.4	7.91	11.8	0.02	2	0.2	57.2	<10	6
RBTP-08L	1.78	0.03	0.04	0.1	8	0.02	0.05	6	0.2	<.02	5.8	0.27	0.1	0.07	0.04	2.2	0.3	<.05	2.2	7.16	10.8	0.03	1	0.2	54.4	<10	4
RBTP-09P	1.69	0.03	0.05	2.6	6.5	0.02	0.1	99	0.1	0.02	5.5	0.28	0.1	0.1	0.02	2	0.4	<.05	2.6	5.24	10.8	0.02	<1	0.2	46.5	<10	4
IBWR-1	1.74	0.06	0.08	<.1	7.1	0.03	0.24	9	0.3	0.14	8.8	0.37	0.1	0.08	0.07	3	0.6	<.05	1.9	14.6	18.4	0.06	2	0.3	30.7	<10	2
IBWR-2	1.58	0.07	0.06	<.1	8.9	0.06	0.59	255	0.8	0.1	8.2	0.39	0.1	0.07	0.02	2.5	0.4	<.05	1.3	15.4	17.9	0.05	5	0.4	27.4	<10	<2
IBWR-3	1.48	0.1	0.05	<.1	7.5	0.03	0.19	<5	0.3	0.04	7.2	0.26	0.1	0.11	0.02	1.6	0.3	<.05	2	12	17.1	0.04	1	0.3	20.2	<10	<2
IBWR-4	1.61	0.07	0.08	<.1	10.6	0.08	0.76	1980	1.4	0.19	9.3	0.38	0.1	0.07	0.02	2.9	0.6	<.05	1.4	17.1	20.3	0.1	7	0.4	33.9	<10	<2
QA/QC																											
RE DWR-1	3.04	0.01	0.07	<.1	15.8	<.02	0.27	<5	0.4	0.06	11.5	0.29	0.1	0.09	0.02	2.3	0.2	<.05	2.4	9.62	12.4	0.06	29	0.3	86.4	<10	4
Percent Difference	-0.7	0.0	0.0	-	-6.0	-	-3.8	-	0.0	-100	-4.5	-3.6	0.0	-28.6	33.3	4.2	0.0	-	-4.3	0.2	-3.3	0.0	27.5	25.0	1.7	-	0.0
RE IBWR-4	1.62	0.06	0.08	0.1	11	0.09	0.75	1386	1.5	0.16	9.1	0.4	0.1	0.08	<.02	2.9	0.6	<.05	1.3	16.7	20.7	0.11	11	0.3	33.6	<10	<2
Percent Difference	-0.6	3.0	0.0	-	-3.8	-12.5	1.3	30.0	-7.1	15.8	2.2	-5.3	0.0	-14.3	-	0.0	0.0	0.0	7.1	2.5	-2.0	-10.0	-57.1	25.0	0.9	0.0	0.0
STANDARD DS6	1.88	0.07	0.16	3.1	3.2	1.7	0.02	226	4.3	2.25	6.5	5.61	<.1	0.04	1.53	14.1	5.8	<.05	3.3	6.84	28	1.86	1	2.4	16.3	175	42
True Value Std DS6	1.89	0.07	0.15	3.33	3.3	1.69	0.04	231	4.3	2.24	6.2	5.51	0.1	0.05	1.58	14.1	5.8	<0.02	3.4	7.05	27.4	1.88	1	2.4	16.3	169	37
Percent Difference	-0.5	2.8	7.4	-6.9	-3.0	0.6	-50.0	-2.2	0.0	0.4	4.8	1.8	-	-20.0	-3.2	0.0	0.0	-	-2.9	-3.0	2.3	-1.1	0.0	0.0	0.0	3.6	13.5
Method	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1	1F1
Detection Limits	0.01	0	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.1	0.02	0.1	0.02	0.02	0.1	0.1	0.05	0.1	0.01	0.1	1	1	0.1	0.1	10	2

T: 604-224-4331 | F: 604-224-0540 | info@vizonscitec.com | www.vizonscitec.com
Vizon SciTec Inc. | 3650 Wesbrook Mall | Vancouver, BC | Canada V6S 2L2

VIZON SCITEC

Table 4: Results of BCMEM Shakeflask (250g sample to 750mL DI water) on Robert's Bay Samples Received September, 2005

Parameter	Units	Method	Detection	OP-E	MYWR-2	IBARO-1	FOP-1	WHWR-1	DWR-1	RBTP-09P	IBWR-1	IBWR-3
pH		meter		8.8	9.0	9.1	8.8	8.85	8.84	8.54	9.15	9.28
EC	uhmos/cm	meter		127.0	125.0	117.0	157.0	113	169	276	119	109
Dissolved Metals												
Al	mg/L	ICP-MS	0.005	0.52	0.6	0.6	0.41	0.56	0.42	0.04	0.5	0.73
Sb	mg/L	ICP-MS	0.001	0.002	0.003	0.002	0.005	0.003	0.002	2.33	0.001	< 0.001
As	mg/L	ICP-MS	0.001	0.006	0.011	0.001	0.016	0.002	0.002	15.7	0.006	0.002
Ba	mg/L	ICP-MS	0.001	0.26	0.22	0.3	0.25	0.3	0.035	0.073	0.015	0.004
Be	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bi	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
B	mg/L	ICP-MS	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05
Cd	mg/L	ICP-MS	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Ca	mg/L	ICP-MS	0.05	9.81	8.86	7.14	14.8	8.92	12.7	33.8	7.94	7.68
Cr	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Co	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cu	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	0.003	< 0.001	< 0.001	0.003	< 0.001	< 0.001
Fe	mg/L	ICP-MS	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pb	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Li	mg/L	ICP-MS	0.001	0.004	0.002	0.001	0.007	0.002	0.005	0.005	0.002	0.002
Mg	mg/L	ICP-MS	0.05	2.62	2.23	2.07	4.18	2.74	5.48	1.44	2.46	1.49
Mn	mg/L	ICP-MS	0.001	0.002	0.001	< 0.001	0.002	< 0.001	0.001	0.004	< 0.001	0.002
Mo	mg/L	ICP-MS	0.0005	0.0093	0.012	0.0015	0.037	0.031	0.031	0.019	0.0071	0.0029
Ni	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.087	< 0.001	< 0.001
PO4	mg/L	ICP-MS	0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
K	mg/L	ICP-MS	0.1	5.0	5.6	2.5	4.0	4.3	6.8	7.2	3.7	2.3
Se	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
SiO2	mg/L	ICP-MS	0.25	4.0	4.2	3.8	3.2	3.0	3.3	5.8	4.4	4.9
Ag	mg/L	ICP-MS	0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025
Na	mg/L	ICP-MS	0.05	4.68	5.22	8.11	2.93	2.94	3.9	14.1	6.11	6.94
Sr	mg/L	ICP-MS	0.001	0.038	0.04	0.054	0.037	0.047	0.035	0.058	0.015	0.01
Te	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Tl	mg/L	ICP-MS	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Th	mg/L	ICP-MS	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Sn	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ti	mg/L	ICP-MS	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
U	mg/L	ICP-MS	0.0005	< 0.0005	0.0008	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
V	mg/L	ICP-MS	0.001	0.003	0.003	0.003	0.001	0.001	0.001	0.006	0.003	0.005
Zn	mg/L	ICP-MS	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Zr	mg/L	ICP-MS	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Tim O'Hearn, Lab Supervisor

DEC 6/05
Date

amec

EARTH & ENVIRONMENTAL

Chain of Custody Record/Analysis Request

Tracking #:			
ISSUING OFFICE:	Mississauga AMEC E&E		
Project Name:	Roberts Ida Bay Closure Plan	**Job No.:**	WX15131
Project Manager:	Caius Priscu	**Phone No.:**	204-488-2997
Sampler:	Jim Warren 905-568-2929 x4356		

ANALYSIS REQUIRED (Note preferred method)

QUOTED PRICE

☐ YES

Please attach a copy of the quote

☒ NO

Quote #:

Client Sample ID	AMEC E & E Lab Sample ID FOR LAB USE ONLY	Date Collected yyyy/mm/dd	Matrix	1L Bottle	250 mL Jar	40 mL Vial	1L Polyethylene	50 ml polyethylene			Metals via ICP/MS plus sulphur	Filter with 45 um filter										50% RUSH (Please Notify Lab!)	100% RUSH (Please Notify Lab!)
Ida Bay Adit 1		2005/08/19	water		X						X												
Ida Bay Adit 2		2005/08/19	water		X						X												
Roberts Tailing Pond		2005/08/21	water		X						X												
Roberts Lake Adit		2005/08/21	water		X						X												
Traveller		2005/08/21	water		X						X												
North Pond 008		2005/08/21	water		X						X												
Roberts Bay Tails Sump		2005/08/22	water					X			X	X											

Receiver's Comments

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	Comments:
Signature:	Signature:	Signature:	Signature:	
Printed Name: Jim Warren	Printed Name:	Printed Name:	Printed Name:	
Firm: Mississauga AMEC E&E	Firm:	Firm:	Firm:	
Date/Time: 15-Sep-05	Date/Time:	Date/Time:	Date/Time:	

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

amec

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Date Received: 2005/09/16
Date Sampled: 2005/08/19
Report Date: 2005/09/28

Water Analysis - Total Metals - ICP/MS

Attention: Priscu, Caius

Project No. WX15131

File No.: EC-49432

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	05-8922 Ida Bay Adit 1	05-8922-D Ida Bay Adit 1 Duplicate	05-8923 Ida Bay Adit 2	05-8924 Roberts Tailing Pond	05-8925 Roberts Lake Adit
JD	2005/09/22	Aluminum	µg/L (ppb)	APHA 3030E/3125B	5	< 5	< 5	24	136	< 5
JD	2005/09/22	Antimony	µg/L (ppb)	APHA 3030E/3125B	0.1	0.7	0.8	< 0.1	5.6	47.7
JD	2005/09/22	Arsenic	µg/L (ppb)	APHA 3030E/3125B	0.4	2.5	2.5	2.5	28.2	3.7
JD	2005/09/22	Barium	µg/L (ppb)	APHA 3030E/3125B	5	15	15	16	75	32
JD	2005/09/22	Beryllium	µg/L (ppb)	APHA 3030E/3125B	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
JD	2005/09/22	Boron	µg/L (ppb)	APHA 3030E/3125B	10	34	34	34	38	33
JD	2005/09/22	Cadmium	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	< 0.1	2.5	< 0.1	0.7
JD	2005/09/22	Chromium	µg/L (ppb)	APHA 3030E/3125B	0.9	2.1	2.3	2.6	4.7	4.6
JD	2005/09/22	Cobalt	µg/L (ppb)	APHA 3030E/3125B	0.1	0.1	0.1	0.3	0.3	0.2
JD	2005/09/22	Copper	µg/L (ppb)	APHA 3030E/3125B	1.0	5.1	5.2	6.1	8.7	11.5
JD	2005/09/22	Lead	µg/L (ppb)	APHA 3030E/3125B	0.1	3.0	3.0	4.8	7.7	0.3
JD	2005/09/21	Mercury (Total)	µg/L (ppb)	APHA 3112	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
JD	2005/09/22	Molybdenum	µg/L (ppb)	APHA 3030E/3125B	0.5	0.8	0.8	0.8	21.6	1.7
JD	2005/09/22	Nickel	µg/L (ppb)	APHA 3030E/3125B	0.6	2.1	2.6	2.9	7.2	3.1
JD	2005/09/22	Phosphorus	µg/L (ppb)	APHA 3030E/3125B	50	< 50	< 50	< 50	< 50	< 50
JD	2005/09/22	Selenium	µg/L (ppb)	APHA 3030E/3125B	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
JD	2005/09/22	Silver	µg/L (ppb)	APHA 3030E/3125B	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
JD	2005/09/22	Thallium	µg/L (ppb)	APHA 3030E/3125B	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
JD	2005/09/22	Uranium	µg/L (ppb)	APHA 3030E/3125B	0.05	2.70	2.74	2.87	6.60	3.78
JD	2005/09/22	Vanadium	µg/L (ppb)	APHA 3030E/3125B	0.1	0.8	0.8	1.0	1.8	1.4
JD	2005/09/22	Zinc	µg/L (ppb)	APHA 3030E/3125B	2	17	16	24	9	9

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit
Note: Sample 05-9175 had very low volume. Sample was diluted by a factor of 10, filtered and analyzed for dissolved metals as per client's request. Detection limits were adjusted accordingly for those elements that were undected.

Report reviewed by:

for Brenda Chomin

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

amec

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Date Received: 2005/09/16
Date Sampled: 2005/08/19
Report Date: 2005/09/28

Water Analysis - Total Metals - ICP/MS

Attention: Priscu, Caius

Project No. WX15131

File No.: EC-49432

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	05-8926 Traveller	05-8927 North Pond 008	05-9175 Roberts Bay Tails Sump
JD	2005/09/22	Aluminum	µg/L (ppb)	APHA 3030E/3125B	5	< 5	< 5	< 50
JD	2005/09/22	Antimony	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	0.2	10.9
JD	2005/09/22	Arsenic	µg/L (ppb)	APHA 3030E/3125B	0.4	< 0.4	19.6	15.5
JD	2005/09/22	Barium	µg/L (ppb)	APHA 3030E/3125B	5	< 5	156	230
JD	2005/09/22	Beryllium	µg/L (ppb)	APHA 3030E/3125B	0.5	< 0.5	< 0.5	< 50.0
JD	2005/09/22	Boron	µg/L (ppb)	APHA 3030E/3125B	10	< 10	13	< 100
JD	2005/09/22	Cadmium	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	< 0.1	< 1.0
JD	2005/09/22	Chromium	µg/L (ppb)	APHA 3030E/3125B	0.9	0.9	6.7	< 9.0
JD	2005/09/22	Cobalt	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	0.4	2.1
JD	2005/09/22	Copper	µg/L (ppb)	APHA 3030E/3125B	1.0	< 1.0	1.4	122
JD	2005/09/22	Lead	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	< 0.1	7.8
JD	2005/09/21	Mercury (Total)	µg/L (ppb)	APHA 3112	0.1	< 0.1	< 0.1	< 0.1
JD	2005/09/22	Molybdenum	µg/L (ppb)	APHA 3030E/3125B	0.5	< 0.5	< 0.5	23.4
JD	2005/09/22	Nickel	µg/L (ppb)	APHA 3030E/3125B	0.6	< 0.6	12.4	17.8
JD	2005/09/22	Phosphorus	µg/L (ppb)	APHA 3030E/3125B	50	< 50	72	< 500
JD	2005/09/22	Selenium	µg/L (ppb)	APHA 3030E/3125B	0.8	< 0.8	5.5	< 8.0
JD	2005/09/22	Silver	µg/L (ppb)	APHA 3030E/3125B	0.2	< 0.2	< 0.2	< 2.0
JD	2005/09/22	Thallium	µg/L (ppb)	APHA 3030E/3125B	0.05	< 0.05	< 0.05	< 0.50
JD	2005/09/22	Uranium	µg/L (ppb)	APHA 3030E/3125B	0.05	< 0.05	0.21	< 0.50
JD	2005/09/22	Vanadium	µg/L (ppb)	APHA 3030E/3125B	0.1	0.2	1.6	2.0
JD	2005/09/22	Zinc	µg/L (ppb)	APHA 3030E/3125B	2	< 2	4	221

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit
Note: Sample 05-9175 had very low volume. Sample was diluted by a factor of 10, filtered and analyzed for dissolved metals as per client's request. Detection limits were adjusted accordingly for those elements that were undected.

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

amec

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Date Received: 2005/09/16
Date Sampled: 2005/08/19
Report Date: 2005/09/28

Water Analysis - Total Metals - ICP

Attention: Priscu, Caius

Project No. WX15131 **File No.:** EC-49432

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	05-8922 Ida Bay Adit 1	05-8922-D Ida Bay Adit 1 Duplicate	05-8923 Ida Bay Adit 2	05-8924 Roberts Tailing Pond	05-8925 Roberts Lake Adit
JD	2005/09/22	Calcium	mg/L (ppm)	APHA 3030E/3120	0.20	39.9	40.6	41.1	56.6	50.7
JD	2005/09/22	Iron	mg/L (ppm)	APHA 3030E/3120	0.01	0.05	0.05	0.08	0.26	0.12
JD	2005/09/22	Magnesium	mg/L (ppm)	APHA 3030E/3120	0.50	31.1	31.7	32.0	15.6	19.2
JD	2005/09/22	Manganese	mg/L (ppm)	APHA 3030E/3120	0.002	0.015	0.015	0.043	0.011	0.037
JD	2005/09/22	Potassium	mg/L (ppm)	APHA 3030E/3120	0.5	5.0	5.2	5.2	4.3	3.7
JD	2005/09/22	Silicon	mg/L (ppm)	APHA 3030E/3120	0.01	0.98	0.99	1.02	0.99	1.33
JD	2005/09/22	Sodium	mg/L (ppm)	APHA 3030E/3120	0.5	65.2	66.9	67.2	12.5	20.8

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit
Note: Sample 05-9175 had very low volume. Sample was diluted by a factor of 10, filtered and analyzed for dissolved metals as per client's request.

Report reviewed by:

for James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Date Received: 2005/09/16
Date Sampled: 2005/08/19
Report Date: 2005/09/28

Water Analysis - Total Metals - ICP

Attention: Priscu, Caius

Project No. WX15131

File No.: EC-49432

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	05-8926 Traveller	05-8927 North Pond 008	05-9175 Roberts Bay Tails Sump
JD	2005/09/22	Calcium	mg/L (ppm)	APHA 3030E/3120	0.20	< 0.20	238	110
JD	2005/09/22	Iron	mg/L (ppm)	APHA 3030E/3120	0.01	< 0.01	0.46	0.26
JD	2005/09/22	Magnesium	mg/L (ppm)	APHA 3030E/3120	0.50	< 0.50	127	22.3
JD	2005/09/22	Manganese	mg/L (ppm)	APHA 3030E/3120	0.002	< 0.002	0.139	0.238
JD	2005/09/22	Potassium	mg/L (ppm)	APHA 3030E/3120	0.5	< 0.5	12.2	13.0
JD	2005/09/22	Silicon	mg/L (ppm)	APHA 3030E/3120	0.01	< 0.01	1.23	1.72
JD	2005/09/22	Sodium	mg/L (ppm)	APHA 3030E/3120	0.5	< 0.5	574	27.4

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit
Note: Sample 05-9175 had very low volume. Sample was diluted by a factor of 10, filtered and analyzed for dissolved metals as per client's request.

Report reviewed by:

for James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Report Date: 2005/09/28

Quality Control Standard

Attention: Priscu, Caius

Project No. WX15131 **File No.:** EC-49432

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No.
JD	2005/09/22	Calcium	mg/L (ppm)	APHA 3030E/3120	0.20	34.9	30.5-39.5	35.00	V-CAT01044
JD	2005/09/22	Iron	mg/L (ppm)	APHA 3030E/3120	0.01	0.36	0.312-0.411	0.36	V-TM01054
JD	2005/09/22	Magnesium	mg/L (ppm)	APHA 3030E/3120	0.50	19.7	17.3-22.8	20.00	V-CAT01044
JD	2005/09/22	Manganese	mg/L (ppm)	APHA 3030E/3120	0.001	0.189	0.171-0.209	0.19	V-TM01054
JD	2005/09/22	Potassium	mg/L (ppm)	APHA 3030E/3120	0.5	20.9	17.0-22.9	20.00	V-CAT01044
JD	2005/09/22	Silicon	mg/L (ppm)	APHA 3030E/3120	0.01	0.23	0.21-0.26	0.23	QCP-QCS-2 (CCV)
JD	2005/09/22	Sodium	mg/L (ppm)	APHA 3030E/3120	0.5	39.4	35.8-44.2	40.00	V-CAT01044

All Analytical results pertain to samples analyzed as received.

APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.

MDL - Method Detection Limit

Note: Sample 05-9175 had very low volume. Sample was diluted by a factor of 10, filtered and analyzed for dissolved metals as per client's request.

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

amec

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Report Date: 2005/09/28

Quality Control Standard

Attention: Priscu, Caius

Project No. WX15131 **File No.:** EC-49432

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No.
JD	2005/09/22	Aluminum	µg/L (ppb)	APHA 3030E/3125B	2	47	45-55	50.00	MS-CCV-HIGH
JD	2005/09/22	Antimony	µg/L (ppb)	APHA 3030E/3125B	0.1	108	90.0-110	100.00	MS-CCV-HIGH
JD	2005/09/22	Arsenic	µg/L (ppb)	APHA 3030E/3125B	0.1	104	90.0-110	100.00	MS-CCV-HIGH
JD	2005/09/22	Barium	µg/L (ppb)	APHA 3030E/3125B	3	54	45-55	50.00	MS-CCV-HIGH
JD	2005/09/22	Beryllium	µg/L (ppb)	APHA 3030E/3125B	0.1	52.0	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/09/22	Boron	µg/L (ppb)	APHA 3030E/3125B	4	50	45-55	50.00	MS-CCV-HIGH
JD	2005/09/22	Cadmium	µg/L (ppb)	APHA 3030E/3125B	0.1	51.4	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/09/22	Chromium	µg/L (ppb)	APHA 3030E/3125B	0.4	52.5	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/09/22	Cobalt	µg/L (ppb)	APHA 3030E/3125B	0.1	49.7	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/09/22	Copper	µg/L (ppb)	APHA 3030E/3125B	2.0	50.6	45-55	50.00	MS-CCV-HIGH
JD	2005/09/22	Lead	µg/L (ppb)	APHA 3030E/3125B	0.1	106	90.0-110	100.00	MS-CCV-HIGH
JD	2005/09/21	Mercury (Total)	µg/L (ppb)	APHA 3112	0.1	2.8	2.10-3.50	2.80	P-TM01055
JD	2005/09/22	Molybdenum	µg/L (ppb)	APHA 3030E/3125B	0.3	54.2	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/09/22	Nickel	µg/L (ppb)	APHA 3030E/3125B	0.1	51.3	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/09/22	Phosphorus	µg/L (ppb)	APHA 3030E/3125B	5	252	225-275	250.00	MS-CCV-HIGH
JD	2005/09/22	Selenium	µg/L (ppb)	APHA 3030E/3125B	0.4	50.4	45-55	50.00	MS-CCV-HIGH
JD	2005/09/22	Silver	µg/L (ppb)	APHA 3030E/3125B	0.1	12.7	11.25-13.75	12.50	MS-CCV-HIGH
JD	2005/09/22	Thallium	µg/L (ppb)	APHA 3030E/3125B	0.02	241	225-275	250.00	MS-CCV-HIGH
JD	2005/09/22	Uranium	µg/L (ppb)	APHA 3030E/3125B	0.05	98.3	90-110	100.00	MS-CCV-HIGH
JD	2005/09/22	Vanadium	µg/L (ppb)	APHA 3030E/3125B	0.5	50.8	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/09/22	Zinc	µg/L (ppb)	APHA 3030E/3125B	2	52	45-55	50.00	MS-CCV-HIGH

All Analytical results pertain to samples analyzed as received.

APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.

MDL - Method Detection Limit

Note: Sample 05-9175 had very low volume. Sample was diluted by a factor of 10, filtered and analyzed for dissolved metals as per client's request. Detection limits were adjusted accordin those elements that were undected.

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Report Date: 2005/09/28

Quality Control Standard

Attention: Priscu, Caius

Project No. WX15131 **File No.:** EC-49432

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No.
JD	2005/09/21	Sulphur	mg/L (ppm)	APHA 3030E/3120	0.5	7.1	6.0 - 7.3	6.70	SC3155670

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Date Received: 2005/09/16
Date Sampled: 2005/08/19
Report Date: 2005/09/28

Water Analysis - Total Metals - ICP

Attention: Priscu, Caius

Project No. WX15131 **File No.:** EC-49432

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	05-8922 Ida Bay Adit 1	05-8922-D Ida Bay Adit 1 Duplicate	05-8923 Ida Bay Adit 2	05-8924 Roberts Tailing Pond	05-8925 Roberts Lake Adit
JD	2005/09/21	Sulphur	mg/L (ppm)	APHA 3030E/3120	0.1	11.2	11.4	11.4	20.3	6.8

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Date Received: 2005/09/16
Date Sampled: 2005/08/19
Report Date: 2005/09/28

Water Analysis - Total Metals - ICP

Attention: Priscu, Caius

Project No. WX15131

File No.: EC-49432

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	05-8926 Traveller	05-8927 North Pond 008	05-9175 Roberts Bay Tails Sump
JD	2005/09/21	Sulphur	mg/L (ppm)	APHA 3030E/3120	0.1	< 0.1	9.5	88.2

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit

Report reviewed by:

for Brenda Chomin

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

amec EARTH & ENVIRONMENTAL

EC 49428 Bin 2

Chain of Custody Record/Analysis Request

18.2°c.

Tracking #:

ISSUING OFFICE: AMEC Winnipeg

Project Name: ROBERTS BAY Mine Job No.: WX15131/Ph 2000

Project Manager: C. PRISCU Phone No.: 204-488-2997

Sampler: JIM WARREN

Client Sample ID	AMEC E & E Lab Sample ID (FOR LAB USE ONLY)	Date Collected (yyyy/mm/dd)	Matrix	1L Bottle	250 mL Jar	40 mL Vial	1L Polyethylene	Ziplock Bag	ANALYSIS REQUIRED (Note preferred method): ICP-MS Metals	50% RUSH (Please Notify Lab!)	100% RUSH (Please Notify Lab!)
RBTP-10V	8910	Aug 22, 2005	Vegetation					X			

QUOTED PRICE: ○ YES (Please attach a copy of the quote) ◉ NO

Quote #:

Receiver's Comments:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	Comments:
Signature: [signature]	Signature: RECEIVED.	Signature:	Signature:	
Printed Name: CAIUS PRISCU	Printed Name:	Printed Name:	Printed Name:	
Firm: AMEC WPG	Firm: A E-EDMONTON	Firm:	Firm:	
Date/Time: Sept 15, 2005	Date/Time:	Date/Time:	Date/Time:	

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

amec

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Date Received: 2005/09/16
Date Sampled: 2005/08/22
Report Date: 2005/09/28

Soil Analysis - ICP/MS

Attention: Priscu, Caius

Project No. WX15131/Ph 2000

File No.: EC-49429

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	05-8911 RBTP-10V	05-8911-D RBTP-10V Duplicate
JD	2005/09/21	Aluminum	µg/g (ppm)	EPA 3050B/6020	1.0	122	218
JD	2005/09/21	Arsenic	µg/g (ppm)	EPA 3050B/6020	0.05	3.11	3.87
JD	2005/09/21	Barium	µg/g (ppm)	EPA 3050B/6020	1.0	55.2	73.8
JD	2005/09/21	Cadmium	µg/g (ppm)	EPA 3050B/6020	0.01	0.18	0.20
JD	2005/09/21	Calcium	µg/g (ppm)	EPA 3050/6010	5	6390	12000
JD	2005/09/21	Chromium	µg/g (ppm)	EPA 3050B/6020	0.05	6.99	7.30
JD	2005/09/21	Cobalt	µg/g (ppm)	EPA 3050B/6020	0.05	0.36	0.53
JD	2005/09/21	Copper	µg/g (ppm)	EPA 3050B/6020	0.01	9.62	7.73
JD	2005/09/21	Iron	µg/g (ppm)	EPA 3050/6010	5	371	555
JD	2005/09/21	Lead	µg/g (ppm)	EPA 3050B/6020	0.10	9.32	11.3
JD	2005/09/21	Magnesium	µg/g (ppm)	EPA 3050/6010	1	862	1970
JD	2005/09/21	Manganese	µg/g (ppm)	EPA 3050/6010	0.10	298	496
JD	2005/09/21	Mercury	µg/g (ppm)	EPA 3050/6010	0.50	< 0.50	< 0.50
JD	2005/09/21	Molybdenum	µg/g (ppm)	EPA 3050B/6020	0.2	6.1	4.5
JD	2005/09/21	Nickel	µg/g (ppm)	EPA 3050B/6020	0.10	4.13	5.62
JD	2005/09/21	Phosphorus	µg/g (ppm)	EPA 3050B/6020	5.0	1440	1510
JD	2005/09/21	Potassium	µg/g (ppm)	EPA 3050/6010	1	12100	16000
JD	2005/09/21	Selenium	µg/g (ppm)	EPA 3050B/6020	0.10	< 0.10	< 0.10
JD	2005/09/21	Sodium	µg/g)ppm)	EPA 3050/6010	1	205	347
JD	2005/09/21	Thallium	µg/g (ppm)	EPA 3050B/6020	0.05	< 0.05	< 0.05
JD	2005/09/21	Vanadium	µg/g (ppm)	EPA 3050B/6020	0.05	2.56	0.73
JD	2005/09/21	Zinc	µg/g (ppm)	EPA 3050B/6020	0.5	120	129

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
EPA: U.S. Environmental Protection Agency. 1997. Test Methods of Evaluation of Solid Waste 3rd Ed through Update III. Office Solid Waste Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.
MDL - Method Detection Limit

Report reviewed by:

for James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

amec

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Report Date: 2005/09/28

Quality Control Standard

Attention: Priscu, Caius

Project No. WX15131/Ph 2000

File No.: EC-49429

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No.
JD	2005/09/21	Aluminum	µg/g (ppm)	EPA 3050B/6020	1.0	6250	5408-10788	8,098.00	SS#8
JD	2005/09/21	Arsenic	µg/g (ppm)	EPA 3050B/6020	0.05	13.2	10.1-14.7	12.40	SS#8
JD	2005/09/21	Barium	µg/g (ppm)	EPA 3050B/6020	1.0	307	139-332	236.00	SS#8
JD	2005/09/21	Cadmium	µg/g (ppm)	EPA 3050B/6020	0.01	1.24	0.9-1.3	1.10	SS#8
JD	2005/09/21	Calcium	µg/g (ppm)	EPA 3050/6010	5	19100	15155-23039	19,097.00	SS#8
JD	2005/09/21	Chromium	µg/g (ppm)	EPA 3050B/6020	0.05	22.9	16.3-33.0	24.70	SS#8
JD	2005/09/21	Cobalt	µg/g (ppm)	EPA 3050B/6020	0.05	6.72	4.3-9.1	6.70	SS#8
JD	2005/09/21	Copper	µg/g (ppm)	EPA 3050B/6020	0.01	108	91.4-125	108.00	SS#8
JD	2005/09/21	Iron	µg/g (ppm)	EPA 3050/6010	5	16100	13667-21894	17,781.00	SS#8
JD	2005/09/21	Lead	µg/g (ppm)	EPA 3050B/6020	0.10	35.4	25.5-37.8	31.60	SS#8
JD	2005/09/21	Magnesium	µg/g (ppm)	EPA 3050/6010	1	3640	3145-4496	3,821.00	SS#8
JD	2005/09/21	Manganese	µg/g (ppm)	EPA 3050/6010	0.10	433	369-610	489.00	SS#8
JD	2005/09/21	Mercury	µg/g (ppm)	EPA 3050/6010	0.50	3.60	1.8-3.7	2.70	SS#8
JD	2005/09/21	Molybdenum	µg/g (ppm)	EPA 3050B/6020	0.2	60.1	47.6-78.1	62.90	ERA 540
JD	2005/09/21	Nickel	µg/g (ppm)	EPA 3050B/6020	0.10	18.5	13.8-23.2	18.50	SS#8
JD	2005/09/21	Phosphorus	µg/g (ppm)	EPA 3050B/6020	5.0	1100	1008-1375	1,192.00	SS#8
JD	2005/09/21	Potassium	µg/g (ppm)	EPA 3050/6010	1	1360	532-1567	1,050.00	SS#8
JD	2005/09/21	Selenium	µg/g (ppm)	EPA 3050B/6020	0.10	106	69.6-124	97.00	ERA 540
JD	2005/09/21	Sodium	µg/g (ppm)	EPA 3050/6010	1	746	485-1244	865.00	SS#8
JD	2005/09/21	Thallium	µg/g (ppm)	EPA 3050B/6020	0.05	84.2	58.4-100	79.10	ERA 540
JD	2005/09/21	Vanadium	µg/g (ppm)	EPA 3050B/6020	0.05	17.7	12.6-23.1	17.90	SS#8
JD	2005/09/21	Zinc	µg/g (ppm)	EPA 3050B/6020	0.5	140	110-156	133.00	SS#8

All Analytical results pertain to samples analyzed as received.

APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.

EPA: U.S. Environmental Protection Agency. 1997. Test Methods of Evaluation of Solid Waste 3rd Ed through Update III. Office Solid Waste Emergency Response, U.S. Environmental P Agency, Washington, D.C.

MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

amec

EARTH & ENVIRONMENTAL

Chain of Custody Record/Analysis Request

Tracking #:			
ISSUING OFFICE:	Mississauga AMEC E&E		
Project Name:	Roberts Ida Bay Closure Plan	**Job No.:**	WX15131
Project Manager:	Caius Priscu	**Phone No.:**	905-568-2929
Sampler:	Jim Warren		

ANALYSIS REQUIRED (Note preferred method)

QUOTED PRICE

☐ YES

Please attach a copy of the quote

☒ NO

Quote #:

Client Sample ID	AMEC E & E Lab Sample ID FOR LAB USE ONLY	Date Collected yyyy/mm/dd	Matrix	1L Bottle	250 mL Jar	40 mL Vial	1L Polyethylene	50 ml polyethylene			Metals via ICP/MS												50% RUSH (Please Notify Lab!)	100% RUSH (Please Notify Lab!)
H2O		2005/11/16	water		X						X													
H2O w/ Acid		2005/08/19	water		X						X													

Receiver's Comments

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:	Comments:
Signature:	Signature:	Signature:	Signature:	
Printed Name: Jim Warren	Printed Name:	Printed Name:	Printed Name:	
Firm: Mississauga AMEC E&E	Firm:	Firm:	Firm:	
Date/Time: 16-Nov-05	Date/Time:	Date/Time:	Date/Time:	

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Date Received: 2005/11/17
Date Sampled: 2005/11/16
Report Date: 2005/11/29

Water Analysis - Total Metals - ICP/MS

Attention: Priscu, Caius

Project No. WX15131

File No.: EC-49792

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	05-12530 H2O	05-12531 H2O w/ Acid
JD	2005/11/24	Aluminum	µg/L (ppb)	APHA 3030E/3125B	5	< 5	< 5
JD	2005/11/24	Antimony	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	0.1
JD	2005/11/24	Arsenic	µg/L (ppb)	APHA 3030E/3125B	0.4	< 0.4	< 0.4
JD	2005/11/24	Barium	µg/L (ppb)	APHA 3030E/3125B	5	< 5	< 5
JD	2005/11/24	Beryllium	µg/L (ppb)	APHA 3030E/3125B	0.5	< 0.5	< 0.5
JD	2005/11/24	Boron	µg/L (ppb)	APHA 3030E/3125B	10	< 10	< 10
JD	2005/11/24	Cadmium	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	< 0.1
JD	2005/11/24	Chromium	µg/L (ppb)	APHA 3030E/3125B	0.9	< 0.9	< 0.9
JD	2005/11/24	Cobalt	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	< 0.1
JD	2005/11/24	Copper	µg/L (ppb)	APHA 3030E/3125B	1.0	< 1.0	< 1.0
JD	2005/11/24	Lead	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	< 0.1
JD	2005/11/24	Mercury (Total)	µg/L (ppb)	APHA 3112	0.10	< 0.10	< 0.10
JD	2005/11/24	Molybdenum	µg/L (ppb)	APHA 3030E/3125B	0.5	< 0.5	< 0.5
JD	2005/11/24	Nickel	µg/L (ppb)	APHA 3030E/3125B	0.6	< 0.6	< 0.6
JD	2005/11/24	Phosphorus	µg/L (ppb)	APHA 3030E/3125B	50	< 50	< 50
JD	2005/11/24	Selenium	µg/L (ppb)	APHA 3030E/3125B	0.8	< 0.8	< 0.8
JD	2005/11/24	Silver	µg/L (ppb)	APHA 3030E/3125B	0.2	< 0.2	< 0.2
JD	2005/11/24	Thallium	µg/L (ppb)	APHA 3030E/3125B	0.05	< 0.05	< 0.05
JD	2005/11/24	Uranium	µg/L (ppb)	APHA 3030E/3125B	0.05	< 0.05	< 0.05
JD	2005/11/24	Vanadium	µg/L (ppb)	APHA 3030E/3125B	0.1	< 0.1	< 0.1
JD	2005/11/24	Zinc	µg/L (ppb)	APHA 3030E/3125B	2	< 2	< 2

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Date Received: 2005/11/17
Date Sampled: 2005/11/16
Report Date: 2005/11/29

Water Analysis - Total Metals - ICP

Attention: Priscu, Caius

Project No. WX15131

File No.: EC-49792

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	05-12530 H2O	05-12531 H2O w/ Acid
JD	2005/11/24	Calcium	mg/L (ppm)	APHA 3030E/3120	0.50	< 0.50	< 0.50
JD	2005/11/24	Iron	mg/L (ppm)	APHA 3030E/3120	0.10	< 0.10	< 0.10
JD	2005/11/24	Magnesium	mg/L (ppm)	APHA 3030E/3120	0.50	< 0.50	< 0.50
JD	2005/11/24	Manganese	mg/L (ppm)	APHA 3030E/3120	0.010	< 0.010	< 0.010
JD	2005/11/24	Potassium	mg/L (ppm)	APHA 3030E/3120	0.5	< 0.5	< 0.5
JD	2005/11/24	Silicon	mg/L (ppm)	APHA 3030E/3120	0.01	< 0.01	< 0.01
JD	2005/11/24	Sodium	mg/L (ppm)	APHA 3030E/3120	0.5	< 0.5	< 0.5

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

amec

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Report Date: 2005/11/29

Quality Control Standard

Attention: Priscu, Caius

Project No. WX15131

File No.: EC-49792

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No.
JD	2005/11/24	Calcium	mg/L (ppm)	APHA 3030E/3120	0.20	34.5	33.8-41.3	37.50	SC4166266 (CCV)
JD	2005/11/24	Iron	mg/L (ppm)	APHA 3030E/3120	0.01	0.96	0.90-1.10	1.00	QCP-QCS (CCV-Cats)
JD	2005/11/24	Magnesium	mg/L (ppm)	APHA 3030E/3120	0.50	35.5	33.8-41.3	37.50	SC4166266 (CCV)
JD	2005/11/24	Manganese	mg/L (ppm)	APHA 3030E/3120	0.002	0.970	0.90-1.10	1.00	QCP-QCS (CCV-Cats)
JD	2005/11/24	Potassium	mg/L (ppm)	APHA 3030E/3120	0.5	37.7	33.8-41.3	37.50	SC4166266 (CCV)
JD	2005/11/24	Silicon	mg/L (ppm)	APHA 3030E/3120	0.01	2.41	2.10-2.57	2.33	QCP-QCS (CCV-Cats)
JD	2005/11/24	Sodium	mg/L (ppm)	APHA 3030E/3120	0.5	35.4	33.8-41.3	37.50	SC4166266 (CCV)

All Analytical results pertain to samples analyzed as received.

APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.

MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

4810 - 93 Street
Edmonton, Alberta
Canada T6E 5M4
Tel: (780) 436-2152
Fax: (780) 435-8425

amec

ANALYTICAL REPORT

AMEC Earth & Environmental
440 Dovercourt Drive
Winnipeg, MB R3Y 1N4

Report Date: 2005/11/29

Quality Control Standard

Attention: Priscu, Caius

Project No. WX15131

File No.: EC-49792

Analyst	Date of Analysis (yyyy/m/d)	Analytical Parameter	Units	Reference Method	MDL	Analyzed Value	Advisory Range	Target Value	Reference No.
JD	2005/11/24	Aluminum	µg/L (ppb)	APHA 3030E/3125B	2	49	45-55	50.00	MS-CCV-HIGH
JD	2005/11/24	Antimony	µg/L (ppb)	APHA 3030E/3125B	0.1	106	90.0-110	100.00	MS-CCV-HIGH
JD	2005/11/24	Arsenic	µg/L (ppb)	APHA 3030E/3125B	0.1	98.5	90.0-110	100.00	MS-CCV-HIGH
JD	2005/11/24	Barium	µg/L (ppb)	APHA 3030E/3125B	3	51	45-55	50.00	MS-CCV-HIGH
JD	2005/11/24	Beryllium	µg/L (ppb)	APHA 3030E/3125B	0.1	53.9	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/11/24	Boron	µg/L (ppb)	APHA 3030E/3125B	4	52	45-55	50.00	MS-CCV-HIGH
JD	2005/11/24	Cadmium	µg/L (ppb)	APHA 3030E/3125B	0.1	52.6	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/11/24	Chromium	µg/L (ppb)	APHA 3030E/3125B	0.4	49.8	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/11/24	Cobalt	µg/L (ppb)	APHA 3030E/3125B	0.1	51.4	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/11/24	Copper	µg/L (ppb)	APHA 3030E/3125B	2.0	52.8	45-55	50.00	MS-CCV-HIGH
JD	2005/11/24	Lead	µg/L (ppb)	APHA 3030E/3125B	0.1	102	90.0-110	100.00	MS-CCV-HIGH
JD	2005/11/24	Mercury (Total)	µg/L (ppb)	APHA 3112	0.10	2.85	2.10-3.50	2.80	P-TM01055
JD	2005/11/24	Molybdenum	µg/L (ppb)	APHA 3030E/3125B	0.3	54.5	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/11/24	Nickel	µg/L (ppb)	APHA 3030E/3125B	0.1	51.1	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/11/24	Phosphorus	µg/L (ppb)	APHA 3030E/3125B	5	267	225-275	250.00	MS-CCV-HIGH
JD	2005/11/24	Selenium	µg/L (ppb)	APHA 3030E/3125B	0.4	49.8	45-55	50.00	MS-CCV-HIGH
JD	2005/11/24	Silver	µg/L (ppb)	APHA 3030E/3125B	0.1	13.1	11.25-13.75	12.50	MS-CCV-HIGH
JD	2005/11/24	Thallium	µg/L (ppb)	APHA 3030E/3125B	0.02	255	225-275	250.00	MS-CCV-HIGH
JD	2005/11/24	Uranium	µg/L (ppb)	APHA 3030E/3125B	0.05	103	90-110	100.00	MS-CCV-HIGH
JD	2005/11/24	Vanadium	µg/L (ppb)	APHA 3030E/3125B	0.5	53.3	45.0-55.0	50.00	MS-CCV-HIGH
JD	2005/11/24	Zinc	µg/L (ppb)	APHA 3030E/3125B	2	51	45-55	50.00	MS-CCV-HIGH

All Analytical results pertain to samples analyzed as received.
APHA: Standard Method for the Examination of Water and Wastewater, 1998. 20th Ed. American Public Health Association.
MDL - Method Detection Limit

Report reviewed by:

James A. LeBlanc, B.Sc., P.Chem.
Director of QA/QC
Laboratory Services

Brenda Chomin, P.Chem.
Manager
Laboratory Services

** All samples will be disposed of after 30 days following analysis. Please contact the lab if you require additional sample storage time. (Samples deemed hazardous will be returned to the client at their own expense or disposal will be arranged.) **

APPENDIX B

Waste Rock – Volume & Area Summary

Land Surveys Limited

Prepared: November 16, 2005
Project: ALS050052

Waste Rock - Volume & Area Summary

Robert's Bay

Total Waste Rock Area = 12,655 sq. m.

		Perimeter Area (sq. m)	Average Depth (estimated) (m)	Volume (average depth method) (cu. m)	Volume (by cross section method) (cu. m)	Average Depth (calc'd) (m)
1	Ore Pad - West Half	156.0	0.2	31.2	n/a	n/a
2	Ore Pad - East Half	161.0	0.2	32.2	n/a	n/a
3	Explosives Area (including road)	198.0	0.1	19.8	n/a	n/a
4	Fuel Bladder Berm - South Half	225.0	n/a	n/a	76.0	0.3
5	Fuel Bladder Berm - North Half	223.0	n/a	n/a	72.0	0.3
6	Waste Rock Pile - South End	66.3	n/a	n/a	79.6	1.2
7	Waste Rock Pile - North East End	66.3	n/a	n/a	79.6	1.2
8	Waste Rock Pile - North West End	66.3	n/a	n/a	79.6	1.2
9	Discrete Sample	n/a	n/a	n/a	n/a	n/a
10	Discrete Sample	n/a	n/a	n/a	n/a	n/a
11	Waste Rock Plateau - East	1625.0	0.3	487.5	n/a	n/a
12	Waste Rock Plateau - North	1105.0	0.3	331.5	n/a	n/a
13	Waste Rock Pile 1 (East)	165.8	n/a	n/a	154.8	0.9
14	Waste Rock Pile #2 (North)	39.6	n/a	n/a	26.8	0.7
15	Waste Rock Berm #1 (W of Fine Ore Pad))	113.9	n/a	n/a	59.0	0.5
16	Access Road to Ida Bay	902.0	0.5	451.0	n/a	n/a
17	Fine Ore Pad	669.0	0.2	133.8	n/a	n/a
18	Mill Yard Area (North)	836.0	0.3	250.8	n/a	n/a
19	Waste Rock Berm #2 (N of Tailings Pond)	145.0	0.3	43.5	n/a	n/a
20	Waste Rock Berm #3 (S of Tailings Pond	401.0	0.8	320.8	n/a	n/a
21	Waste Rock around Dump	80.0	0.6	48.0	n/a	n/a
22	Ramp of Waste Rock (to Adit #2)	322.0	0.2	64.4	n/a	n/a
	Total Waste Rock Accounted For:	7566.2		2214.5	627.4	
	Waste Rock Area Unaccounted For:	5088.8				

Ida Bay

Total Waste Rock Area = 4,875 sq. m.

A	Waste Rock Pile # 1 (East)	1077.6	n/a	n/a	1606.4	1.5
B	Waste Rock Pile # 2 (North)	390.9	n/a	n/a	602.3	1.5
C	Waste Rock Pile # 3 (South)	369.0	0.4	147.6	n/a	n/a
D	Waste Rock Pile #4 (West)	228.9	n/a	n/a	156.0	0.7
	Total Waste Rock Accounted For:	2066.4		147.6	2364.7	
	Waste Rock Area Unaccounted For:	2808.6				